PROCEEDINGS
International Conference on New Media Research Networks - March 26 - 27, 2004

Arts-Netlantic

CAHIERS DES ACTES
Conférence sur les réseaux de recherche en nouveaux médias - 26 - 27 mars, 2004

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 1

PROCEEDINGS
CAHIERS DES ACTES

March 26 - 27, 2004
Charlottetown, PEI

26 - 27 mars, 2004
Charlottetown, ÎPÉ

International Conference on New Media Research Networks

Arts-Netlantic

Conférence sur les réseaux de recherche en nouveaux médias

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 3

ORGANIZING COMMITTEE

Steering Committee:

Annabel Cohen (Convener)	University of Prince Edward Island
Jon Tupper	Confederation Centre of the Arts
Chadia Moghrabi	Université de Moncton
Richard Hornsby	University of New Brunswick

Finance and Administration:

Ellen Sherren	University of Prince Edward Island

Scholarly Program Committee Co-Chairs:

Friedemann Sallis
Anne Furlong

Sub-Committee:

Ronald Labelle	Culture
Jane Ledwell	Culture
Wladyslaw Cichocki	Multimedia
Sandy McAuley	Multimedia
Tang-Ho Le	Technology
Kirby Ward	Technology
Janet Stoppard	Cognition
John Tivendell	Cognition

Artistic Program Committee:

Lise Robichaud
Luc Charette
Betsy Epperly
N.L. Altman

Page 4

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004
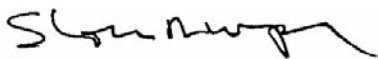
Dear Friends,

On behalf of the Federal Government, I would like to welcome you to the Arts-Netlantic International Conference on New Media Research Networks.

In recent years, advances in information technology have offered our society new outlets through which to express our arts and culture. These new media channels must be cultivated through research, discussion and innovation. This conference will offer you a chance to create the relationships necessary to ensure that new media continues to grow in Atlantic Canada and around the world.

Please accept my best wishes for a very successful conference.

Sincerely,

Hon. Shawn Murphy, MP
Hillsborough

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 5

University of
Prince Edward Island
Office of the President

March 22, 2004

Dear Participants in Arts-Netlantic New Media Research Networks Conference,

On behalf of the University of Prince Edward Island, I am delighted to welcome you to this wonderful Conference on *New Media Research Networks*. This Conference represents a special collaboration among the Department of Canadian Heritage, l'Université de Moncton, University of New Brunswick, the Confederation Centre of the Arts, and the University of Prince Edward Island. This unique partnership contains an important message about the most promising and productive ways to achieve new media breakthroughs.

This Conference and Arts-Netlantic CMTC seek new interactions among culture, multimedia, technology, and cognition. The underlying platforms are both human and technological, in the broadest sense. This Conference is truly multi-disciplinary and cross-sectoral, aiming to build bridges across cultures, languages, disciplines, institutions, and geographies. At UPEI, we are proud of the leadership role that Dr. Annabel Cohen has played in bringing about this remarkable collaboration. And we look forward to long-term fruitful relationships as we pursue all of the possibilities to which this Conference on *New Media Research Networks* will give rise.
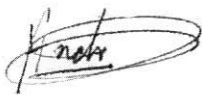
Have a great Conference.

Sincerely,

H. Wade MacLauchlan
President and Vice Chancellor

UNIVERSITÉ
DE MONCTON

Bureau du vice-recteur adjoint à la recherche et
Faculté des études supérieures et de la recherche

Moncton, le 24 mars 2004

Au nom de l'Université de Moncton et de la Faculté des études supérieures et de la recherche, je voudrais féliciter chaleureusement les organisateurs au sein du réseau Arts-Netlantic de la Conférence internationale sur les réseaux de recherche en nouveaux médias.

Le programme est impressionnant et reflète les accomplissements issus de la collaboration bien établie entre l'University of Prince Edward Island, l'Université de Moncton et l'University of New Brunswick. Quel meilleur exemple de système productif de connectivité que trois universités atlantiques travaillant dans deux langues et permettant des partenariats efficaces entre scientifiques et artistes et entre académiciens et industriels, tout en s'assurant de la participation active des secteurs privé et publique. L'originalité de l'intéressante approche de Arts-Netlantic saisit l'essence même de la recherche multidisciplinaire et de la créativité. Je présente à toutes et à tous mes meilleurs souhaits pour une réunion réussie et profitable et je saisis l'occasion pour reconnaître le travail remarquable de Dr Annabel Cohen, chef du projet, et de Dr Chadia Moghrabi, directrice technique du réseau. La contribution importante de Patrimoine canadien qui a permis le décollage et la réalisation du projet ne saura être sous-estimée.

Andrew Boghen, Ph.D.
Vice-recteur adjoint à la recherche &
Doyen de la Faculté des études supérieures et de la recherche

On behalf of the Université de Moncton and the Faculty of Graduate Studies and Research, I would like to extend my warmest congratulations to the organizers of the Arts-Netlantic International Conference on New Media Research Networks.

The program is impressive and reflects well on the accomplishments emanating from the collaboration established between UPEI, UdeM and UNB. What can be more exemplary of productive networking than three Atlantic universities working in two languages and helping to create effective partnerships between scientists and artists and between academics and industry, while at all times ensuring that private and public sectors remain actively involved. The originality of Arts-Netlantic's exciting approach captures the spirit and value of multidisciplinary research and creativity. I extend my best wishes to all for a successful and profitable meeting and take the opportunity to acknowledge the remarkable work achieved by Dr. Annabel Cohen, Director of the project and Dr. Chadia Moghrabi, its Technical Director. Heritage Canada's important contribution in allowing this project to take off and becoming a reality cannot be overstated.

Andrew Boghen, Ph.D.
AssociateVice-President, Research &
Dean of the Faculty of Graduate Studies and Research

On behalf of Arts-Netlantic, I welcome delegates to the International Conference on New Media Research Networks.

During the last year, through the generosity of many institutions and individuals, a dream has become a reality. Imagine a space where artists, scientists, and humanists come together to share ideas. Imagine a place in which artists have free access to the latest technologies which enable expression of ideas in new ways. Imagine a time when people gather to consider questions about culture, creativity in new media, and through discussions increase their knowledge. Imagine a forum where creativity thrives, an arena where both tradition and departures from tradition are revered. Imagine Arts-Netlantic.

The New Media Research Networks Fund of the Canadian Culture Online Program of Canadian Heritage enabled over 60 people from two provinces, three regions, two primary cultures, industrial, academic and government sectors, and countless disciplines to meet, discuss, develop, learn, laugh, and communicate together.

Arts-Netlantic is about connections. How far we have come from where we were a year ago. We have become aware of the many resources of knowledge in the artistic and information technology areas that are within our midst in Atlantic Canada and beyond. By bringing together in one place many people who belong to networks that focus on new media research, the present conference becomes an opportunity to create a network of networks.

Arts-Netlantic is an experiment. It is a test of an hypothesis that optimal conditions will produce creativity in the arts, discoveries in the sciences, and advances in technologies. We hope to show during the very full program of this conference that the results support the hypothesis.

None of this would have been possible without the support of numerous institutions and individuals. Already mentioned is the Canadian Culture Online Program, but we should specifically mention Jennifer Friend, our truly helpful Program Officer. The Universities of Prince Edward Island, Université de Moncton, and University of New Brunswick have provided outstanding support for this project by sharing their personnel, space, and consultation. Over three years ago, the President of the University of Prince Edward Island, Wade MacLauchlan, envisioned a collaboration among these three campuses, a vision shared by other U. P. E. I. senior administrators at that time. It is wonderful to see this vision realized in Arts-Netlantic over the last year. The project could not have happened without the help of Dr. Katherine Schultz, Vice-President of Research and Development of U.P.E.I. Immeasurable support was also provided by Dr. Andrew Boghen, Associate Vice President and Dean of the Faculty of Graduate Studies and Research of the University of Moncton, and Dr. Greg Keeley, Vice President of Research at the University of New Brunswick.

Arts-netlantic is a network of people. The Network owes its strength to the strength of its Principal Investigators. Chief among these is Dr. Chadia Moghrabi, the Network Technical Leader who extended her efforts far beyond technology to oversee many of the goals of the network. Coordinating the technological elements at each of the three sites was Blair Vessey at U. P. E. I, Tang-Ho Lê at Université de Moncton, and Kirby Ward at University of New Brunswick. Team Leaders Betsy Epperly (U.P.E.I.), Friedemann Sallis (U de M) and Wladyslaw Cichocki (UNB) are owed much for their conscientious monitoring of activities on their respective campuses and their active participation in Network and executive meetings. Other members of the University Community such as Anne Furlong, Sandy McAuley, Luc Charette, Lise Robichaud, and Richard Hornsby were active contributors to the Network. The P.E.I. Council of the Arts and the New Brunswick Arts Board are acknowledged with gratitude for facilitation of the links with the arts and culture communities in the two provinces respectively and assistance with the Artist-Technologist Partnership Awards. The National Research Council Institute for Information Technology in Moncton (e-Learning) and Fredericton (e-Business) linked Arts-Netlantic

with its latest scientific activities. The work of three e-Learning companies: Future-Learning Inc (PEI), Blizzart Conseil (NB), and Red Hot Learning (NB) added an applied dimension to the activities of the Network, as did the development of the DKNS e-learning system of Dr. Tang-Ho Lê. Christine Gordon in PEI, and Joanne Hachey and Jean Roy at U de M worked on the inventory, design, and the prototype of the digital library.

The Arts-Netlantic Behavioural Research Team focused on the mental activities that underly artistic and audience behaviour. Through numerous videoconferences, traditional research paradigms were extended to research that focused on human responses to new media. It was a pleasure to work with principal investigators Dr. Janet Stoppard of UNB and Dr. John Tivendell of U de M and to have the support and assistance of Susan Noye, Jean François Martel, Betty Bailey, Jennifer Ghiz and Kelti MacMillan, who devoted themselves to determining the nature of new media, its creators and its audience.

Meeting the administrative demands of Arts-Netlantic was a team of administrative coordinators: Annette Campbell (U.P.E.I.), Alicia Tracey (UNB), and Carolji Corbeil (UdeM). Ellen Sherren, the conference administrative coordinator, worked countless late hours to support the meeting in recent months.

People with skills in audiovisual and information technologies were essential to the success of the network. Mélanie Roy, and Patrick Kenny at the Université de Moncton, Rodrigo Gutierrez-Hermlo of UNB, and Shawn McCormack, Robert Drew, Jeff Porter, Steven Comeau (web-site), and Danny Ledwell at U.P.E.I. carried out two essential tasks without which the Network could not function. First, in cooperation with the Principal Investigators, they established the technical resources. Second, they offered training and support to the artists who wished to use the equipment. As well as one-on-one assistance, Rodrigo Gutierrez-Hermlo, Robert Drew, and Jeff Porter offered well attended weekend workshops that have been archived for future use. The rapid development of the Arts-Netlantic facilities was greatly assisted by the cooperation of Networx, one of the major suppliers of the audiovisual production equipment. In particular Kaushal Hathi worked with the researchers to optimize the facilities. We also are grateful for the kind co-operation of David Vokey of IBM, and Paul S. Barton of PSB speakers.

Additional gratitude is extended to all those who gave of their time to make presentations at the monthly videoconferenced network meetings. It has been gratifying to see the many artists in our communities who have taken part in these meetings and who have benefitted from the technical and human resources provided by Arts-Netlantic. There are many others who have contributed to the success of this project, whose names have not been mentioned.

On a personal note, I would like to thank my academic home, the Department of Psychology at the University of Prince Edward Island, for providing me the time to concentrate on the Arts-Netlantic project. I hope that this will be useful in the long term for the Department by opening new doors to research in experimental aesthetics and multimedia perception. The support of my past and present Deans of Arts, Dr. Philip Smith and Dr. Richard Kurial respectively, is also greatly appreciated. The contribution of U.P.E.I. psychology students Angela Arsenault, Elizabeth McFadden, Gabrielle Major, and Steven Macintyre is also acknowledged.

Sincerely,

Annabel J. Cohen, Ph. D.
Arts-Netlantic CMTC Project Leader

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 9

INTERNATIONAL CONFERENCE OF NEW MEDIA RESEARCH NETWORKS
CONFÉRENCE INTERNATIONALE DES RÉSEAUX DE RECHERCHE SUR LES NOUVEAUX MÉDIAS

We are pleased to provide the *Proceedings of the Conference of New Media Research Networks,* held in Charlottetown, PE March 26 - 27, 2004. The conference is being hosted by Arts-Netlantic CMTC, an expanding network of researchers, information technologists, and artists within Atlantic Canada working on culture, multimedia, technology, and cognition. Inspired by the Confederation Bridge that links Prince Edward Island and New Brunswick, the conference theme is connections and reflections: connections made possibly by new media and reflections of culture through new media. Arts-Netlantic aims to build bridges between arts and technology across cultures, languages, disciplines, institutions, and geographies. With this in mind, scholarly/ technical and artistic/narrative contributions for all fields relevant to New Media research are well represented. These published conference *Proceedings* provide evidence of a broad forum for discussion that encompasses many scholars, information technologists, and artists.

We would like to thank the many authors who provided papers for the *Proceedings* on the conference themes of culture, multimedia, technology and cognition and their interaction. Publication of these *Proceedings* would not have been possible without the dedicated service of Robert Drew, at U. P. E. I. He spent countless, sleepless hours compiling and formatting the papers using Adobe InDesign. He also designed the attractive cover. Ellen Sherren provided steady administrative support and communicated with the authors. Special thanks go to Gerald Beaulieu who was willing for Arts-Netlantic to use his artwork as our logo and in our *Proceedings*. The Proceedings represents the achievement of a final milestone in this phase of the Arts-Netlantic project. The Canadian Culture Online Program is gratefully acknowledged for its support.

Sincerely,

Annabel J. Cohen, Ph. D.
Chadia Moghrabi, Ph. D.
Co-editors

Nous sommes heureuses de fournir les Cahiers des actes de la conférence des réseaux de recherche sur les nouveaux médias, qui a lieu à Charlottetown, IPE les 26-27 mars 2004. La conférence est organisée par Arts-Netlantic CMTC, un réseau en croissance formé de chercheurs, d'informaticiens, et d'artistes du Canada atlantique oeuvrant sur la culture, le multimédia, la technologie et la cognition. Inspirés par le Pont de la confédération qui connecte l'Ile du Prince Édouard et le Nouveau-Brunswick, le thème de la conférence porte sur les connexions et les reflets: connexions facilitées par les nouveaux médias et reflets de la culture par ces médias. Arts-Netlantic vise à construire des ponts entre l'art et la technologie à travers les cultures, les langues, les disciplines, les institutions et les régions géographiques. En ce sens, des articles à la fois académiques, techniques ou artistiques sont assez bien représentés dans les actes. Ces cahiers témoignent de la largeur du forum de discussion parmi les académiciens.

Nous voudrons remercier les nombreux auteurs qui ont fournit des articles pour ces Cahiers des actes portant sur la culture, le multimédia, la technologie et la cognition ainsi que leur interaction. La publication des Actes n'aurait pas pu se faire sans les sincères services de Robert Drew, à l'Î.P.É. Il a passé de nombreuses heures sans sommeil pour compiler et formater les articles soumis en utilisant Adobe InDesign. Il a aussi conçu la magnifique page couverture. Ellen Sherren a fournit un support administratif continu et une communication ponctuelle avec les auteurs. Un spécial remerciement est présenté à Gérard Beaulieu qui a permis l'utilisation de son oeuvre pour notre logo et dans les Cahiers. Ces Cahiers représentent une importante pierre angulaire dans cette phase du projet Arts-Netlantic. L'appui du programme de Culture canadienne en ligne est reconnu avec gratitude.

Sincèrement,

Annabel J. Cohen, Ph. D.
Chadia Moghrabi, Ph. D.
Coéditeurs

Page 10

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

TABLE OF CONTENTS / TABLES DES MATIÈRES

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 11

SESSION 3: FOCUS ON TECHNOLOGY

SESSION 4: FOCUS ON COGNITION

SESSION 5: MULTIMEDIA, TEACHING AND LEARNING

SESSION 6: COLLABORATION AND CREATIVITY VIA TECHNOLOGY

Page 12

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

SESSION 7: DIGITAL REPOSITORIES

SESSION 8: SHORT TUTORIALS/WORKSHOPS

ARTISTIC-TECHNOLOGY PARTNERSHIP PRESENTATIONS

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 13

Être artiste c'est s'apercevoir à un moment donné que le monde n'est peut-être pas de la bonne couleur ou qu'il n'a pas la forme qu'il devrait avoir et qu'il faudrait, c'est certain, en proposer une autre version plus belle, plus calme, plus silencieuse et assurément plus tolérable.

Être artiste c'est donc vouloir changer le monde pour qu'il nous ressemble un peu mieux, pour qu'il soit surprenant, différent, nouveau mais pour qu'il soit aussi plus près de nous, pour qu'on s'en souvienne et pour dire aux autres comment nous l'avons vu, comment nous aimerions le voir et surtout travailler à faire en sorte que les autres puissent aussi le voir un peu comme nous l'avons vu, un peu comme nous aimerions qu'il soit.

Être artiste c'est nouveau, ici, et c'est toujours nouveau partout parce que le monde s'ennuie et qu'il lui faut des artistes sinon le monde serait gris et fade et c'est pour ça que le monde a besoin de nous, pour se redire, se refaire et trouver le moyen de se montrer aux autres pour qu'eux aussi puissent le voir à travers nos yeux et nos gestes.

Être artiste c'est avoir le courage de s'inventer un monde à soi et faire en sorte qu'on puisse le donner aux autres avec générosité sans savoir si ce qu'on fait intéressera quelqu'un, sans savoir si quelque part, un jour, une autre voix, un autre regard viendra vers nous pour nous dire que le monde ressemble à celui qu'on a imaginé, a celui qu'on a peint, imprimé, sculpté, photographié, modelé ou dessiné.

Être artiste c'est un travail à plein temps, c'est un travail pour la vie, c'est un travail qui se fait avec acharnement, c'est un métier important et c'est un métier dangereux parce que nous avons les moyens de parler le langage des émotions, c'est une très grande responsabilité puisque nous avons les moyens de dire et de voir ce que les autres ne peuvent pas dire ou voir, ce qu'ils ont oublié, distraits dans le trafic de la vie quotidienne à un point tel que l'on finit par ne plus remarquer la couleur ou la forme des choses.

Être artiste c'est vouloir sauver le monde, c'est le prendre de ceux qui nous ont précédés pour le redonner à ceux qui nous suivent, parce que l'avenir ressemblera aux estampes, aux photos, aux peintures, aux sculptures et aux dessins que nous en aurons laissé et lorsque beaucoup plus tard l'on voudra connaître la couleur, la consistance ou la texture de nos rêves, de nos peines et de nos idées actuelles, ce qui nous a maintenus sur la terre à un moment donné, ce qui nous a fait rêvé, ce sera à nous que l'on fera appel, ce sera à nous de dire notre version de l'histoire.

Être artiste c'est faire de la magie, c'est faire croire aux autres que la réalité pourrait ressembler aux rêves que nous leurs proposons, c'est faire apparaître des merveilles et c'est pour ça que nous vous souhaitons une vie merveilleuse, une vie inspirée où vous allez être pour longtemps des artistes.

Page 14

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

To Be An Artist
Inspired by
Herménégilde Chiasson-2002

To be an artist is to perceive at any given moment that perhaps the world is not the beautiful color you wish it to be, or that is does not take the shape that it should have - the artist creates more lovely, more tranquil, and more serene versions which also prove more liveable.

To be an artist is to want to change the world so that it resembles us just a little better, so it seems surprisingly different and novel, but so it also appears closer to us, so we can remember it and so others can see how we ameliorated the view. Above all, to be an artist is to represent our world so that others may see it as we have and how we wished it to be.

To be an artist is pristine, and it always seems new, well-needed and inevitable all around the world because everyone falls victim to boredom, at times the world seems grey and dull and that explains why artists are crucial to our world - to retell, to reform, and to find a way to demonstrate to others so that they too can see our creative vision through our eyes and our ideas.

To be an artist is to have the courage to invent your own world and organize it so that we may generously share it with others without knowing whether what we are working on is interesting to someone else, without knowing if somewhere, someday, another voice, another opinion will come to us to tell us that to them, the world indeed represents that which we imagined, which we painted, wrote, sculpted, pictured, modelled, or drew.

To be an artist is a full-time job, it is a life-long career, a job which is both crucial and dangerous because artists have the ability to speak the language of emotion. It is a huge responsibility, since we have the capacity to both see and describe that which others can not, that which they have forgotten somewhere within the traffic of everyday life, to a point where people abandon the idea of taking the time to notice the beauty of things.

To be an artist is to want to save the world, to take from people who have come before us and give to the people that follow, as our past will be retold by our poems, pictures, paintings, sculptures, and photographs that we have left behind. We will wish to use artistry to understand the meaning and making of our dreams, our pain, and our own personal ideas, what we experienced on the earth at any given moment, and that which makes us dream. It is up to us to make the call, it is up to us to tell our version of history.

To be an artist is to make magic, to make others believe that reality can resemble the dreams that we propose to them, it is to make miracles appear, and that is why we wish them a marvellous life, an inspired journey where they will forever be our artists.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 15

ARTS-NETLANTIC CMTC

Annabel J. Cohen[1] & Chadia Moghrabi[2]
[1]Project Leader, Arts-Netlantic, Univ.Prince Edward Island, Charlottetown, PE C1A 4P3
[2]Network Technical Leader, Arts-Netlantic, Univ. de Moncton, 165 Massey, Moncton, NB E1A 3E0
www.artsnetlantic.ca

Arts-Netlantic CMTC stands for the Atlantic Research Network in Culture, Multimedia, Technology and Cognition. It is an ever-expanding network of researchers, information technologists, and artists within Atlantic Canada interested in culture, multimedia, technology, and cognition and their interaction. Arts-Netlantic aims to build bridges between arts and technology across cultures, languages, disciplines, institutions, and geographies. The primary partners are University of Prince Edward Island (lead), University of New Brunswick and Université de Moncton, IBM, and Networx. Three regional e-learning companies are also involved: Future Learning Inc. (Charlottetown), Blizzart Conseil (NB), and Red Hot Learning (NB). The project has been made possible by the New Media Research Networks Fund of the Canadian Culture On-Line Programme of Canadian Heritage.

The project is governed by an executive distributed across the Network geographically, and distributed by discipline. The executive planned originally to meet bimonthly but as progress and change was rapid, monthly videoconferenced executive meetings take place in order to work toward completing the four goals of the network which will be reviewed briefly in turn.

1. To establish a New Media Research Network of individuals from the private and public sectors, representing the diverse arts, information technologies, and cultures in PEI and NB as a foundation for research in new media.

To this end, monthly full Network videoconferences (in addition to the monthly executive meetings) have taken place across the three sites of Charlottetown, Moncton, and Fredericton. Each such meeting features an update on each of the research goals, and presentations are made by experts from PEI and NB in the new media arts and information technologies. To date 20 such expert presentations have been made on topics as wide-ranging as the nature of new media, Acadian culture, Island culture, web-logging, digital

libraries, and digital rights management. A final Conference of New Media Research Networks is being held in Prince Edward Island on March 26-27, 2004 in conjunction with the Confederation Centre for the Arts. Inspired by the Confederation Bridge that links Prince Edward Island and New Brunswick, the theme of the conference is connections and reflections: *connections* made possible by new media and *reflections* of culture through new media. The conference brings members of the network together in one physical space for the first time and extends the new media research network to all others who attend.

2. To inspire the production of new media by current and potential new media artists through shared technical resources and exchange of knowledge.

To this end, at each of the three sites, a high-end new media production facility has been created. The facilities contain professional audio (Pro-Tools) and video (e.g., Avid) non-linear editing equipment. The re is also a presentation facility which includes the videoconferencing equipment. These faciloities are supported by technology-trainers who have been hired at each of the three sites both to set up the equipment and to enable artists in the community to realize their creative ideas with new media tools. A New Media Artist-Technology Partnership Competition was developed in both Prince Edward Island and New Brunswick to encourage promising artist and information technologist collaborations. Fifteen winning works will be shown at the Confederation Centre of the Arts during the conference.

3. To establish a shared multi-institutional digital library archive representing Atlantic Canadian cultural content and a culturally adaptive, user friendly interface.

A framework for a data base has been developed by computer scientists at Université de Moncton, and an inventory of arts and cultural activities (past and present, new and traditional media) is being created for NB and PEI. Through the inventory, new media is

placed in the context of traditional media. For archival purposes, activities of Arts-Netlantic have been recorded.

Page 16

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

4.   To determine the role of culture in the appreciation and creation of new media.

To this end, behavioural scientists at each of the three sites are engaging in several types of research to study how artists view new media and new media opportunities, and how audiences view new media art works. The methods used include qualitative interviews of artists with respect to their opinions about new media, and unobtrusive natural observation of people who are given the opportunity of looking at a small collection of both traditional and new media artworks. Concept mapping is also being exploited and is of particular interest in that it provides a means to tapping mental representations through the use of pictures as opposed to words. In this way, the researchers can more easily determine similarities and differences between representations of mental constructs (like culture) depicted by members of particular cultures, genders, age groups, or professions.

The primary outcome of the Network is the development of new connections: connections among people, people with technology, and arts- with information-technologies. Arts-Netlantic cuts across boundaries of culture, geography, discipline, and sector. Arts-Netlantic fosters imagination, creativity and the realization of artistic and technological dreams in the new media and information technology environment. Such activities have led to new artistic creations and new understanding of artists and audiences in the multi-cultural Canadian context.

Arts-Netlantic has also inspired new applications of old technologies. Many of these developments are reviewed in depth in these Proceedings and will be described in detail at the meeting.

.

Contact:

Project Leader

Annabel J. Cohen, Arts-Netlantic, UPEI, Charlottetown, PE C1A 4P3

acohen@upei.ca

(902) 628-4325

(902) 566-6007 (Arts-Netlantic Office)

(902) 566-6023 (Arts-Netlantic Studio Lab, PEI)

Technical Network Leader

Chadia Moghrabi, Arts-Netlantic, U de Moncton, Moncton New Brunswick

moghrac@umoncton.ca

(506) 858-4521

(506) 858-4091 (Arts-Netlantic Studio Lab, Moncton

)

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 17

3D WEB RESEARCH NETWORK: PROJECT SUMMARY

Willemse, Lisa[1], and MacLeod, Douglas[1]
[1]Netera Alliance, BIO 530, 2500 University Drive NW, Calgary, Alberta, Canada, T2N 1N4

1. INTRODUCTION

The 3D Web Research Network is a cost-shared $1.8 million project to advance the third dimension in the World Wide Web. Primary project funding is provided by the Department of Canadian Heritage through its New Media Research Networks Fund, one of the components of the Canadian Culture Online program, with additional contributions from the project partners :

Simon Fraser University	Alias
University of Alberta	Antarctica Systems, Inc.
University of Calgary	BigBangwidth
University of Toronto	Manage Data
MediaVoice Communications	SGI
Netera Alliance	

The overriding purpose of the 3D Web Research Network is to create a national industry cluster in the development and deployment of online three-dimensional content. Drawing on the expertise and research interests of its researchers, this content would consist of architectural models, historical artifacts, and a range of interactive virtual environments that extend the boundaries of knowledge in content creation and delivery, while enriching the educational, cultural and technological resources available to Canadians.

The 3D Web Research Network's stated vision is to combine Canadian leadership in telecommunications with its expertise in computer graphics and human-computer interaction, while working in partnership with internationally respected cultural institutions to create a national industry cluster that will provide a forum for ongoing applied research in the development, delivery and management of three-dimensional content.

The Network's research team intends to place Canada as a global leader in the field of 3D online content and to enable end users from across the country to explore and interact with cultural environments and artifacts through the Internet. Moreover, it is expected that ongoing work in this field will act as a catalyst to augment the research and development capacity of the cultural sector of the Canadian economy by attracting and retaining high-quality personnel, and by offering opportunities for the commercialization of Canadian research.

2. PROGRAM DESCRIPTION

The project was divided into two sub-projects, each with its own research streams and deliverables. The two sub-projects were integrated and managed by the project management team at Netera Alliance, with evaluation on all facets conducted by Academic Technologies for Learning at the University of Alberta.

2.1 Realtime Rendering Across Networks

Work in this sub-project was focused on the development of visual area networking, a way for distributed users to simultaneously manipulate large sets of data and deliver high-quality, interactive graphics over advanced networks.

Specific goals were to :
a) upgrade the ONYX Reality Engine at the University of Alberta;
b) implement Visual Area Networking by installing BigBangwidth switches at each university to allow dedicated lightpath connections from partner desktops to the upgraded ONYX at the University of Alberta;
c) test the applicability of lightpaths over CA*net 4 and NeteraNet for the transmission of complex, three-dimensional models and data sets;
d) develop integration tools for real-time rendering;
e) investigate and evaluate the commercialization potential of the integrated tools, services and products created by the network.

2.2 3D Content Management and Interface Design

This component extended existing work in online digital libraries by investigating a variety of solutions in both two-and three- dimensions. The research team shared specifications, standards and best practices for developing and deploying both large sets of content and three-dimensional content.

Specific goals of this sub-project were to :
a) consolidate existing physical resources at the partner institutions through CA*net 4;
b) create and test a digital object repository focused on three-dimensional content informed and guided by existing protocol developed by the A•VI•RE online gallery project and the eduSource Canada national network of learning object repositories;
c) investigate three-dimensional interfaces to browse, search and manage the Web and integrate existing

Page 18

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

interface design work at the partner institutions with industry partners such as Alias and Antarctica Systems Inc.

3. OUTCOMES

Principal research in the 3D Web Research Network began on March 27, 2003 with an announcement of funding from Canadian Heritage. Preliminary work included the purchase and installation of required equipment and software at the partner institutions. This included upgrades to the ONYX Reality Engine at the University of Alberta, network upgrades and the installation of BigBangwidth switches at the Universities of Alberta and Calgary, the purchase and configuration of PC-based real-time rendering equipment at the University of Toronto, and the installation of 3D interface and content creation software from Alias, Antarctica Systems and Immersion Studios. Research results for each sub-project are outlined below :

3.1 Realtime Rendering Across Networks

With a Visual Area Network in place between the Universities of Alberta and Calgary, researchers were able to test the transfer of complex data sets and large-scale three-dimensional models. Students working on interactive computing simulations in the Computer Science labs at the University of Calgary used the network to run complex mathematical computations in a fraction of the time. Public demonstrations of realtime rendering over this 300-kilometre network were held on December 2003 and February 2004, and featured 3D cultural and historical models, such as a walk-through of a Haida House.

Rendering solutions at the University of Toronto focused on the development of PC-based alternatives, as a means to explore less expensive computer and network solutions. Testing of the prototype system indicated that high rendering speeds could be achieved using a set of PC hard drives, however, sharing data and running simulations across large distances would still require a dedicated lightpath for optimum usability.

Extensive work at Manage Data led to the development of 3DXpress, an on-demand visualization tool that streamlines the process of rendering by allowing users to simply drag-and-drop an object onto a desktop icon to initiate and automate the rendering to pre-specified outputs. Market research indicates that commercialization of this product has great potential – at project completion, beta testing was underway at several locations in Canada.

3.2 3D Content Management and Interface Design

Through the installation of compatible software at all partner institutions and through the sharing of best practices and research findings, the research team in this sub-project was able to consolidate their resources and outcomes for maximum results.

The majority of research hours were invested in the research and development of digital object repositories, where project work developed along two distinct, but related streams. The first was the continued development of the A•VI•RE online gallery, in conjunction with the University of Queensland in Australia. This system allowed researchers at Simon Fraser University to investigate the related themes of curatorship in online collections and the management of large data sets, resulting in the release of several thousand architectural photographs and models in exhibition format, along with published research papers. The second stream of research was led by the University of Calgary, in conjunction with Netera Alliance. This stream focused on metadata standards for complex and three-dimensional models and developed a metadata repository based on standards recommended by the Standards Committee of Canadian Heritage. It also sought to align the work in this area with other national repository projects, such as eduSource national network. Testing of the metadata standards and repository were conducted in conjunction with researchers at the University of Toronto.

Content development at most of the partner sites led to the formation and integration of several collections in environmental design, landscape architecture, architecture, cultural history and visual interactive computing. All content is available for viewing through the 3D Web Research Network's project website (see below).

Investigation into 3D design interfaces ran concurrently at the Universities of Toronto and Simon Fraser. Though no formal system was adopted in the year-long research, work at Simon Fraser University with Antarctica Systems on large-scale data management led to encouraging preliminary findings that will be pursued following the completion of the project.

4. CONCLUSION

The success of the 3D Web Research Network has implications for Canadian industry, culture and education. It has created a Canadian nexus of research, industrial applications and training of personnel. Further, it has clearly demonstrated the scope of continued work in this area and has helped define its progress.

5. RESOURCES

The following is a list of project resources :
3D Web Research Network : http://3dweb.netera.ca
3DXpress : www.mdata.ca
A•VI•RE development site : http://dev.avire.com/project
Metadata repository : http://3drepository.netera.ca
Visual Interactive Computing :
http://innovis.cpsc.ucalgary.ca/3DWeb/

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 19

CANADIAN NETWORK FOR INCLUSIVE CULTURAL EXCHANGE

Jutta Treviranus[1] and Jan Richards[1]

[1]Adaptive Technology Resource Centre, University of Toronto, 130 St. George St. Toronto, Ontario, Canada, M5S1A5

1. INTRODUCTION

Many Canadians are prevented from creating or enjoying cultural resources due to a disability. At least 15% of Canadians have a disability. This percentage is increasing at both ends of the age continuum as the population of seniors increases and as infant mortality decreases. No Canadian escapes the impact of disability. Each one of us will either directly experience a disability during our lifetime or have a close relative or friend who does. Wide participation in the development of culture is critical to a society's welfare and growth. Frequently the onset of a disability is accompanied by social marginalization. One antidote to this marginalization is participation in cultural experiences. Unfortunately, most forms of cultural expression and most cultural content have significant barriers to people with disabilities.

At the 7th World Wide Web conference in Brisbane, Australia in 1998, the assertion was made that: "Accessibility is the challenge that will finally push the Web to become the ubiquitous tool for interactive sharing that it was meant to be. Creating an environment that is welcoming to billions of users with widely varying motivations, capabilities and needs is not a fringe goal but *the* critical goal. Inclusive design will not hamper the speed of Web development, instead it will stretch the envelope and guide the rapid growth of a truly useful World Wide Web."[1] In the intervening years, Canada has distinguished itself as a leader in inclusive design on-line. Our impetus to be inclusive of users with widely varying cultures has spurred us to think creatively. Experience has shown that accommodating the needs of people with disabilities leads to innovation and improved usability for everyone. We all gain from the cultural contributions of people with disabilities and we also benefit from the more inclusive design of content and tools. Inclusion is not a specialized goal, it defines the envelope and acts as a stimulus for innovation.

Development of online-delivered rich media content in Canada is at a critical juncture: either, conventions can be established that exclude a large sector of the population, or conventions can be adopted that make cultural participation possible for many people who have been previously excluded. If proactive steps are taken now, accessible tools and content can be a naturally integrated component of Canadian online cultural environments.

2. LEGISLATION AND POLICIES TO SUPPORT ACCESSIBILITY

Worldwide, there is a growing awareness and respect for the human rights of people with disabilities. As a result, legislative steps are beginning to be taken to insure access and there is a large market worldwide for barrier-free digital content and tools. In the United States, at both the federal and state level, stringent legislation has been passed governing the accessibility of tools and content to people with disabilities. At the federal level this legislation includes the Americans with Disabilities Act, Section 508 of the Rehabilitation Act, Section 255 of telecommunications legislation and the "No child left behind" educational legislation. Some of Canada's other important trade partners, such as Australia and the EU, are passing similar legislation.

Recognition of the importance of inclusive design practices in Canada is evidenced by the recent implementation of federal policy based on established accessibility guidelines. The Treasury Board of Canada has introduced The Common Look and Feel (CLF) initiative, requiring all government resources to be accessible to users of a "wide range of technologies, including personal computers, assistive devices, and advanced technologies."(2) The CLF standards, which were to be fully implemented by federal departments and agencies by December 31, 2002, specify design standards directed toward ensuring equitable access to all content on Government of Canada Web sites and accommodation of individual needs and preferences.

3. THE CNICE PROJECT

The soon to be completed CNICE project, has brought together consumer groups across Canada to formulate guidelines and requirements for creating on-line cultural content that is accessible to people with disabilities. In addition the network partners have developed or enhanced software tools needed to produce accessible on-line cultural content. CNICE has also developed on-line environments that enable accessible collaboration and exchange.

During the CNICE project, a cross section of artists and producers of cultural content were exposed to the challenges of inclusive design. The response varied and

shifted during these discussions. Several producers expressed initial resistance, reluctance or defensiveness. This response was often and soon replaced by enthusiastic recognition that the need to accommodate people with disabilities could act as an incentive to be more creative and explore new forms of expression. A frequent message given to the CNICE partners was "don't constrain us, we are artists, we can think of new and innovative ways to meet your needs." Through a follow –on project InCNet the partners would like to work with artists, content producers and curators employing various media to discover new ways of creating inclusive cultural experiences that meet the needs of both the artist and the audience.

When engaged in exercises intended to approximate the experience of an audience member with a disability, artists frequently reported that they developed a new perspective with which to view their work. This new perspective inspired them to explore new ways of expressing themselves through their art form or to extend their art form. It prompted artists to examine more closely the process of production and ask questions such as: "what am I saying, how am I saying it, in what other ways can I say this?"

In reviewing existing cultural content on-line it became clear that producers and artists have a constrained view of the audience or user. While many producers make allowances for diversity in education, experience, language and age, it is rare that an artist or producer creates a work or experience that is accessible to audiences with sensory or motor impairments. If they do, it is usually as an afterthought or add-on. What is needed is an expanded view of the user or audience conventionally held by artists and producers of cultural content to include people with a broad range of abilities.

If artists or producers are cognizant of this broader definition of the audience during the design and production phase of their work, they are likely to produce a richer experience and inclusive design will be more naturally integrated into the work. An example of this integrated approach to inclusive design is portrayed by an animation producer who accommodated the need to describe visual elements in the animation for people who are blind by developing a new character who is a spy who comments extensively on what he sees. This approach not only interpreted the visual elements for audience members who cannot see but added a character that enhanced the experience for all viewers of the production.

One issue, identified in the CNICE project, that requires further research is the issue of creating accurate equivalent alternatives. To provide access to rich media, the message conveyed in a modality that is inaccessible to certain audience members, is interpreted into an alternative modality. This includes creating captions or sign translations for people who are deaf or hard of hearing and creating audio descriptions for people who are blind.

This is a relatively straightforward process when the content is educational or purely informational. The same cannot be said for cultural content. Art, whatever form it takes, cannot be a solitary or constrained activity. The perception, thoughts and emotions of the audience are as much the artist's medium as the paint, the music or the dance. As such it is an unpredictable medium influenced by the myriad of experiences and the cultural contexts of the viewer. If we add interpretation from one sensory modality to another to this complex mix of interactions we can strive to provide an accessible equivalent interpretation but we can never truly achieve this. This is not a bad thing, nor does it mean that we cannot hope to provide equal access in the arts. It spurs us to explore our perceptions, our points of view and the great diversity of the human experience as well as the core elements that we all share. We come to realize that there is no equivalency, no uniform perception or interpretation among audience members who have no disability. This diversity can be seen as an asset, not a deficit. CNICE participants felt that the question is not how can someone with a disability have the same experience but how can the experience of someone with a disability be as rich and evocative as the experience of the individual without a disability. A related question is how can the person with a disability feel they have shared in the collective experience of the artwork or performance? Through InCNet the partners will develop models of best practice that respond to these questions in the various on-line media.

CONCLUSIONS

Canadian culture thrives when cultural participation is open to everyone in Canada. At present, most forms of cultural expression and most cultural content on-line have significant barriers to people with disabilities. With the shift to rich, interactive media there is a risk that these barriers will increase if guidelines for accessible design do not exist. Conversely, the creative application of emerging technology can enable and enrich cultural participation for all Canadians. The Canadian Network for Inclusive Cultural Exchange has developed tools, models of practice, and guidelines to enable cultural exchange and collaboration on-line that is inclusive of the diverse range of participants that make Canada a vibrant and innovative culture. In a follow-on project the network partners will explore how these tools, and guidelines can be integrated into the workflow of cultural content creation.

REFERENCES
(1) http://www7.scu.edu.au/programme/panels/ 1944/com1944.htm
(2) http://cnice.utoronto.ca

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 21

CBC ARTSPOTS : ARTS, TELEVISION, NEW MEDIA

Mary Elizabeth Luka

Executive Producer, CBC ARTSPOTS, P.O. Box 3000, Halifax, NS, Canada B3K 2L5 mary_elizabeth_luka@cbc.ca

1. GENESIS

CBC ARTSPOTS began as a tool to focus dialogue with the arts community in the Maritimes & as a creative, artistic experiment to meet a programming gap in visual arts at CBC Television and New Media. Pre-production and production is highly collaborative in nature & simple in process. The producer works closely with the artist to develop concepts and propose ways of treating the work creatively and with integrity.

Our first volunteer advisory group was set up in Nova Scotia in 1998, including curators, artist co-op and craft guild representatives, and artists. Subsequently, we developed advisory groups in each province and territory except Saskatchewan and Nunavut, now in development. The advisory groups work to develop and review goals, objectives and processes specifically for ARTSPOTS, and generally for the CBC, especially in the arts. In practical terms, the advisory groups help us to identify artists whose work might suit television and new media.

Since many of the artists are involved with their community, and advisory groups represent a broader viewing community, it is relatively easy to integrate CBC ARTSPOTS into other engagements with artists and audiences. The brevity and dynamism of both the video and internet items helps make them accessible, and empowers audiences as participants. This allows CBC ARTSPOTS to move easily between the local "scene", a national context, and international impact.

2. PROCESSES

Typically, it takes six to eight months to recruit an advisory group, review **CBC ARTSPOTS** goals and objectives, develop a list of artists based on the priorities in the province, and enter into pre-production with artists. It then takes about three months to execute the pre-production, production and post-production stages. In some cases, this process is accelerated aggressively in order to take advantage of pre-existing events or conditions in a particular region or province, resulting in new **CBC ARTSPOTS** on the air within six months of beginning the development process.

From the point of view of most artists, pre-production consists of meeting the producer, looking at slides or artwork, talking about some ideas, and then both individuals going away and thinking about it for a while. Once some ideas have been solidified, arrangements are made for production. This usually consists of one day with a camera, and one to one and a half days in the edit suite to produce three 30-second ARTSPOTS and one artist profile. We then usually spend time collecting or arranging the content for artist pages on www.cbc.ca/artspots.

In all, on a per capita basis, this represents about $10,000 worth of production value for each artist, an amount that most would otherwise never be able to access. Most ARTSPOTS circulate on television for three to six years, and have an ongoing home on the web site. The value of this exposure for individual artists as well as for the community as a whole is difficult to measure, but is substantial.

3. RESULTS

We currently work with a combination of 14 freelance and staff (part-time) producers, and have worked with about 50 or so technicians, for a full-time equivalent of about four people a year. CBC ARTSPOTS has worked with over 200 artists across Canada during the past six years, of which 70 or so are from the Atlantic Region.   We currently work with about 40 artists a year.   On average, we produce about 3 x 30-second ARTSPOTS per artist, and one Artist Profile or interview, usually two to five minutes long.

One ARTSPOT per artist continues to be premiered on *Opening Night,* as space allows. We have produced about 500 ARTSPOTS to date, of which over 350 can be found on cbc.ca/artspots. About 120 ARTSPOTS are in circulation on the main CBC channel, and another 180 ARTSPOTS are being broadcast on the Country Canada digital channel. In addition, over 75 Artist Profiles are in circulation on television, and over 100 Profiles or interviews can be found on cbc.ca/artspots.

ARTSPOTS reels have been requested by several galleries, educational programs, arts events, and by craft shows such as the One-of-a-Kind Craft Show in Toronto. The Department of Foreign Affairs and Industry uses several ARTSPOTS reels, as well as the 45-minute documentary "Making the Ordinary Extraordinary: The Recipients of the Saidye Bronfman Award for Excellence in the Fine Crafts", in cultural posts around the world.

Page 22

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

4. PARTNERSHIPS

One of the fundamental principles of ARTSPOTS has been the development of partnerships. The financial and co-operative partnership in the first two years with The Canada Council for the Arts provided a model for engagement with the arts and the cultural community that ARTSPOTS has continued to build on.

Partnerships are long-term, strategic, value-based relationships that CBC develops over a period of time with communities, corporations, government agencies, organizations, and individuals. Partnerships are based on shared objectives, values and processes and offer us a way to emotionally connect with those we serve.

CBC ARTSPOTS supports and enhances public broadcast objectives through cultural awareness initiatives, educational programming and a dialogue with cultural and economic communities. Programming outcomes include the 30-second ARTSPOTS and the content and style of the web site but the most important set of outcomes relates to communication with artists, the cultural community and the education system, as well as quality of life and public service. The view is long-term.

A partnership project that has been two years in development is a collaborative effort between CBC Television, CBC New Media, Gros Morne National Park, two artists and one writer. The Gros Morne Time Lines project will focus on the development of a multi-media interactive site and a documentary that will air on CBC Television, and at the Park. Gros Morne Time Lines was initially a limited-edition artists' book, with text by renowned author Kevin Major, illustrations & prints by recently deceased Anne Meredith Barry, and the binding, printing and layout by book artist Tara Bryan. The new media and television projects are being designed to capture the spirit, the depth and the richness of the original artists' books.

5. CBC ARTSPOTS AUDIENCES

There have been significant changes in the field over the last six years. When we first started working on cbc.ca/artspots, there were a very limited number of artists with their own sites, and/or whose work primarily took place on the internet. ARTSPOTS was pretty much the only place at CBC where you could find visual art and fine craft on the web, and on television.

That environment has changed dramatically. On Radio 3 and ZeD alone, CBC collects and presents massive quantities of primarily non-mainstream performing arts work. Most of the visual art on cbc.ca is still delivered on the ARTSPOTS site. Most of the artists we work with now have web sites of their own. In fact, we're looking at

introducing a kind of "self-serve" function on the ARTSPOTS site for our artists to access, as well as taking advantage of the lessons learned at Radio 3 and ZeD to develop a more direct space for visual artists to use, especially those whose work takes place primarily on the internet.

Since we don't have a scheduled timeslot for the 30-second television items, it's hard to keep count of how many are aired. Indications are that the aggregate number of ARTSPOTS airing on tv is in the thousands. It's a little easier to track the use of our web content – partly because the systems for tracking usage are built right in to the sites at CBC. In 2003, we had 27,400 visits, averaging 11 ½ minutes a visit, and representing about half the traffic on the TV arts websites at CBC. It also represented about 3% of the total visits to all the CBC TV sites.

In 2004, we have had about 9,200 visits to date, averaging 7 ½ minutes a visit, and representing about 23% of the TV arts traffic, and about 2.8% of the traffic on the overall CBC TV sites. Proportionately to the rest of CBC, our web audience is down, but in real numbers it is holding strong or ahead of last year. We are investigating why the *proportions* have changed so dramatically. It seems to have to do with internal links and promotions rather than external. The periodic collaborations that we did to produce internet features is on hiatus at the moment. Cbc.ca is in the midst of revamping its approach to the arts, switching its focus to a primarily news-based operation. This will mean more headlines about the arts, and hopefully a renewed emphasis on providing context and analysis for the arts in features and articles, especially as more and more of the creative content is presented directly on the internet by the artists and creators.

This year about 40% of the ARTSPOTS traffic is Canadian, most of the rest from the US, Australia, and the U.K. This is the first time that the greatest number of users of the site are Canadian. Interestingly, the proportion of Canadian vs non-Canadian users on the ARTSPOTS site is almost exactly opposite to the proportions found on the other CBC arts sites. Last year, only about 34% of ARTSPOTS traffic was from Canadian visitors. The countries of origin, by volume, were: U.S., Canada, Korea, U.K., and then all others. Although our international audience is of great potential benefit to the artists, it is a considerable challenge to interest Canadians to come see Canadian work.

An amazing amount of content on CBC's television and web properties and services could be, and is, arts-based. It is also delivered pretty directly to potential users. The identification and presentation of vast amounts of artist-driven creative work is a significant challenge facing not just CBC, but also every iteration of the cultural community. We look forward to meeting that challenge.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 23

Bridging the Semantic Gap in Media Analysis: Computational Media Aesthetics

Chitra Dorai, Ph.D. IBM Thomas J. Watson Research Center, Hawthorne, NY USA

With the explosion of digital media and online services, a key challenge is automation of content annotation, indexing, and organization for efficient media access, search, retrieval, and browsing. A major failing of current media annotation systems is the semantic gap --- the incompatibility between the low-level features computed automatically to describe the content and the high-level meaning associated with the content in user queries and search. This inevitably leads to retrieval of media clips that correspond in terms of low-level descriptions, but differ entirely in terms of semantics sought by the users.

In this talk, I will introduce Computational Media Aesthetics as an approach to bridging the semantic gap and outline its foundations in media production principles. I will describe a detailed example of Computational Media Aesthetics at work, that of extracting a high-level semantic construct of film, Tempo. I will present, how from definition, to formulation, and even its exploitation resulting in the location of high-level filmic components such as dramatic occurrences, our process is guided by film grammar. I will conclude with results from our detailed analysis of numerous full-length motion pictures.

Chitra Dorai is a Research Staff Member and Manager at the IBM T.J. Watson Research Center, New York, where she leads the Media Semantics and E-Learning Media projects. Her research interests are in the areas of multimedia systems and digital video analysis, computer vision, pattern recognition and machine learning. Her current research focuses on developing technologies for digital media analysis in various domains such as education and training media and motion pictures, that are useful in content-based structuralization, annotation and search, and smart browsing. She received her Ph.D. from the Department of Computer Science at Michigan State University, where she was a recipient of the Distinguished Academic Achievement Award from the College of Engineering. Her work has received awards and recognition such as the Top-Ranked Paper at the 2002 Asian Conference on Computer Vision, the Best Paper Prize at the 2001 IEEE Pacific-Rim Conference on Multimedia, the Best Industry-related Paper Award at the 2000 International Conference on Pattern Recognition, and Honorable Mention in the 24th Annual Best Paper Award Contest of the Pattern Recognition Journal, 1997. She recently edited a book on Computational Media Aesthetics. She is a senior member of the IEEE and a member of the ACM.

Page 24

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

CULTURE.ca AND THE CANADIAN CULTURAL OBSERVATORY

Vladimir Skok[1], Rory Ridler[2]
[1,2] Government of Canada, Department of Canadian Heritage, eCulture Directorate,
15 Eddy Street, Gatineau, QC K1A 0M5

1. INTRODUCTION

The Department of Canadian Heritage (PCH) has developed two innovative collaborative on-line initiatives: Culture.ca and the Canadian Cultural Observatory. These projects are supported by the Canadian Culture Online Program, which has the mandate to support the digitization of Canadian cultural content.

Culture.ca, Canada's Cultural Gateway, is gathering place that allows Canadians to explore, find and share the best Canadian cultural content on-line. The Canadian Cultural Observatory, including its interactive digital hub Culturescope.ca, meets the special needs of Canadian cultural development professionals.

These projects are managed by the eCulture Directorate of the eServices Branch of Canadian Heritage. The mandate of this branch is to enable PCH and Canadians to engage, develop and showcase Canadian arts, culture, heritage and sports through improved service delivery and innovative use of the Internet and new media technologies.

2. CULTURE.CA

Culture.ca is a collaborative initiative of the Department of Canadian Heritage, as part of the Canadian Culture Online Strategy. The site was developed in partnership with institutions from the public and private sectors, and was publicly released November 3, 2003 in tandem with a sponsored nationwide promotional campaign. Prior to release, the site was extensively tested with focus groups across Canada and received favourable reactions.

Culture.ca is a unique gateway designed for Canadians to explore and find the best of Canadian culture on-line. Extensive and continually revised and updated resources connect to the history, art, peoples, places, sports, and media that help define who we are as Canadians. No other Web site, portal or search engine provides such broad and expansive views of Canadian cultural life and diversity in both official languages.

This initial version of the site includes 1.5 million fully searchable Web resources, and provides direct access to more than 10,000 quality Canadian cultural sites catalogued in partnership with the National Library of Canada. Featured content encourages users to explore cultural topics in further depth and presents candid perspectives from Canadians, including cultural leaders from across the country. Culture.ca also links to Terminus 1525, an innovative on-line community for emerging creators and youth. Long-term goals include the addition of further sharing opportunities for Canadians and increased youth participation.

2.1 Partnership Opportunities

Culture.ca is a collaborative arrangement between the federal government, the cultural community and the private sector. Government departments and agencies as well as community, private, and cultural organizations are involved and contribute to the gateway's rich and growing knowledge and topic databanks by becoming content partners or corporate sponsors.

Culture.ca offers organizations the opportunity to become content partners and expand their reach to a broader audience across regions and communities, while also taking the lead in helping to create a new and unique knowledge tool.

Please contact info@culture.ca to learn more about partnership opportunities with Culture.ca.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 25

3. CANADIAN CULTURAL OBSERVATORY

The Canadian Cultural Observatory provides access to specialized information pertaining to cultural development in Canada and abroad. The information available through the Observatory promotes better-informed decision-making on the part of Canada's cultural development professionals. The Observatory's interactive digital hub, Culturescope.ca, was publicly released by the Deputy Minister of Canadian Heritage on November 13, 2003, in collaboration with its federal and non-governmental partners.

Culturescope.ca delivers, in both official languages, quick and easy access to:

A **Resource Collection** of quality Canadian content, consisting of up-to-date research, statistics, global perspectives, and links to quality sites of interest.

A **Reference Desk**, enabling researchers to quickly and easily access the services of the National Library of Canada's national and international network of over 10,000 reference librarians.

An on-line **Knowledge Network** area, in which cultural practitioners associated with cultural organizations can share information and knowledge amongst themselves, providing more opportunities for community interaction and for professional development. Pilot testing with communities-of-practice is taking place with key partners such as the Canadian Cultural Research Network (CCRN), the Canadian Conference of the Arts (CCA) and the Statistics Canada Cultural Statistics Working Group.

3.1 Partnership Opportunities

By becoming a partner of the Observatory and Culturescope.ca, organizations play a direct role in the advancement of cultural development in Canada while gaining more visibility on-line.

There are a number of ways to contribute. For example, current partners:

- Provide strategic and topic-related advice on policies, programs and research;

- Contribute content to the Cutlurescope.ca Resource Collection;

- Pool resources with the Observatory to create content;

- Serve as editors for on-line communities within the Culturescope.ca Knowledge Network.

Please contact info@culturescope.ca to learn more about partnership opportunities with the Canadian Cultural Observatory.

ACKNOWLEDGEMENTS

Page 26

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Création en arts médiatiques et transfert en éducation artistique.
(New media, Children and Visual Art Education)

Lise Robichaud, PhD
Département d'enseignement au primaire et de psychologie éducationnelle, Université de Moncton,
Moncton, Nouveau-Brunswick, Canada, E1A 3^{E}9   Adresse électronique : robichli@umoncton.ca

1. INTRODUCTION

Cet article est relié à la thématique de la conférence qui est *connexions et réflexions*. Ici, nous faisons ces connexions et réflexions par rapport aux nouvelles technologies, au domaine des arts visuels et `a l'enseignement des arts visuels en milieu culturel acadien au Nouveau-Brunswick.

Être *artiste-enseignant* « Artist Teacher » favorise les conditions de création artistique (Feldman 1982). Être *enseignant-chercheur* « Teacher as Researcher » favorise l'amélioration de sa propre pratique d'enseignement (Kincheloe 2002). Étant à la fois artiste, enseignante et chercheure en arts visuels j'ai pu à maintes occasions vivre ces affirmations et je suis complètement d'accord avec ces auteurs car je constate qu'une pratique en arts visuels facilite les transferts en éducation artistique. La réflexion dans ce texte s'inscrit dans ce contexte et porte sur le sujet de l'esthétique des arts médiatiques en milieu culturel acadien au Nouveau-Brunswick.

Cette étude est reliée au domaine de la formation en arts visuels mais principalement en ce qui a trait au volet des nouvelles technologies. Elle n'exclut pas l'intégration des techniques traditionnelles dans les cours d'arts visuels. Notre position à cet effet préconise un mariage des pratiques anciennes et nouvelles afin de découvrir de nouvelles façons de faire et de dire les choses dans le domaine des arts visuels.

Théoriquement, la recherche résumée dans cet article est ancrée dans l'esthétique des arts médiatiques (Poissant 1995a). Elle tient compte du développement artistique (Kindler et Darras 1997) et de la conscience esthétique (Parsons 1989) des apprenantes et des apprenants ainsi que de la réalité sociale et culturelle des francophones du Nouveau-Brunswick.

Le questionnement porte sur l'intégration des nouveaux médias en éducation en milieu culturel acadien et s'inspire de l'analyse critique développé par Clark (1992)

à partir des recherches portant sur les nouveaux médias en éducation. Il s'agit d'une étude qui révèle le besoin pressant d'étudier l'intégration des nouvelles technologies en salle de classe. Il l'exprime de la façon suivante: "Finally, there is a pressing need for future studies of classroom implementation of media."(Page.813).

Même si les propos de Clark datent d'une dizaine d'années, sa suggestion s'avère encore actuelle. En Acadie par exemple, il n'y a pas eu d'études à cet effet dans le champ des arts visuels et sa suggestion nous a amené à poser les questions suivantes en rapport avec l'esthétique des arts médiatiques, l'art acadien et l'enseignement des arts visuels:

1.1 Chez les francophones du Nouveau-Brunswick, qu'en est t'il des pratiques artistiques en arts visuels intégrant l'esthétique des arts médiatiques?

1.2 En tant qu'artiste professionnelle acadienne en arts visuels, où se situe ma praxis par rapport au paradigme des nouvelles technologies?

1.3 Quel type d'intégration des nouvelles technologies préconise t'on pour le domaine des arts visuels en éducation en milieu scolaire francophone au Nouveau-Brunswick?

2. STRATÉGIE MÉTHODOLOGIQUE

Dans cette recherche qualitative, la méthodologie relève de l'étude philosophique et autobiographique. Il y est question de recherche action puisqu'on étudie le processus de création de notre propre praxis artistique ainsi que les arts médiatiques des francophones en montre dans les galeries d'art au Nouveau-Brunswick et ailleurs. Ce type de recherche permet de développer des théories et de résoudre des problèmes techniques. Il s'agit aussi d'une stratégie méthodologique qui permet d'explorer des problématiques d'inégalités sociales et des problématiques reliées aux notions de pouvoir (May 1997). Il s'agit donc d'une approche méthodologique approprié pour mener des études en milieu culturel Acadien au Canada.

Afin de résumer l'état des arts médiatiques chez les

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 27

francophones du Nouveau-Brunswick, nous avons procédé par une analyse de contenu (Lacour, Provost et Saumier 1995) intégrée à la recherche historique (Stankiewicz 1997) car vouloir comprendre l'art acadien demande des techniques relevant de ce type de méthodologie afin de trouver les données visuelles et textuelles. De plus, dans la procédure méthodologique, nous avons fait une vérification des données via le courrier électronique et le téléphone avec le directeur de la Galerie d'art de l'Université de Moncton qui est spécialisé en arts médiatiques. Cela a permis une 2ᵉ vérification de l'information que nous avions accumulée à propos du champ des arts médiatiques francophone au Nouveau-Brunswick.

Les données en arts visuels furent sélectionnées selon les critères suivants : œuvres récentes et présentant des caractéristiques d'esthétique des arts médiatiques.

Les caractéristiques sont issues d'un texte de Poissant (1995a) qui porte sur l'esthétique des arts médiatiques. Ces caractéristiques furent incorporées dans une grille d'analyse de contenu, cela a permis d'inventorier, de classer et de regrouper les éléments de contenu qui furent principalement des données visuelles (ex. œuvres originales et reproductions d'œuvres dans des revues, catalogues d'exposition et esquisses mixtes médias et numériques).

Finalement, afin de constater l'état de l'implantation des nouvelles technologies dans les cours d'arts visuels en milieu scolaire francophones du Nouveau-Brunswick (Direction des services pédagogiques, 2003) nous avons analysé le contenu de la version la plus récente du *programme d'études en arts visuels du Nouveau-Brunswick* « version provisoire» comme l'indique le document disponible sur le site Internet du Ministère de l'Éducation du Nouveau-Brunswick.

3. RÉSULTATS

3.1 Chez les francophones du Nouveau-Brunswick, qu'en est t'il des pratiques artistiques en arts visuels intégrant l'esthétique des arts médiatiques?

En arts visuels, les artistes francophones du Nouveau-Brunswick utilisent des outils relevant des nouvelles technologies. Spécialisé en arts médiatique, Luc Charette à Moncton œuvre principalement dans les multimédias interactifs. D'autres, font leurs créations à l'extérieur du Nouveau-Brunswick. Pierre Noël LeBlanc, actuellement à Terre-Neuve, réalise des créations d'images animées. En Alberta, Valérie LeBlanc se spécialise dans la vidéo d'art et Daniel Dugas réalise des performances vidéo. Ensemble ils font de l'art réseau. Au Québec depuis plusieurs années, Robert Saucier fait des créations reliées à la robotique. Bien que les artistes francophones du Nouveau-Brunswick ne soient pas nombreux à être spécialisés en arts médiatiques, plusieurs explorent la

technologie en l'intégrant aux procédés traditionnels en arts visuels.

En effet, un regard posé sur les expositions en art actuel réalisées par des artistes francophones du Nouveau-Brunswick permet de constater que la pratique d'art technologique en Acadie est présente mais de manière *hybride*. Cette expression réfère à un croisement de deux éléments différents (ex. procédés traditionnels en arts visuels et ordinateur). Il s'agit de l'une des trois formes d'art qui se révèle au travers de l'ordinateur et que Druckrey (1993) résume ainsi :
« The first is a hybrid form of montage. The second, a mixture of sound, image, and text within interactive, often screen-based, media. The third is speculative and encompasses a range of possibilities, from electronic sculpture to immersive and virtual technology" (p.30).

La forme d'art hybride est celle où l'ordinateur permet d'incorporer des éléments appartenant à d'autres formes d'art. En esthétique des arts médiatiques Poissant (1995a), à partir d'une analyse de praxis artistiques, annonça que les œuvres hybrides seraient appelées à se multiplier et que les possibilités de mélange seraient littéralement infinies allant des emprunts de style que peut simuler l'ordinateur à l'insertion d'éléments d'électrofacture dans une œuvre classique. Elle constata que le rapport à l'œuvre était modifié par l'introduction des technologies qui permettent de trafiquer et de bricoler des images, par la photocopie, par la vidéo et ses multiples effets.

C'est ce qui s'est passé dans la praxis de plusieurs artistes francophones du Nouveau-Brunswick car ces caractéristiques de l'esthétique des arts médiatiques sont présentes dans plusieurs productions culturelles. Elles le sont, par exemple, dans les œuvres de Paul Édouard Bourque qui croise des techniques traditionnelles (photographie, dessin, peinture etc) et technologiques (photocopieurs). Elles le sont dans les œuvres picturales de Francis Coutelier qui incorpore céramique, acrylique et photo numérique. Elle le sont aussi chez des sculpteurs, dont André Lapointe, qui se sert de la caméra numérique pour documenter des sculptures éphémères. Ce ne sont que quelques exemples de productions culturelles intégrant les nouvelles technologies et il y en a possiblement beaucoup plus.

3.2 En tant qu'artiste professionnelle acadienne en arts visuels, où se situe ma praxis par rapport à ce nouveau paradigme des nouvelles technologies?

Analyser sa propre praxis artistique à partir de théories en esthétique des arts médiatiques voilà l'exercice qu'on a fait et cela nous révèle où se situe

notre œuvre dans ce paradigme. Cet analyse nous permet de mieux comprendre le paradigme en question et de faire des transferts en éducation artistique par la suite. Voici les résultats de cet exercice d'auto-analyse de production artistique.

D'abord, mentionnons qu'en création artistique, depuis 1996, je réalise des productions culturelles qui portent sur le questionnement de *l'identité*. Pour ce faire je puise dans mes mémoires intimes, sociales, écologiques et dans la symbolique universelle par un procédé d'intégration de bois, de couleurs de textes et d'images parfois numériques. Je puise à la fois dans les techniques traditionnelles et technologiques.

Les outils et les matériaux que je priorise sont ceux qui ont un sens symbolique par rapport à l'idée que je désire communiquer par les arts visuels. Je travaille souvent les matières naturelles (terre, encens, fibres etc.) ainsi que les objets récupérés (papier, plastique, vêtements, miroirs etc.) par des procédés techniques variés allant de l'assemblage en passant par la peinture et la photographie jusqu'à l'usage de l'éclairage de manière symbolique dans les installations.

Dans le processus de création, je débute par une recherche portant sur les concepts et réalise des croquis sur papier soit par techniques mixtes (Voir image I), soit avec l'ordinateur (voir image II).

(Image I : Croquis en « techniques mixtes » de l'installation *Liens* réalisée par Lise Robichaud lors du *Symposium en arts visuels des Iles-de-la-Madeleine* en 2000).

Les logiciels de traitement de l'image me sont surtout utile lorsqu'il s'agit de planifier une installation In Situ et les nouveaux médias sont pour moi des outils d'expression par l'art. J'ai surtout recours au procédé

d'agrandissement d'images numériques pour l'impression grand format. Je conçois l'idée et je vais chercher de l'aide technique au besoin pour m'assister si je ne suis pas familière avec le logiciel. Dans le processus, j'aime travailler vite sauf pour l'étape d'incubation de l'œuvre. Je m'attarde longtemps à la conceptualisation de l'oeuvre que dans la réalisation finale de l'œuvre. Je cherche aussi un équilibre entre l'idée et le procédé technique.

(Image II : Croquis « numérique » de l'installation *Écrire l'avenir* réalisée par Lise Robichaud lors du *Festival des arts visuels en Atlantique* en 2002).

Je trouve que l'un des avantages de l'usage de l'ordinateur est la vitesse d'exécution. Il y a les maintes versions qu'on peut rapidement créer à l'aide de logiciels de traitement de l'image, le côté « fini » de l'esquisse et la possibilité de diffusion rapide. Ainsi, les échanges entre l'artiste et la galerie d'art en sont accélérés et on peut passer plus de temps à la production de l'œuvre. Cette qualité de vitesse d'exécution est en fait une des caractéristiques de l'ordinateur. Cet outil, présent dans la vie des artistes, il l'est aussi dans celle des jeunes d'aujourd'hui.

Du *Game boy* au *Game cube* , des logiciels de dessin aux CDROM il y a pleins de nouvelles technologies dans la vie des jeunes d'aujourd'hui. Cela m'amène à penser qu'il y aura certainement un impact sur la relève en arts médiatiques. En attendant, où en est l'intégration des nouvelles technologies dans les arts visuels chez les francophones du Nouveau-Brunswick, pour le savoir nous sommes d'abord allé consulter les documents qui en préconisent l'enseignement.

3.3 Quel type d'intégration des nouvelles technologies préconise t'on pour le domaine des arts visuels en éducation en milieu scolaire francophone au Nouveau-Brunswick?

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 29

Dans le secteur de l'enseignement des arts visuels en milieu scolaire francophone au Nouveau-Brunswick, il y a un programme d'arts visuels en développement que l'on peut consulter sur Internet (1). Le contenu comprend le cadre théorique qui présente les orientations du système scolaire dont la mission de l'éducation ainsi que les objectifs et normes en matière d'éducation. Le document présente aussi les composantes pédagogiques dont les principes directeurs qui comprennent entre autres « la présence et l'utilisation des technologies modernes afin de préparer l'élève au monde d'aujourd'hui et, encore davantage, à celui de demain » (p.6). [Remarque : Dans cette phrase, il est écrit technologies « moderne » on propose d'écrire *nouvelles technologies* car il y a une différence entre les deux paradigmes…]

Parmi les *principes directeurs* il y a référence au mot « talent » (page 6), « d'imagination et de créativité » (page 7) et cela pour toutes les matières dont les arts visuels. Dans les *Résultats d'apprentissages transdisciplinaires* se trouvent les « Technologies de l'information et de la communication » (page 9) ainsi que les concepts de « Culture et patrimoine » (page 12). Ces résultats d'apprentissages sont pour toutes les matières dont les arts visuels au primaire et au secondaire. Le *Modèle pédagogique* préconisé relève de la pédagogie différenciée et « doit respecter les principes directeurs » (page 15). Le programme vise à ce que les élèves « apprennent à leur manière ». (page 15) et il s'agit d'un « enseignement personnalisé » et non individualisé (page 15). L'évaluation des apprentissages doit se faire surtout de manière « formative » (page 17) et « l'évaluation sommative survient au terme d'une période d'enseignement consacrée à une partie de programme ou au programme entier. Elle doit être au reflet des apprentissages visés par le programme d'études. » (Page 18).

Le *programme d'étude en arts visuels* est orienté vers la « complémentarité des expériences de création artistique et d'appréciation esthétique ». (Direction des programmes d'études 2003, page 26). Quant au contenu notionnel du plan d'études, il est résumé dans une structure cubique qui rappelle l'orientation du programme. Ces notions sont reliées à l'histoire de l'art, au langage plastique, aux sources d'inspiration thématiques et aux types d'expérimentations techniques (page 29).

Par rapport au résultat d'apprentissage transdisciplinaire intitulé *Culture et Patrimoine*, le programme d'arts visuels prévois que les jeunes du Nouveau-Brunswick seront initiés aux œuvres d'ici et d'ailleurs, d'hier et d'aujourd'hui. Cela nous permet de déduire que l'étude des arts médiatiques devrait faire partie du contenu à explorer dans les cours d'arts visuels plus précisément dans le cadre des activités d'appréciation critique des œuvres d'art.

Quant au volet « Exploration du monde de l'art » (p.30), à part le mot « design », il n'y a aucune référence à l'esthétique des arts médiatique. Toutefois, dans le volet création artistique de l'expérimentation technique on retrouve le mot « technologie » (p. 33). Ainsi, les apprenantes et les apprenants auront l'option d'explorer avec les nouveaux médias dans le cadre de leur cours en arts visuels.

Dans le plan d'études, il est écrit que les résultats d'apprentissages spécifiques visent surtout « l'art pour l'art » (page 36 , une conception « moderne » de l'art, alors que le concept d'*art médiatique,* ou a*rt technologique,* est actuel et réfère à un nouveau paradigme en arts visuels.

Si le volet expérimentation technique prévoit l'option de travailler avec la technologie (page 46) et que les technologies de l'information et de la communication sont à intégrer à la matière des arts visuels, ne faudrait-il pas intituler le programme d'étude « arts visuels et arts médiatiques »? Ainsi serait incorporé l'esthétique des arts médiatiques.

En résumé, le cadre théorique préconise un enseignement des arts visuels intégrant entre autres la technologie mais le plan d'études annonce timidement quelques pistes pour le faire. En effet, s'il y en a une intégration partielle dans le volet technique elle est loin des attentes visés par les résultats d'apprentissage transdisciplinaires (page 7) et les principes directeurs (page 6). N'est-ce pas là un pas décisif à prendre si on veut que l'école joue pleinement son rôle dans l'éducation artistique et d'éducation esthétique par les arts visuels? Pour ce faire, on propose les quelques pistes de solutions qui sont résumées dans la section *discussion*.

4. DISCUSSION

4.1 Apprendre à décoder le sens des images.

Décoder l'art actuel est une habileté à développer pour enseigner les arts visuels et pour faire de l'art. Il faut savoir que chaque époque amène des problématiques artistiques différentes. Les artistes parlent visuellement de leur temps avec les outils de leur époque.

Le critique et théoricien romain Achille Bonito Oliva a dit, lors d'un colloque sur l'éthique et l'esthétique pour aujourd'hui, que les villes de notre époque sont des réservoirs « d'énergie et de violence, de vitalité et de dépression, et les artistes des dernières générations, conditionnés par tout cela, produisent un art de documentation qui enregistre la négativité de la ville moderne… » (Del Picchia 2004, p.70). C'est vrai car l'art

Page 30

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

actuel reflète notre époque. Quand Del Picchia cite Bonito Oliva qui dit que notre époque « permet au terrorisme de réaliser une performance médiatique qui visiblement a enlevé sa puissance `a l'art » mais que « nous allons vers le développement d'une nouvelle tendance créative capable de représenter des contenus neufs et ouverts aux petites utopies et à d'inédites valeurs constructives. » (Page 70) cela nous donne une vision plus positive de l'avenir de l'art. Une vision qui s'inscrit dans celle du postmodernisme de reconstruction.

Dans l'immédiat, nous vivons des temps de troubles et les images violentes qui nous proviennent par l'Internet et les autres moyens de communication nécessitent des habilités de lectures d'images. Les arts visuels peuvent jouer un rôle dans la formation à la compréhension des images montrant de la violence (ex. images montrant du contenu relié aux guerres et à des événements violents dans le monde). Il existe des stratégies de lecture et Green (2004) en propose une dans les trois étapes que voici: « These steps are : 1) the organization of imagery into comprehensible components, 2) a research methodology for reading images, and 3) an activist plan that employs art production to address the issues raised by the images."(page 6).

La lecture de l'image est une habileté qui peut se développer par les cours d'arts visuels en éducation lorsque les personnes-enseignantes sont habiletés à le faire. En Acadie, il y a peu de spécialistes d'arts visuels en éducation et la relève est rare comme on a pu le constater dans un bilan de la recherche en milieu francophone minoritaire au Canada (Robichaud 2002, 20 août). De plus, les arts visuels en éducation chez les francophones du Nouveau-Brunswick accusent un retard en matière d'art médiatique en éducation en comparaison avec d'autre milieu francophone au Canada, dont le Québec où les arts médiatiques sont davantage intégrés en éducation autant en milieu scolaire qu'au post-secondaire.

4.2 La formation en arts visuels et en arts médiatiques.
En Acadie, la venue des nouvelles technologies dans la formation des artistes en arts visuels est récente et la formation demeure axée sur les techniques traditionnelles (ex. peinture, céramique, sculpture etc.). Mais la jeunesse d'aujourd'hui utilise avec facilité les nouvelles technologies et il n'est pas rare de voir de jeunes enfants ou adolescents montrer aux adultes comment se servir de l'équipement électronique. Cela nous porte à croire que les artistes en herbe seront peut-être plus portés vers l'esthétique des arts médiatiques, voilà une hypothèse qu'il faudra éventuellement vérifier.

Chez les francophones du Nouveau-Brunswick, on demande aux enseignants et enseignantes non spécialisés en arts visuels d'enseigner cette matière. Ces personnes font ce qu'elles peuvent dans les conditions qu'on leur donne. Au niveau de la formation, par exemple, elles suivent en moyenne un cours de deux crédits pour apprendre la didactique des arts visuels au primaire, c'est peu de temps pour beaucoup de contenu et de pratique à maîtriser. Quant aux spécialistes d'arts visuels du secondaire, ils ont l'avantage d'avoir au moins un baccalauréat en arts visuels, ils ont peu de cours spécialisés dans la didactique des arts visuels. Il existe donc un besoin réel au niveau de la formation de spécialistes en art médiatiques en Acadie et cela en enseignement, en création, en développement et en recherche.

4.3 La recherche et la pratique relié à l'intégration des nouveaux médias dans l'enseignement des arts visuels.
Les nouvelles technologies combinées à l'enseignement des arts visuels est l'objet de plusieurs projets de recherche. Citons entre autres le projet de l'UNESCO qui fait la promotion des communications interculturelles et de la diversité [http://www.insea.org/idee/].

Il s'agit d'un projet expérimental dédié aux formes d'art numériques et à l'enseignement des arts visuels. En voici la description : « The 'Young Digital Creators' project is part of the 'Digi-Arts' sub-portal under the 'Knowledge' Portal initiated by UNESCO's Director General Mr Koïchiro Matsuura. 'Digi-Arts' takes the shape of an experimental portal site dedicated to digital arts, pasrts of it catering to researchers, artists and professional people and another part, which is called 'Young Digital Creators'. To adolescents and their educators". (UNESCO project, 2004, page 6). Ce projet de l'UNESCO qui est d'initier un programme d'enseignement des arts médiatiques pour les jeunes est un exemple de ressource possible pour notre milieu.

D'autres expériences pratiques sont inspirantes, citons entre autres les portfolios électroniques ou médiatiques (Dussault et Richard 2003) et les galeries d'art électroniques (O'Connell 1996) qui permettent des projets d'échange international en arts visuels et cela dès le primaire (Richard 1999). Il y a aussi des ressources reliées aux arts visuels en éducation et aux nouvelles technologies. Exemples : associations d'artistes-enseignants(tes) dont l'AQÉSAP [http://aqesap.org/liens.htm] et éducation esthétique soutenu par des musées[http://www.artsednet.getty.edu].

4.4 Nouvelles pistes de recherches
Cette étude révèle des besoins propres en matière de nouveaux médias et d'éducation en arts visuels en milieu culturel acadien au Nouveau-Brunswick. Elle révèle de nouvelles pistes de recherches.

Premièrement elle révèle le besoin d'étudier davantage le milieu de l'art en Acadie afin d'avoir un portrait plus

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 31

complet de la situation de l'esthétique des arts médiatiques en milieu francophone minoritaire au Canada.

Deuxièmement, cette étude révèle l'importance de faire de la recherche-action en tant que créateur en arts visuels afin de situer sa propre praxis artistique dans le champ de l'art. Dans notre cas, il s'avère qu'on pourrait regarder du côté de la photonique et ainsi continuer nos recherches sur l'intégration de la lumière dans nos installations. Troisièmement, l'étude révèle le besoin de recherche développement en matière de programme d'enseignement en arts médiatique et cela autant en milieu scolaire que post secondaire.

Ainsi pourrait se faire la connexion à l'aide des nouveaux médias et les réflexions culturelles par les nouveaux médias dans les arts visuels en milieu culturel acadien au Nouveau-Brunswick.

NOTES

1. http://www.gnb.ca/0000/publications/servped/Artsvisuels M-8.pdf

REFERENCES

Clark, R.C. (1992). Media use in education. (p.805-814). In *Encyclopedia of Educational Research.* 6e ed. New York : Toronto : Macmillan ; Maxwell Macmillan Canada.

Del Picchia, M. (2004). Éthique et esthétique pour aujourd'hui. Autour de Gao Xingjian, un colloque réuni penseurs et rebelles à Marseille. *Art Sud.* (janvier-février) 43 : 68-72.

Direction des services pédagogiques. (2003). *Programme d'études : Arts visuels (M-8).* [en ligne]. Disponible: http://www.gnb.ca/0000/publications/servped/Artsvis uelsM-8.pd

Druckrey, T. (1993). *Revisioning Technology.* Cambridge, Massachusetts: The MIT Press.

Dussault, S. et Richard, M. (8 novembre 2003). *Le portfolio médiatique en pédagogie du projet artistique : un artefact de recherche collaborative.* Québec : Congrès AQÉSAP 2003.

Feldman, E.B. (1982). *The Artist.* Englewood Cliffs, N.J.: Prentice-Hall, inc.

Green, G. (2004). Reading violent Images. *Art Education 57*(2): 6-9

Kincheloe, J.L. (2003). *Teachers as Researchers.* London : RoutledgeFalmer.

Kindler, A.M. et Darras, B. (1997). Artistic development and the teaching of art. In R. Irvin et K. Grauer. *Readings in Canadian Art Teacher Education* (p.157-170). Boucherville, Québec: Canadian Society for Education through Art.

Lacour, L., Provost, J. et Saumier, A. (1995). *Méthodologies de la recherche en sciences humaines. Fascicule : l'analyse de contenu.* Montréal : Éditions du Renouveau Pédagogique Inc.

May, W. et Diket, R. (1997). Action Research . Part I : Teachers-as-Researchers (p.223-240). In LaPierre, S.D. et Zimmerman, E. *Research Methods and Methodologies for Art Education* Reston, Virginia: The National Art Education Association.

O'Connell, K.R. (1996). Virtual Gallery in Japan. *School arts* (May/June): 33.

Parsons, M.J. (1989). *How we understand Art. A cognitive developmental account of aesthetic experience.* Cambridge: Cambridge University Press.

Poissant, L. (1995a). (dir). *Esthétique des arts médiatiques* Tome 1. Sainte-Foy (Québec): Presses de l'Université du Québec.

Poissant, L. (1995b). Éléments pour une esthétique des arts médiatiques. In L. Poissant (dir.) *Esthétique des arts médiatiques* Tome 1 (1-23). Sainte-Foy (Québec): Presses de l'Université du Québec.

Richard, M. (1999). *Autoportrait à découper. Projet d'échage internations en arts plastiques au primaire.* Montréal : UQAM.

Robichaud, L. (2000). Installation: *Liens.* Havre-Aubert : Symposium des Iles-de-la-Madeleine.

Robichaud, L. (2002). Installation: *Écrire l'avenir.* Caraquet : Festival des arts visuels en Atlantique.

Robichaud, L. (2002, 20 août). *Répertoire de la recherche en enseignement des arts visuels en milieu francophone minoritaire au Canada.* Actes du Colloque pancanadien sur la recherche en éducation en milieu francophone minoritaire : Bilan et prospectives qui eut lieu en novembre 2000. Université de Moncton : CRDE. [en ligne]. Disponible: http://www.acelf.ca/publi/crde/index.html

Stankiewicz, M.A. (1997). Historical Research Methods in Art Education (p.57-73). In LaPierre, S.D. et Zimmerman, E. Research Methods and *Methodologies for Art Education.* Reston, Virginia: National Art Education Association.

UNESCO Project. (2004). Young Digital Creators. In *InSEA news* (2): 6-7.

Page 32

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

NEGOTIATING CULTURAL AND ECONOMIC URBAN LANDSCAPES USING IMMERSIVE MEDIA

John Danahy, Rodney Hoinkes
Knowledge Media Design Institute and the Centre for Landscape Research (CLR),
University of Toronto, 230 College Street, Toronto, Ontario   land@clr.utoronto.ca

1. CONSUMING IMAGES

The urban cultural landscape gives us the stuff of everyday life. It forms our communities and immerses us in urban sensory experiences. The well formed urban cultural landscape helps us negotiate our public social interactions. Urban cultural landscapes are sold to us and decorated using consumptive images. Designers (graphic to city designers) craft these images. Advertising, visual art and film media convey images, meanings and symbols of cities as cultural lifestyle artifacts that people aspire to acquire. At the same time, cities are fundamental structures for economic exchange. The economic urban landscape in a healthy economy is under constant pressure to increase densities and property values. Canada's major cities are growing and physically transforming. By definition, this process endangers a city's heritage landscape. Thoughtless or selfish satisfaction of contemporary demand by people to live in proximity to urban amenities and infrastructure can lead to the needless destruction of significant cultural landscapes. Negotiating these conflicting values and needs is extremely difficult using conventional media.

The images of urban culture used to be made exclusively by elites (landscape architects, visual artists, film makers). The evolution of usable digital visual media by citizens is making it possible to add a layer of negotiation to both the consumption and crafting of urban images. People no longer need to passively consume images supplied only by the proponents of a urban development. Through advances in digital media, it is becoming increasingly possible for citizens to engage visual propositions in a process more akin to dialogue. This raises the question of how will the culture of design elites adapt to increasing visual and spatial literacy and how can these tools be used to assist in heritage planning?

An image of an urban design proposition can be analyzed and reformed in a digital media setting in ways that were not practical to consider using analogue visual media. An analogue image usually has to be destroyed in the process of examination and re-representation. In addition, the skills and training needed to easily decode and create analogue images involves years of practice that few people other than designers and artists possess.

Today's emergent context of relatively easy and fast sampling, copying and operation on images means a digital image can be received as an argument, deconstructed and reassembled by the receiver. The process is similar to the way a linguistic proposition is received in conversation or read as a text by a literate person and restated in the form of dialogue. This capacity for engagement lies at the heart of negotiation between people, a process essential to urban design. Given the new digital design media, visually literate elites should no longer expect to specify a society's consumptive images in isolation. Designers cannot expect to be solely responsible for establishing a single formal compositional image that users of a space consume

Digital media as it is commonly used has a pervasive focus upon single-user experiences, single-user interfaces, and single-user engagement. In our lives, we perform many actions as an individual, many more are influenced, shared, or learnt in a social setting. In order to support the process of negotiation, it is time we put as much effort into developing contexts that promote the social construction of knowledge as those developed for the individual.

Group Interactive Immersive Environments (GIIE) are an inclusive concept of social media interaction. GIIEs are built upon an active or "hands-on" approach to the application of knowledge within social contexts. Unlike many media pursuits, this is not a reductionist view, rather a more holistic view of new media integration and interaction. A GIIE combines concepts of immersive environments to establish context, rich media integration to provide critical knowledge, and interactivity to support investigation, play, collaboration, and competition. A GIIE provides a range of media, representations, and modes of interaction that support diverse learning, working, and playing styles, providing a leveling playing field for dialogue and debate.

2. CASE STUDIES THAT NEGOTIATE HERITAGE AND ECONOMIC VALUES

There is intense economic incentive in many Canadian cities to increase densities. A single apartment complex can generate a 100 million dollars in gross revenue. Therefore, when heritage values in a community come into conflict with such a development, there is little the public can do to represent heritage values. It costs thousands of dollars and requires elite skill to craft imagery depicting the impact of development on a heritage landscape and even more to propose an alternative using conventional media. A developer can afford to spend tens of thousands of

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 33

dollars to pressure and appeal to the courts to protect their financial interest but citizens cannot. Of further concern, there is almost no significant regulation to protect heritage landscapes. We have set out to build immersive media tools that empower both citizens and experts to discuss and negotiate urban design solutions.

In every real-world case that the Centre for Landscape Research has worked on, politics and law dictated that development interests were assigned first priority. Protection of heritage values had to be negotiated in terms of showing a developer how they could achieve the zoned density using more innovative building form. The following figures illustrate applications of real-time interactive immersive visualization that were systematically linked to economic representations. Citizens and developers used the tools to negotiate improvements to the protection of the visual heritage resource of the urban landscape using the immersive lab at the CLR.

Fig. 1 : A Case of View Protection in the National Capital Similar to the Fort York case, the National symbols are juxtaposed with the economic reality of the land development mechanisms in the Capital's two cities. This image depicts negotiated height controls to preserve heritage views toward the Parliament Hill.
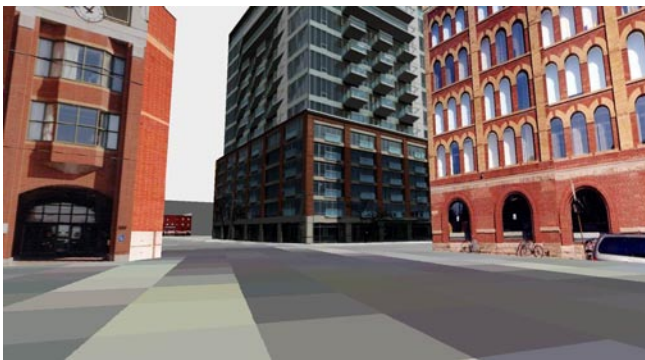
Fig.2 : Illustrates an image made for a citizens group when a developer did not show them how a proposed building would look from other streets in Toronto's 'Old Town'.

Fig. 3 : CLR used immersive interactive media to negotiate the form of a buildings surrounding Fort York, Toronto.
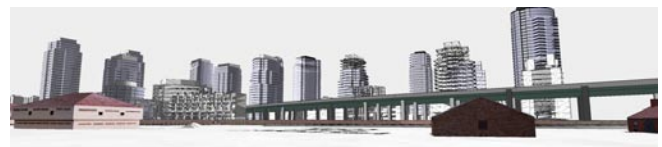
Fig. 4 : Proposed Impacts on Fort York's view of the sky.

3. EVOLVING THE TECHNOLOGY OF REAL-TIME GROUP INTERACTIVE IMMERSIVE ENVIRONMENTS (GIIE)

CLR's current work with Immersion Studios Inc. is moving the capability used in these case studies to low cost personal computers. The objective is to make it more possible for heritage issues to be fully debated. Citizens involved with testing and using the systems found the use of a group interactive immersive visualization provided a much better understanding of scale and experience than images presented on a single screen. Real-time visualizations worked extremely well at keeping pace with discussions and ideas in group decision-making. Holding meetings and finding times when every particpant was able to meet proved to be a significant constraint in each case study. Therefore, our next generation of research is looking closely at networked collaborative solutions to support dialogue.

REFERENCES

Danahy, J.W. (2004). Dynamic Immersive Visualization. The Real and Virtual Worlds of Spatial Planning, ed. Koll-Schretzenmayr, Nussbaumer, Sringer, Heidelberg. Chap. 11, pp.157-171

ACKNOWLEDGEMENTS

Page 34

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

DIGITAL MEDIA PLAYER CONTROLS SUPPORTING MUSIC EDUCATION

Bruno Emond[1], Norman G. Vinson[1], Janice A. Singer[1], Marion A. Barfurth[2],
Gary Fernandes[3], Rachel White[3], Leo Ferres[3], Martin Brooks[1], John Spence[4]

[1]Institute for Information Technology, National Research Council Canada, 1200 Montreal Road, Building M-50, Ottawa,
ON, Canada. K1A 0R6 {bruno.emond, norm.vinson, janice.singer, martin.brooks}@nrc-cnrc.gc.ca
[2]Faculty of Education, University of Ottawa, barfurth@uottawa.ca
[3] Department of Psychology, Carleton University, {gjfernan, rewhite}@connect.carleton.ca, lferres@ccs.carleton.ca
[4]Communications Research Centre, john.spence@crc.ca

1. INTRODUCTION

Recent research on learning from self-observation through video has shown positive effects on skill acquisition in various domains such as sports (Horn, Williams, & Scott, 2002; Guadagnoli, Holcomb, & Davis, 2002; Beilock, Wierenga, & Carr, 2002), nursing (Hill, Hooper, &Wahl, 2000), counselling (Urdang, 1999), and music teacher training (Broyles, 1997). For these domains, video playback can act as an aid for remembering and supporting skill representation.

In the context of music performance, the role of memory and other cognitive functions such as planning, self-monitoring, and music representation have been extensively studied (Palmer, 1997; Palmer, Jungers, & Jusczyk, 2001). Previous studies suggest that skilled behaviour is characterized among other factors by an ability to monitor one's own performance.

The findings regarding the usefulness of video for skill acquisition in domains other than musical performance, and the role of self monitoring in music learning and performance, has led us to conduct research on the effect of video to support learning in skilled musicians. Here, we report our findings in regard to skilled musicians' use of a variety of digital media player controls in reviewing video of their performance.

Digital video creates the potential for several new browsing controls that could not be implemented on VCRs (which play analogue media), such as random access to video segments, looping, segment preview by thumbnails (Geisler, et al. 2002a; Geisler, et al. 2002b), slide bar, and other indexing mechanisms supporting video browsing. Nonetheless, VCR-like controls that enable quick and user-friendly browsing of multimedia content are desirable in digital video applications (Lin, Zhou, Youn, & Sun, 2001).

Previous research has indicated that the use of different media player controls (like Fast Forward) depends strongly on the content of the video (Li, et al. 2000). In particular audio-centric videos (classroom lectures, conference presentations) tend to reveal uses of media browser controls supporting content indexing. Video-centric content (sports, travel) makes the use of video frame based navigation more relevant, while narrative/entertainment-centric content (shows) does not promote use of browsing functionality because the viewer's enjoinment is bound to the sequential and normal play speed of the media.

We examined the use of media player controls by highly skilled music students viewing one of their own ensemble coaching lessons. Such lessons have both important audio components (music played and verbal instructions), and video components (musician movements and postures). Even if this type of media content is focussed on learning, it is certainly different from audio-centric videos studied by Li (Li, et al. 2000), raising the possibility that users would prefer different media player controls.

This study is part of the MusicGrid project (www.musicgrid.ca). MusicGrid's educational goal is to enable, expand and enrich Canadian music education programmes in urban, rural and remote communities by reducing barriers to broadband e-learning applications.

2. METHOD

2.1 Participants

Participants were music students enrolled in the National Arts Centre's Young Artists Programme during the summer of 2003. The Young Artists Programme only admits highly skilled advanced classical music students. Their participation was requested in writing before the programme began, and through an oral presentation made at the start of the programme. Twenty students between the ages of 14 and 25 volunteered to participate. Eighteen of them played string instruments, and two played the piano.

2.2 Apparatus

Participants viewed their coaching session videos on the YAP Media Player developed in Visual

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 35

Basic especially for this study. We equipped our media player (see Figure 1) with the usual VCR-type controls: play, rewind, and fast-forward, and volume and mute controls. With a VCR, the different parts of a tape must be accessed in sequence. In contrast, a digital video format provides the potential to access any part of the video in an instant. Like many other media players, our player has a slide bar that can be used to move quickly from one frame to any other (Figure 1, number 2). Like a computer window's scroll bar, the slide bar provides a spatial indication of the current movie frame's position in the movie. Additional information about the controls of the media player is provided in the Figure 1 caption.
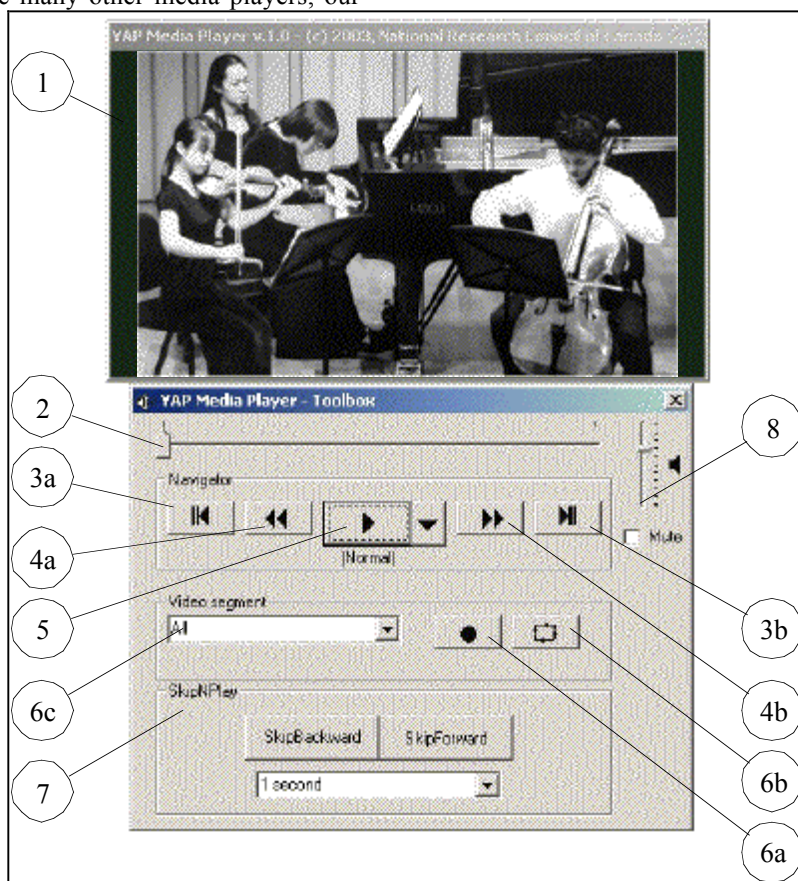
Figure 1. The Viewer Window displays the video image. 2. The Slide Bar can be clicked and dragged to navigate through the video. 3, 4, and 5. The navigator control panel. 3a. The Skip-to-Beginning button instantly sets the movie to its beginning. 3b. The Skip-to-End button instantly sets the movie to its end. 4a. Rewind plays backward through the movie with sound at 4x the normal speed. 4b. Fast Forward plays forward through the movie with sound at 4x the normal speed. 5. Play With Speed control drop down menu (options: slowest, slow, normal, fast, and fastest). 6. Video Segment control panel. These controls allow users to save video segments, loop them, and replay them later. When a video segment is played, the navigation controls work in relation to that segment only. 6a. Clicking on the Record button starts or stops the recording of a video segment. As the segment plays, it is saved. 6b. Clooping button. Continuously loops a video segment. 6c. Video Segment Selection drop down menu. 7. The SkipNPlay controls allow the user to quickly skip through the video forward or backward by increments of 1, 5, and 30 seconds, or, 1 and 5 minutes. 8. Volume Control and Mute.

2.3 Materials

MiniDV videotapes of coaching sessions were rendered into the video NTSC format (720X480, 29.97fps) and uncompressed sound using iMovie on an Apple Macintosh G4 running OS X. Coaching session NTSC files were then transferred to Windows-based computers for the viewing sessions, which constituted the experiment. Test

Page 36

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

stimuli were videos of the participants' ensemble coaching sessions. The videos recorded no more than two days prior to the experimental session and presented with the YAP Media Player. The average duration of the eight videos was 53 minutes.

2.4 Design

The core design consisted of a single between subjects factor, viewing condition, with 2 levels: individual viewing and ensemble viewing. In the individual viewing condition, students viewed their coaching session video by themselves. In the ensemble viewing condition, the whole ensemble viewed their coaching session video together. It is important to note that in both the individual and ensemble conditions, the video showed the students' ensemble coaching session.

As dependent measures, we collected subjective ratings of the usefulness of the media player controls and logs of media player control use.

2.5 Procedures

Before participating, each student read and signed an informed consent sheet. The entire video viewing experimental procedure took no longer than 70 minutes. Students participated either individually or as an ensemble. The researchers began reading the procedure script, which contained an overview and instructions for the experiment.

After the introduction, participants were given 10 minutes to complete a questionnaire, which probed their memory of their ensemble performance.

After completing the first questionnaire, participants were trained to use the different YAP Media Player controls and were presented with an example of a think-aloud protocol. Participants were then given 25 minutes to view their coaching session using the YAP Media Player while thinking aloud. They were reminded to think aloud after every 5 minutes of silence. A digital camera was used to capture participants' comments and their mouse movements while the YAP Media Player's data logging capabilities tracked control usage.

Participants were then given 10 minutes to complete a second questionnaire, which asked similar questions to the first. However, responses to the second questionnaire were based on the viewing of the recorded coaching session.

A final questionnaire was then administered. Participants were given 10 minutes to respond to rating scales and questions about the usefulness of the YAP Media Player's controls in the context of music education.

3. RESULTS

This paper focuses on the results of the questions about the usefulness of the YAP Media Player's controls and the YAP Media Player usage logs.

3.1 YAP Media Player Control Usefulness Ratings.

A repeated measures analysis of variance of usefulness judgements showed that, in the ensemble viewing condition, the usefulness of the media player controls were judged significantly more useful than in the individual condition ($F(1,18)=9.080$ MS=67.213 $p<0.05$). In addition, the within subject variable related to each specific control of the media player was also significant ($F(9,162)=3.694$ MS=5.161 $p<0.005$). No interactions were found significant. Figure 2 shows the average usefulness rating and 95% confidence interval for each media player control. The slide bar was judged as the most useful control, though, as the scale ranged from 1 to 7, all controls were judged to be useful.
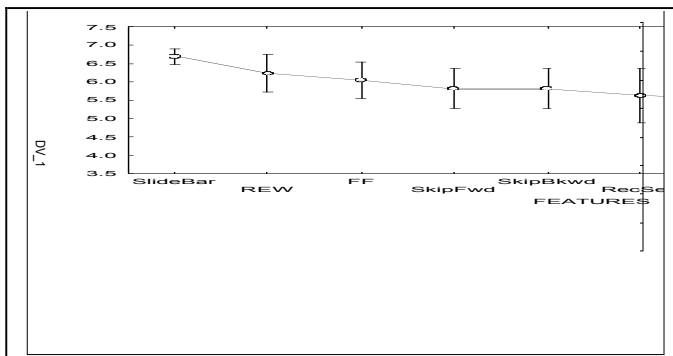
Figure 2. Subjective evaluation of media player controls

3.2 Use of YAP Media Player Controls.

A repeated measures analysis of variance of the media player controls usage frequency from the log files showed a significant difference between controls. ($F(11,99)=2.950$ MS=567.689 $p<0.005$). No main effects of viewing conditions or interactions were significant. Figure 3 shows the average frequency and 95% confidence interval for use of the media player controls. As reflected in the usefulness judgement, students used mostly the slide bar to navigate in the video content, followed by the skip forward, and play and pause buttons. However, the other controls received hardly any use at all.
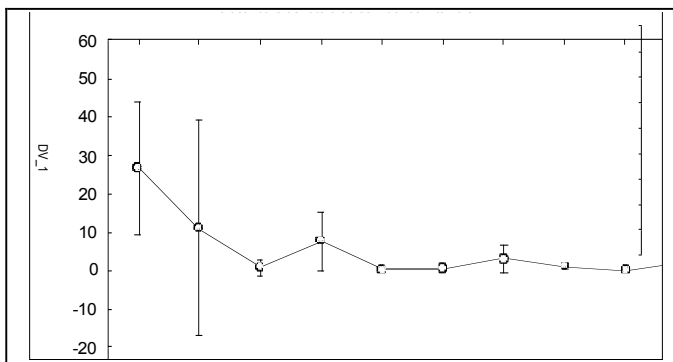
Figure 3. Frequency of media player control use

4. DISCUSSION

The data analysis of overall judgment of media player control usefulness shows a significant difference between ensemble and individual viewing. In addition, some controls were judged as being more useful than others. The preferred control was the slide bar, which supports rapid

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 37

positioning of the play head as well as variable speed browsing of video content. The data on control use is convergent with this result because the slide bar was the most used media player control.

One goal of this study was to identify which controls should be included in a media player to support video browsing. These results suggest that only a simple set of controls is required: pause, play, and the slide bar. However, it is important to note that the students were limited to a single viewing session of 25 minutes. Longer or additional sessions may have revealed different control use patterns.

The pause, play and slide bar controls are easy to implement in a digital media player. However, the slide bar's function is limited when the video is streamed — that is, when the video is stored on a server and is streamed to the user's computer while s/he views it through the media player. In our experiment's viewing sessions, the videos were stored locally, on the same computer as the YAP Media Player. The YAP Media Player therefore responded quite quickly to manipulations of the slide bar (and other controls). In contrast, when video is streamed, the media player responds more slowly to slide bar manipulation depending on the available network bandwidth. This slowing may discourage slide bar usage. Our results raise the possibility that the quality of experience of video on demand using streamed media could benefit from an aggregation of streamed media and preload components to support slide bar responsiveness.

REFERENCES

Beilock, S.L., Wierenga, S.A. Carr, T.H. (2002). Expertise, attention and memory in sensorimotor skill execution: Impact of novel task constraints on dual-task performance and episodic memory, The Quarterly Journal of Experimental Psychology, 55A(4), 1211-1240.

Broyles, J.W. (1997). Effects of Videotape analysis on role development of student teachers in music. Unpublished PH.D. Thesis, University of Oklahoma, 173 p.

Geisler, G., Giersch, S., McArthur, D. McClelland, M. (2002a). Creating virtual collections in digital libraries: benefits and implementation issues, Proceedings of the second ACM/IEEE-CS joint conference on Digital libraries, 210-218.

Geisler, G., Marchionini, G., Wildemuth, B.M., Hughes, A., Yang, M., Wilkens, T., Spinks, R. (2002b). Video browsing interfaces for the open video project, CHI '02 extended abstracts on Human factors in computer systems, 514-515.

Guadagnoli, M., Holcomb, W., Davis, M. (2002). The efficacy of video feedback for learning the golf swing, Journal of Sports Sciences, 20 (8), 615-622.

Hill, R., Hooper, C., Wahl, S. (2000). Look, learn, and be satisfied: video playback as a learning strategy to improve clinical skills performance, Journal for Nurses in Staff Development, 16(5), 232-239.

Horn, R.R., Williams, M.A., Scott, M.A. (2002). Learning from demonstrations: the role of visual search during observational learning from video and point-light models, Journal of Sports Sciences, 20 (3), 253-269.

Li, F.C., Gupta, A., Sanocki, E., He, L-W., Rui, Y. (2000). Browsing digital video, Proceedings of CHI 2000, ACM, The Hague : Amsterdam.

Lin, C.-W., Zhou, J., Youn, J., Sun M-T. (2001). MPEG video streaming with vcr functionality, IEEE Transactions on Circuits and Systems for Video Technology, 11 (3), 415-425.

Palmer, C. (1997). Music performance, Annual Review of Psychology, 48, 155-138.

Palmer, C., Jungers, M., & Jusczyk, P. W. (2001). Episodic memory for musical prosody, Journal of Memory and Language, 45 (4), 526-545.

Urdang, E. (1999). The video lab: mirroring reflections of self and the other, Clinical Supervisor, 18(2), 143-165.

ACKNOWLEDGEMENTS

AUTHOR NOTES

Bruno Emond, Norm Vinson, Janice Signer, and Marion Barfurth contributed to the design, data collection, analysis and redaction of the paper, as well as to the design of the media player.

Rachel White, and Gary Fernandes contributed to the data collection and analysis, as well as to the design of the media player. Leo Ferres contributed to the design and encoding of the media player.

Martin Brooks and John Spence contributed to the coaching sessions video capture, and facilitated the relationship with the National Arts Centre.

Page 38

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Experimenting with the DKNS Teaching Tool

Tang-Ho Lê, Chadia Moghrabi, John Tivendell, Jean Roy, Johanne Hachey
Université de Moncton, Édifice Rémi Rossignol, Moncton, N.-B., Canada, E1A 3E9, letangho@umoncton.ca

1. Introduction

One of the goals of the Arts-Netlantic project is to contribute to the production of new media art by current and potential new media artists through the sharing of technical resources and the exchange of knowledge (www.upei.ca/artsnetlantic). In order to reach this goal, a sophisticated multimedia laboratory was established in our university including advanced equipment and software which will allow artists to create their artworks using new technologies. First the artist must learn to effectively use this equipment and software. However, with limited time and budget, we cannot provide them all with a private tutor to help them complete a full training program. A more convenient way is to have them use an e-learning software tool. This tool could be installed in the laboratory or it could be downloaded from our web site in order to teach the artist how to use the multimedia equipment and software available in our laboratory. This e-learning tool must be simple yet efficient in order to provide the learner with enough knowledge to execute the specific tasks he or she has chosen. In this specific context, we have adopted a teaching tool called DKNS (Dynamic Knowledge Network System) that should respond to these needs. In this paper, we present this new software tool with an emphasis on the elaboration on those lessons needed to teach people how to use this new media software. We shall begin with an introduction to the concept of e-learning. We shall then present the DKNS as a self-learning tool and then explain the cognitive steps needed to structure a lesson in DKNS. Finally we shall sketch out some of the criteria that can be used to evaluate this new software tool.

2. Defining E-learning

In this electronic era we frequently hear the term "e-learning". In a broad sense, this refers to a learning process that is to be carried out with a computer being one of the elements. Generally there are two major components, i.e. the content which must be learnt (including multimedia pedagogical resources) and the engine needed to teach this content. In the content component, one needs to distinguish between procedural knowledge (how to do something) and declarative knowledge (what that something IS). Briefly, the former includes the ordered set of actions required to accomplish a precise task. The latter is the definition of the concept, the event or the fact.   To learn effectively the content must first be well organized and take into account the learning conditions (prerequisites.   Thus, the content

designer has to structure the textual content and lay out the appropriate resources. For example a given resource could be an image, a diagram, a video clip, an animation, etc. This structuring of the task is usually done by means of a program tool imbedded in the teaching engine. Secondly, the teaching engine has to convey (transfer) this content to the learner in an organized manner building upon the learner's actual knowledge [Lê, 1998].   As a common practice, at the end of an e-learning lesson a questionnaire is administered to the learner in order to access the knowledge acquired and to evaluate the learner's level satisfaction with the session.

3. DKNS as a self-learning tool

3.1 Compared with existing e-learning tools

Today there are numerous e-learning software tools for training and teaching being used by various organizations. These tools generally include a learner module to recognize the prerequisite knowledge the learner needs to have. Then each lesson is created using a number of prescribed steps each with their own pedagogical rules (e.g. defining objectives, categorizing the content knowledge, etc.). in some situations the software is to be used in a more complex task and/or the learning process itself must be totally controlled by the software.   In an academic context, for instance, this control over the process may be necessary because the learners are in a supervised situation. However, when self-learning approach is desired, there is no need to have such control over the learner. In this latter case, it is the learner who is responsible for the learning process. Moreover the learner is already very motivated. These users we are meeting in our laboratories fall under this second category. With the DKNS learning tool, the learner has the power to choose his or her own learning path and learning process. In other works the learning process is controlled by the user via the software.

3.2 Practical aspects of DKNS

We hypothesized that DKNS is a convenient self-learning tool and indeed it uses the same interface for both the content designer and the learner.   The template lesson content used in this DKNS study emphasizes the procedural knowledge needed to establish the actions necessary to accomplish the specified task. For example, the user might wish to identify the steps needed to transform a picture into an electronic format using a desk scanner and appropriate software (see figure 1).   Whenever an essential concept

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 39

appears, the designer can add a definition of the concept (i.e. a knowledge declaration) in the allotted space and then link it to the procedural knowledge needed for the task. Moreover it has been established elsewhere that access to pertinent demonstrations can contribute highly to the learning process [Gagné, Briggs & Wager., 1992]. The most powerful didactic resources available to the learner is a demonstration related to the specific lesson content of interest (visual file). DKNS lesson template has an allotted space to easily insert JUST such demonstrations. With today's multimedia technology, it is easy to create A demonstration that includes a video clip, an animation program, an audio file, a photo, or a diagram (these are commonly called multimedia resources). The DKNS lesson template also allows the learner to link up to other Internet related resource files to further complement the lesson content. This will permit the learner to deepen his knowledge or broaden his understanding of the specific subject of interest.

3.3 Defining DKNS Knowledge networks

A DKNS course content will consists of a number of lessons that can be called Knowledge Networks (KN). Each lesson also is represented by a knowledge network that in turn includes several knowledge units (KU). A procedural KU (see the yellow box) can be linked to one or more declarative KU (see the blue box) in order to explain some related concept. A set of these KU will form the domain's ontology. The procedural KU can also be linked to other procedural KU in order to reflect a workflow structure, i.e. it can be divided into subtasks. This KN is displayed on the screen and gives an *overall view* of the lesson. By clicking on any one of the KU that makes up a given KN, the user opens up a more *detailed view* of its content. For example he or she opens up a frame (lesson template) with several slots or fields in which to inscribe the lesson's content and any other related information. As illustrated in the figure 1, this relates to what was previously mentioned about the learner having total control over this learning process.
You are invited to participate in our workshop which is part of the conference's activities. We will demonstrate many of the system's functions and allow participants to actually use the DKNS software.

4. The cognitive steps involved in structuring a lesson in DKNS

A Task Analysis is what industrial and organisational psychologists and other Human Resource specialists use to generate accurate descriptions of the steps required to complete a task. It is commonly known that in the learning process there are two main aspects: what you must know and what you must do. With simple jobs using simple technologies the analytic focus is easily identified. However as tasks become more intricate and knowledge intensive, relying on more complex technologies needing increasingly complex technological support, the traditional forms of decomposing these tasks is often no longer

adequate [Barnard & May, 1998]. Cognitive Task Analysis (CTA) was developed to provide a way to capture the knowledge and procedures needed to complete the more complex tasks encountered in many of today's jobs.

4.1 Defining Cognitive Task Analysis (CTA)

CTA is a method of task analysis that intends to identify the cognitive demands of a complex task. This includes the knowledge, mental transformations and the decisions necessary to do the task. The goals of CTA are to identify the factors that lead to cognitive performance difficulty and to find the knowledge and skills used by expert practitioners whilst doing the task. A CTA can also help specify ways to improve performance through new forms of training, changes to the user interface and/or by adding new job aids. CTA has been shown to be an effective method of eliciting information about decisions being made and the information used by experts to perform their job [Gordon & Gill, 1997]. It has been a useful tool when used to capture the key cognitive elements in real-world tasks.

4.2 CTA in our laboratories when using DKNS

In our laboratory, we can apply the CTA to identify the cognitive factors that contribute to a good performance on the learning process with DKNS. With DKNS the method consists of breaking down a complicated task into simpler subtasks. Each subtask describes a sequence of primitive actions. If a new concept or a cognitive demand is to be added, the designer can add a declarative KU in order define this new concept and then connect it to the actual procedural KU. More important perhaps is that a given learner will be able to repeat a visual representation of the underlying task by clicking on the file name of, for instance a video clip or animation file such as Flash file, which can be found in the demo slot within the KU's frame.

Figure 1: DKNS's Knowledge Unit.

Page 40

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

5. The evaluation of the software tool

A behavioral study aimed at evaluating the pedagogical approach provided by DKNS is being conducted at our laboratory as we are writing this paper.

5.1 Résumé of the evaluation criteria

ThinkQuest

Our own evaluation study is inspired from a recently available procedure for program evaluation currently being used by New York City [ThinkQuest, 2004]. This program seeks to combine the power of new technologies with proven educational principles in order to help teachers and students meet their common goal, i.e. to facilitate curriculum learning. The team first identified four basic criteria. These are

Respectively: educational value, content quality, technical quality and actual learning. Then they attributed differential weightings to each criterion, in their case respectively 30, 25, 25 and 20 points. Finally they identified a set of measures for each of these criteria. To determine educational value they measured the importance of the objective, its originality, the degree of innovation and the artistic presentation of the material. To evaluate content quality they sought to measure the accuracy, completeness and clarity of the information conveyed. To evaluate technical quality they measured reliability of use, internal consistency and ease of use. Finally to evaluate the learning they measured active participation, the degree of data sharing and the degree to which the program fostered further exploration.. We are using very similar criteria and measures.

ICOM-CIDOC Multimedia Evaluation Criterion

In designing our own program evaluation we are also taking into account the work done by the International Committee for Documentation, part of the International Council of Museums. This committee sought to identify those characteristics that make for good multimedia museum. Their criteria has been organised into the five "sections": content, functionality, interface, implementation, and overall impact. They associated particular questions to be used to evaluate those criterions.

We will present our evaluation tools at the conference
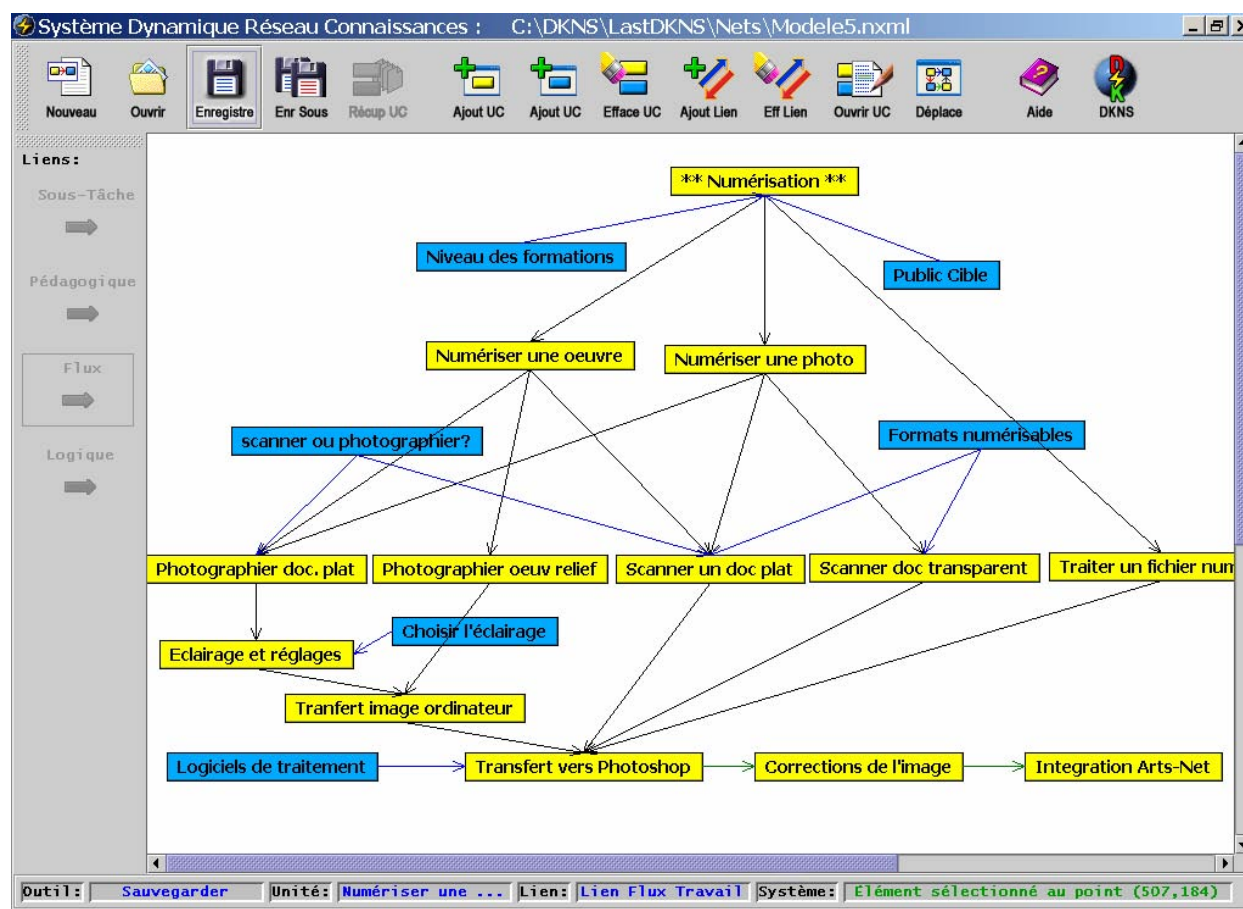
Figure 2: DKNS's Knowledge Network.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 41

6. Conclusion

As of now we can only assess the functionality of the DKNS as simple and effective didactic tool for our own multimedia laboratory. Following our learning session, two sources of evidence will be used to convey the scope and quality of the teaching: a practical evaluation and a written evaluation. In the practical evaluation, the procedural acquired knowledge of the learner is assed. In the written evaluation, the user friendliness and the degree to which the program fostered further exploration interest by the learner are assed.

DKNS lesson has been created taking into account the student motivation to dedicate time alone to overview or study the content of the lesson. Complementary didactic resources are made available to the user and are easily identify and accessible by user. Thus, there is no imposition of a teacher or the consulting of written manual. As learning progresses, the learner's need may become more specific, relying on more sophisticated techniques in order to accomplish more complex tasks. The DKNS learning approach responds to that need and provides him or her with the necessary information. Complementary options are in place in the DKNS lesson templates allowing one to broaden or deepen one's knowledge of specific lesson content.

7. References:

Barnard, P.J. & May, J., 1998. *Towards a theory based form of cognitive analysis of broad scope and applicability*. M.Sc. Cognition and Brain Sciences Unit, Cambridge University, and the Department of Psychology, University of Sheffield. England.

CIDOC, J.Trant and members at the Nuremburg CIDOC meeting. *Multimedia Evaluation Criteria*. Nuremberg, Germany. September, 1997 http://www.archimuse.com/consulting/cidoc.mmwg.eval.crit.html

Gagné, R.M., Briggs, L.J. et Wager, W.W., 1992. *Principles of Instructional Design*. Harcourt Brace Jovanovich College, Publishers. Fort Worth, Texas.

Gordon Se & Gill RT, 1997. Cognitive Task Analysis in Zsambok, C.E. & Klein, G. (Eds). *Naturalistic decision making*. Mahwa, N.J. Lawrence Erlbaum.

Lê, Tang-Ho, 1998. *Defining a Common Framework for Teaching Sessions* in Proceedings of ICCE ' 98 Global Education On The Net, Volume 1, pp. 567 – 575. The Sixth International Conference on Computers in Education. October 1998, Pékin, China.

ThinkQuest New York City, 2004. Evaluation Criteria. http://www.tqnyc.org/criteria.php

Page 42

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

IMAGE INDEXING BY FEATURE CORNERS AND COLOR HISTOGRAMS

Eric Hervet[1] and Mustapha Kardouchi[2]
Computer Science Department, University of Moncton, Moncton, N.-B., Canada E1A 3E9
[1] hervete@umoncton.ca
[2] kardoum@umoncton.ca

ABSTRACT

This paper presents two image processing approaches for index searching based on image content. One compares feature vectors characterizing points rich in photometric information that are called color corners. The other measures similarities between histograms which take into account spatial distribution of colors in images. Each method has advantages and drawbacks depending on the variety of applications in image searching based on content.

1. INTRODUCTION

Image indexing and searching in databases has been an extremely active research topic in the last decade, both in academic and industrial sectors. Indexing is based on an extraction module and on a model of image content. This content model is stored in the database, then indexing consists in matching image descriptors from index with descriptors from a specific request. Several indexing systems have already been developed in the past [7, 3, 1].

This paper presents two differents methods for image indexing: the first one is based on extraction and characterization of feature corners, the second one on cumulated color histograms. The article is organized as follows: Section 2 describes the method to extract and characterize color feature corners. Section 3 presents the approach for image indexing and searching with cumulated histograms. Section 4 presents the results obtained with the two approches on a faces images database and on the Vistex database from MIT. Finally we conclude in Section 5.

2. COLOR FEATURE CORNERS

Here we describe a way to characterize images with feature points. A feature point corresponds to a bidimensional variation in the signal representing the image, that means corners, junctions or every area where texture varies rapidly. This section first presents a technic to extract feature points and corners from an image (Sect. 2.1) then a method to characterize the extracted feature points (Sect. 2.2).

2.1. Extraction of Color Feature Corners

Color feature points detector

Harris and Stephens [2] defined a detector that takes into account first derivatives calculated in a window from a gray-level image and that can be expressed in a matrix form as:

$$M_{\text{gray}} = \exp\left(-\frac{x^2 + y^2}{2\sigma^2}\right) \otimes \begin{bmatrix} I_x^2 & I_x I_y \\ I_x I_y & I_y^2 \end{bmatrix} \quad (1)$$

First term represents a gaussian smoothing with parameter σ, $\otimes$ is the convolution operator and the second term is called multispectral gradient. The eigenvalues of M_{gray} are the main curvatures of auto-correlation function of the image. A high eigenvalue means the presence of a feature point. Generalization to color images with 3 plans R, G, B gives the matrix:

$$M_{\text{color}} = \exp\left(-\frac{x^2 + y^2}{2\sigma^2}\right) \otimes$$

$$\begin{bmatrix} R_x^2 + V_x^2 + B_x^2 & R_x R_y + V_x V_y + B_x B_y \\ R_x R_y + V_x V_y + B_x B_y & R_y^2 + V_y^2 + B_y^2 \end{bmatrix} \quad (2)$$

Let $G = \begin{bmatrix} G_{11} & G_{12} \\ G_{12} & G_{22} \end{bmatrix}$ be the second term in Eq. (2) (multispectral gradient), then eigenvalues and eigenvectors of G can be used to compute the norm $\lambda_{\max}$ and the direction θ of the multispectral gradient thanks to equations:

$$\lambda_{\max} = \frac{1}{2}\left(G_{11} + G_{12} + \sqrt{\Delta}\right) \quad (3)$$

$$\theta = \frac{1}{2}\arctan\left(\frac{2G_{12}}{G_{11} - G_{22}}\right) \quad (4)$$

with $\Delta = (G_{11} - G_{22})^2 + 4G_{12}^2$.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 43

Feature corners detector

Kitchen and Rosenfeld [6] proposed a feature corners detector based on the search for maximum curvatures of iso-intensity lines in a gray-level image. Corners are feature points more specific than points computed in previous section; they are less numerous but richer in information and we hope getting more efficient similarity measures (Sect. 2.3) with them.

Generalization of Kitchen and Rosenfeld's detector to RGB color images is done by considering in the image plan a curb whose tangent has an angle θ_τ with the x-axe [11]. The corresponding curvature CMS, also called Kitchen-Rosenfeld operator, can be written according to θ_τ as:

$$\text{CMS} = \frac{d\theta_\tau}{ds} = \frac{\partial\theta}{\partial x}\frac{dx}{ds} + \frac{\partial\theta}{\partial y}\frac{dy}{ds} \qquad (5)$$

with

$$\frac{dx}{ds} = -\sin\theta \qquad \text{and} \qquad \frac{dy}{ds} = \cos\theta \qquad (6)$$

and

$$\frac{\partial\theta}{\partial x} =$$

$$\frac{\left(\begin{array}{l} AB_xB_{xy} + BB_{xx}B_y - 2V_xV_{xy}V_y^2 + 2B_x^2B_{xx}B_y + \\ 2B_xB_{xy}B_y^2 - 2B_xB_yR_xR_{xx} + AR_xR_{xy} - \\ 2B_xB_{xx}R_xR_y + 2B_{xy}B_yR_xR_y + AR_{xx}R_y - \\ 2R_x^2R_{xx}R_y + 2B_xB_yR_{xy}R_y + 2R_xR_{xy}R_y^2 - \\ 2B_xB_yV_xV_{xx} - 2R_xR_yV_xX_{xx} + AV_xV_{xy} - \\ 2B_xB_{xx}V_xV_y + 2B_{xy}B_yV_xV_y - 2R_xR_{xx}V_xV_y + \\ 2R_{xy}R_yV_xV_y + AV_{xx}V_y - 2V_x^2V_{xx}V_y + \\ 2B_yB_yV_{xy}V_y + 2R_xR_yV_{xy}V_y \end{array}\right)}{A^2 + 4\left(B_xB_y + R_xR_y + V_xV_y\right)^2} \qquad (7)$$

where $A = B_x^2 - B_y^2 + R_x^2 - R_y^2 + V_x^2 - V_y^2$, and

$$\frac{\partial\theta}{\partial y} =$$

$$\frac{\left(\begin{array}{l} -2B_x^2B_{xy}B_y + 2B_xB_y^2B_{yy} - 2B_xB_yR_xR_{xy} - \\ 2B_xB_{xy}R_xR_y + 2B_yB_{yy}R_xR_y - 2R_x^2R_{xy}R_y + \\ 2B_xB_yR_yR_{yy} + 2R_xR_y^2R_{yy} - 2B_xB_yV_xV_{xy} - \\ 2R_xR_yV_xV_{xy} - 2B_xB_{xy}V_xV_y + 2B_yB_{yy}V_xV_y - \\ 2R_xR_{xy}V_xV_y + 2R_yR_{yy}V_xV_y - 2V_x^2V_{xy}V_y + \\ AB_{xy}B_y + AB_xB_{yy} + AR_{xy}R_y + AR_xR_{yy} + \\ AV_{xy}V_y + 2B_xB_yV_yV_{yy} + 2R_xR_yV_yV_{yy} + \\ 2V_xV_y^2V_{yy} + AV_xV_{yy} \end{array}\right)}{A^2 + 4\left(B_xB_y + R_xR_y + V_xV_y\right)^2} \qquad (8)$$

Then color corners detection with Kitchen-Rosenfeld operator is performed thanks to the following algorithm:

- extraction of feature points by computing the maximum eigenvalue λ_{max} from multispectral gradient (Eq. 2) according to direction θ of the associated eigenvector, then by performing a threshold,

- computation of color curvature $K_{color} = \text{CMS} \times \lambda_{max}$ (Eq. 5, 6, 7, 8),

- extraction of points having the highest curvature by maximizing K_{color} in the direction $\theta : K_{max}$,

- search for feature points among K_{max},

- finally, extraction of color corners by thresholding the local maxima of previously found feature points.

Fig. 2 shows an example of color corners detected on the image from Fig. 1.

Figure 1. Color image (512×512 pixels) of an outdoor scene.
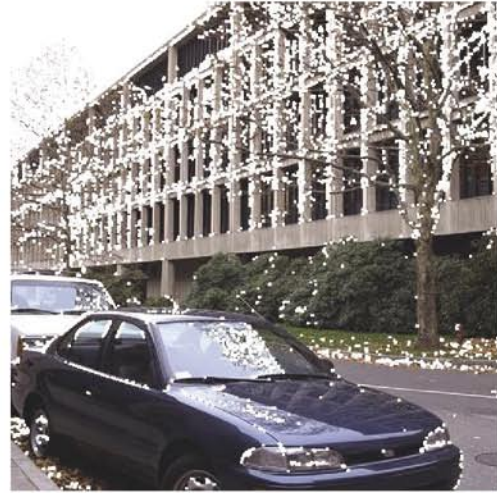

Figure 2. Color feature corners detected on image from Fig. 1 (3.6% of total number of pixels).

Now we know how to extract feature corners, let us see a method to characterize them.

2.2. Hilbert's Differential Invariants

For a gray-level intensity image I, Hilbert [5] showed that there exists a set of 5 differential invariants of first and second orders that are independant of image rotation when expressed in Gauge coordinates: $I, I_\eta, I_{\eta\eta}, I_{\xi\eta}, I_{\xi\xi}$, where η is the unit vector such that $\eta = \frac{\nabla I}{|\nabla I|}$ (normalized gradient vector of intensity) and ξ the unit vector such that $\xi \perp \eta$. For a second order characterization, one generally considers a combination of these 5 invariants [10] :

$$I \qquad I_{\eta\eta} + I_{\xi\xi} \qquad I_\eta \qquad \frac{I_{\xi\xi}}{I_\eta} \qquad \frac{I_{\xi\eta}}{I_\eta} \qquad (9)$$

For a color image with 3 canals RGB, there is a total number of 17 differential invariants of first and second orders [8]. This corresponds to 5 invariants for each color plan, plus 2 color specific invariants between $\nabla R.\nabla V$, $\nabla R.\nabla B$, $\nabla V.\nabla B$. This makes numerous values to compute that will have to be compared further (Sect. 2.3), moreover the computation of second order derivatives is very sensitive to noise in the image and thus can yields wrong feature points. Then for color images and to improve efficiency and reliability, we prefer to limit ourselves to first order invariants and color specific invariants, what gives 8-component vectors:

$$\vec{v}_{\text{col}}(\vec{x}, \sigma) =$$
$$(R, |\nabla R|^2, V, |\nabla V|^2, B, |\nabla B|^2, \nabla R.\nabla V, \nabla R.\nabla B) \quad (10)$$

This characterization offers two majors advantages: it avoids computing second and third order derivatives from gray-level images that would be very sensitive to noise; This is a very compact representation that groups together all the color information in the neighborhood of a point in 8 components.

2.3. Similarity Measure

Once corners have been extracted and characterized for each image from an image database, we have to define a similarity measure to be able to compare images between them.

Mahalanobis Distance

Basically we need a measure to compare two 8-component vectors. Given the fact that components are not all the same order of magnitude and may be correlated, the use of euclidian distance is not appropriate. We rather modelize components as random gaussian variables and we use Mahalanobis distance to compare two vectors.

This is a statistical measure based on the covariance matrix Λ of two vectors that can take into account the difference in magnitude between components as well as their correlation.

$$\delta(\vec{v_1}, \vec{v_2}) = \sqrt{(\vec{v_1} - \vec{v_2})^T \Lambda^{-1} (\vec{v_1} - \vec{v_2})} \qquad (11)$$

The quality of the similarity measure depends strongly on the accuracy of the covariance matrix Λ that must take into account parameters like possible noise in the images, lighting variations, inaccuracy in the location of feature points.

Similarity between two images

Let us remember that image searching by content consists in comparing a reference image I_R to several images from a database in order to find the most visually similar to the reference.

Previously to so-called searching, every image, that means the reference and all images from the database, is processed to extract and characterize color feature corners, then this information is stored as description files. For every 8-component vector $\vec{v}$ characterizing a color corner in the reference image, and considering an image I_B taken from the database, more exactly its associated description file, the Mahalanobis distance is computed as:

$$\delta(\vec{v}, \vec{m}) = \sqrt{(\vec{v} - \vec{m})^T \Lambda^{-1} (\vec{v} - \vec{m})} \qquad (12)$$

between $\vec{v}$ and the mean vector $\vec{m}$ of feature vectors in image I_B. Λ represents the 8×8 covariance matrix between $\vec{v}$ and $\vec{m}$.

Finally the global similarity between I_R and I_B is computed by summing the $\delta(\vec{v}, \vec{m})$ for all vectors $\vec{v}$ featuring corners in I_R. Database images yielding the smallest sums are the most similar to the reference image. Image indexing results with Mahalanobis distance based on color feature corners are shown in Sect. 4.

The main drawback of indexing by color corners comes when images are too uniform. The number of corners extracted from such images is insufficient to characterize them efficiently. We introduce image characterization by color histograms to face this issue.

3. COLOR HISTOGRAMS

Image indexing by color histograms consists in computing the statistical distribution of colors in an image. For an image I of size $M \times N$, the histogram $h(c)$ is defined as:

$$h(c) = \frac{1}{MN} \sum_{i=0}^{M-1} \sum_{j=0}^{N-1} \delta(f(i,j) - c) \quad \forall c \in C \qquad (13)$$

where C is the space of all possible colors, $h(c)$ the frequency of color c in the image and δ the Kronecker symbol.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 45

However the color histogram approach is limited because it does not take into account the spatial distribution of colors in the image. To deal with this issue authors like Pass et al [4] propose to add information to color histograms about the geometric distribution of colors in the image. The approach described in [9] propose to subdivide the image in several windows and to compute the usual histogram (Eq. 13) upon each window. This subdivision makes it possible to have information about the color dispersal through local histograms. Two approaches for cumulated histograms are studied here: the cumulated multiplicative histogram (Sect. 3.1) and the cumulated additive histogram (Sect. 3.2).

3.1. Cumulated Multiplicative Histogram

The cumulated multiplicative histogram is defined as:

$$h(c) = \prod_{i=1}^{N} (1 + h_i(c)) \ \forall c \in C , \ \sum_{i=1}^{N} h_i(c) = 1 \qquad (14)$$

N is the number of windows and h_i represents the histogram computed on the i-th window. $(1 + h_i(c))$ is a weighting term. A high weighting value means a strong presence of color c in the i-th window and thus a strong contribution of c to the cumulated multiplicative histogram.

3.2. Cumulated Additive Histogram

The cumulated additive histogram is defined as:

$$h(c) = \sum_{i=1}^{N} g\left(h_i(c)\right) \quad \forall c \in C \qquad (15)$$

where g is a weighting function of local presence of colors. The higher $g(h_i(c))$ is, the stronger the color c contributes to the histogram. A study about the choice of function g is proposed in [9] In our implementation we chose $g(x) = x^{\frac{1}{2}}$.

3.3. Similarity Measure

We used L_1 distance to measure the degree of similarity between color histograms. An image I_B from a database is the most similar to a reference image I_R if the L_1 distance between I_R and I_B is the smallest of the L_1 distances between I_R and every image in the database. In practice the number of possible colors is very high. To lower this number we use cumulated histograms where colors are grouped together in packets. In our implementation every packet contains a range of 64 colors. The cumulated histogram is then defined as:

$$c_j^I = \sum_{i=1}^{j} h_i^I \qquad (16)$$

where h_i^I is the number of pixels in image I that have a color vector in the j-th packet.

The L_1 distance used to measure the similarity between images is computed as:

$$d_{L_1}(I, H) = \sum_{j=1}^{N} |c_j^I - c_j^H| \qquad (17)$$

4. RESULTS

Results presented in this section were obtained with a software developed in the computer science department of the University of Moncton. A graphical interface (Fig. 3) allows the user to select an image database, choose a reference image and launch the search for the most similar images in the database, according to measures based on feature color corners (Sect. 2) or on cumulated color histograms (Sect. 3).
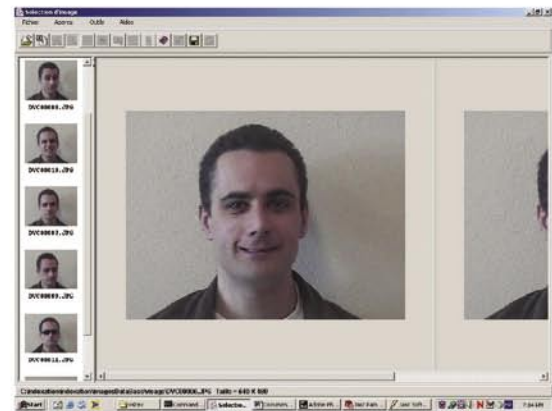

Figure 3. Graphical interface of the image indexing software.

4.1. Faces Database

We first tested the image searching software on faces images (Fig. 4). Every person has been shot 6 times in different conditions (smile, grimace, sun glasses, etc.).

Figure 4. Some faces images used in indexing testings.

Table 1 presents results in the following way: for every person, one face image has been chosen as the reference and we asked the software to give among all the faces images in the database, the 5 most similar to the reference, first according to the Mahalanobis distance based on color corners, then according to distance between cumulated additive histograms and then according to distance between cumulated multiplicative histograms. Numbers in table 1 represents the number of images of the same person as in the image reference found in the 5 provided by the software.

Results are globally comparable for the three approaches. We can not conclude about the superiority of one method over the two others.

More thorough studies have lead us to conclude that the method based on corners yields bad results when there are too many or too few corners, and also if the numbers of corners between the reference and the image to be compared are too different. We must also notice that shade, clothes and background that is the same for everyone have a negative effect for the image searching.

First name	Corners	Add. hist.	Mult. hist.
Abdel	2	3	3
Chadia	5	4	4
Chanthan	3	3	2
Eric	5	4	5
Jean	0	3	3
Komi	4	2	4
Mustapha	5	4	4
Tang-Ho	4	2	2
Yoan	2	4	3
Zikuan	5	4	5
Mean	70%	67%	70%

Table 1. Indexing results with faces images.

4.2. VisTex Database

We also used the image database VisTex[1] (Fig. 5) to test our three indexing methods. This database contains numerous, various general images without ground-truth. Some images are very much textured, some others very uniform.

[1] http://www-white.media.mit.edu/vismod/imagery/VisionTexture/vistex.html

Figure 5. Some images from VisTex database.

Table 2 presents indexing results by counting the number of images found by the software that are similar to an image reference, according to the images that seem to be visually similar for human eyes. Like for the faces images, we can not conclude to one method better than the others. However results in table 2 show that according to the data, the two families (corners and cumulated histograms) can be complementary. Indeed when the approach with corners gives average results, histograms approaches often yields better results and conversely.

Image	Corners	Add. hist.	Mult. Hist.
Bark	2/2	0/2	0/2
Buildings	4/5	1/5	1/5
Fabric	2/2	2/2	2/2
Flowers	1/3	2/3	1/3
Sand	1/4	4/4	2/4
Terrain	3/6	4/6	2/6
Mean	59%	59%	45%

Table 2. Indexing results with VisTex images.

5. CONCLUSION

We compared two sorts of methods for image indexing and searching by content. The first one is based on color feature corners and does not take into account spatial distribution of colors. It gives visually satisfactory results except for images with too many or too few feature corners. The second method uses cumulated color histograms and takes count of geometric distribution of colors. It gives visually satisfactory results when images are not too much textured. Globally on a general image database both methods have the same success rate. However we can notice from tables 1 and 2 that where one method fails, the other gives better results. Then it would be judicious to use a joint approach based on the two technics described in this paper in order to achieve a better efficiency for a large range of applications.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 47

REFERENCES

[1] L. G. S. A. P. Berman. A flexible image database system for content-based retrieval. *14th Int. Conf. on Pattern Recognition*, 1:894–898, 1998.

[2] M. S. C. Harris. A combined corner and edge detector. *4th Alvey Vision Conference*, pages 147–151, 1988.

[3] M. F. et al. Query by image and video content: the qbic system. *IEEE Computer*, 28(9):23–23, 1995.

[4] R. Z. G. Pass. Histogram refinement for content-based image retrieval. *IEEE Workshop on Application of Computer Vision*, pages 96–102, 1996.

[5] D. Hilbert. *Theory of Algebraic Invariants*. Cambridge Mathematica Library, Cambridge University Press, 1890.

[6] A. R. L. Kitchen. Gray-level corner detection. *Pattern Recognition letters*, 1:95–102, 1982.

[7] V. G. N. Boujemaa, J. Fauqueur. What's beyond query by example? *International Conference on Image and Signal Processing (ICISP'2003)*, June 2003.

[8] R. D. P. Montesinos, V. Gouet. Differential invariants for color images. *International Conference on Pattern Recognition (ICPR'98)*, August 1998.

[9] C. V. S. Boughorbel, N. Boujemaa. Description de la répartition spatiale de la couleur pour l'indexation d'images. *Reconnaissance des formes et Intelligence Artificielle (RFIA'2002)*, 2:407–414, January 2002.

[10] C. Schmid. Appariement d'images par invariants locaux de niveaux de gris - application l'indexation d'une base d'objets. *PhD Thesis*, July 1996.

[11] R. D. V. Gouet, P. Montesinos. Evaluation de détecteurs de points d'intérêt pour la couleur. *Reconnaissance des formes et Intelligence Artificielle (RFIA'00)*, 2:257–266, February 2000.

ACKNOWLEDGMENTS

Page 48

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

DESIGN ELEMENTS FOR A DIGITAL REPOSITORY
FOR CULTURAL ARTEFACTS

Robert Woodbury[1], Alissa Antle[1], Michael Docherty[2], Tracey Leacock[1], Monique Silverman[1], Doreen Leo[1], Ben Lin[1], Desmond Mulligan[1], Cheryl Qian[1], Hank Szeto[2], Phil Wang[1]

[1]School of Interactive Arts and Technology, Simon Fraser University, 2400 Central City, 10153 King George Highway, Surrey, BC, CANADA, V3T 2W1, E-mail rw@sfu.ca

[2]Information Environments Program, School of Information Technology and Electrical Engineering, The University of Queensland, St Lucia QLD 4072, Australia.

For several years we have developed and supported digital repositories of visual material for architectural libraries, scholarship, teaching and learning, These experiences have shown us that such projects have much in common. Particularly, in all cases, the value of collections of visual material is enhanced by user-provided commentary. Users act as authors, and their productions can add value to collections.

Our past systems included early teaching websites, a teaching website compiler we called *WebWeaver* at The University of Adelaide, the *DigiLib* system at the University of Queensland, and the *vGallery* at The University of Adelaide (Shannon et al. 2001, Woodbury et al. 2000).

Based on these experiences, we have designed, implemented and populated a generic system based on a gallery metaphor. The system design supports collecting, archiving and interpreting sets of digital, visually-based material. We have named our implementation with the non-acronym A•VI•RE ($\acute{a}$-v$\overline{er}$´-$\overline{a}$).

1. OBJECTIVES

Our overall objectives are to devise, implement, use and test a generic repository for visual material related to cultural disciplines such as architecture, art and heritage. Our design abstracts from the particular requirements of, for instance, slide collections, lectures or student work-posting, and implements a set of common features based on the metaphor of a gallery.

In functional terms, galleries are *spaces* in which *curators* organize and interpret collections of material. The material may be sourced by a curator or may be contributed by an *exhibitor*. *Viewers* visit a gallery to experience its content and to read the curatorial interpretation of the collections shown. *Critics* provide commentary on the material and on the curatorial interpretations of it.

Our design provides for each of these roles and implements them as actions on five fundamental types of objects. *Resources* are atomic objects in the system. They may be any digital object (including ones distributed across logical files). *Exhibitions* comprise collections of exhibitions and resources, along with authored interpretation of the exhibition contents. Most resources describe a *work*, that is, an object in the world outside of the gallery. Works take a variety of forms. Buildings, unbuilt projects, books, paintings and sculptures are all examples of works. Works may contain other works as their proper parts. Galleries are accessed by *people* and both resources and exhibitions cite the people involved, be they, for example, authors, curators, creators of works, custodians or critics. Resources and exhibitions may be tagged with *annotations*. These function as lightweight commentary on a galleries contents.

2. METHODOLOGY

Building a gallery is both a technical and social enterprise. The technical issues include a metadata scheme, database design, interface design, implementation and metatagging process. Social issues are crucial and revolve around discovering and designing workable processes for meaningful contribution to a gallery system.

A metadata scheme must describe a gallery's contents. With current technology (absent, for example, content-based retrieval for images), textual metadata is the sole handle for information retrieval from a gallery. Our metadata scheme developed from several sources, including Dublin Core (DCMI 2004), the Categories for the Description of Works of Art (CDWI 2004) and the Visual Resources Association's VRA Core standard (VRA 2004). It is marked by its separation of *works* from *resources,* and by its inclusion of *exhibitions, people* and *annotations.* It uses controlled vocabularies, largely from the Getty Art and Architecture Thesaurus (AAT 2004).

The database design is built on standard relational structures. One significant feature is that its metadata is not explicitly built into tables. A *meta-metadata scheme* is used to allow evolution of metadata structures over time.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 49

The interface is, and will remain, changeable. It turns out that the social processes involved in supporting different forms of interface each pose requirements on a gallery's interface design. Further, these requirements are largely unknown to us. It seems that the literature on digital archives has a relative scarcity of experience with the social processes supported by actual gallery systems.

We have chosen an open-source implementation environment. *Tikiwiki* (www.tikiwiki.org) is an open source initiative providing tools for building portals. It provides a relational database structure for supporting such common tools as articles, blogs, FAQs, fora and wikis, interface building tools and user management. We have extended Tikiwiki with our relational structures.

Social issues dominate both system design and deployment. A shortfall of several gallery efforts of which we are aware (including our own prior works) is that they have experienced difficulties in the growth and management of collections over time. We have trialled several processes of resource and exhibition acquisition and have developed conjectures of social processes that may sustain gallery collections. The processes we have trialled (and continue to trial) include both small-scale *community-based* contributions and larger-scale *archiving* processes.

Our gallery metaphor is deliberately abstract. It was designed as a generic solution for slide collections, lectures, student work posting, online exhibitions of work and peer-review processes. For each of these processes we have designs for how the gallery can be deployed so as to sustain the development of significant collections of material.

3. CURATORSHIP

At the core of the digital repository, we envision a conceptual model for online curatorship. Our model acknowledges and moves past concerns of access, storage and navigation in digital library design (Bishop 1999, Furnas 1998). It moves towards a model that supports intellectual, creative work. It provides a framework to understand how individual users create meaning with stored digital objects and how those meanings evolve with communities of use over time. We extend current conceptions of "user as curator" where curator implies only a collector or interpreter of information. Our premise is that to fully support social work practices we must support users as they engage in a special form of curatorship in which users collect, interact with and *create* digital collections in order to create personal meanings.

4. WORKFLOW

Issues of workflow are key to any task, and repository building and usage is no exception. For this portion of the project, we have focused on workflow surrounding the initial population of the repository. Solid metatdata is critical if users are to be able to access the resources they need to create new meaning, yet the process of metatagging is often time-consuming and onerous. The costs of metadata acquisition are immediate; the benefits are deferred. This fact at least partly explains the widely noted reluctance of users to participate in metatagging processes. Another source of the reluctance is that, within a collection, metadata tend to be coherent from object to object—much metadata is shared. Yet most interfaces focus resolutely on single objects and provide minimal support for transferring metadata from object to object. The resulting redundancies in data entry are a major disincentive to participation.
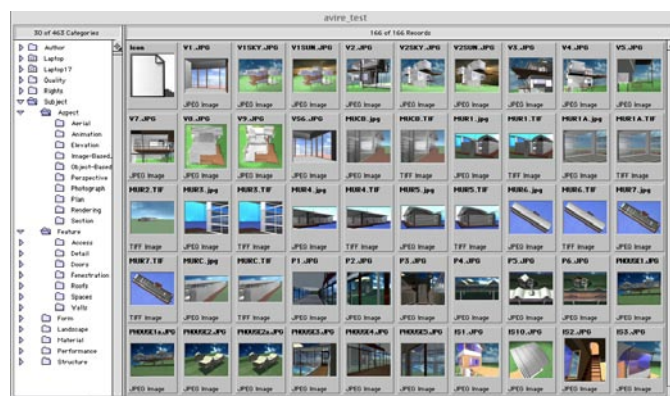
Figure 1: The CUMULUS interface. CUMULUS generates and displays thumbnails of resources (shown on the right). A cataloguer can read in a set of categories, each representing a value of a metadata field, from a text file. These appear as a set of folders (shown on the left). The cataloguer can drag and drop sets of thumbnails onto categories or sets of categories onto thumbnails. The result is that the resources become associated with the categories. Thumbnails can be associated with several categories.

We have developed methods to facilitate the tagging of large collections of resources and of websites (containing individual resources). We are using a variety of tools, especially the Cumulus media-asset management system (Canto 2004). Cumulus has a highly developed interface that enables cataloguers to share metadata schemas, import and tag large collections through simple methods such as "dragging and dropping" groups of resources into catalogue categories, and export human-readable files to the repository itself.

Page 50

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

5. INTERFACE

The TikiWiki system provides tools for the rapid construction of interfaces. An early design for A•VI•RE interface is shown in Figure 2. Here we see many Tikiwiki-provided elements such as explicit space for RSS feeds, blogs, for a, etc. Much of this will disappear as the A•VI•RE interface develops, leaving mostly the basic A•VI•RE elements of Exhibitions, Resources, Works, People and Annotations.

Figure 2. Initial prototype of the A•VI•RE Web Application, based on TikiWiki.

Eventually A•VI•RE will store many thousands of objects. Supporting browsing in such large collections is a non-trivial task for an interface. We have developed an interface for aspects of such browsing that abstracts the properties of objects into three main types, each with its own interface components. The first property type is *location*, which we represent by a zoom-able world map. The second is *timeline*. This we represent as a zoom-able, pan-able time line, which embeds such things as the period of practice of architects, building lifecycles and periods of styles. The third property type we label *feature*. Features convey no particular spatial information, but are crucial to selecting objects. Examples of features include architect, material and building type. Figure 3 shows a prototype for our mass-browsing interface, implemented in Flash.

6. IMPLEMENTATION

Our gallery system exists as a implemented, online system. It currently has significant private foundation funding in Australia and government funding in Canada. In early 2004 we plan a first public release. At that time the gallery will contain at least 3000 high-quality images of architectural works from Australia, Canada and other locations in the world.

Figure 3. Prototype of mass browsing interface for A•VI•RE.

As the implementation environment, TikiWiki can be used to create Web-based collaborative applications with modules such as Wikis, Weblogs, forums, chat rooms, polls, surveys and user and group management. Web sites, Intranets, extranets and web portals can be built also using TikiWiki's Web-based administration interface. Complete customisation is also possible because TikiWiki's PHP (http://www.php.net) source-code and relational database is made available. The application architecture makes a clear distinction between the data, programming logic and presentation logic with a templating engine and Cascading Style Sheets (CSS). This supports a separation of the development roles in Web development projects: database design, programming, and user experience. For example, a user-experience engineer can develop new themes while a software engineer is programming a new TikiWiki module.

The A•VI•RE application has been implemented using a subset of the TikiWiki modules and incorporating the A•VI•RE data model into its relational database. User collaboration features such as Wikis, Forums, chat rooms, Shout box, polls, RSS feeds and Weblogs form the community aspect, while the Exhibition functionality has been implemented by programming our own custom TikiWiki modules. TikiWiki also provides Image Gallery and File Gallery modules, which provide a subset of the functionality required by the Exhbition metaphor. For example, Images can only belong to one Image Gallery, while in A•VI•RE. Resources can belong to more than one Exhibition.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 51

REFERENCES

Anonymous, *Dublin Core Metadata Initiative*, Accesses at http://dublincore.org/ on 4 Feb 2004.

Anonymous, *VRA Core Categories, Version 3.0 a* project of the Visual Resources Association Data Standards Committee, Accessed at http://www.vraweb.org/vracore3.htm on 4 Feb 2004.

Anonymous, *Canto website*, Accessed at http://www.canto.com on 4 Feb 2004.

Bishop, A.P. (1999) Making Digital Libraries Go: Comparing Use Across Genres. *Proceedings of ACM DL '99,* pp 94-103

Furnas, G.W., Rauch, S.J. (1998) Considerations for Information Environments and the NaviQue Workspace. *Proceedings of ACM DL '98,* pp 79-88

J.P. Getty Trust, *Categories for the Description of Works of Art,* Accessed at http://www.getty.edu/research/conducting_research/standards/cdwa/index.html on 4 Feb 2004.

J.P. Getty Trust, *Art and Architecture Thesaurus,* Accessed at http://www.getty.edu/research/conducting_research/vocabularies/aat/ on 4 Feb 2004.

Shannon, Susan J.; Roberts, Ian W.; and. Woodbury, Robert F. (2001) vGallery: Scaffolding Reflection-in-Action for Students and Teachers, *Proceedings of the 18th Conference of the Australasian Society for Computers in Learning in Tertiary Education, ASCILITE 2001*, Dec 9-12, 2001, pp. 141-144.

Woodbury, R.; Roberts, I.; and Shannon, S. (2000) vGallery: Web Spaces for Collaboration and Assessment, *Australian University Teaching Committee, 2000 National Teaching Forum, Assessment in Higher Education*, Canberra 6-7 Dec 2000, on the WWW http://www.autc.gov.au/forum/2000/papers.htm (as of 10 February 2004).

Page 52

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

From Laser Scanning to Virtual Worlds:
The Reconstruction of Traditional Arctic Houses

Richard Levy [1] and Peter Dawson[2]

[1]Faculty of Environmental Design, University of Calgary, 2500 University Dr. NW, Alberta, Canada, T2N 1N4
rmlevy@ucalgary,ca
[2]Department of Archaeology, 2500 University Dr. NW, Alberta, Canada, T2N 1N4
pcdawson@ucalgary.ca

1. INTRODUCTION

The use of laser scanning technology offers the archaeologist and architectural historian a new means of capturing 3D images of artifacts, buildings and sites (El-Hakim, S. F, Beraldin, J.A, Picard, M. 2003). Key to the use of this technology for research and teaching is the translation of 3D data sets into multimedia products (Levy 2001). This discussion focuses on the work process responsible for creating virtual environments. The processes of building an interactive Inuvialuit sod house from the Mackenzie Delta region of western Canada and an Arctic Thule Wale bone house from Arviat are examined. Computer based learning environments were developed from these projects in conjunction with The Prince of Wales Northern Heritage Centre and the Canadian Museum of Civilization. A goal was to provide archaeological reconstructions as well as artifacts from museum and archive collections in a form accessible to schools and communities throughout Canada. The virtual reconstruction of a Thule whalebone house from the Canadian High Arctic demonstrates the critical role 3D laser scanning data can play in the archaeological reconstruction effort. Both these case studies illustrate the importance of collaboration in the creation of multimedia products to serve the needs of universities, schools and museum.

2. METHOD

Creating virtual worlds that accurately represent archaeological and historic sites begins with the assembly and assessment of existing records, photos and plans. On both sites the archaeological records provided information on the terrain, the location of possible structures, building perimeters, the size and uses of internal spaces and the location of the entranceways. In both cases, site excavation data also revealed the types of materials that were used to build these houses. Laser scanning was critical in the modeling of the elments used in the construction of the Thule Whale Bone house. Restrictions on the excavation of the site would not permit the removal and examination of the whale bones. However, even if the bones had been removed from the site, their unique shapes and sizes, some over three meters in length, would have been difficult to model from field notes. Using a CYRAX2500 Laser

scanner, a whale skeleton on display at the New England Acquarium was scanned, capturing the shape and size of the bones. A point cloud of over two million points (accurate to .5mm) was captured with a CYRAX2500 on a one centimeter point grid (Fig. 1).

Fig. 1. North Atlantic Right Whale: Right - photo, Left – laser scan, New England Aquarium, Boston, MA.

Extracting individual bones for the modeling exercise was performed using Polyworks, an application by Innovmetric. With Polyworks, point cloud data was converted into optimized meshes that were imported into 3D Studio VIZ. Once the individual bones were scaled to those found on the site, reconstruction proceeded by placing the major elements (mandibles, maxillas, ribs, craniums) of the house form at possible locations within the building site perimeter. Constrained by the length and shape of these elements, a number of possible spatial solutions were created and examined for their strucutral integrity (fig. 2).

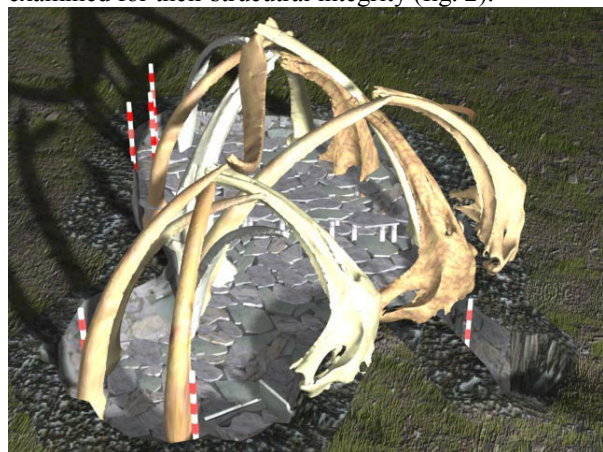Fig. 2. Computer model of an arctic Thule whale bone house from Arviat

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 53

Each trial was created using 3D Studio VIZ and loaded into a VR environment (Virtools), allowing the geometric details of assembly to be explored from any angle. Other products created during the course of the projects included QTVR and animations that could be easily shared by the researchers during the course of this research project.

The researchers working in conjunction with The Prince of Wales Northern Heritage Centre and the Canadian Museum of Civilization developed a kiosk version of this interactive environment. "Across Time and Tundra: The Inuvialuit of the Canadian Arctic**"** showcases many of the digital artifacts created from laser scanning (Fig. 3). For the public, a digital version of an Inuit Sod House provides a context for the display of artifacts found on or near these sites. To create the digital copies of the Inuit tools, Prof. Denis Gadbois, Faculty of Environmental Design, University of Calgary used a Cyberware laser scanner to capture point cloud data of representative Inuit artifacts. From these point clouds, 3D computer models were produced that were then featured as objects in a virtual world, embedded in webpages or used as part of video explaining life in the North. Visitors in this learning environment have the opportunity to learn how Inuit houses are built by interacting with video, audio and virtual worlds. In the virtual world, visitors can explore this unique architectural form, enter the living space, and click on objects that activate movies explaining how these artifacts were used in daily life. In addition, The Prince of Wales Northern Heritage Centre used these materials to develop a web-based learning program on Inuvialuit culture and history, titled "Journey's of Nuligak". A goal of this project is to make museum and archive collections, as well as related cultural and heritage information from other sources, available to schools and communities throughout the Northwest Territories.

3. DISCUSSION

For the researcher, laser scanning technology can be of vital assistance in the virtual reconstruction of archaeological sites. In the case of the Thule whalebone house, arriving at the arrangement of these complex architectural forms could only have happened in virtual space. It is impossible to have the actual number of real whalebone elements in a good enough condition to physically reconstruct a Thule whale bone house. Though castings from the original skeleton might have been possible, cost made this solution prohibitive. In addition, having a virtual model permits the structural analysis of design solutions.

For the educator, challenges of integrating 3D media into a learning environment require the cooperative efforts of digital artists and computer programmers. Virtual worlds, if they are to be of value to educators in all fields,

must address a range of concerns including, curriculum design and student accessibility. However, as databases of 3D learning objects become more prevalent, teachers and students will have the tools and components needed to personalize these virtual worlds. This opportunity to work interactively with virtual worlds will justify the investment of creating accurate models of cultural artifacts from laser scanning data.

REFERENCES

El-Hakim, S. F, Beraldin, J.A, Picard, M. (2003) Effective 3D Modelign of Heritage Sites, Fourth International Conference on 3-D Digital Imaging and Modeling, Proceedings, 302-309.

Levy R. M. (2001) Temple Site at Phimai, Modeling for the Scholar and the Tourist, VSMM Conference Proceedings, 147-158.

ACKNOWLEDGEMENTS

Fig. 3. Screen image from the virtual world of an Arctic Thule whale bone house with artifacts recovered from an archaeological site in the Mackenzie Delta.

Page 54

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

PERCEPTIONS OF ARTISTS IN ATLANTIC CANADA OF NEW MEDIA TECHNOLOGY IN ART: A QUALITATIVE INTERVIEW STUDY

Janet M. Stoppard[1], Susan Voyer,[1] Annabel Cohen,[2] & John Tivendell[3]
[1]Psychology, University of New Brunswick, Fredericton [2]Psychology, University of Prince Edward Island
[3]Psychologie, Université de Moncton

1. INTRODUCTION

The purpose of this research was to explore artists' perceptions of new media technology (NMT) in relation to art and how this technology has affected or might affect their work as an artist. Artists with diverse backgrounds (e.g., visual artists, film makers, musicians, creative writers, and photographers) who work in the Fredericton and Moncton areas of New Brunswick, and in the Charlottetown area of PEI, participated in this study. The artists were interviewed individually using a semi-structured interview approach. Interviews were audio-taped and transcribed. The interview transcripts were analyzed thematically focusing on perceived advantages and disadvantages of new media technology in art and perceptions of 'art' and 'artist' when the artistic process draws on computers and digital technology. The role of artist cultural background in relation to themes identified in the interview transcripts is also discussed.

An important goal of the Arts-Netlantic project is to foster and support use of new media technology (NMT) by artists across cultural difference, with a focus on the arts community in Atlantic Canada. The overall purpose of the behavioural research team of the Arts-Netlantic project is to investigate, in various ways, the role of culture in the creation and appreciation of new media art. This study focused on the creation of new media art by exploring artists' perceptions of NMT in relation to art and their views about the impact of this new technology on their work as an artist. Inclusion of artists from different cultural locations also enabled consideration to be given to the role of culture in artists' reactions to NMT.

Although scholars have explored the potential of NMT for contributing to the creative process in art (e.g., Edwards, 2001), to date there has been no investigation of the views of artists about this new technology or of artists' perceptions of the technology's impact on their own artistic process. Instead, research has tended to focus on factors affecting use of information technology within a business context (Mahmood, Hall, & Swanberg, 2001), with findings indicating that perceptions of

ease of use and perceived usefulness are most predictive of workers' use of this technology. Use of digital technology by graphic artists has also been investigated, with findings suggesting that this new technology may enhance the creative quality of graphic art work (Howe, 1992).

Despite increased availability of NMT and a growing awareness, and use, of this technology within the arts community, little is known about artists' response to this new technology and its impact on their work as artists. The aim of this study was to explore the views of artists about NMT in art and in relation to their own artistic process, and also to explore connections between artists' perceptions of NMT and the cultural influences shaping their work.

Because the present study was exploratory rather than intended to test specific hypotheses, we chose a qualitative methodology as best-suited to exploration of artists' views about NMT in art. The primary data collection method involved use of semi-structured interviews, a method that allows topics to be explored in depth by providing an opportunity for those interviewed to express their views in their own way without being 'prestructured' by the researcher's concerns. Thus, this style of interviewing is characterized as non-directive and open-ended (Willig, 2001). The artists who participated in the study were heterogenous with respect to mode of artistic expression and reflected varied cultural backgrounds. Cultural background was linked primarily with the particular Arts-Netlantic site (UNB, UPEI, UdeM) where interviews were conducted. Artists interviewed by the UNB team were anglophone; those interviewed by the UPEI team reflected an " island" culture specific to PEI; and those interviewed by the UdeM team were francophone. It was also the case that within each of these geographical domains, members who identify with various subcultures reside. For example, members of the Acadian Francophone community may reside in each of the regions, though would be more likely to reside in Moncton. Members of the Native community could reside in any locale and members of the Anglophone community would be most likely to reside in Prince Edward Island and

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 55

Fredericton.

For ease of presentation, findings with artists in the Fredericton area are the focus of this paper. However, the results with artists from Prince Edward Island were very similar, suggesting that artists views about NMT are not specific to their cultural background

2. METHOD

Individuals who self-identified as artists were invited to participate in the study by posting flyers in locations likely to be visited by artists, through announcements in arts newsletters, and through the Arts-Netlantic network. In Fredericton, five artists expressed interest in being interviewed, two women and three men. Diverse modes of artistic expression were represented within this group: creative writing, mixed media, film-making, music, and animation. The artists' ages ranged from 23 to 65. Three had received some formal training and two described themselves as self-taught. Two of those interviewed currently work professionally as artists.

Among these five artists, exposure to and experience with NMT also varied quite widely. Experience with NMT ranged from use of this technology as an integral part of their artistic process to occasional use of NMT in a peripheral aspect of their work. As might be expected, a fairly wide range of skill level and comfort in use of NMT was also reflected within the group. With respect to the two professional artists in the sample, one uses NMT quite extensively, while the other relies primarily on traditional media.

Individual interviews took place in a room at UNB assigned to the Arts-Netlantic project and, in one case, at the artist's home. Interviews lasted from 30 minutes to 11/2 hours and were audio-taped and transcribed verbatim. Interview transcription resulted in 103 pages (double-spaced) of text for analysis. The female interviewer was an experienced researcher in psychology, but without any formal connection to the arts community. Thus, the interviewer was essentially "naive" with respect to topics addressed in the interview and, so, had no vested interest in the outcome of the study. Interview questions were open-ended and included the following topics: the artists' personal experience with NMT; their views on integration of NMT with the artistic process; how NMT has affected their work; things that facilitate or stand in the way of NMT use in their own work and that of artists in general.

The interview transcripts were analyzed using an interpretive, thematic approach (Auerbach & Silverstein, 2003; Boyatzis, 1998; Willig, 2001) by the two Fredericton-based members of the behavioural research team. First, the five transcripts were read independently by each researcher and sections of text relevant to the research questions were identified and highlighted.   Each researcher made notes on the theme(s) (or meaning(s)) reflected in each highlighted section of text and these themes were summarized for each interview. Next, the two researchers discussed the themes identified for each transcript and compared these themes across the interviews. Themes that were specific to a particular mode of artistic expression or judged tangential to the research questions were excluded at this point. This stage of the analysis concluded when consensus was reached by the two researchers on the main themes reflected in the interviews. Finally, themes were considered in relationship to each other and were structured or "clustered," in terms of superordinate ("master") themes and sub-themes based on the linkages identified.

3. ANALYSIS

Results of the thematic analysis are presented in the form of the superordinate themes and related sub-themes that emerged from the researchers' interpretive process based on their reading of the five transcripts. Positive views of NMT in relation to art might have been anticipated, given that the study was conducted under the auspices of Arts-Netlantic, a primary purpose of which is to foster and support use of NMT by artists. What we found instead was a careful weighing of the advantages and disadvantages for artists and the arts community of integration of NMT with art. None of those interviewed perceived access to and availability of NMT as offering unqualified benefits to artists. At the same time, none of the artists rejected use of NMT or perceived its use by artists in wholly negative terms. These artists' views about NMT are perhaps best captured by the phrase "double-edged sword," as illustrated by the following interview excerpt:

> ... for every artist out there, you are gonna get the layman who's gonna play with the tools and think that it's going to make them the artist which is the double-edged sword.... and it's taking a lot of the art out of it because people think that they are an artist now because they can push a few buttons and they really don't know what's behind it or what the meaning is and they don't take the time to learn the craft the right way. (film maker)

Thus, the interviews reflected a nuanced understanding of the potential of NMT in the context of art. For each theme, advantages cited with respect to NMT were counterbalanced by disadvantages. Across the interviews, we identified four main themes with respect to NMT in art: communication, efficiency, audience accessibility, and availability to artists. Each of these themes is discussed in turn.

3.1 Communication

A perceived advantage of NMT is its capacity to foster communication among artists, to cross geographic boundaries and bridge cultural difference. This communicative aspect is perceived as a "humanistic" strength of NMT:

> ... how that will bring people from other cultures closer if they see themselves and their language in the art validated by other cultures that otherwise they wouldn't have that possibility. So that is why the new media for me is fascinating, it has a humanistic aspect that is lost sometimes in the language used for describing what the new media is. But as an instrument of getting to know each other, crossing borders. It is an extremely humanistic approach. (creative writer)

For another artist, NMT is seen as a vehicle for sharing his work with others: "To get it out there, to show people that it exists" (animator).

At the same time, NMT can undermine communication by disconnecting artists from their artistic process and isolating them from each other.

> ...it feels at times as though I am disconnected from something bigger. Whereas if I was doing these things on my own I can feel the materials and ... for example if I were doing a photograph and I was using say a particular kind of paper .... And you feel it, you are involved with the materials but there is a distance when you use it on the computer.... there is a kind of impersonality about it that I still grapple with. (mixed media)

> ....these musicians (are) doing these wonderful things and I mean you just never see them. They are just in these closets because they are not really part of a scene per se. They are not part of a community.....They don't reach out or connect with other people as much and that's maybe a risk. (musician)

NMT is perceived as enhancing opportunities for communication among artists and for sharing their work, but it is also seen a source of isolation that separates them from their own artistic process and from other artists. Thus, the "double-edged sword" character of NMT in art is apparent in its potential for contributing both to community building and to community disconnection.

3.2 Efficiency

Several sub-themes contributed to the 'efficiency' theme: ease of use, use of time, reproduction, and cost-benefit issues. In each case, the artists' views reflected both advantages and disadvantages associated with use of NMT.

Ease of use. On the plus side, the ease with which NMT facilitates 'technical' aspects of artistic work enables them to focus more on the creative process.

> ... and that just makes my life so much easier and it allows me to be a lot more creative with the tools that are at hand.....Now it is just a matter of a click of a few buttons and so you can focus more time on being creative than having to worry about (the) technical. It's just made life for the artist a lot easier. (film maker)

> .... creatively I would be able to express myself in the ways I have yet to be able to do. And I work with a lot of artists who use it [NMT] all the time. And so I see how it helps them put things together that there's no way they would have been able to do without that technology. (musician)

NMT can make artists' lives easier, but it also makes their lives harder, because of the challenges they face in learning and using this new technology. An artist who uses NMT for animation work said, "it's hard to find good information on what technology you need to do certain things." Others complained about the opacity of technical language, the difficulty understanding manuals, and the need for training in use of the NMT. Use of the computer can also lead to debilitating effects on the body:

> It has it's downside for me because it means sitting at a computer, which I really don't enjoy. I find it's hard on my body and particularly my eyes and my upper body, my neck and shoulders. (mixed media)

Use of time. An advantage of NMT is that it allows artists to make more efficient use of their time.

> ... it does open up a lot of possibilities for artists that they wouldn't have had 20 years

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 57

ago, where we have so much access to computers and different editing techniques that would have taken days that you can do in an hour now. (animator)

You can actually see it and you can get a flash of the back of the picture you just took. I mean that is wonderful compared to what you did before where you had to take the film in and you'd wait. (mixed media)

The time efficient character of NMT has drawbacks, however, not least the time investment required before the benefits of time efficiency can be realised.

...once they are familiar with it, it's a great resource. But it can be time consuming to begin to understand what you can do with the programs. (animator)

The speed of the work process with NMT also opens up possibilities that threaten the integrity and quality of the artistic endeavour.

And this would have never happened without computer technology.... it wouldn't have been a possibility. Not only is it a possibility, it's actually not even done very well. The thing about the album is you can see the person got the initial idea, then they just whipped it off. I mean they didn't even really do anything....very mediocre attempts seem to get very far. (musician)

Once again, a feature of NMT that makes artists' lives easier can, in other ways, make their lives more difficult.

Reproduction. Several artists highlighted the capacity of NMT to reproduce artwork with no loss of quality as an advantage.

... in the film industry, you make a master copy of something and you have the problem of losing what is called the generation. Every time you make a copy it's not quite as good as the original. The main thing about digital technology is that you don't have that problem anymore. You can make a duplicate master that has virtually the identical quality and you can make print copies that have the exact same high definition quality. (film maker)

At the same, this advantage raises problematic issues

concerning the originality and quality of the work produced.

The fact that you can reproduce the digital art as many times as you want. Then that doesn't become an original piece. That is one of the problems (for) artists. (creative writer)

....these are formulaic recordings that are only possible in such massive quantities because of new media and technology available there. (musician)

Cost-benefit issues. Use of NMT allows artists to have greater control over the quality of their work, at relatively low cost.

....but now with new technology, you can go get a Macintosh computer and you can rent a camera and you can create an amazing quality project for pennies by comparison. That was just never available 15 years ago. (film maker)

I think it gives people a lot more leeway to manipulate what they are doing....there is a lot more color and in terms of new color. Like people seem able to make more neon images. Really strange and they are very effective. They seem to be able to do that on the computer. (mixed media)

But the perceived cost-benefits of NMT also brings quality issues into sharper focus.

It's slapped together....They just use so much effects because they can. It's like "Hey I can do this because I can". Well it doesn't look that good. (film-maker)

I think a lot of times now people are able to use a lot of computers and things that try to do things for you and do things you don't necessarily want them to do. I think that may take away from some of the quality of the art. (animator)

3.3 Audience Accessibility
A major benefit of NMT is to make art accessible to more people, as the film maker said, "to actually get your materials out there to be shown." However, these same features also increase the risk of 'art theft.' When art is digitized, it can be pirated; computers can be hacked into or stolen. At the same time, artists perceive the response of Arts institutions

to new media art as somewhat ambivalent. On the one hand, funding agencies support work seen as innovative with a view to bringing the work to a larger audience. On the other hand, galleries and museums may lack appropriate facilities for showing new media work.

> I had taken visual metaphors and exhibited ....where they were not prepared for that. They were standing in the theatre where you have the screen that comes for other kinds of projections....And so it moves and so it distorts images. (creative writer)

3.4. Availability to Artists

An issue raised by everyone interviewed for this study was that of accessibility and availability of NMT to artists.

> I mean having a venue where these technologies can be accessed for people who might not otherwise have a chance to discover them is really important....how to set it up and how to empower people. (musician)

Inequality of access to this new technology among artists was identified as a problem.

> ...you have the people that understand, have the possibilities, have all the technology and the people that do not have access.....So it is becoming a privileged medium. (creative writer)

> ...the biggest factor I think would be the expense of it. I think a lot of artists wouldn't have access to decent technology without spending a lot of money and that is very intimidating if you don't know exactly what you are going to do with it ahead of time. (animator)

The accessibility issue is partly one of cost but also one of opportunity to find out about and sample what is available. For professional artists, lack of time to learn and experiment with NMT is also a factor.

> I have a family, I have to pay bills so how is it [NMT] going to help me do that?.....as expressive or creative as I want to be, I really want to feed my child. So, new media technology, I look at that and go, "wow yeah I have lots of ideas that I think would just be really cool on that." I just don't have the

time for it right now and it's not commercially viable. (musician)

3.5 NMT and Defining Art and Artists

A theme that emerged throughout the interviews was that of the impact of NMT on how art and artists are defined. Regardless of their personal use of NMT, these artists were consistent in voicing the view that the person of the artist is central to the artistic process and to the quality of work produced. Doing art involves more than proficiency in use of NMT. Computers and software are tools artists use to express their vision.

> There is a certain spark in an artist that no piece of technology is going to replace. Never will, because a camera can't get a great shot. It's the tool... the eye piece of the artist that will capture the great shot. But it is not the camera doing the great work, it is the people behind it. (film maker)

> But I think it's like any technology ... if you use it and you really try to look at the process and look at what you are doing and know who you are as much as you can, then you produce something. It has to come from an idea. And it doesn't matter what your tools are. (mixed media)

> I don't think that art needs technology....as long as nobody else thinks that art is less because it doesn't have technology integrated into it then I think it will still be a positive thing. But if it comes to the point where museums are only showing digital things then...I think the art world would suffer because of that, because things aren't always better when they are digital. (animator)

4. DISCUSSION

Although engaged in different forms of artistic expression, and with differing experience with NMT, the five artists who participated in this study offered somewhat similar views on the impact of NMT on art. The advantages of NMT they perceived with respect to communication, efficiency, audience accessibility, and availability to artists were offset by a number of disadvantages. In sum, these artists saw NMT as a "double-edged sword," a useful set of tools with a mixture of positive and negative implications for their work as artists. Moreover, while they shared a view of NMT as offering useful tools for artistic

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 59

expression and creativity, they emphasised the importance of the person of the artist as central to the artistic endeavour.

5.0 ACKNOWLEDGMENTS

6.0 REFERENCES

Auerbach, C.F., & Silverstein, L.B. (2003). *Qualitative data: An introduction to coding and analysis.* New York: New York University Press.

Boyatzis, R.E. (1998). *Transforming qualitative information: Thematic analysis and code development.* Thousand Islands, CA: Sage.

Edwards, S.M. (2001). The technology paradox: Efficiency versus creativity. *Creativity Research Journal, 13(2),* 221-228.

Howe, R.P. (1992). Uncovering the creative dimensions of computer-graphic design products. *Creativity Research Journal, 5(3),* 233-243.

Mahmood, M.A., Hall, L., & Swanberg, D.L. (2001). Factors affecting information technology usage: A meta-analysis of the empirical literature. *Journal of Organizational Computing and Electronic Commerce, 11(2),* 107-130.

Willig, C. (2001). *Introducing qualitative research in psychology: Adventures in theory and method.* Buckingham, UK: Open University Press.

Paper presented at the International Conference on New Media Research Networks, University of Prince Edward Island, Charlottetown, PEI, March 27, 2004

Page 60

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

STUDENT AND TEACHER APPRAISAL OF IMMERSIVE INTERACTIVE ENTERTAINMENT EDUCATION

Betty Bailey[1], Jennifer Ghiz[1,2], & Kelti MacMillan[1], Sandy McAuley[2], Annabel J. Cohen[1]
Department of Psychology, Faculty of Arts[1] & Faculty of Education[2]
University of Prince Edward Island, Charlottetown, PE C1A 4P3 (acohen@upei)

1. INTRODUCTION

A recent application of multimedia technology blends educational goals with entertainment. According to Ritterfeld, Weber, Fernandes, & Vorderer (2003), the Entertainment-Education paradigm tries to bridge the gap between learning and enjoyment, by merging school and leisure time, and by exploiting the "cognitive and emotionally involving entertainment experience" for educational goals.

The present study explored the impact of degraded resolution on the effectiveness of state-of-the-art interactive, multimedia, immersive education-entertainment experience. Two different shows were presented at three levels of resolution in a special theatre with a large "immersive" screen. The highest level explored was Intranet quality that is used in the purpose-built Immersion Theatres created by Immersion Studios Inc. Two conditions of reduced resolution, developed by Immersion Studies for the purpose of the study, represented the quality arising from the constraints of standard broadband transmission.

Previously Ritterfeld et al. (2003) had investigated the response of both teachers and students to the Entertainment Education program *Sea Lions* created by Immersion Studios Inc. – a science-based immersion show in an Immersion Theatre environment which combined a movie-like cinematic presentation on a large screen with a computer-game-playing environment on a personal screen. Through interplay between information presented on the global screen and individual game play, students participated in solving a real scientific problem about sea lions. Results indicated that the Entertainment Education immersion experience had positive educational effects, for example, on enjoyment and sense of presence. The present study provides a replication of the earlier study, and, at the same time, varies the degree of resolution, examines effects of gender and age and also includes a second show entitled *Dinosaurs*.

The study by Ritterfeld et al. (2003) entailed over 650 students who visited an Immersion Studio at one of three sites in the United States. In the present study, over 500 students were tested all within one Canadian city, Charlottetown. Testing within this district enabled control over the participants in terms of grade (age) and gender, two factors which were not examined in the US study that spanned three different states. Ritterfeld et al. (2003) obtained follow-up data on retention or learning from less than 20% of the original sample. The present study obtained such data from a majority of those who saw the shows.

2. METHOD

Acquisition of the participation of 36 classes in the study entailed contacts with the school boards, principals, and teachers; creation of schedules, and clearance of transportation services (school buses). Once permissions had been obtained, classes were assigned to control and experimental conditions. When actual testing took place, two experimenters and typically one teacher organized the testing of each single class of approximately 22 students in the immersion theatre. Teachers oversaw any questionnaire completion conducted in the classroom.

Approximately one to five days prior to the immersion experience, the students filled out a preliminary questionnaire in their class to develop a personal code number, and to collect demographic information of age, and hobbies and interests. On the day of the immersion experience, students and their teacher arrived by bus at the Atlantic Technology Centre (ATC) and were escorted to the Immersion Theatre. The Theatre is a purpose-built facility, sloping to a two-story height of the wall supporting the screen. It is sound-treated and carpeted. There is one computer terminal for every pair of seats spaced in several rows, with 25 terminals in all, 22 of which were functional for the study.

The students participated in the interactive show while their teachers observed them interacting at their terminals or watching the large screen. Following the show, the students were asked to complete a questionnaire about their experience of the show as well as questions about their general school experience. Teachers were also asked to complete a short term evaluation of the show related to their observations of the students during the show. A week after the show, students were asked to complete a second questionnaire related to the long term impact of the show and the teachers also completed a second more reflective

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 61

evaluation of their attitudes about the show. After pilot testing (approximately 150 students in Grade 6), testing of experimental participants began. The testing lasted about 45 minutes, whereas the presentations were approximately 22 and 25 minutes in duration. Upon arrival and settling down of the class in the theatre, the first 22 students were assigned to a separate terminal, with the remainder (if any) required to double up. Immediately upon completion of the presentation, the students were asked to complete a questionnaire. Teachers were asked to fill out another questionnaire. A week later, students completed another questionnaire (30 minutes) in their classrooms, and the teacher also completed a follow-up questionnaire. A total of 567 students viewed the Immersion show and completed the immediate impact questionnaire and 531 completed the delayed impact questionnaire (93.6% retention). There were also 201 control students who completed the first and final questionnaires in order to determine the amount known about the topics of Sea Lions and Dinosaurs and to obtain demographic data. There were approximately 50 students in each Grade (5 and 9) x Show (Sea Lions / Dinosaur) combination.

3. RESULTS

Each student who participated in the main experiment produced three sets of data: (1) in their school classroom, preliminary demographic data, 1 to 5 days prior to the Immersion presentation (2) in the Immersion Theatre, immediately after the Immersion presentation, and (3) in their school classroom, 1 week after the show. As well, the teachers in the main experiment completed two questionnaires to give their impressions of the experience of the show for their students, (1) immediately after the Immersion presentation and (2) approximately a week after the Immersion presentation.

3.1 Short term impact of the show from the student's perspective

The students had completed a questionnaire of 29 items providing information about their self-assessed: academic achievement, pre-show interest in scientific issues related to the topic of the show, interest in computer related activities, sensation seeking, and post-show evaluation in terms of enjoyment, degree of absorption in the show, amount learned, confusion, and desire for a repeat performance.

Following Ritterfeld et al. (2003), for all but one of the 29 questions, each was a member of a pair of questions examining the same concept, for example "I am excellent student" and "My grades in school could be better" test the self-assessment of scholastic performance, or, as another example: "I wanted to investigate why the sea lion pups died" and "I wanted

to learn why the sea lion population went up". For purposes of comparison with Ritterfeld et al. (2003), the 28 questions were recoded into pairs that tested the 14 concepts specified by Ritterfeld et al. (2003) as shown in Table 1.

Table 4 Students: Questionnaire Immediately Following Immersive Presentation Descriptive Statistics				
	Sea Lions		Dinosaurs	
Variable	Mean	N	Mean	N
SENSS	3.19	240	3.32	208
ACHIEV	3.84	239	4.15	212
MEDCOMP	3.88	241	3.83	207
ENJOY	4.57	245	4.59	213
PRESEN	3.7	243	3.69	205
CHALL	4.36	240	4.40	217
TOPIC	2.29	239	2.53	207
NIGEMO	1.74	232	1.30	214
USABIL	4.07	243	3.91	216
INTERPL	2.13	233	2.24	205
MOTIVAT	3.98	240	3.48	210
INTERES	3.66	242	3.55	210
LEARN	4.36	240	4.01	215
PLAY AGAIN	4.39	240	4.36	211
RECOMM	4.49	245	4.4	214

3.2 Summary of the Analyses of Variance of the 15 Rating Dimensions used by Ritterfeld et al. (2003).

For each of the 15 variables (abbreviated in Table 1, above) assessed by Ritterfeld and Vorderer (2003), an analysis of variance was conducted having one within factor of Resolution with 3 levels, and three between groups factors of gender, grade, and show, each having two levels. Only the data from participants who had his or her own terminal during the presentation are presented here. This left 162 participants in the lowest level of resolution, 155 in the middle level, and 147 in the highest level of resolution, for a total of 464 students at individual terminals. There

Page 62

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

were 219 in Grade 5, and 245 in Grade 9.

An experimental error, discovered after all testing and initial data analysis, made possible the evaluation of the Resolution variable only for one of the shows, Dinosaurs. Logs of the host computer at Immersion Studios revealed that high resolution presentations replaced one of the intended low resolution conditions and three of the intended medium resolution conditions. The error was specific to the *Sea Lions* show and absent from all Dinosaur presentations. The Resolution variable was therefore completely accurate for *Dinnosaurs* and less so for *Sea Lions*, where intrusion of the High Resolution condition was once in the Low Resolution condition and three times in the Medium Resolution condition. This nevertheless meant that the condition designated low resolution did indeed contain the greatest number of low resolution presentations, and the condition designed high resolution contained the greatest number of high resolution conditions..

Complete ANOVA was carried out on all 15 variables but only a few highlights will be given here. What is also important is similarity in the pattern of findings for the two shows. Although the content of the shows is completely different, the pedagogical approach and style of content which is common to both leads to the same positive effects. As well, the results of the study in Prince Edward Island generalize well to those of the centres in the United States

3.1.1 Enjoyment (ENJOY)

The Enjoyment variable aggregated the judgments that the show was fun and that the participant would have loved to play the game longer. Grade 5 children (Mean = 4.67) enjoyed the experience significantly more than the Grade 9 students (4.50), although Enjoyment level was exceedingly high and almost at ceiling (4.58, SD. 0.66) on a 5-point scale, $F (1, 23) = 7.3$, $p < .01$. Of considerable interest is the fact that for the *Dinosaur* show, Enjoyment increased with increasing Resolution (4.47, 4.60, 4.73 respectively), but the same pattern was not observed for the *Sea Lion* show as compared to the steadily increasing function for *Dinosaurs*, as could be expected given the greater validity of the variable for the *Dinosaurs* show.

3.1.2 Presence (PRESEN)

Presence is one of the key effects of the Immersion experience, and is, in a sense, a measure of Immersion. It represented the aggregate of the degree to which all else was forgotten during the show and the feeling that the participant was part of the show. The overall rating was high (3.69) and almost identical for both shows. While it might have been expected that the Resolution variable would have influenced the sense of Presence,

this was not the case. There were no significant effects of Resolution. The only significant effect was that of Gender, with females (3.80) expressing higher levels of Presence than males (3.57), $F (1, 23) = 5.85$, $p < .05$. The effect was stronger in the Dinosaur show, and the interaction between Gender and Show approached significance ($p < .054$). Females may be willing to report higher levels of Presence or they may be more willing to "let themselves go". Regardless, the effect is again on the order of .25 of a scale value.

3.1.3 Challenge (CHALL)

The Challenge factor aggregated the degree to which the show was boring, and the excess of information in the show. The mean value overall was high (4.29) indicating that students were neither bored by or overloaded with information from the show.

3.1.4 Interest in the Topic Prior to Attending the Show (TOPIC)

This variable of Prior Interest in the topic aggregated reports of prior interest in the topic and specific interest in the fate of sea lions or dinosaurs, respectively. The rating was relatively low (2.4) indicating that the students disagreed with the statements about prior interest which were presented in the negative. Nevertheless, translated into the positive, the values would still have been low (2.6), but the values given by the students, may have resulted from poor encoding of the questions put into the negative. There were several significant effects. Grade 5 students expressed lower values than Grade 9 students (2.17 vs 2.60) indicating their greater prior interest, $F (1, 23) = 21.03$, $p < .001$.

3.1.5 Motivation (MOTIVAT)

The Motivation variable measured the desire during the show to investigate the problem of the sea lions or the dinosaurs, respectively (e.g., why the dinosaurs became extinct). Grade 5 children (3.96) were more motivated than were Grade 9 students (3.56), $F = 22.02$, $p < .001$. Motivation was greater for the Sea Lion than the Dinosaur show (3.98 vs 3.48), $F = 18.9$, $p < .001$. Gender also played a role in Motivation in interaction with the show. Females were relatively more motivated for the Sea Lion show than were males, though equally motivated for the Dinosaurs as were the males, $F (1, 23) = 4.48$, $p < .05$.

3.1.6 Negative Emotions (NIGEMO)

Negative Emotions measured anger and upset during the show. It might have been expected that if the Resolution variable were to have an impact, it would be here. The mean negative emotion score for Sea Lions was 1.74 and for Dinosaurs was 1.30, $F (1, 23) = 24.05$, $p < .001$. For the Dinosaur show, the degree of Negative Emotions decreased with degree of increasing

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 63

Resolution (1.45, 1.23, and 1.16 for increasing Resolution). This is as would be predicted. The same pattern was not obtained for Sea Lions (1.58, 1.92, and 1.61), consistent with the reduced validity of the resolution variable here. The interaction between Show and Resolution was significant, $F(2, 23) = 3.79$, $p < .05$. There was also an interaction with Gender and Show. Females became relatively more upset with the Sea Lion show (1.23, vs 1.89), possibly indicative of the emotional content of the narrative (compare males 1.37 vs 1.56), $F(1,23) = 7.47$, $p < .01$. Grade, Gender, and Show was also significant, with the effect for females being most pronounced in Grade 9 (1.21 vs 1.95) as compared to males (1.49 vs 1.47) who show no difference at this grade, $F(1, 23) = 4.00$, $p < .05$.

3.1.7 Usability (USABIL)
Usability referred to the ease of figuring out how to play the game and in knowing what to do during the show. The overall Usability was high (3.97). Surprisingly, the older and younger students fared equally well, however, the Grade 5 students found the Dinosaur show relatively more easy than the Sea Lion (3.92 vs 4.06) show and the Grade 9 students found the opposite (4.14 vs 3.72 for Grade 9 Sea Lions vs Dinosaurs), $F(1, 23) = 12.14$, $p < .001$.

3.1.8 Interplay (INTERPL)
Related to Usability was the Interplay factor which measured the confusion regarding when to look at the big and small screen, and the degree of distraction created by the two screens. Males reported less confusion (1.98) than females (2.36), $F(1, 23) = 15.58$, $p < .001$. This is consistent with the literature on gender and spatial ability and it would also be consistent with the female willingness to admit difficulties in spatial tasks. Whether there is a real gender difference here bears further investigation.

3.19 Learn (LEARN)
The Learn factor aggregated the self-assessed amount of learning during the show, including the learning of specific important information about sea lions or dinosaurs respectively. The overall mean amount of Learning was high at 4.20. Not surprisingly, Grade 5 students reported higher Learning than Grade 9 (4.42 vs 4.20), $F(1, 23) = 32.31$, $p < .001$. Females reported more learning than males (4.27 vs 4.11), $F(3.85, p < .05$.

3.1.10 Recommend (RECOMM)
The Recommend variable reflected the interest of the participant in recommending the Immersion experience to a friend and the wish of the participant to be provided similar learning experiences by the teacher. The overall rating was high (4.38). The mean values

increased with the degree of Resolution (4.25, 4.42, and 4.49), $F(2, 23) = 3.13$, $p < .05$. This effect was confined to the *Dinosaur* show. The interaction of Resolution and Show only approached significance, $F(2, 23) = 2.83$, $p < .06$ and statistically does not rule out attention to the effect of Resolution on the Recommend reaction.

3.1.11 Wish to play the show again (PLAY AGAIN)
This variable represented this single question, and of the 15 dependent measures was based on one question only. The wish to play the show again was greater for Grade 5 (4.62) than for Grade 9 (4.30), $F(1, 23) = 13.74$, $p < .001$.

3.1.12 Increased Interest During the Show (INTERES)
Of related importance to that of Prior Interest is the Increase in Interest During the Show. This variable aggregated the responses concerning the wish to learn more about science and to learn more specifically about the topic of the show (be it survival of sea lions or dinosaurs, respectively). The mean Increased Interest was relatively high (3.61). Not surprisingly, the Increased Interest was higher for Grade 5 (3.88) than for Grade 9 (3.37), since the Grade 5 students have more to learn than Grade 9 students, $F(1, 23) = 29.86$, $p < .001$. The effect was stronger for Dinosaurs (3.94 vs 3.16) than for *Sea Lions* (3.81 vs 3.54) suggesting that the *Dinosaur* show may lead to lower self-assessed learning for the older than younger students moreso than the *Sea Lion* show.

3.1.12 Sensation Seeking (SENSS)
This variable represented an interest in loud music and noise. Grade 5 children sought this sensation significantly less than Grade 9 students (3.75 vs 4.11) $F(1,23) = 13.26$, $p < .001$, and those in the Dinosaur show had a significantly higher value (4.13) than those who saw the *Sea Lion* show (3.78), $F(1, 23) = 13.62$, $p < .001$. The direction of this difference is consistent with that associated with the recent literature on adolescence which characterizes adolescents as sensation seeking.

3.1.13 Achievement (ACHIEV)
This variable was based on two self-assessments of excellence as a student and grades. Students with highest self-assessed achievement were significantly more prevalent in the two highest categories of Resolution. Mean Achievement for Low Resolution was 3.067 (.08 SE), for Medium Resolution was 3.31 (.08), and for High Resolution was 3.40 (.09). The Resolution factor was statistically significant, $F(2, 23) = 4.41$, $p < .05$, and was attributable to the difference between the low and high resolution groups (Tukey HSD = .33, $p < .01$). This distribution of achievement

decreases the chances of observing an effect of immersion because those most likely to benefit from high resolution (the lower achievers) were not well represented in the high resolution condition and were disproportionately distributed in the low resolution condition. Thus, if effects of resolution do emerge, they are likely to be strong effects that counteract this achievement variable. The argument is based on the validity of Ritterfeld et al.'s conclusion that the Immersion experience benefits the poorer students.

3.1.14 Media Competence (MEDCOMP)

Media Competence referred to frequency of playing computer games and surfing the Internet. The overall level was relatively high at 3.85. Media Competence of Grade 9 students exceeded that of Grade 5 (3.99 vs 3.69), $F (1, 23) = 7.07$, $p < .01$, and males (4.0) exceeded females (3.73), $F = 6.17$, $p < .05$. The gender variable also interacted with show, with only a negligible difference between males and females in the Sea Lion show as compared to the Dinosaurs show, $F = 4.04$, $p < .05$.

3.1.15 Correlations among the 15 dependent measures

A correlation matrix was produced separately for the two shows. The highest correlation (Pearson 2-tailed) was obtained between Presence and Interest in Learning More for both of the shows (.556 for

Mean Ratings on 15 Dependent Measures for Sea Lions and Dinosaurs

Dinosaurs and .504 for Sea Lions). Since a characteristic of the Immersion experience is Presence (where Presence is to some extent synonymous with Immersion), this connection with interest in learning speaks highly for the value of the Immersion Experience for learning. Multiple regressions were also carried out as had been conducted by Ritterfeld et al. (2003).

The correlation between the 15 dependent measures for the two shows was .98 and is plotted in Figure 1. It is clear that the two shows, though different in content, lead to the same pattern of appraisal and impression. This is one of the most important outcomes of the study.

3.2 Short term impact of the show from the teacher's perspective

There were 27 teachers who completed the questionnaire including several teachers of control groups who also had the opportunity to experience the Immersion studio.
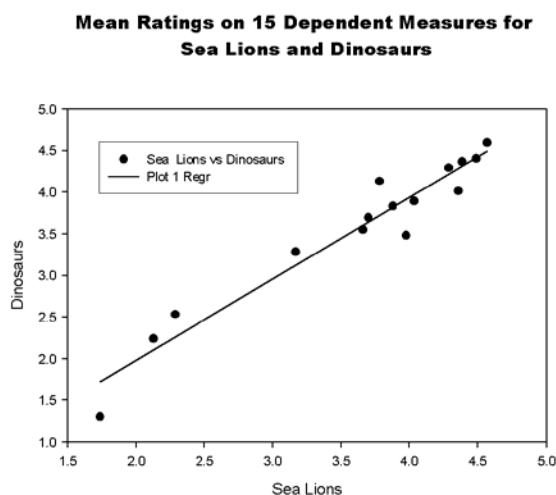
Value of the show

The questionnaire administered to the teachers was identical to that used by Ritterfeld et al. (2003) for *Sea Lions*. The means are quite compatible. The teachers reported that the students enjoyed the show very much (M = 4.56, as compared to 4.50 in the previous study), and reported the student's involvement in the game playing (M = 4.19, compare 4.15). The value of the big screen and interactive component was rated highly as well (4.23, compare 4.6). Previous results with teachers suggested that " the entertainment experience can overcome motivational deficits and focus attention, but does not compensate for cognitive limitations". Similar results were obtained here.

3.3 The long term impact of the show from the students perspective.

A week after the show, the students completed a 40-item questionnaire of which 8 of the items assessed their general impressions of the Immersion Educational experience, 16 of the items tested knowledge presented during the show, and 16 items tested knowledge about the topic that was not presented during the show. A control group also received the 32 items specific to the topic of the show, however, for them this was entirely a test of general knowledge. There were separate 32-item tests for the Sea Lion and Dinosaur shows. The test for Sea Lions was the same as had been used by Ritterfeld et al. (2003).

The long-term impact questionnaire was administered one week after the original immersion experience in the present study, but in the Ritterfeld et al. (2003) study, the delay was one month. From Table 2, it is clear that the Immersion experience had a very positive impact on the Canadian students from both a general as well as scientific attitude perspective.

Mean performance on the factual items for Sea Lions for both experimental and control groups was low at 58%. Chance performance is 50%. Mean performance

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 65

for both of the groups tested on Dinosaur information was higher at 68% and 65% for experimental and control group respectively, but this increase over the Sea Lion study reflects general knowledge or ease of the test. The difference between experimental and control groups is negligible and the difference between means was not significant in a t-test. The r^2 on the 32 items for both Sea Lions and Dinosaurs was moderately high again suggesting that participants were relying on general knowledge rather than facts acquired during the test.

The overview here suggests that the educational benefit of the show is not in the communication of facts that can be tested through yes-no questions. The more detailed analysis reveals that for several questions, exposure to the show led to much higher scores, but this was not always the case, and indeed some scores were lower with exposure to the show, though not to the same extent.

Ritterfeld et al. (2003) also reported low scores on these questionnaire items. They found that control questions led to higher responses and argued that the students had been so inspired by the Sea Lion show that they had actually sought out additional information in the intervening month between the show and the questionnaire. This explanation seems less likely given the high correlation between the control group and the test group in the present study. The breakdown for facts contained in the show and those not contained in the show further supports this claim. At first glance the low scores on the test for those who have seen the shows challenges the view that much was learned through the show. There are many kinds of learning and the kind tapped by the yes-no questionnaire is not that which is acquired through the immersion experience. Learning how to do something, broadening a perspective, and changing an attitude cannot be easily tested this way

3.4 The long term impact of the show from the teacher's perspective

There were 17 teachers who completed the second questionnaire as compared to only 7 in the study by Ritterfeld et al. (2003). The teachers typically focused on the technology of the presentation rather than details of content. They had quite systematic judgments about who would benefit most from the Immersive experience. Their judgments were spread across those with an interest in science as well as those less motivated. This pattern is consistent with the teachers of the USA study.

Table 2
Follow up Appreciation of the Students for Sea Lions. Comparison data from Ritterfeld et al. (2003)

	Sea Lions Charlotte-town Delay of 1 week		Sea Lions USA Delay of 1 month (Ritterfeld et al., 2003)	
	Valid N	% Agree	Valid N	% Agree
I would love to play the game again	270	97	126	85
I learned quite a bit during the show	267	87	121	77
The show helped me to understand how scientists work	270	80	125	70
I talked to friends or relatives about the show	270	80	126	66
The show encouraged me to become more interested in science	268	67	124	61
I still have vivid memories of the show.	263	82	126	59
I want to learn more about El Nino	266	61	126	52
The show helped me become more interested in biology	267	56	124	42
The show encouraged me to become more interested in geography	267	49	125	35

4. CONCLUSION

The effect of resolution, though modestly apparent from a statistical standpoint particularly for the Dinosaur show, was for all practical purposes negligible. To review, enjoyment increased modestly with Resolution for Dinosaurs (from 4.47 to 4.73) but

Page 66

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

showed the opposite pattern (but more weakly, 4.61 to 4.43) for Sea Lions leading to a significant interaction of Show with Resolution. Similarly, Negative Emotions decreased with increasing Resolution for Dinosaurs (from 1.45 to 1.16) leading to a significant interaction with Show and Resolution. This effect was retained in the analysis of variance for Dinosaurs alone.   There was one significant main effect of Resolution and that was for the willingness to Recommend the show (increase from 4.25 to 4.49 with increasing Resolution) but again the effect interacted with Show and was most prominent for Dinosaurs (range of .40 as compared to range of .13 for Sea Lions). The Grade 5 students wanted to play the show more for the highest resolution, and for both Grades, the lowest resolution led to the least desire to play the show again. As a potential confounding variable, it so happened that the highest self-assessed achievement was disproportionately found in the students who received the highest Resolution condition. If high achievers are least likely to benefit from high Resolution, this could account for weaker effects of Resolution than would otherwise have appeared. Nevertheless, additional analysis revealed that achievement was not significantly correlated with any other of the 14 dependent measures, so its confounding effect, if any, is negligible.

That resolution of the presentation had a negligible effect on the many variables examined in the present study may well be consistent with several theories of multimedia perception and learning. As described by Ritterfeld et al. (2003), several theorists have also pointed to the importance of visual imagery in the absorption of an audience into a narrative (e.g., Green & Brock, 2003). Immersion into the narrative is referred to as transportation, and absorption of the narrative is referred to as transformation. Together transportation and transformation lead to learning. Again, the extent to which visual resolution influences absorption into a narrative or absorption of the narrative may have less impact than many other variables that comprise the multimedia material presented. From another perspective, the Congruence-Associationist theory proposes that multimedia perception elicits the creation of a working visual narrative (Cohen, 2001) in an audience member who aims to create a story to explain the sensory data received. The establishment of such a narrative depends on external cues from the media presentation that prompt cognitive hypotheses about their meaning. The best match between the hypotheses and the received media create the working narrative. In such a theory, the effectiveness of visual cues to the generation of the working visual narrative could be quite independent of their degree of resolution, assuming a basic level of resolution has been achieved.

Information obtained from the present study in regard to the resolution variable may serve then to advance the accessibility of immersive environments in schools able to exploit the broadband network for Education Entertainment. In other words, it appears from the present work, that moderate levels of resolution for a large screen presentation remain effective in conveying the benefits of Education Entertainment. Thus, delivery from a central site, such as that of Immersion Studios, to many large screens, not simply to purpose-built Immersion Studios, could offer the advantages of Education Entertainment to an infinitely greater audience worldwide.   Continuing studies of the effects of resolution remain important, as the limits of the effects of this variable need to be determined. In future work, it is necessary to provide independent measures of visual clarity by the participants. The impact of audio resolution and immersive effects (surround panoramic versus stereo or mono) need also to be determined.

In regard to other results of the study, effects of gender, grade and patterns among the many dependent measures such as enjoyment were highly similar for the two different shows despite differences in content. Students' high ratings of enjoyment, presence, and acquired knowledge generally confirmed results of a prior study of the *Sea Lion* show (Ritterfeld,et al., 2003). Enjoyment, interest in learning more, and presence were highly correlated for both shows, and in general the two different shows led to the same pattern of appraisal. Girls responded significantly more positively to the presentation than did boys, and grade 5 students responded significantly more positively than did grade 9 students, but these differences were small from a practical standpoint. Teachers who had accompanied their students also rated the experience positively both immediately and after the one week delay. They believed that students benefited most from the combined large screen and interactive component, that all students enjoyed the experience, and that even students with special needs would benefit from it.

Although self-assessed and teacher-assessed student-learning was high, learning of specific facts was not well-reflected in the results of the yes-no questionnaire when compared with control groups who had not experienced the presentation. Similar findings were also observed by Ritterfeld et al. (2003) suggesting that the educational value of the presentation lies not in acquisition of new facts but rather in more global aspects such as positive attitudes toward educational experiences.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 67

The overall validity of the findings is supported by the high correlations between the results for Sea Lions and Dinosaurs in the present study, and the correlations between the Canadian and US study. Since the individual results provide evidence for the achievement of the goals of the Entertainment Education experience that uniquely employed a large interactive screen and interactive games at individual consoles, it can be concluded that the principles used by the Immersion Developers for creation of e-learning content may well provide an excellent beginning for an Interactive Content Developers' Guide. Nevertheless, the educational value could perhaps be increased through increasing the educational content of the individual game-playing experience.

5. ACKNOWLEDGEMENT

5.0 REFERENCES

Cohen, A.J. (2001). Music as a source of emotion in film. In P. Juslin & J. Sloboda (Eds). *Music and emotion* (pp. 249 - 272). Oxford: Oxford University Press.

Green, M. C. & Brock, T. C. (2003). In the mind's eye: Transportation-imagery model of narrative persuasion. In M. C. Green et al., (Eds). *Narrative impact: Social and cognitive foundations* (pp. 315-342). Hillsdale, NJ: Erlbaum.

Ritterfeld, U., Weber, R., Fernandes, S., & Vorderer, P. (2003). Think Science! Entertainment Education in interactive theatres. Unpublished paper. University of Southern California

CONCEPT MAPPING: A STUDY OF ARTISTS AND TECHNICIANS' CONCEPT OF CULTURE

John Tivendell, François Martel, Annabel Cohen & Janet M. Stoppard
École de Psychologie, université de Moncton, Psychology, University of New Brunswick, Fredericton,
Psychology, University of Prince Edward Island

The aim of the Arts-Netlantic research network is to foster collaboration between artists and scientists by making available to creative artists state-of-the-art new media equipment and technologies. The behavioural science research team in particular wants to better understand the relationship between the users of new-media and the potential of these information technologies, by exploring some of the cognitive processes involved. One new-media tool available to behavioural scientists is Cognitive Mapping. In brief, this is a graphical technique for representing a network of ideas and questions that are in turn organised in a hierarchical fashion (Novak, 1998). In this research project we use two concept mapping techniques to explore the differences and similarities between various users' concept of culture. In study 1, 16 participants were asked to draw a concept map of culture using a paper and pencil format. In study 2 participants using the web based graphical technique attended a short tutorial and were then asked to draw their own concept map of culture. The results are presented and commented, and the role of cultural background is also discussed

INTRODUCTION

A concept map is a special form of a web diagram for representing and organising knowledge (Novak, 1998). Concept mapping is the strategy employed to develop a concept map. In brief, a concept map consists of nodes or cells that each contains a concept, item or question, and the links between these nodes (Lanzing, 1997). The links are usually labelled and they explain the relationship between the nodes. A link can be a word or more usually an arrow that denotes the direction of this relationship between the nodes. According to Novak (1998) the concept is usually a word representing an object or event about which we want to make a statement or proposition.

Thus concept mapping is a graphical technique for representing knowledge. Usually in the form of web diagram it purports to help one gather, represent and then communicate information. The critical questions are: what is the central concept or research question that will be used to start to build the network? and what are the other concepts that the user will associate with this initial topic?

Concept mapping has been proposed as a tool for assisting and enhancing thinking and learning. According to an anonymous official in Victoria University's student counselling department, concept mapping is a type of brainstorming that may be used to encourage the generation of new material (Anonymous, 2003). However unlike brainstorming, it does not rely on intentionally random input from multiple partners and may thus produce fewer "zany" ideas and connections. Moreover, brainstorming encourages highly divergent "lateral" thinking, whereas concept mapping seems rather to encourage a more convergent type of thinking. That is, whilst the task demands in concept mapping are that the individual designer fit a number of ideas together, all these ideas are somehow to be connected to the centre. Finally, as in brainstorming, in concept mapping no idea takes precedence with the exception perhaps of the original question or concept.

The same official noted that a concept map can be drawn up with a pencil and paper. For example to construct a map, one starts by writing the main idea, usually in the centre of the page. This concept may be a word, a phrase, a couple of juxtaposed ideas or even an image or web site. Next, one then places related ideas on branches that radiate from this central idea (Anonymous, 2003). However new-media technologies can also be used to elaborate a concept map. Moreover, because of the very nature of new media technologies, the result may well be a richer and more complex representation of the concept and the very process may permit us to monitor the various steps and information being used to construct the map.

History

Concept mapping was first developed in the 1960's by Joseph Novak, a professor of education at Cornell University. His work was based on the ideas of his mentor, learning psychologist David Ausubel (1963), who stressed the importance of prior knowledge when learning about new concepts. As with Swiss

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 69

educator Jean Piaget, Novak and Ausubel (1968) believe that learning involves the assimilation of new concepts into already existing cognitive structures.

Meanwhile in England Tony Buzan (1995) was developing a related technique called mind mapping. In a mind map one also starts with a central word or concept, around which one draws five to ten ideas that are related to that word. You then take each of these new words and draw another five to ten ideas related to these new words. There is no real difference between concept maps and mind maps albeit a mind map is often represented as a tree, while a concept map may resemble a network.

Concept mapping and creativity
Professor Novak first proposed concept maps as a tool to evaluate learning, that is to identify both the valid and invalid ideas held by his students (Novak, 1998). He also believed that meaningful learning processes are the same processes that scientists and presumably artists too, use to construct new knowledge. Thus, according to Novak (1998), there are two features of concept maps that are important to the facilitation of creative thinking. First there is the hierarchical structure of the concept map itself and, secondly, there are the cross-links or relational propositions between these concepts, which also help to clarify the concepts' meanings.

Both concept mapping and mind maps rely on vocabulary and semantics. There are some 500,000 words in English language which can then be combined to form a quasi infinite number of propositions, not all of which are nonsensical (Novak, 1998). Moreover there are numerous national and regional semantic variants, a fact that continues to plague psycholinguistic research. On the one hand this great number of alternatives can help better represent the complexity of individual differences in a given concept but, on the other hand, it might also hinder the usefulness of the tool when searching for intra and inter group similarities in representing the same concept (see Tivendell, 1978).

Research idea
The objective here is to generate a map of a concept that is pertinent to our understanding of how artists and scientists use state-of-the-art new media equipment and technologies, i.e. their idea of "culture". This concept map will be a sort of cluster analysis of various examples, nodes or roles that can compose one's idea of what culture is. Eventually, with this technique we should be able to explore possible differences between cultures using these individual concept maps. In a first study we used a simple paper and pencil version of the concept mapping technique (see too appendix 1). In the second study we used a commercially available computer program, called "Inspiration", as the concept mapping technique.

Method
Study 1
Sixteen university students were asked to participate in a short exercise. They were handed a single sheet of typing paper with a circle printed in the centre, one inch in diameter, and asked to write in the word culture. Next we asked the participants to attempt to define, describe or represent what culture is for them by using words or images from the Arts. These words or images could be an actor, a book, a movie, a painting, a picture, a play, a poem, a sculpture or a verse and were to be placed around the circle in order to best represent the word culture. Next we asked them to repeat the process, this time in order to help define or represent those new words or images that they had just chosen. Finally we asked them to draw any links between these various words or concepts.

Study 2
In the second study we wanted to see if similar maps would be produced when using a commercially available computer program. In brief our version of the computer program called "Inspiration" offered the participant a wide range of images stored as icons from which he or she could choose in order to construct their map. Eight volunteers were asked to participate. They were first given a short on-line tutorial that allowed them to manipulate the computer program itself. Next, they were asked to draw up their own concept map in much the same way as the participants in study 1 did, albeit using only images rather than words.

Results
The following are examples of some of the concept maps produced (see studies 1 and 2).

Page 70

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Discussion

In order to understand how people act upon the world around them, it is necessary to find out how they think and what they know, how they organize and structure information, and what they seek to better understand. As we have seen, the data from both studies is *qualitatively* very rich. It is believed that, as with our previous experience with similar tools (Tivendell, 1978), the resulting map can be the starting point for a very meaningful discussion with the participant. Meanwhile *quantitatively* both techniques offer a gamut of information that can indeed be subjected to statistical analyses. However, when the tasks people are doing are complex it may not be enough to simply observe the consequences of their behaviours. We also need to understand the process. From this perspective we can now conclude that the new-media based technique potentially makes available much more the information than does the simple paper and pencil technique: such as allowing a time line evolution of the concept, to name but one. Recently a new family of tools for looking at the mental processes that organise and give meaning to observable behaviours have been developed. Cognitive Task Analysis (CTA; Höök, 1998) attempts to describe the cognitive processes that underlie performance of tasks and the cognitive skills needed to respond adeptly to complex situations. Perhaps CTA could help guide our next step in the understanding of concept mapping.

References

Anonymous (2003). Concept Mapping. The author is an anonymous official in Victoria University's student counselling department (see http://www.coun.uvic.ca/learn/program/hndouts/map_ho.html)

Ausubel, D. P. (1963). *The Psychology of Meaningful Verbal Learning*. New York: Grune and Stratton.

Ausubel, D. P. (1968). *Educational Psychology: A Cognitive View*. New York: Holt, Rinehart and Winston.

Ausubel, D. P., J. D. Novak, and H. Hanesian. (1978). *Educational Psychology: A Cognitive View,* 2nd ed. New York: Holt, Rinehart and Winston.

Buzan, T. (1995). The MindMap book. (2 ed.). London, UK: BBC

Jonassen, D.H., Beissner, K., & Yacci, M.A. (1993). Structural knowledge: Techniques for conveying, assessing, and acquiring structural knowledge. Hillsdale, NJ: Lawrence Erlbaum Associates.

Höök, K. (1998). Designing Adaptive Systems SICS, Sweden, kia@sics.se

Lanzing, J. (1997). see http://users.edte.utwente.nl/lanzing/cm_home.htm).

Novak, J.D.(1991). Clarify with concept maps: A tool for students and teachers alike. The Science Teacher, 58 (7), 45-49.

Novak, J. D.(1993). How do we learn our lesson? : Taking students through the process. The Science Teacher, 60 (3), 50-55.

Novak, J.D. (1998). The Theory Underlying Concept Maps and How To Construct Them http://cmap.coginst.uwf.edu/info/

Tivendell, J (1978). The Cognitive World Structure Game, a factor analysis. Perceptual and Motor Skills.

Appendix 1: a pilot study of concept mapping

Our intention was to asked participants to attempt to define, describe or represent what culture is for them by using images from the Arts. These images could be an actor, a book, a movie, a painting, a picture, a play, a poem, a sculpture or a verse, i.e. anything that that could help represent what they think culture is. instance we could ask them to draw any links between this second set of concepts.

We then carried out a simple pilot study. First we asked a female participant to represent the statement "I am a woman" by using something from the arts. In fact she quickly answered "Julia Roberts". Meanwhile a nearby male represented his "I am a man" by choosing Bruce Willis. When we asked her to explain, she spontaneously said she did so because they both shared the same birthday! We then asked her to represent the statement "I am a student" and she quickly named a new film starring the same

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 71

actress as it involved a story about a student. Evidently the images chosen to represent a stimulus concept are not random, albeit the reasons for choosing a given image may not always be self-evident.

Appendix 2 : the computer study materials

Introduction
The ArtsNetlantic research network aims to foster collaboration between artists and scientists by making available to creative artists state-of-the-art new media equipment and technologies. The behavioural science research team in particular wants to better understand the relationship between the users of new-media and the potential of these information technologies by exploring the congnitive processes involved. One new-media tool available to behavioural scientists is Cognitive Mapping. In brief, this is a graphical technique for representing a network of ideas and questions that are in turn organised in a hierarchical fashion (Novak, 1998). In this research project we shall apply concept mapping techniques to study the differences and similarities between various users.

Consent form
The ArtsNetlantic research network aims to foster collaboration between artists and scientists by making available to creative artists state-of-the-art new media equipment and technologies. So as to better understand how people use some of these new technologies we want to observe people as they explore, express and link some of their ideas using a new-media software.

Thus we are asking you to first answer a short questionnaire and then we will ask you to use a simple computer program in order to explore some of your ideas about art and culture. The whole process should take about fifteen minutes of your time.

It is important to state that your participation is completely confidential and no information will be kept that could identify you. Finally you may cease to participate in this study at any time without there being any repercussions for you.

If you have any questions about this research please do not hesiate to ask Jean-Francois Martel (martelj@umoncton.ca) or John Tivendell (at 506-858-4203), both members of the research team. You may also contact any one of the

research professors responsible for this study, i.e. doctors Annabel Cohen at 902-858-4521, Janet Stoppard at 506-858-4120 or John Tivendell.

Note that by completing this questionnaire you are indicating that you voluntarally accept to participate in the study and are cognissant of its conditions.

Thank you
Jean-Francois Martel,
John Tivendell, Ph.D., L.Psych.
Université de Moncton

Task instructions
1. The first thing I want you to do is to type in the word *culture*. The question is: what is culture?
2. Next, identify the *key concepts* that apply to this word culture. That is, I want you to type in any word or expression that comes to mind when you think of what culture is. Place these key words in any way you wish around the initial word culture.
3. You now have group of words, all more or less linked to your idea of what culture is. Using the *symbols* available to you on the upper right section of your video screen, link one or more of these symbols to each of the words you have just generated.
4. Treat these concepts as if they were "*Post-its*" and move them around or add new ones until they feel right to you.
5. Now, looking at the resulting "map", identify those ideas, links or pathways that seem to you to best express what you now think culture is? *Rank order* the most important of these groups of concepts and paths (i.e. the links between these concepts) and then identify each by a number placed beside it (where 1 is the best, most inclusive, most general definition; where 2 is the second most general or inclusive definition, and so on towards the more specific or less general of these groups of concepts and paths).

That's it! This is your personal map of what you think of, at least today, when you say "*culture*" If you have any comments, questions or ideas please feel free to type these at the bottom of your map.

Thank you very much for participating,
Jean-Francois Martel,
John Tivendell, Ph.D., L.Psych.
Université de Moncton

Page 72

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

CREATIVITY AND THE NEW MEDIA: WHAT DO WE KNOW?

Jean-François Martel, Cindy Poirier & John Tivendell
Université de Moncton
Moncton, NB
E1A 3E9

People have been decorating their abodes, leaving messages to others and otherwise marking their existence since the beginnings of time. A cursory look at this art seems to tell us that the themes (or as Marshall McLuhan would say, the messages) have not really changed much since the Chauvet cave dwellers in the Ardèche, through the citizens of Pompey, to the gang related graffiti in southern California. Perhaps what has really changed is the medium, i.e. how people transmit their thoughts about aesthetics and knowledge. In terms of its nature, each new medium seems linked to the era's new technologies. One thinks here of the advent of iron and metal alloys, of the evolution of paints and colours, of the introduction of the printing press, of films, radio, and television, and now the personal computer. However, as each new medium was introduced and replaced the old in popularity, the older medium still seemed to survive in some form: from graffiti to watercolours, from headstones to jewellery, etc.. So as scientists, perhaps some of our attention should be turned to our understanding of how new technologies can perhaps influence the creative process itself and the audience's appreciation of art.

A history of New Media art would require an overview of those artists and scientists who have helped to dissolve the traditional boundaries between their disciplines (Parker, 2003; Pioch, 2000). Perhaps it suffices to say that it seems obvious that many of our needs, interests and tastes are being redefined due to our access to a plethora of ideas and images, many of which belong to this new media. So what do psychologists today know about the target of this art and the creative process involved in its development?

1. The Audience

First, we are all members of the audience. Since men and women got together in the caves in the Ardèche, we have been the receptors of oodles of communications. Many times we actively seek information and stimulation from others, sometimes times we are members of the audience because of our knowledge and expertise, and often we are simply the unintended and perhaps even the unwilling target of these messages.

Secondly, in the case of art, the existence of an audience requires an interaction between the creator and the appreciator. There is here an element of the old philosophical quandary about trees falling in the forest but, any product of a creative mind which has not been intentionally destroyed before any other human can possibly happen upon it, can be said to have had an intended audience however undefined that target may be. That interaction may in some cases not be what was expected nor planned for, by either the artist or the target. Thus we have the artist who creates a piece of art, it is then advertised however meekly and distributed, all in order to reach and touch some kind of an audience. This may be an undefined audience or an entirely different audience than what was originally intended. Only if the work of art fails to reach any person whatsoever, can we then say that there is no audience, and then we should perhaps also argue that there is no work of art.

Finally, the work of art itself may reach its intended audience, but perhaps touch them in a different way than that which was planned for by the artist. This is the basis of that other adage that says that a work of art, once it is made, no longer belongs to its artist. According to this perspective the audience's reaction towards the work of art, that is what he or she feels, says or does about it, should belong to the audience alone. Once completed and made available, the artist no longer has much control over it, nor perhaps should he or she have this control, and this even if the audience's reactions are only remotely linked to what the artist intended to provoke.

In a previous text (Tivendell & Martel, 2003; see in the behavioural group's site) we presented three approaches that can and have been used to define the nature and functions of an audience. In that text we warned that none of the three approaches, alone, was sufficient to define an audience and that care must therefore be taken when, for instance, scientists or critiques choose an operational definition of an audience. What we do know is that there are many facets to understanding the audience and that most of these have some kind of link to what can be considered to be creativity.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 73

2. Creativity

Much of our formal education emphasises acquiring those skills necessary for critical analyses, such as how to understand a logical argument, to eliminate incorrect paths and to focus on the steps necessary to get to the right answer. However there is another kind of skill or set of skills, that of creative thinking, that focuses on exploring ideas. Creativity can be defined in terms of the *ability* to generate new ideas, often by combining, changing, or reapplying existing ideas. This approach defines creativity in terms of abilities, aptitudes, knowledge, skills and competencies. However, creativity can also be seen as *an attitude*, that is a willingness to play with ideas and a capacity to enjoy looking for these new possibilities. Indeed according to Frank Barron, a professor of the psychology of creativity at Princeton university who died in 2002, to be creative requires taking risks, showing independent judgement and having a strong motivation to bring order to their world. Finally creativity can also be construed as a *process* where one works hard and continually, at improving ideas, creating new products and finding new solutions.

Teresa Amabile, a professor of business administration at Harvard university, believes that creativity is a function of three components: the level of knowledge and expertise, creative-thinking skills and the motivation to do something or to solve problems (Amabile, 1998). She believes that for creativity to occur a person must overcome his or her own mental set, and that this usually follows the period of incubation when the person is no longer focussing on the problem at hand (Amabile, 1983). If professors Amabile and Barron are correct, to understand creativity we should be looking respectively at levels of knowledge and expertise, actual cognitive skills, and at the types and level of motivation. However, social psychologists would also have us consider the role of the environment, that is those facets of the context that foster or inhibit the creative process.
Most researchers in motivation, including Amabile, will tout the importance of intrinsic factors to stimulate creativity. In a recent book Amabile (1996) sees extrinsic motivators often acting as inhibitors of creativity. That is, she thinks that rewards and even evaluations can cause people to focus on these external dimensions rather than on solving the problem. However she says that there are exceptions to the detrimental effects of such external constraints on creativity, as some individuals consistently produce under conditions made salient by these rewards. Indeed professor Robert Eisenberger's work at the university of Delaware, although then working with fifth and sixth graders, indicates that both views are right. It seems that properly offered meaningful rewards for original thinking can inspire people to do their tasks better, whilst indiscriminate rewards for little effort can help destroy creativity (Eisenberger & Selbst, 1994; Moncure, 1994).

Evidently the work of Amabile, Barron and Eisenberger shows that the context is also important. It would seem that a context that puts undue time pressure on a worker can quash creativity because it can limit his or her freedom to ponder different options and directions (Murray, 2002) or it can help one to focus on a single activity considered important. Meanwhile collaboration with others can also spur creativity, regardless of time pressure. However an organisational context that is filled with boring meetings or work composed of routine tasks can inhibit creativity by making the worker feel unproductive, unfocused yet still pressed for time (Murray, 2002).

Once again in a previous text (Tivendell & Martel, 2003) we presented four different paths to creativity, i.e. evolution, revolution, synthesis and change. We argued therein that these four models are complementary steps in the creative process. Thus creativity can be considered in terms of the artist, i.e. skills, attitudes and motivation, and in terms of the process i.e. the intra-personal and even the interpersonal processes by means of which original products are developed (Barron & Harrington, 1981). Finally creativity has been defined in terms of the products themselves which, we have argued above, necessarily involves the audience.

2.1 Measuring creativity

According to Amabile (1996), creativity can be measured by three assessment techniques: creativity tests such as skills assessments and personality inventories, by the objective analysis of products, and by subjective judgments of experts or other audiences. The most widely used test to measure individual creativity is still the Torrance Tests of Creative Thinking also called the Minnesota Tests of Creative Thinking. This measures creativity in terms of a person's skills, such as cognitive complexity, but arguably the criteria it uses could also be used as to evaluate creative products. Other instruments measure personality or attitudes said to be necessary for creative thinking. These include Guilford's Unusual Uses Test, Gough's Creative Personality Scale for the Adjective Checklist, Kirton's Adaption-Innovation Inventory and Amabile's own Consensual Assessment Technique. Evidently these cannot be used to evaluate the creative product albeit perhaps the audience's cognitive set. There is a third type of psychometric test, a semantic differential type test (see Osgood, Suci & Tannebaum, 1957) that has been used. However its reliance on the measurement of a purely affective component means it is measuring creativity at best indirectly because it evaluates an audience's reactions to a creative product. Now creative products can be evaluated based on the

Page 74

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

theoretical model wherein the combination of *unusualness* (or originality) and *usefulness* is the criteria for determining product creativity (Moss, 1966). Perhaps the best example of this new type of test, the *Creative Product Semantic Scale* (the *CPSS* by Besemer & O'Quin, 1989) uses a bi-polar semantic differential scale which is consistent with Moss' theoretical model.. It has been argued that semantic differential scales measure the affective component of mental concepts or images (Alreck, 1995) and as such the CPSS has lent itself to measuring the creative product (Michael, 2001).

3. Our study

We have argued that art and the creative process cannot be disassociated from the audience. It also seems logical to deduce that an audience's aesthetic experience is at least equally, and more likely dominated by, the affective rather than the cognitive component of this psychological evaluation. Finally we presented a new psychometric tool in the evaluation of creativity, i.e. a tool measuring this affective component based on the semantic differential technique. In our study we sought to explore the nature of such an affective based measure of audience appreciation using two types of music video stimuli, one traditional and one new media type.

In brief, our audience is composed of 102 university students whose ages ranged from 17 to 42. We presented two types of stimuli that would serve as nmemonics to two popular music videos, one using new media technologies and the other using traditional themes and simple structures. These videos were then evaluated by this audience using the twelve item semantic differential measure and our own six facet grid for art evaluation. The data will be presented to the conference's audience and the validity and viability of the new measure discussed with them.

References

Alreck, T.L., & Settle, B.R. (1995). *The survey research handbook* (2nd Ed.). Chicago: Irwin Inc.

Amabile, T. M. (1982). Social psychology of creativity: A consensual assessment technique. Journal of Personality and Social Psychology, 43, 997-1013.

Amabile , T. M. (1983). The Social Psychology of Creativity: A Componential Conceptualization", Journal of Personality and Social Psychology 50, 357-376.

Amabile, T.M. (1996). Creativity in Context. Boulder, Colorado: Harper Press.

Amabile, T. M. (1998). How to kill creativity: Keep doing what you're doing. Or, if you want to spark innovation, rethink how you motivate, reward, and assign work to people. Harvard Business Review (September-October): 77- 87.

Barron, F. & Harrington, D.M. (1981). Creativity, Intelligence and Personality. Annual Review of Psychology, 32, 439-476.

Besemer, S.P., & O'Quin, K. (1989). The development, reliability and validity of the revised creative product semantic scale. Creativity Research Journal, 2, 268-279.

Eisenberger, R., & Selbst, M. (1994). Does reward increase or decrease creativity? Journal of Personality and Social Psychology, 66, 1116-1127.

Eisenberger, R., & Armeli, S. (1997). Can Salient Reward Increase Creative Performance Without Reducing Intrinsic Creative Interest? Journal of Personality and Social Psychology, 72, 652-663.

Michael, K.Y. (2001). The effect of a computer simulation activity versus a hands on activity on product creativity in Technology Education. Journal of Technology Education, 13 (1), in the digital library and archives, Virginia Polytechnic Institute and State University.

Moncure, S.S. (1994). Just rewards? Psychologist studies what stimulates creativity. Update, 14 (10), p 6.

Murray, B. (2002). A ticking clock means a creativity drop. APA Monitor, 33, (10 November).

Osgood, C.E., Suci, G.J. & Tannebaum, P.H. (1957). The measurement of meaning. Chicago: University of Illinois Press.

Parker, Randall (2003). History of New Media: a course syllabus. http://www.zakros.com/mica/wvrF03/wvrF03.html

Pioch, Nicolas (2000). The WebMuseum, Paris, http://www.ibiblio.org/wm/paint/

Tivendell, J. & Martel, J.F. (2003). Psychological notes on creativity. see in the behavioural group's site.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 75

DIGITAL TECHNOLOGIES AND CONTEMPORARY CAREER STRATEGIES IN ATLANTIC CANADA: A CASE STUDY OF YOUNG MUSICIANS AND AUDIO TECHNICIANS

Jan Marontate[1],

[1]Sociology Dept. , Acadia University, U-Hall Box 205, Nova Scotia, Canada, B4P 2R6 e-mail: jan.marontate@acadiau.ca

1. INTRODUCTION

Digital technologies and the creative practices associated with them are transforming the lived experience of music in ways that may radically reconfigure relations between creators (or producers), mediators and publics (audiences, fans, consumers, users).   This paper investigates the transformation 'techno-cultural' activities in artistic work by focusing on practices associated with digital recording technologies in music--making.

New technologies and the file-sharing protocols associated with them are at the centre of public debates about conventions in musical creation and consumption.   Yet, the widespread adoption of digital technologies is so recent and the practices are so unstable that it is difficult to gauge what is happening. Nonetheless it is clear that people working in music and audio production need to develop fresh strategies. How are musicians, composers, technicians and other occupational groups involved with creative practices experiencing and using new technologies?

This paper begins with an overview of theoretical insights and hypotheses about the place of technology in musical practices (Théberge 1997), "music in action" (DeNora 2000), and about "performativity" in mediation (Hennion 2000). Then I briefly discuss examples from a case study about the place of digital recording practices in the creative practices of young musicians and students in rural Canada. This case study is part of a larger research project about the transformation of creative practices associated with new uses of digital recording technology in performance and composition.

2. EARLY RECORDING TECHNOLOGIES AND THE CRYSTALLIZATION OF MUSIC

Research on the history of sound recording and instrument design has shown the complexity of relations between technological change and musical practice (Théberge 1997, Kraft, Mitsui and Hosokawa 1998, Hennion *et al.* 2000). However, for many (both creators and listeners), sound recordings came to be seen as crystallizations of musical works during the 20th century. Of course, the reception of musical works is very diverse.   Listeners are active agents who creatively appropriate music and "use" it in varied

ways (DeNora 2000). Nonetheless many uses of recorded popular music drew on or reinforced the canonical character of recordings as primary embodiments of the creative act.

French sociologist and musicologist Antoine Hennion has maintained that early recordings of classical and popular music attained a status similar to that of conventional art objects in the visual arts– as records of a past creative act, "frozen in time", preserved intact to be savoured or emulated (Hennion, 1997).   From this perspective, recordings served to de-emphasize "performative" nature of music-making for listeners. It was no longer necessary to make music or be around musicians in order to hear music.

Digital recording technologies have made the manipulation of music and recording more accessible. Are new technologies re-configuring the relations between performance and recording?

3. NEW TECHNOLOGIES AND "PERFORMATIVE PRACTICES"

Computer-based music-making practices have increasingly integrated recording processes into composition and improvisation. Much public debate about intellectual property rights and fair use has focused on how new practices blur the distinctions between originality, authorship, ownership, emulation and replication. New technologies used in connection with file-sharing protocols have been at the center of media coverage in connection with audiences and consumption, however such practices have also been associated with creative processes in diverse and innovative ways. File-sharing and other forms of internet use have allowed both listeners and creative participants (musician, sound technicians etc.) to become active agents in creation, mediation and dissemination processes.

Our study is concerned with ways in which the appropriation of such technologies may be transforming creative practices, but it is also interested the interface between past conventions and new processes. Preliminary findings suggest that digital recording technologies and the creative practices associated with them may indeed be reviving performance as a "listening technique" and

"composition technique" in unexpected ways that emphasize performance and agency.

Cultural studies scholars often use the term "performativity" in connection with studies of identity, gender and sexuality as a way of going beyond old notions that separate symbolic meaning from practices. Antoine Hennion has used it in studies of reception in music and taste (or, passion) for music. This notion of "performativity" is very useful for studying how new recording technologies are bringing action back into musical creation. This version of actor-network theory considers the dynamics of relations between human and non-human components. Such relations avoid both technological determinism and extreme forms of social constructivism. In this spirit the central idea in our study is that technology (in this case digital recording software and hardware) shapes and is shaped by users, their values and practices in specific socio-historic contexts.

4. CASE STUDY OF MUSIC TECHNOLOGY STUDENTS: RESEARCH STRATEGY

The study of the values and practices of students in a music technology program at Acadia University, a small, primarily undergraduate university in rural Nova Scotia, Canada is part of a larger interdisciplinary research project, with multiple goals and interests (aesthetic, social, political, economic and ethical). It investigates strategies for developing sustainable careers and viable enterprises in music, audio recording, and multimedia production.[a]

The music technology program at Acadia University is of interest for several reasons. In the first place it is a small, rural campus far from major centres of the music industry that has adopted a policy of intensive use of computers on campus. All students have laptops. Most of the campus is fully wired. In the music programs there is an active integration of digital recording and composition technologies (featuring Steinberg software, Roland equipment and a digital recording studio). One of the widely bruited advantages of new technologies is the notion that communications and information networks will dissolve distances between centres and peripheries.

The case study of Acadia University music technology students relies on multiple methods: collection of archival materials and documentation, focused interviews and a survey of students.

The first step was to gather documentation about the history of the music technology program since its inception and build a website (still under construction) to archive relevant course materials for analysis (http://music.acadiau.ca/musictech).
The site features syllabi, assignments, and tests for courses that are core requirements in the program as well as some other materials (notably information about performances). A sample of student works from each course has been collected and is being prepared for inclusion in the site. The website also includes a second section about resources for electro-acoustic music intended to be of use to students and recent graduates. This section will also be used to generate a sample for a series of interviews about different models for careers and survival strategies in music and audio recording.

A survey of students was completed in January 2004. It gathered data about the impact of tastes in musical genres, training and attitudes toward technology (including the open software movement) on creative experiences, paid and unpaid work and integration into organizations (networks, associations and unions). The survey results will be linked to targeted interviews and an analysis of student works in this component of the larger research program.

5. NEW TECHNOLOGIES & MUSIC INDUSTRY CONVENTIONS

An examination of selected projects shows that students and professors insist on innovative elements of new technologies in their artist's statements and other written work associated with the assignments. However they actually use new technologies in music composition and performance in ways that draw heavily on conventions in the field of musical composition (although they often integrate popular and high culture forms in surprising ways). For example, students are encouraged to produce written scores using varied recording and imaging techniques to be played using different software interfaces. Often the scores draw heavily on conventions by master composers in twentieth-century electro-acoustic music.

Student work includes CDs, music videos and web sites in creative projects that make use of new recording techniques and communications technologies associated with them in varied collaborative projects. They frequently produce artist's statements that express their intention to deliberately challenge the music industry or the "system". Sometimes

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 77

this involves producing texts, scores and recordings that mimic and mock music industry conventions. For example, recent graduates Mike Gillespie and Martin Maunder maintain a website that includes material from their student projects and more recent works (http://www.thesoundandthefury.ca). One music video 'Video Hit' begins with a satire of a hip hop video:

    "Get out, get out, get outta my mind
Unwind to find the time, it's time when it's on your dime
It burns! It burns when you're takin' turns
Lightin' my neurons on fire
Extinguish the flame burnin' in my brain
When I say 'ooooooo, I'm in so much pain'
How can I become hectic if I don't know how to play?
Rhymes become erected if I just knew what to say
I can stay here, chillin' in the cold night, out of fight
That I might go crazy if I'm left alone tonight
Fearin' that I'll bust a brother's brain in just right
If I let myself go out and get into a pistol fight
Move so I can get by, groove
Or you'll find yourself swimmin' in the dead pool
People think it's cool tellin' kids to stay in school
But I think it's cruel if you don't know what do
With yourself as your body melts in a special mold
Be prepared to come on down and do just what you're told
Sometimes people like to play
Games that drive your mind astray
Sit down, shut up, throw the dice and play
Stay only if you wanna throw it all away
Throw it all away, lose before you play
Pay for gettin' paid, the predator must pay."

Later the duo uses knowledge of the genre to express distain for recording and marketing techniques that promote formulaic approaches to music rather than "music with some mental stimulation":

    "You're dissin' my life and it's pissin' me off
What you call music just makes my brain soft
What I'm lookin' for is music with some mental stimulation
Not the latest fad dance hall craze sensation
You say you're feelin' it but I just don't get it--
What you call music is <<over-produced, over-edited>>
To fit the needs of specific target market
Putting meaning in the music is the least important part
The record company hires their marketer chum
To create the latest fad that they can cash in on

Take an old idea and change it just a bit--
There's tons of money involved and they can't afford to risk it
On something that's original--heaven forbid"

The duo laments the negative effects on "genuine" artists of industry practices and gullible consumers who fall for marketing gimmicks:

"The media conglomerates like where they sit
Churning out the same old and collectin' the money
From spoiled 14-year old teenie-bopper dummies
Who follow the trends of which they wanna be a part
Makin' it harder for the artist every time they choose the fake art
They fill their cart and approach the check-out line
Choosin' packaging over content every single time
Record company employees cruise the chat-lines at night
Spreadin' rumours, makin' street buzz, creating the hype
Gauranteein' the sales before the CD's out"

The video concludes with a call to arms to musicians and their fans that encourages downloading and promotes the "open source" approach to music consumption, the implication being that the best way to "support your local musician" is to cease purchasing works from recording industry giants:
"The System's so fucked I just wanna shout
How did we ever let it get this way?
It makes me so depressed--I just wanna say:
Let's take the music back, they can't keep it from us
Without their wallets they're not so tough.

Yeah....
Little shout out to Deanne Cameron at EMI
Stan Coolin at Warner, yeah, yeah...
Doug Chappell at Polygram
Richard Cameleri at Sony Musics...
We're not buyin' your shit no more....

Support Your Local Musician...."

["Video Hit" by Mike Gillespie and Martin Maunder
http://www.thesoundandthefury.ca]

The composers of "Video Hit" express distain for "the system" and the effects of the music industry's advertising and economic practices on fans who purchase music industry products. They

Page 78

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

also criticize the fans themselves for their gullibility and consumption that benefits the industry, proposing an alternative (but unclear) solution : supporting local musicians. At the same time they emphasize their sense of empowerment and dexterity with new recording technologies and related dissemination tools (the World Wide Web) in a site that provides music, lyrics, biographical information, and much information about the musicians and their group..

6. CONCLUDING REMARKS

In a reflection on the resistance to change in musical practices (or the "power of inertia"), Howard Becker proposed that social organizations involved with musical creation and performance promote stability by "raising the price of innovation" (Becker 1995). Becker maintained that change occurs "through the activity of people for whom that price is, for whatever reason, not prohibitive".

In our case study, our informants have strong interests in recent digital technologies, but do not have established positions in mainstream music associations or vested interests in maintaining the *status quo* in institutional frameworks. On the contrary, these young performers, composers and technicians entering the field often stress flexibility, risk-taking and rebellion against "the system" as ways for attaining recognition in the field of musical creation. Indeed, risk-taking and transgression of boundaries of past practices are longstanding features in career models in the performing arts and fine arts (Menger 2003, Heinich 1998).

What do our preliminary findings tell us about the place of new recording technologies in the practices of young musicians in Atlantic Canada?

First of all they suggest that digital recording occupies a central place in some contemporary techniques of musical creation allowing for a convergence of music as object, creation-performance and composition.

New technologies allow performance to be used as a composition technique in many different ways. Although some current practices (such as those based on sampling) challenge past notions of authorship & authenticity of the musical act, the integration of previously recorded works (composed or performed by others) into 'new' recordings may constitute a contemporary system of "footnotes" that establishes links with other musicians in ways that other types of references (stylistic or formal) did in the past.

Questions still remain, however, about whether new technologies and the uses made of them are *fundamentally* changing musical practices. It is hoped that the other information-gathering activities foreseen in this project will help answer these questions (in particular the survey results).

The most important insight from the examination of student works has been that new recording technologies are a central mode of communication that allows young musicians to participate in creative networks. Recent graduates of the music technology programme use digital recording technologies for various types of collaboration (including on-line jam sessions) and for the dissemination of works at low cost with considerable ease.

Will this sort of access allow these young musicians to build sustainable careers in the field of music? The answer to this question is still unclear. In order to understand the place of technology in student works and careers it is necessary to arrive at an understanding of how cultural innovation occurs, how 'innovations' are identified and how they attain recognition in the field of music.

As well research on the spaces of labour in information "internetworks" has demonstrated that however abstract the notion of a "virtual" economy might seem arriving at a clearer understanding of "what workers do, and where they do it, is fundamental" [Downey 2001].

Do digital technologies reposition geographical, physical and time factors in the creative process? For

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 79

musicians working in rural contexts this is an important issue. Later phases of the project will consider institutional and macro-social organizational changes associated with new technologies in more depth.

Cited Works

Ackrich, Madeleine. 1998 « Les utilisateurs, acteurs de l'innovation », in *L'innovation en question. Education Permanente*, No. 134, pp. 79-90.

Becker, Howard. 1995. "The Power of Inertia", *Qualitative Sociology* 18, pp. 301-309

DeNora, Tia. 2000. *Music in Everyday Life*. Cambridge U. Press.

Downey, Greg. 2002 "Virtual Webs, Physical Technologies and Hidden Workers: The Spaces of Labor in Information Internetworks," *Technology and Culture*. 42:2, pp. 209-235.

Hennion, A. 1997. « La musicalisation des arts plastiques » in *Images Numériques*. Publication Collective sur 'L'aventure du Regard', Presses Universitaires de Rennes, 19997, pp. 147-151.

Hennion, Antoine, Sophie Maisonneuve, Émilie Gomart. 2000. *Figures de l'amateur. Formes, objets et pratiques de l'amour de la musique aujourd'hui*, Paris, La Documentation française,

Hennion, Antoine. "Music Lovers. Taste as Performance", *Theory, Culture, Society* vol. 18(5): 1-22

Menger, Pierre-Michel. 2002. *Portrait de l'artiste en traveilleur. Métamorphoses du capitalisme.* Paris : Le Seuil.

Mitsui, Toru and Shuhei Hosokawa. (ed.). 1998. *Karaoke around the world. Global technology, local singing*. New York: Routledge.

Théberge, Paul. 1997. *Any Sound You Can Imagine. Making Music, Consuming Technology*. Ashgate.

Page 80

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

DIGITAL TECHNOLOGIES AND CONTEMPORARY CAREER STRATEGIES IN ATLANTIC CANADA: A CASE STUDY OF YOUNG MUSICIANS AND AUDIO TECHNICIANS

Jan Marontate[1],

[1]Sociology Dept. , Acadia University, U-Hall Box 205, Nova Scotia, Canada, B4P 2R6 e-mail: jan.marontate@acadiau.ca

1. INTRODUCTION

Digital technologies and the creative practices associated with them are transforming the lived experience of music in ways that may radically reconfigure relations between creators (or producers), mediators and publics (audiences, fans, consumers, users). This paper investigates the transformation 'techno-cultural' activities in artistic work by focusing on practices associated with digital recording technologies in music--making.

New technologies and the file-sharing protocols associated with them are at the centre of public debates about conventions in musical creation and consumption. Yet, the widespread adoption of digital technologies is so recent and the practices are so unstable that it is difficult to gauge what is happening. Nonetheless it is clear that people working in music and audio production need to develop fresh strategies. How are musicians, composers, technicians and other occupational groups involved with creative practices experiencing and using new technologies?

This paper begins with an overview of theoretical insights and hypotheses about the place of technology in musical practices (Théberge 1997), "music in action" (DeNora 2000), and about "performativity" in mediation (Hennion 2000). Then I briefly discuss examples from a case study about the place of digital recording practices in the creative practices of young musicians and students in rural Canada. This case study is part of a larger research project about the transformation of creative practices associated with new uses of digital recording technology in performance and composition.

2. EARLY RECORDING TECHNOLOGIES AND THE CRYSTALLIZATION OF MUSIC

Research on the history of sound recording and instrument design has shown the complexity of relations between technological change and musical practice (Théberge 1997, Kraft, Mitsui and Hosokawa 1998, Hennion *et al.* 2000). However, for many (both creators and listeners), sound recordings came to be seen as crystallizations of musical works during the 20th century. Of course, the reception of musical works is very diverse. Listeners are active agents who creatively appropriate music and "use" it in varied

ways (DeNora 2000). Nonetheless many uses of recorded popular music drew on or reinforced the canonical character of recordings as primary embodiments of the creative act.

French sociologist and musicologist Antoine Hennion has maintained that early recordings of classical and popular music attained a status similar to that of conventional art objects in the visual arts– as records of a past creative act, "frozen in time", preserved intact to be savoured or emulated (Hennion, 1997). From this perspective, recordings served to de-emphasize "performative" nature of music-making for listeners. It was no longer necessary to make music or be around musicians in order to hear music.

Digital recording technologies have made the manipulation of music and recording more accessible. Are new technologies re-configuring the relations between performance and recording?

3. NEW TECHNOLOGIES AND "PERFORMATIVE PRACTICES"

Computer-based music-making practices have increasingly integrated recording processes into composition and improvisation. Much public debate about intellectual property rights and fair use has focused on how new practices blur the distinctions between originality, authorship, ownership, emulation and replication. New technologies used in connection with file-sharing protocols have been at the center of media coverage in connection with audiences and consumption, however such practices have also been associated with creative processes in diverse and innovative ways. File-sharing and other forms of internet use have allowed both listeners and creative participants (musician, sound technicians etc.) to become active agents in creation, mediation and dissemination processes.

Our study is concerned with ways in which the appropriation of such technologies may be transforming creative practices, but it is also interested the interface between past conventions and new processes. Preliminary findings suggest that digital recording technologies and the creative practices associated with them may indeed be reviving performance as a "listening technique" and

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 81

Communication, Culture and Information Technology (CCIT)
University of Toronto:
Developing new programs in media and technology

William Forde Thompson

Institute of Communication and Culture, University of Toronto at Mississauga
Mississauga, Ontario, L5L 1C6 Canada b.thompson@utoronto.ca

1. INTRODUCTION

Communication, Culture and Information Technology (CCIT) is a set of programs offered jointly by the University of Toronto at Mississauga and the Sheridan Institute of Technology and Advanced Learning. The focus of CCIT is on the generation, diffusion, and social impact of new technologies, and how media and technologies interact with commerce, culture, and communication. CCIT has expanded considerably within a short period of time. In the 2000-2001 academic year there were no CCIT courses and no CCIT students. There are now over 60 courses and four programs (the major and three specialists) dedicated to CCIT. In 2003-2004 there were 2949 enrolments in 30 courses, and over 200 majors and specialists. Using the development of the CCIT program as an example, the aim of this paper is to identify potential challenges in developing new academic programs in media and technology.

1.1 Context

The Honours B.A. / B.Sc. major program in CCIT was approved on April 10th, 2000. Three specialist programs in CCIT were approved on March 19, 2003: Digital Enterprise Management; Human Communication and Technology; and Visual Culture and Communication. The four programs are interdisciplinary and combine academic courses in the arts and sciences with applied courses in digital media and technology.

Students who enroll in CCIT must first be enrolled at the University of Toronto at Mississauga (UTM) and are admitted to the program after one year of study at UTM. Once in the program, they obtain not only an honours degree from the University of Toronto at Mississauga, but also a *Certificate in Digital Communication* from the Sheridan Institute of Technology and Advanced Learning. Through initiatives such as the CCIT Speaker Series, the CCIT Internship programs, and Advisory Boards, critical industry links and sponsors have also been established.

2. CHALLENGES

Challenges in developing an interdisciplinary program in technology and media include: (1) Defining core academic goals and establishing adequate benchmarks and comparators (2) Establishing an administrative means of harnessing teaching, research, internship, and humanitarian activities that reflect the distinctive values and goals of the interdisciplinary unit; (3) establishing an appropriate faculty complement through joint-appointments and dedicated appointments; (4) integrating technology skills-building and internships into the curriculum while retaining an essentially academic mission.

First, interdisciplinary units must actively communicate clear academic goals to students, faculty, and industry partners. Without clear and persistent communication, goals that are inaccurate may be assumed. For example, students may infer that the goals are similar to that of short-term college IT programs, which differ significantly from the academic goals of a University. If so, students may be disillusioned by the high level of academic content. In the case of CCIT, we have emphasized that our goal is to integrate academic training with a form of literacy in information and communication technology: the ability to use a wide range of digital technologies and communication tools to access, create, manage, and evaluate information in order to solve real-world problems and function successfully in a knowledge society (Gonzalez, 2004).

Second, in order to develop a large and interdisciplinary program in media and technology, it is often optimal to situate the program within an *extra-departmental unit* (EDU*)*. Small interdisciplinary programs may be developed within a specific department such as English or Sociology. However, because the interaction between technology, media, and culture is an interdisciplinary topic, a departmental model is not ideal. The interdisciplinary nature of CCIT suggested the need for faculty involvement across a range of disciplinary backgrounds.

To allow such appointments, it was necessary to establish a new administrative structure to which CCIT faculty could be appointed independently of any one department. The structure was defined as an extra-departmental unit (EDU) and named the *Institute of Communication and Culture* (ICC). The formation of the institute allowed us to plan for growth through the appointment of new faculty members who have formal joint-appointments between the ICC and a number of relevant departments. This arrangement removed the dependence of CCIT on faculty from other departments who were borrowed or subcontracted to teach in the program from year to year.

Third, it is advisable to establish a faculty complement for the program that includes some dedicated appointments. The establishment of the ICC allowed joint-appointments to be made to CCIT. However, reliance on jointly appointed faculty alone limits the potential for growth, and dedicated appointments are now planned. Significant growth is possible only by establishing a core of faculty who have most or all of their teaching and administrative obligations to the interdisciplinary unit.

Joint appointments bring together expertise from multiple disciplines, promoting cross fertilization of ideas. Nonetheless, faculty with a departmental home cannot be relied upon to sustain a large program in the long term because they view their joint appointment to the interdisciplinary unit as secondary. Tensions emerge between participating departments when joint-appointed faculty increase their involvement in the interdisciplinary unit. Issues of tenure, promotion, and progress through the ranks encourage primary involvement with the department and minimal involvement with interdisciplinary initiatives.

Complications also arise when joint-appointed faculty shift directions in teaching and research. The department may have teaching obligations to the interdisciplinary unit but may be unable to unwilling to fulfill such obligations in a satisfactory manner (e.g., if no faculty member in the department is qualified to teach in that unit, or if the department decides to transfer stipendiary funds rather than deploy a full-time faculty member). To address these challenges it is advisable to seek a number of faculty with a primary appointment to the interdisciplinary unit.

Fourth, students and industry leaders expect programs in media and technology to integrate cognitive skills with applied technology skill-building and internship or cooperative placements. As mentioned, integrating academic and hands-on skills can provide students with enormous insight into the machinations of media and technology industries. To this end, CCIT was developed in partnership with the Sheridan Institute of Technology and Advanced Learning. Sheridan has an international reputation for their technical and applied programs, such as

computer animation. Although the CCIT curriculum consists entirely of University approved courses and all CCIT students are enrolled at the University of Toronto, some courses in CCIT are taught at Sheridan. Upon graduation, CCIT students not only obtain an Honours Arts/Science degree from the University of Toronto; they also obtain a Certificate in Digital Communication from Sheridan Institute of Technology and Advanced Learning. Academic content is emphasized in CCIT courses taught at the University of Toronto; applied and technical skills are emphasized in CCIT courses taught at Sheridan.

Internships provide another valuable source of applied knowledge. Developing an internship program may require a dedicated internship coordinator to evaluate and coordinate placements and ensure that all internships have academic integrity. CCIT has initiated one of the largest internship programs at the University of Toronto, with up to one hundred students scheduled to be enrolled in internships each year. Initially, students are required to find their own internships and submit a formal proposal to the internship coordinator. Over time, strong links between the University and technology industries are expected.

3. CONCLUDING REMARKS

The development of the CCIT program was associated with a number of significant challenges. These challenges are not specific to CCIT but may be experienced by anyone attempting to develop an interdisciplinary program in media and technology. Successful development of such programs involves defining and communicating distinctive academic goals, forming an interdisciplinary unit to house the program, securing a committed faculty complement, and integrating cognitive and applied skills. More generally, the ultimate challenge of any program in media and technology is to facilitate the intellectual development of the next generation of leaders, entrepreneurs, and academics so that they can use their knowledge and skills to advance, enhance, and support human values.

REFERENCES

Gonzalez, K. (2004). Defining, assessing information and communication technologies (ICT) literacy. http://www.ets.org/news/02050701.html

ACKNOWLEDGEMENTS

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 83

TOWARDS A MODEL OF LEARNING IN A MULTI-MEDIA ENVIRONMENT: THE CONSTRUCTION AND DECONSTRUCTION OF THEORY

Patricia Balcom[1] and Friedemann Sallis[2]
[1]Dép. d'anglais, Université de Moncton, Moncton N.-B. E1A 3E9. balcomp@umoncton.ca
[2]Dép. de musique, Université de Moncton, Moncton N.-B. E1A 3E9. sallisf@umoncton.ca

1. INTRODUCTION

There has been a great deal of work done developing materials for learning in a multi-media environment as well as research examining the contribution of the various tools of multi-media to learning and what technical aspects of multi-media favour learning. However, to the best of our knowledge there has been no attempt to present a model of cognition which would incorporate the various cognitive faculties involved in multi-media environment--visual, musical and linguistic--as well as their interaction. In this paper a linguist and a musicologist will join forces to present perspectives from their respective disciplines to provide a preliminary attempt to reconcile the relationship between language and music, a relationship which should be understood if the two are combined in a multi-media learning environment.

While there are a number of theories of music cognition (Snyder, 2000; articles in Cook, 2001 for example), Jackendoff and Lerdahl's (1983) generative theory of tonal music is the only one to be inspired by a linguistic model, namely generative grammar. Moreover, Jackendoff (1995, 1997) situated music cognition within a theory of the mind which contains other modules, including language and vision. We have therefore chosen to examine the relationship between language and music based on this work. Sections 1 and 2 provide brief summaries of Chomsky's (1965, 1986, 2000) theory of the language faculty, and Jackendoff and Lerdahl's (1983) theory of musical capacity, concluding with Jackendoff's (1997) proposal for how these different faculties of the mind interact. Section 3 gives a critique of Jackendoff & Lerdahl's theory, followed by Section 4, our tentative conclusions.

2. THE LANGUAGE FACULTY[1]

According to Chomsky (1965, 1986, 1995, 2000) one basic goal of generative grammar is to explain how children acquire the language they are exposed to quickly, effortlessly and without being taught. He proposed that there is an interaction of humans' genetic predisposition for language with the linguistic environment. This genetic predisposition, called the Language Acquisition Device in Chomsky (1965) and later referred to as U[niversal] G[rammar], is a specific module of the mind which contains universals which hold of all languages as well as language-specific particularities (transformations or parameters) which are acquired unconsciously through experience in a particular linguistic environment. The resulting knowledge acquired goes far beyond the speech data in the linguistic environment, and enables adult native speakers to produce and understand sentences they have never heard before, detect ungrammaticality, and recognize ambiguity and paraphrase.

A second goal of generative grammar is to describe the knowledge attained by adult native speakers. This mentally represented grammar consists of a phonological system and a semantic system linked by the syntactic system, as well as a lexicon. The *phonological system* is the inventory of sounds in a language and the rules determining their variants and their combinations, in other words: "the mental representations that underlie the production and perception of speech and the rules that relate these representations to the physical events of speech" (Chomsky, 1986:41). Speakers of English know that the sound /p/ is pronounced with aspiration (a puff of air) immediately before a stressed vowel and that while /spr/ is a possible sequence in English, /srp/ is not. *The semantic system* in generative grammar is the system for interpreting sentences by determining *, inter alia,* the reference of pronouns and variables, and scope relations. For instance, the sentence *Everyone saw someone* has two interpretations: it can either mean that each person saw someone different, or that each person saw the same individual. The semantic component determines whether *everyone* has scope over *someone*: if it does the sentence means that each person saw someone different while if *everyone* does not have scope over *someone* it means that each person saw the same person. The *lexicon* or mental dictionary contains the words of the language as well as phonological information--how they are pronounced--, semantic information--what they mean--and syntactic information--their category and what complements they take. In theories of lexical semantics, the lexicon also contains conceptual information. To give an example, *place* is a verb pronounced /pleis/ with the meaning 'to put' which takes a Noun Phrase (NP) and a Prepositional Phrase(PP) as its complements, so that *Mary placed the book on the table* is grammatical while both **Mary placed the book* and **Mary placed on the table* are ungrammatical.

The lexical entry would also contain the verb's event structure, that is that there is an Event in which Mary caused a book to go from her to the table.

The phonological system (PF) and the semantic system (LF) are viewed as the interfaces between language and other cognitive systems, including speech perception and production in the case of PF and conceptual and pragmatic knowledge in the case of LF. They are linked by the *syntactic system*. Words are selected from the lexicon and enter the syntactic component where operations such as substitution and movement apply to the selected words to generate syntactic expressions. The result of these operations is the input to PF and LF.

3. MUSICAL CAPACITY

The goals, basic approach and some formalisms of generative grammar (hierarchical tree structures for example) were applied to music cognition by Lerdahl & Jackendoff (1983), henceforth L & J. The basic goals of L & J's generative theory of tonal music (henceforth GTTM) were to describe the internalized musical grammar possessed by experienced listeners and explain how novice listeners acquire this knowledge. L & J assumed that there is a specific module of the human mind for music cognition. It consists of principles of musical grammar which are common to all musical idioms. Aspects which are idiom-specific have to be learned ("for the most part unconsciously", p. 296), based on input in the musical environment. L & J argued that any particular musical idiom has a grammar which is an instantiation of universal principles of music and which enables experienced listeners to organize the music they are exposed to, whether they are familiar with the particular idiom or not. Experienced listeners' unconscious knowledge of a particular musical idiom--that is, their internalized musical grammar--consists of complex, abstract knowledge which goes far beyond the surface form of the musical input. This knowledge allows them to recognize a musical phrase as "relatively normal or unusual" (p. 288), and to have intuitions about musical grouping and meter as well as prolongation structure. Moreover, Snider (2000:152) noted that even untrained listeners can detect "wrong and out-of-tune pitches of familiar tonal melodies" another aspect of unconscious knowledge of music.

There are four basic components in L & J's model of musical grammar: a *grouping structure* which segments the musical surface into motives, phrases, and sections, arranged hierarchically; a *metrical structure* that associates a piece with a hierarchical grid of strong and weak beats; *time-span reduction*, which encodes the importance of events relative to the rhythmic framework provided by grouping and metrical structure, relating rhythmic structure and pitch structure; and *prolongational reduction*, which encodes the importance of events in defining domains of tension and relaxation that cut across the rhythmic

framework" (p. 129-130). Archetypal patterns are a result of preference rules for these four components of the musical grammar. Preference rules are an "innate system of preferences among tonal systems" (p. 274). These rules do not dictate the specifics of tonal systems, but they do narrow down the hypotheses the learner will entertain about the system. Preference rules both establish a hierarchical structure and characterize allowable distortions within this structure. If preference rule "applies in the same way to every idiom that employs the distinctions to which the rule is sensitive"(p. 278) it is universal. For example, there is a preference rules for stress, that stresses are heard as strong beats, and others that look for parallelisms, including motivic relatedness (p. 287). (See Snyder 2000 for a discussion of levels of musical structure, including grouping, rhythm, metre and pitch patterns, couched in terms of cognitive psychology, and for an array of empirical support from a wide variety of musical idioms to support the idea that musical structure is partially innate and partially learned.)

Applying the linguistic notions of competence--the unconscious knowledge of the rules of grammar possessed by the native speaker--and performance--the application of this knowledge to real speech situations (understanding and producing speech), Jackendoff (1995) proposed a theory of musical processing (parsing music in real time, one aspect of music performance in the linguistic sense) based on the GTTM (a theory of musical competence). This theory of music processing aimed to show how the experienced listeners' internalized grammars are applied to construct musical representations of musical pieces that they perceive. According to Jackendoff (1995), when experienced listeners hear a piece of music they unconsciously construct abstract musical structures based on what they hear, that is "the events of the musical surface (the sequence of notes and chords)" (p. 126) Three factors come into play when listeners perceive a piece of music: (1) a general substrate of auditory processing which subsumes certain principles of grouping and metrical regularity; (2) music-specific principles (such as principles of metrical and tonal systems) which apply to input which listeners perceive as musical; and (3) principles and parameters which are idiom-specific. Jackendoff (1995) assumed that when musical parsing takes place there are no accentuation clues in the musical surface to help listeners determine the meter of a piece. Moreover, he assumed that listeners are conscious of only one analysis of a musical piece at a time, although other analyses may be going on simultaneously, but at an unconscious level. The music parser develops its analysis based on the rules of musical grammar and operates automatically, attempting to impose musical structure on any "plausibly musical signal" (p. 148).

Turning to language, Chomsky (1986) presented a number of possible situations which can obtain when native speakers are presented with an acoustic signal. Their unconsciously

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 85

represented linguistic grammar (their linguistic competence or I-language) will analyse each "relevant [acoustical] physical event" (p.26) and determine whether it is intelligible and grammatical, intelligible but ungrammatical (i.e. *I want that you do this for me.*) or unintelligible but grammatical (i.e. the well-known sentence *Colorless green ideas sleep furiously.*). Other strings may be represented phonetically by the listener and classified as a possible sentence in a language the listener is unfamiliar with. Finally, some acoustical events are nothing but noise. Chomsky (1986) does not go into detail about how native speakers actually analyse those strings which are perceived to be intelligible in their language, but Jackendoff (1997) argued that the rules of the mentally represented grammar of language are used in comprehending sentences and that the components have "relatively direct processing counterparts" (p. 8). He argued that in speech perception the language processor has to map an auditory signal into an intended meaning, which can only be accomplished via the intermediate levels of representation, namely phonology and syntax (p. 102). Based on psycholinguistic research he proposed that the auditory signal is linked to the phonological system, which

does an partial analysis of the incoming string and sends it to the lexicon, which activates all words consistent with the phonological structure provided. The lexicon also sends these words to the syntactic and semantic components which in turn begin to build up structures. The syntactic processor would starts parsing the incoming words into a hierarchical tree structure, rejecting ungrammatical analyses and sending this information back to the phonological component. At the same time the semantic component attempts to derive an interpretation of the string, rejecting any which are meaningless and sending this information to both the phonological and syntactic components. The three components are acting in a parallel and integrated fashion, with each components integrating and completing information from the other components, even if it is incomplete. This is done via correspondence rules--interfaces which link the various components and permit them to interact as they build up representations during real-time processing.

Jackendoff (1997:39-45) presents four diagrams, which combined give "a rough sketch" of a theory of the various modules of the mind and their interaction, including both language and music (p. 45). In real-time processing of an auditory input, auditory signals are sent to different perceptual interfaces, phonetic, musical and "general purpose auditory perception" (p. 42) *inter alia*. The former two converge on their domain-specific systems of representation, phonological structure and musical surface respectively, and the processes outlined above then take place. What is not clear is how the mind would deal with two sources of auditory input simultaneously, either a song, or instrumental music used as background in a multi-media language-learning experience.

3. A MUSICOLOGICAL PERSPECTIVE ON THE GTTM

In a recent film review Groen (2004) spoke of the work's "daunting message" delivered in muted tones and then concluded, "Fine art needs fine perceivers, or else it will turn crude." (R1) Behind this statement lies the wide-spread assumption that the media of art (be they words, sounds, images, objects or some combination thereof) become means of expression through which the creator communicates to his or her audience. The corollary assumption is that the various arts can be understood as 'languages' and that the concepts and the tools of the linguist can be usefully engaged to study of music, painting, architecture, film, etc. And indeed, if we examine the relationships which can be established between language and music we find a great deal of circumstantial evidence, which appears to back-up the assumptions presented above. First, both language and music use sound production. They become manifest through time and thus are organized in various types of sequential structures. Moreover, both can be notated (though this is not *sine qua non* for the existence of either). Furthermore, the various notational methods are analogous in that they tend to highlight the segmentation of linguistic and musical structures into ever smaller discrete elements: text, sentence, phrase, word, morpheme, sound; work, movement/period, phrase, theme, motive, sound. For an efficient overview of these and other points concerning the relationship between music and language, see Panagl (1993). Both linguists and musicologists frequently borrow concepts and technical terms from each another, creating an aura of familiarity between the two disciplines. We note the 'melodic' quality of certain accents or types of speech and we speak of the 'grammar and syntax' Western tonal music. Finally, one can hardly ignore what we might call the 'musico-linguistic intellectual tradition' going as far back as the Renaissance and to which numerous linguists and philosophers (Roman Jakobson, Nicolas Ruwet and Claude Lévi-Strauss) on the one hand and musicologists (Walter Wiora and Jean-Jacques Nattiez) on the other have contributed during the twentieth century.

It is within this general context that the work of L & J must be examined and evaluated. By bringing together their training as a musician and a linguist, they developed a "formal musical grammar that models the listener's connection between the presented musical surface of a piece and the structures he attributes to the piece." (p. 3) Their analysis tended to focus on how diastematic structures interact with durational aspects, notably metric structures, and they successfully elucidated certain aspects of tonal music which had previously gone unnoticed. Problems arise however once they begin to extrapolate universal principles of musical grammar based on an innate human capacity to understand music (p. 4) : a capacity which, if universal, must be valid in all times and in all places.

Given the vast number of divergent musical idioms in

Page 86

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

existence today, such an enterprise seems doomed to failure. Furthermore, this formal musical grammar will never be able to be tested against all of the musical idioms which mankind has invented already or will invent in the future. Traditionally most of the world's musical idioms have been transmitted aurally. They have not been notated or recorded and consequently many have simply been lost in the passage of time. Thus, even if it could be tested against all musical idioms we know today, the GTTM will necessarily remain highly speculative. Finally, even if we restrict our examination of the applicability of the GTTM to music of the Western art music tradition, we quickly discover that it is severely limited. As the authors admit themselves, their musical grammar was developed from a study of "classical Western tonal music" (p. 4). They are in fact referring to music composed in Vienna in the late eighteenth and early nineteenth centuries and to musical idioms which can be derived from or in some way related to this repertoire. A quick glance at the index of their book reveals that well over half of the musical examples used to illustrate their theory come from the compositions of Joseph Haydn (1732-1809), Wolfgang Amadeus Mozart (1756-1791) and Ludwig van Beethoven (1770-1827): an extraordinarily limited base for the development of universal principles. And indeed, as one would expect, the further they move from their musical point of departure, the less well their theory works.

For example, their grammar supposes a sophisticated, hierarchical system of organizing discrete pitches (the twelve degrees of the European chromatic scale) and a regular metrical structure which, among other functions, allows the listener to perceive pitch hierarchy as it is deployed in time. By making the claim that metrical structure entailing a hierarchical grid of strong and weak beats constitutes a universal attribute of all musical idioms, they are effectively drawing a theoretical line between music and a kind of non-music which is deficient or inadequate. We are not in a position to present disconfirming examples from non-Western musical cultures. We do however feel that their claim that the attributes of Viennese classical music can provide a basis for an all-encompassing definition of mankind's music seems, at first blush, to be extraordinarily naïve.

Be that as it may, disconfirming examples can be easily identified within the Western art music tradition. First the criteria mentioned above can not be applied to European music of the Middle Ages and the early Renaissance. Much of the polyphonic music of the thirteenth and fourteenth centuries has neither a sense of tonality nor anything resembling a uniform metric structure.

As L & J themselves admit (p. 296-301), similar problems arise with respect to twentieth-century art music. One need only bring to mind the compositions based on the serialist methods of the Darmstadt school (Pierre Boulez, Karlheinz Stockhausen, Luigi Nono), the music generated by Iannis

Xenakis's stochastic technique based on the statistical manipulation of sound masses, the so-called 'static' music of György Ligeti, electro-acoustic music (pioneered by Stockhausen among others and developed by generations of composers since) and finally John Cage's compositions based on chance operations. Given that in the early 1950s Cage began using aleatory methodologies to compose, this music would seem to pose a particularly intractable problem for the universalist aspirations of L & J. In a work such as *Music of Changes* (1951) there is no perceivable structure to stimulate a specific response in the listener.

Now to claim that much of the greatest Western art music of the twentieth century is deficient or worse is not music simply because it does not fit into some theoretical model is of course patently absurd. Yet this is precisely what J & L do. Faced with this massive number of disconfirming examples they simply write them off as being par of an inferior musical culture. We read for example that even "an apparently simple Mozart sonata is more complex than many twentieth-century pieces that at first seem highly intricate." (p. 300) Evaluating Ligeti's *Études for piano* (arguably one of the twentieth-century's chef d'oeuvres for this instrument) using criteria derived from a study of Mozart's sonatas can only lead to misunderstanding. The point here is not to discount the theory in its entirety. When it is used to explain certain aspects of the Viennese classical music and music related to this particularly style, then it does indeed work quite well. The real question is why L & J should claim the universality of their theory? What could have motivated such a spectacular example of circular logic?

The answer appears to lie in a barely concealed aesthetic agenda. Though L & J claim that their "ultimate goal is an understanding of musical cognition, a psychological phenomenon" (p. 6), they know full well that their theory has aesthetic implications. And in fact these are sketched in Lerdahl (2001), in which he attempted to further develop and ramify the initial theory. At the very end of the book he acknowledged that his analytical demonstrations have largely remained within the classical canon. He then went on to state that his real interest was not with the music of the past but rather in "the potential of the theory for future music" (p. 381). This is followed by one last jab at the "mutually incompatible and largely private compositional codes" (p. 381) which characterize much twentieth-century art music. He then concluded by hoping that his theory might "help pave the way for a kind of compositional thought based less on aesthetic-historical dialectics than on a growing understanding of the musical mind." (p. 381).

Lerdahl (2001) was tacitly admitting that his real aim was in fact aesthetic. Having written off the music of the last century he was attempting to stave off the production of ever more incomprehensible music by developing a theory, which would naturalize the musical thought of his preferred

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 87

style, that of Haydn, Mozart and Beethoven. By holding up the empty formulae of worn out and discarded musical styles as representing the eternal essence of real music, Lerdahl placed himself in a long line of musical conservatives. At the beginning of the fourteenth century Pope Jean XXII railed against the use of isorhythm and hoquetus techniques, which chopped up and made generally incomprehensible the traditional liturgical chants. He has since and quite rightly become one of the most well-known laughing stocks of Western music history because as he wrote his *Docta santorum patrum* (ca. 1325), even the composers of his own court were continuing to use and develop the very techniques he condemned. A century ago Heinrich Schenker, motivated by a quasi-religious belief that the major triad is the basis of all civilized music and by his personal animosity for the compositions of Arnold Schoenberg and his students, spent his entire career developing a theory of tonal music that was supposed to establish why the new atonal music of the early twentieth century could not be classified as music. Schenkerian theory is now one of the standard tools we use to understand music written up to the end of the nineteenth century. The theory had no impact whatsoever on the composition of music during the twentieth century. To the extent that L & J were attempting to establish a universal theory of the future of all music, the same fate will also no doubt befall the generative theory of tonal music.

4. CONCLUSION

While the previous section has indicated potential problematic cases which the GTTM may not be able to account for, apparent counter-examples can only enhance the theory. As Chomsky (1986) pointed out

> [i]nvestigation of Japanese might show that the assumptions concerning S_0 [the initial state of the language module] derived from the study of English were incorrect; ... Because evidence from Japanese can evidently bear on the correctness of a theory of the initial state, it can have indirect--but very powerful--bearing on the choice of the grammar that attempts to characterize the I[nternalized]-language attained by a speaker of English. (37-38)

It is important for the GTTM to account for the counter-examples presented in Section 4 for the purposes of theory construction. However, apparent the counter-examples are unlikely to be used in multi-media learning situations, and can be put to the side for practical purposes. Lozanov's method of language learning, Suggestopedia, is probably the best-known example of using music to promote second language learning. He used classical music to relax students and the teacher would read materials to the students "his voice modulated in harmony with the musical phrases". (Lozanov 1979 cited in Brown 1987:141).

So where does this leave our study of music and language? First, as was quoted above, Groen (2004) mentioned that the role of the listener is important and should not be ignored: fine music does indeed require close listening. We should however also keep in mind Julian Johnson's admonition that, since the late eighteenth century, great Western art music is defined primarily in terms of inward-looking, intrinsic, objective properties, which allow us to identify the work and only secondarily by in terms of listeners' responses to it. This emphasis has of course little place in commercial music, whose success, by definition, rests on being shaped by commercial demands rather than purely musical ones. (2002: 27) By the same token, to study classical music merely in terms of listeners' responses is to transform it into something it is not.

Second, our evaluation of the GTTM suggests that the quest for principles upon which a <u>universal</u> musical grammar could be established is at best quixotic. Eco (1989) has with reason pointed out that music is a reflection of cultural patterns, a system of preferences and habits, convictions and emotions, fostered in us by the natural, social and historical context we inhabit. (1989: 76) Thus the paradox seems to be that whereas music is a phenomenon in its own right which can really only be understood in its own terms, to be completely understood it must also be set in some sort of context.

Snyder (2000) "takes a position between the extremes of autonomous music perception, unaffected by cultural construction, on the one hand, and purely cultural construction of all levels of musical order, on the other" (p. xvi). He argued music which is mentally represented in the mind of an individual can be shared with other individuals having the same knowledge. When this knowledge is shared in a particular place and time, it might be called "musical culture", which he defined as "a shared repertoire of musical concepts, not all of them necessarily explicit, and practice among different individuals." (p. 102).

5. REFERENCES

Brown, H.D. (1987). *Principles of language learning and teaching.* (2nd ed.). Englewood Cliffs NJ: Prentice Hall, Regents.

Chomsky, N. (1965). *Aspects of the theory of syntax.* Cambridge MA: MIT Press.

Chomsky, N. (1981). *Lectures on government and binding.* Dordrecht: Foris.

Chomsky, N. (1986). *Knowledge of language: Its nature, origin, and use.* New York: Praeger

Chomsky, N. (1995). *The minimalist program.* Cambridge

Page 88

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

MA: MIT Press.

Chomsky, N. (2000). Minimalist inquiries: The framework. In Martin, R., Michaels, D. and Uriagereka, J. (Eds.) *Step by step: Essays on minimalist syntax in honor of Howard Lasnik.* Cambridge MA: MIT Press, pp. 89-155).

Cook, P. R. (Ed.) *Music, cognition and computerized sound.* Cambridge MA: MIT Press.

Eco, U. (1989). *The open work* (A. Cancogni, Trans.). Cambridge MA: Harvard University Press.

Groen, R. (2004, January 16). She's a pearl: so is the picture [Globe Review]. *The Globe and Mail*, p. R1.

Jackendoff, R. (1995). *Languages of the mind..* Cambridge MA: MIT Press.

Jackendoff, R. (1997). *The architecture of the language faculty.* Cambridge MA: MIT Press.

Johnson, J. (2002). *Who needs classical music? Cultural choice and musical value.* Oxford: Oxford University Press.

Lerdahl, F. (2001). *Tonal pitch space*. Oxford: Oxford University Press.

Lerdahl, F. and Jackendoff, R. (1983). *A generative theory of tonal music.* Cambridge MA: MIT Press.

Panagl, O. (1993). Linguistik und Musikwissenschaft. Brückenschläge, Holzwege, 'falsche Freunde'. In S. Mauser (Ed.) *Kunst verstehen Musik verstehen. Ein inter-disziplinäres Symposium (München 1992)*, (pp. 31-38). Laaber: Laaber Verlag.

Snyder, B. 2000. *Music and memory: An introduction.* Cambridge MA: MIT Press.

5. NOTES

[1]While the basic goals of generative grammar have not changed, there have been two major shifts in generative grammar since the Aspects model of 1965; principles and parameters (Chomsky 1981) and the minimalist program (Chomsky 1995). In our description of the components of grammar, particularly syntax, we have therefore been rather general. Jackendoff does not see the interaction of the various components of the grammar in the same way as does Chomsky, and that Jackendoff (1997) distances himself from some of Chomsky's assumptions, including the latter's "syntactocentric assumption" (p. 38), and from the minimalist program.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 89

DEBATE MACHINE AND STRUCTURED KNOWLEDGE BUILDING: A NEW MEDIA NETWORK FOR CULTURAL INQUIRY

Dr. Rodney Hoinkes, D.Des.
Immersion Studios Inc., 285 Manitoba Dr., Toronto ON Canada, M6K 3C3   rhoinkes@imm-studios.com

1. INTRODUCTION

"Without history, a society shares no common memory of where it has been, what its core values are, or what decisions of the past account for present circumstances."
Nash and Crabtree (1996)

A new interest in cultural understanding combined with enhanced developments in socio-media capabilities had led to several national and international projects pushing the envelope for the convergence of these ideas. Two such projects are being undertaken by Immersion Studios Inc. The first of these is the Cyber/Explorer network between sites in Canada and France exploring the image of modern Canada for the celebration of the 400th anniversary of the first French settlement in Canada. The second being the "Interactive Network" Cyber/Explorer for the Canada at Expo 2005 programme of Heritage Canada designed to bring the Expo home to Canada and engage Canadians in the themes of the Expo.

These projects are creating a rich new media network within Canada and with extensions to France and Japan. These networks are designed to engage Canadians in a broader debate about issues of personal, local, national, and international importance, with a particular emphasis on multiculturalism. By expressing ourselves and exploring other's perceptions and facts, we may use each other and the network as a mirror to better reflect on who we are and our shared or divergent views.

The process of externalizing knowledge for communication can be seen as one of anticipating the stimuli needed to transfer a representation from the mind of one individual to another. If one does not anticipate the stimuli needed, questions arise, impeded by the nature of asynchronous transfer. Therefore, the structure of information captured and exposed in communication systems is critical to their successful use.

2. METHOD

The socio-media systems designed for these networks serve two key functions: a) to enable users to "confront their ideas" around pre-defined themes (debate) and b) to enable users to build structured knowledge around pre-defined themes. This implies certain requirements in terms of sources of content and the representation of this content. For example:

- Expert and empirical knowledge vs. media representation of knowledge vs. public opinion
- Volume and type of content should empower the user to construct his/her vision/opinion, building confidence rather than overwhelming the user with information
- Discovery of emergent concepts from large public contributions

Within this paper, an overview of these projects will be presented. The key emphasis will be upon the design of the user experiences needed to engage in these challenging themes. Two methods are presented from the work to date in addressing these information design challenges.

2.1 Debate Machine

The current "Debate machine" format of the Cyber/Explorer follows an I.B.I.S. (Issue-Based Information Systems) information concept but with a level of simplification deemed appropriate to the general public as end-users:

1. Topic: typically a question with two or more positions taken by participants.
2. Story: an individual contribution that can provide a perspective on the topic based on argument or citation.
3. Position: a stated position on the topic, formalized into For, Against, Neutral, Other (allowing for 'fuzzy' interpretations/responses).

While this type of organization remains simple and easy to employ, it may or may not yield clear emergent (summary) results, indicating all key positions. Positions may not be well supported or argued depending on the factual basis and experiences of the participants. Well constructed seed content can aid these potential flaws but a largely user-organized system thereafter <u>may</u> result in unwieldy or unfocused data. The opposite, a clearly classified but utterly unusable (by the general public in normal attention spans) system can occur. This is the problem that has generally plagued knowledge management systems to date – too much effort for little perceived value.

2.2 Structured Knowledge Building

Structured knowledge building ("SKB") is presented here as a user-directed method with two key goals:

1. Organize new areas for inquiry (comprehensive overviews/structuring).
2. Build new understandings (make sense of 'emergence').

In the initial sense of SKB, a definitive 'set' of knowledge is being constructed to provide users a clear jumping off point, a clear support to their building activities. Essentially, the act of robust 'seeding' can be seen as this type of structured knowledge building. This is more a knowledge pursuit outside of the Cyber/Explorer to lead to its clear initial structuring.

The second context of SKB is one of discovery or understanding based on extensive user input. It is focused upon the clear digestion of the content of the Cyber/Explorer to aid in clarifying the key aspects to new users, and to provide a broader cultural understanding to all research participants. This process can ideally be seen in three parts:

1. Search/exploration: the mechanisms by which the knowledge builder can gain the useful and necessary insights into the content of the Cyber/Explorer with which to build.
2. Build: the process of deriving new meaning, clarifying concepts, or providing new ways of understanding the organization of knowledge in the system.
3. Feedback: the act of re-incorporating built concepts back into the Cyber/Explorer to aid future inquiry.

The key challenge in structured knowledge building is the potential belief that those who 'build' are somehow naturally creating 'better' knowledge. This building can be highly biased, if only by the nature of what has or hasn't been input into the Cyber/Explorer. Raising such misinformed knowledge to a higher level can lead to an increase in bias within the overall system information cycle.

3. RESULTS
The Canada-France network includes an installation in Paris, France at the Médiathèque of the Cité des Sciences et l'Industrie and at the Université de Québec à Montréal in Canada. This project is only starting into public use at this time and results are not yet available to assess these strategies in action. We are looking carefully to capture a wide range of user inputs, not only directed content, but modes and styles of content search, linkage, and building. Engagement in the system will also be complicated by support for both synchronous and asynchronous modes, revealing very different characteristics of collaboration and knowledge inquiry.

The Canada-France network is clearly seen as a research initiative by all participants. The site partners in France and Canada, and a number of others who are following this

work, are planning to apply significant additional research direction and value to this process. With high visibility sites, significant quantities of potential users, and a strong underlying technical base, this platform for inquiry is seen as an excellent starting point for a challenging research domain.

It is seen as likely that the above noted concepts of the Debate Machine and Structured Knowledge Building are only initial propositions for useful information structuring in this type of cultural discovery, debate, and sharing. Additional concepts from this authors' own Knowledge Mapping research (Hoinkes, 1996) are being examined to look for potential appropriateness of mapping and adaptation into the Cyber/Explorer interface. Further pattern analysis and user-feedback mechanisms are also under initial consideration for integration on a pure research basis. Of particular interest is a neural network approach to learning user inquiry modes that may assist in more natural and focused exploration. The key to this line of research is the potential for a less formally structured knowledge interface that complicates the user experience and system usability.

4. DISCUSSION
Information structure and access interfaces are far from the only issues faced in such an ambitious project. A key additional challenge is posed by the notion of editorial control, bias, and censorship. To date the partners involved have been willing to pursue a more open policy with user community self-regulation through a positive rating system. It remains to be seen if this will result in too many perceived problems to be acceptable for a government and institutionally-sponsored system. This one factor alone could have serious implications on the opportunities of this research.

REFERENCES
Hoinkes, Rodney M. (1996). *Visualizing Design Processes for Knowledge Mapping*, Harvard GSD Doctoral Dissertation, Boston, USA.

Nash, Gary B. and Crabtree, Charlotte. (1996). *National Standards for History.* National Center for History in the Schools, University of California, Los Angeles, USA.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 91

EXAMINING SOUND PRACTICES: ETHNOMETHODOLOGY AS ANOTHER APPROACH TO MUSICAL COLLABORATION

Dr. Peter Weeks,
Department of Sociology, St. Thomas University, Fredericton, NB Canada   E3B 5G3   pweeks@stu.ca

1.   INTRODUCTION

This paper introduces a different approach to musical collaboration, involving a sub-field of sociology called Ethnomethodology. I shall give brief glimpses of my previous research in two distinct areas of its application to music. First, the bulk of it examines collective music-making in small groups in which I have been the bassist in both chamber-music and jazz contexts. The second area centers upon the problems of visually representing details of it using either musical notation and graphic electronic displays, employing digital technology.

Ethnomethodology focusses on the detailed practices and methods whereby people assemble socially recognizable everyday activities. Derived from Phenomenology, it is an interpretive perspective concerned with members' methods of making sense moment-to-moment of what is going on, involving the often taken-for-granted background understanding on which they base their actions. Ethnomethodologists ask this sort of question: What precisely do members do in detail that makes their activities "accountable", that is, observable or socially recognize for what people take them to be? In other words, how do people organize their social activities in such a way that others can make sense out of them? This is even more challenging in specialized activities like music where "background understandings" or implicit assumptions are tricky to discover and explicate for the non-specialist.

I argue that it is this very attention to the moment-to-moment constitution of activities that makes EM one strategic approach to the analysis of musical collaboration. As well as uncovering how musicians keep 'in synch.' with one another, we can inquire into the detailed practices of 'translating' the resulting music into visual form. In turn, how do musical notation and electronic graphic representations relate to the recording and, in turn, to the original performance?

A useful concept is that of "indexicality" which, according to Garfinkel refer to sentences or phrases whose meanings depend upon their context (Garfinkel, 1967: 4). For example, to understand what a person means by the question, "How did it go last night?" — a very vague and unscientific question, to say the least where "it" could refer to an indefinite range of ideas or objects — the other

conversationalist would have to invoke "background understandings" such as the identity of the speaker, his/her previous biography, what that person was doing that night of particular interest, the prior utterances in that conversation, and so forth. Thus, despite the vagueness and imprecision of such a question, it is usually clear enough *for-all-practical-purposes* because the parties share the requisite understandings about its context

We can apply this concept to the meaning of specific musical notes or chords. Any one of these taken in isolation could lead in an indefinite number of directions. Much of its impact depends on the notes and chords immediately prior to it. More generally, each item of communication are *both context-shaped and context-renewing*. In other words, its meaning depends not only on our retentions of the immediately and more prior events but itself 'sets the stage' for what follows. In music, the note or chord not only 'refers back' to preceding ones but also generates expectations or anticipations of what might follow.

But, how are we to 'get at' these shifting meanings for the participants rather than imposing our own. One strategy used is that of audio-taping or videotaping in order to create a rich source of data. This affords a close examination of the orderliness of mundane activities and remaining descriptively close to the phenomena-at-hand. Recorded data have a number of distinctive advantages. The data is easily accessible and can be studied repeatedly. Further, other investigators can use them as a basis for assessing and challenging the claims made by the researcher and even undertaking independent analysis of the same data (Lynch, 1993: 216).

Even with a fine-grained description of the observable activities, we cannot immediately recover the specific *musicians' practices* that are producing them. We need an 'insider's knowledge' in order to disentangle precisely what they are doing!

A critical entry into member's interpretive practices is through their distinctive "*shop talk*" (Lynch, 1985: 158-168). We need to remember that, like many other social activities, music is to an important degree organized *through* talk. This is highly evident during rehearsals and other sessions in which given versions of the music are 'worked up'. A distinctive language is used, as well as instructional and error-correctional sequences

Page 92

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

involving also 'imitative expressions' or vocalizations of the musical effects (Weeks, 1990, 1996a). The point here is that a great deal of collaboration is accomplished through talk to an extent not usually realized.

Another key aspect is the use of *organizational objects* in the setting, such as musical instruments, amplifiers, microphones, music software, etc. These are considered as conditions for understanding the work practices, that is, how they are understood and used by the practitioners. We can extend this to *texts and documents* of various kinds, in this case music sheets, software manuals, and even the jottings in notebooks and pencil markings on those music sheets as indicative of work-in-progress (see Lynch, 1985: 8).

We need a method to extend this approach to *the embodied activities of making music itself in* relation to the 'shop talk', equipment, physical activities, notebooks, etc. How is that whole scene or activity put together? What are the details of which it consists? Garfinkel has argued that this foundational sort of question has been systematically ignored in conventional sociology. But, to do this, the researcher needs a competence in the activities-being-studied — what Garfinkel calls "*the unique adequacy requirement*", rather than simply learning to talk about them (Lynch, 1993: 274).

2. APPLICATION TO MUSICAL COLLABORATION IN IMMEDIATE SETTINGS:

We traditionally think of musical collaboration as *among musicians who are immediately co-present* — watching & listening to one another during the course of their collective music-making in the immediate, local setting. A major problem is that of the ongoing accomplishment of *synchrony* and its restoration if and when problems arise. In Western 'art music', we can think of the scores and musical texts from which the musicians play, where the notes for the respective instrument sections are printed on parallel lines or 'staves' — with the taken-for-granted expectation that the notes directly above and below one another at any one point are to be sounded simultaneously. But, that leaves us the question of *just how* this synchrony is collectively and ongoingly accomplished (see Weeks, 1990: 323; Weeks, 1996b: 200).

A perspicuous setting for that is examined when this synchrony is threatened by one player missing a beat — in this case the cellist in the final performance of the beginning of the third movement of the Saint-Saens Septet (see Weeks, 1996b). Let us observe the ways in which that is covered over such that most people listening to the recording find no problem with it. Convenient for our analysis is the fact that the piano accompaniment has a steady and repetitive rhythmic structure over which the cellist plays a melodic line. Here is the relevant simplified score extract:

Figure 1
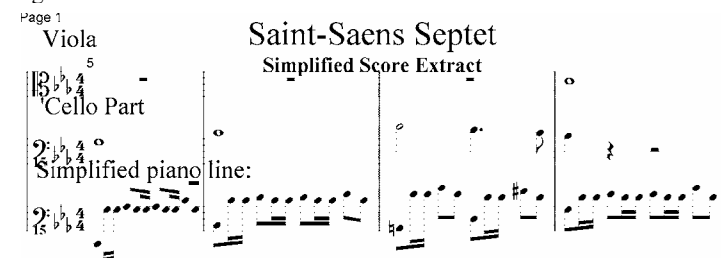
The piano's basic rhythmic which persists despite harmony change consist of these two variants which can be schematized thus:

Figure 2
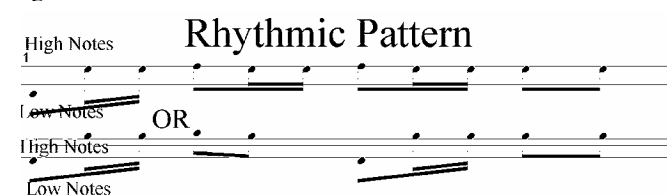
Note that the first beat (with arrows) is "marked" by a deep bass in contrast with the rest of the notes — thus making the beginnings of bars clearly recognizable audibly as well as visually as we shall see later.

Now, let us compare an even smaller fragment of the simplified score (what is supposed to be played) with my transcription of the faulted version in which the cellist loses a beat, as indicated by an arrow. Also, let us listen to the two versions in close succession:

Figure 3
SCORE

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 93

If we look at the simplified score first, then we see that the cellist has two long notes occupying full 4-beat bars in measures/bars 5 and 6. It is only by bar 7 that he is supposed to proceed to the next note which is an Eb at #(1). The notes following it are part of a descending scale ending up with a Bb on the first beat of bar 8. Now, if we compare this with the transcript of the performance, we find that the cellist has 'jumped the gun' by coming in a beat sooner with the high Eb (1) a beat earlier than the first beat of bar 7 where it should have come in. Not surprisingly, he is now 'out of synch.' and throws into doubt just where the players are collectively 'at'.

So, how is this resolved? Who is to follow whom?! One thing we can notice is that the pianist drops a lot of the rhythmic pattern we have described — resulting in a shortened bar 7 such that synchrony is restored quite quickly by bar 8 at which point the pianist is resuming his normal accompaniment, with the violist coming in with her line as demanded by the score. The cellist has managed to play his phrase somewhat similar to the required, despite all. Note that the beginning of bar 8 is a little ahead of schedule — that is, when it would have been if everybody had played correctly. However, its newly improvised position is treated by the entering violist as *now correct place*. Indeed, persisting with the expected pattern as per the score, though "literally" correct, according to the accumulated number of beats indicated by the score, would sound dreadfully out of place — leading to a breakdown of the performance! The new location is correct *for-all-practical-purposes*. Thus, getting to bar 8 with everybody back together has been a collaborative and perhaps clever accomplishment! (See Weeks, 1996b: 211-214)

This example of the restoration of synchrony is, as I have indicated, a perspicuous case giving us more access to *members' practices whereby synchrony is ongoingly and routinely accomplished*. In this type of situation we have just encountered, there are conflicting reference-points regarding the 'place' in the sequence-of-notes-of-the-music that the group is 'at'. In a practical sense, the activities of the musicians and their meaningfulness are *reflexively related*. In the course of playing a piece of music collectively, *where-one-is-at* is bound up with the place-in-the-sequence that *everyone else* is then-and-there producing.

Next, let us take the case of a *small jazz group* which I have observed locally. I find that, most of the time, they are not looking at one another consistently, seemingly absorbed in their own individual playing or looking out at the crowd. It appears to be at points of

transition, such as the beginnings or endings of solos, or returning to the 'head' which is a relatively straight statement of the tune. This is even more so when they are coming to an ending, especially the surprise or sudden ones that are often a source of their amusement. It thus appears from observation and experience that *listening* to one another as oneself in the context of the others is the crux of it.

A related aspect of the practices involved in maintaining synchrony in a jazz group is what is routinely referred to as "*the rhythm section*". The drums, especially, keep the group together, but the bass player also is articulating rhythm as well as the harmonic aspects of the tune — reinforcing a sense of 'place' in the prescribed sequence of chords. But what happens when either of these instruments takes a *solo*? The regular pattern of strong & weak beats is abrogated playfully. The rhythm is no longer explicit but is a tacit reference-point for playful improvisations. Further, some of the other musicians, such as the keyboardist might stop altogether while the bass player is improvising, perhaps with a light drum accompaniment. So, how is synchrony and a sense of 'place' in the tune accomplished?!

An effective technique for researching this is videorecording performances for the purposes of detailed analysis and then asking the musicians themselves to comment on various point when viewing the tapes (Jeddeloh, 2003: 112). This is another way to gain insiders' accounts. Now, we turn to the visualization of these musical sounds employing *digital technology*.

3. DIGITAL VISUALIZATION OF MUSIC:

Before examining graphic readouts such as wave-patterns and spectographs, we should note that musical notation can give only an approximation as to the desired sounds. But, employing musical notation as a *description* is clearly problematic because standard note-values are only an approximation — as it employs easily divisible or additive note-values. Can we solve this problem through electronic graphing?

The first form of digital visualization are *spectographs* which display the amplitudes of sounds by frequency over time. The horizontal dimension, read from left to right, represents the time. The individual layers of marking are arranged such that those higher on the graph are of higher frequency or pitch. It is the thickness of the markings here that represent roughly the amplitudes or intensities of the notes. Vertical lines have been added later to represent the bar-lines — the "down-beats". In drawing these lines, the identification of bar beginnings is relatively easy in this passage as each begins with the

Page 94

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

pianist's deep bass note — which is clearly visible as the bottom markings in these graphs. Repetitive features in the music should be recognizable in the Sonagram as duplicated graphic patterns. Conversely, a deviation from this should be easily detectable as an exception to the expected repeated graphic pattern — in this case, bar 7 which has been shortened in response to the cellist's missed beat, with a perturbation of the usual pattern in the bass (see solid arrows).

Figure 4
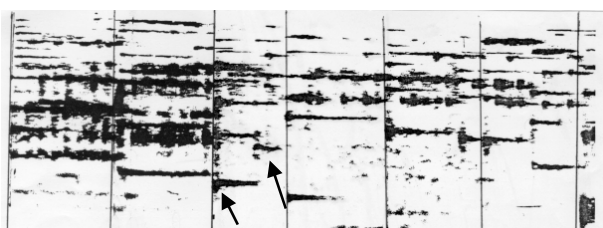
Clearly, we are confronted with tenacious problems of interpretation and relating to the specific part of the sequence in the music. For example, where is the cello?! Certainly, the identities of the different instruments are not directly distinguishable. Minimally, we can assume that the bass instruments must appear near the bottom of the graph, while the higher ones, such as violins, do not appear as lines below a certain point. But, as one goes from the bottom, one finds the same lines and patterns appearing in fainter form a fixed distance above. In terms of the physics of music, this duplication is due to the occurrence of overtones, the first harmonic appearing one octave (or at double the frequency) of the "fundamental" (or lowest component) of the tone. This makes the sorting out of instrumental lines more tricky! Here is the same passage using a juxtaposition of musical notation and the Sonagram — with both of them marked up to highlight the cello line, viz.:

Figure 5
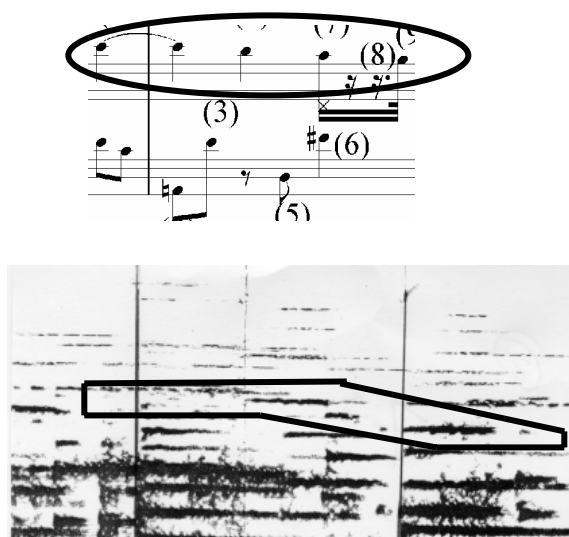
The basic point is that tapping these electronic graphics of the precise divisions of time depends reflexively and ineluctably on knowing what one is looking for! (Weeks, 2002: 376). We are thus confronted with the deeper question of the relation of such visualizations to the sonic events they are invoked to describe.

Now, we turn to *audio processing* as a major part of recording studio work and again raise issues for future research. In contrast with spectrographs, these employ *wave-patterns* through such software packages as Soundforge, Wave Lab, and Pro Tools. These wave-patterns involve *simply variations in amplitudes* over time with no distinctions as to frequency ranges. For example, here is the same passage from the Saint-Saens Septet which we discussed earlier in this format:

Figure 6:
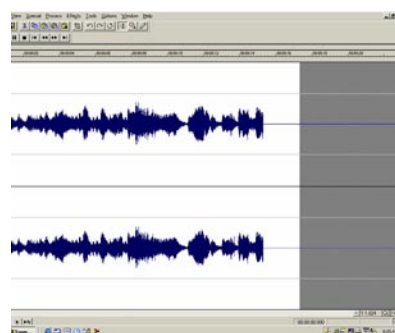
It is even harder to distinguish anything we are interested in! However, not all is lost when it comes to processing because the software allows one to start at any point and activate the "Play" mode to hear instantly what a given section sounds like. This greatly *mitigates the problem of location* of points in the music. In this way, we combine the characteristics of the visual and audio media in that the "random access" capability of the visual is combined with the "linear access" of listening to any segment in "real time", thus immediately making these mysterious wave-patterns hearable after all!

I shall do a brief demonstration by applying Soundforge to 'raw' recordings I have made of a 'gig' by our jazz trio in preparation for transfer to a CD. This is a simple case of a stereo recording of our jazz trio in which one microphone is near the keyboard amplifier/speaker and the other near the bass amplifier/speaker system. With this configuration, the relative amplitudes of the two channels will be highly visible despite the limited access afforded by the respective wave-patterns. The first case, which is simple, is that of where tracks begin (as in 'cueing in') or end — being visible through a binary pair

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 95

of presence or absence — the boundaries of the musical performance being relatively clear, viz.:

Figure 7
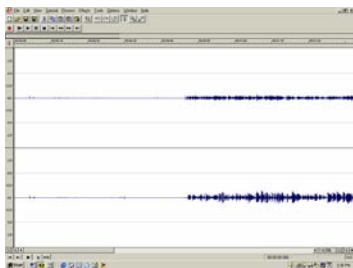
The simple procedure here is to highlight the section-in-question and then press the 'delete' key:

Figure 8:

The same applies to the ending:

Then, there is the matter of volume or gain where it appears desirable to boost levels so that the 'peaks' hit near the —6dB (or decibel) mark. Again, it is a matter, partly, of 'feel' about what to set this at:

Figure 9

This can be viewed as an instance of the more problem of translating from one medium to another. In this case, we are dealing with "dynamic range", the range between the loudest and the softest. And even CDs with their relatively wide range, around 95 dB, are more limited than our ears. If signals are too loud, they produce dist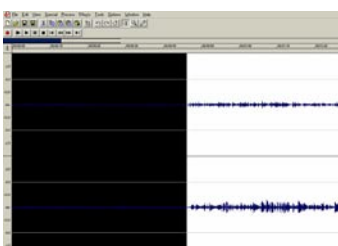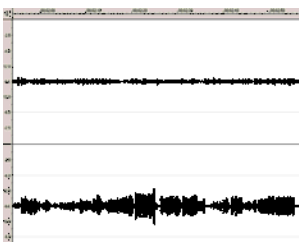ortion (a kind of 'overload'), but if they are too weak, then they decrease what is called "the signal-to-noise ratio" thus ending up with too much hiss, for example.

On this note, we may also find that it is desirable to employ a '*fade-in*' or '*fade-out*' as when we wish to avoid a noisy or incompleteness in the performance somewhere. Unlike a sudden entrance or terminating 'cut-off', such a technique gives us-as-listeners a sense of our entering or leaving an indefinitely ongoing performance scene:

Figure 10
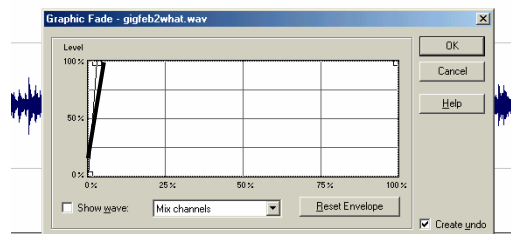
This leads to the next step of *balancing levels among the 'channels'* — especially between the drums and other instruments — oriented to how it would sound in the final recording.   If, by visual inspection, the differences between volume levels of the left and right channels become manifest, we can then 'highlight' the 'weaker' channel for a new volume boost. Then, we need, in the case of jazz, to consider the shift in levels when a specific musician takes a solo — in which we would expect it to be louder than the others in any case. In that context, then, balancing levels to a visually equal level would be in appropriate. Thus, even at this simple level, we are encountered aspects of subjective interpretation even in this 'technical' environment!

We may go as far as employing '*equalization*' which boosts or reduces various parts of the frequency spectrum — expressed in terms of octave ranges. In this way, we might filter out hiss, take out mid-bass 'boom' as in live recordings in clubs, boost the treble for more crispness to compensate for deficiencies in microphones or those of old recordings. The software here mirrors settings worked by physical levers in recording studio monitors or separate units one can buy for one's home or car stereo systems, viz.:

Figure 11
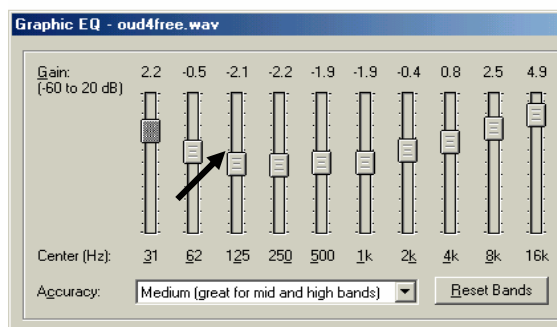
Near the bottom with the row marked "Center" are the central frequencies organized in octaves, i.e.

Page 96

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

progressive doublings ranging from 31 Hz. (or cycles per second) at the bass end to 16 Khz. or 16,000 cycles per second at the very highest pitch. At the top are reading resulting from shifting the 'levers' (such as that marked with the arrow) to give boosts or cuts in levels. The configuration or "response curve" here might be typical for compensating for a small microphone or a tape recording in order to both brighten the treble and give a boost to the deeper range of the bass (as for an acoustic bass in a jazz group).

All these functions depends on an essential feature of visual media — *'random access' to any part of a sequence* — thus rapid location of any part of a musical performance — provided one can detect differences in the wave patterns as *locational* practices to rely upon. Such greatly simplifies the procedures of 'splicing' various sections of a performance and substituting more satisfactory ones for faulted versions of the same passage, and so forth.

This leads us to the broader issue of a distinction we can make *between technical specifications or descriptions and the actual 'art' of achieving given musical effects*. This especially evident with perhaps the best known and most frequently used signal processor, that is, the *equalizer* that alters frequency response by increasing or decreasing the loudness level at selected frequencies. These frequencies are generally in intervals of octaves (as in our examples) or fractions thereof. Now, this is a technical description of frequency responses, but this tells us nothing about what to do with them! What will specific changes sound like?! We are thus thrust back into the inevitability of *members' methods or interpretive practices*.

As this discussion of the language referring to equalization has highlighted, we are confronted with yet another aspect, again a subject of fresh research — that of the problems of *communication between musicians and technicians or sound engineers*. Basically, it is the question of how a given sound quality desired by a musician is to be 'translated' into technical operations in the studio. In this case, we do not have a single kind of 'shop talk' but an interface between two domains of 'shop talk'.

One more general point on this theme before preparing for the Conclusion are the reasonings underlying "postproduction". As most of us know, postproduction is the final stage in the audio production process involving editing and mixing. Further, this has become so much more determinative of the final results, especially in the pop music field in the past few decades (see Jones, 1992). Again, members' practices in relation to the technical equipment has to be borne in mind. Audio processing is

partly *error-correction after-the-fact* through electronic splicing, i.e. deletions & insertions. This raises the point about the nature of the final product. Clearly, it is not a continuous performance in the authentic or traditional sense — but "a collage of perfect details" as Struthers (1987: 246) puts it. Is this a case of postmodern "hyperreality"? Are we creating an illusion of "simulation" of a performance — with "the willing suspension of disbelief"? It is thus an *illusion of going-through a piece of music in a continuous fashion* — oblivious to the repetitions, "takes" and other manipulations. The practices underlying this are no longer accessible to the listeners.

Another area for research on musical collaboration is that between musicians and others at different locations — perhaps only through *file-sharing in "cyberspace"*. A familiar though useful concept is that of "multitracking", involving multiple recordings which can be recorded or played back separately. It allows for what is called "overdubbing" whereby, for example, a track could be recorded on one track, then a different instrumentalist or vocalist could record a new track while listening to an already-recorded track. Either one artist to record all the tracks albeit at different times or different musicians can record tracks at different times and perhaps also places, with synchrony being achieved only through the respective musicians listening to previous performances via headphones. In addition, any given part of a track can be recorded over and over until the desired effect or level of perfection is achieved (see Jones, 1992: 133-135). As a consequence, *synchrony of the whole 'performance' on the final recording becomes essentially an artifact of technical manipulation!*

On this note, another research question arises for us: How do different groups in the Maritimes in different genres employ this technology? To what extent is file-sharing between digital work-stations done in different locations linked through cyberspace?

4.   CONCLUSION:

Thus, we have outlined a preliminary application of EM Studies of Work focus on "embodied practices" whereby activities are constituted as 'accountable' or socially recognizable for what they are. It involves the relations between 'shop talk', equipment, physical activities, notebooks, etc. How is that whole scene or activity put together? What are the details of which it consists? Garfinkel has argued that this foundational sort of question has been systematically ignored in conventional sociology, and I now turn to what he has called "the Becker phenomenon". Howard Becker, a well-known

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 97

qualitative sociologist perhaps best known for his development of "labeling theory" of deviance, did a participant-observation study of jazz musicians in the 1950s (1951). It treats their work as a "service occupation" whose consumers exert a direct pressure on how they do their work, particularly what music they play. A major theme is the dilemma of whether to 'go commercial' and pander to the tastes of the 'squares' and make a good living, or else play jazz which the musicians consider to be vastly superior music, but risk being poor. Another concern is their hostile relations with the audience. But, despite the fact that Becker was a participant as a piano-player in the group he was studying, his analysis gives us no idea what these musicians are actually doing. Garfinkel describes David Sudnow's reaction to this as follows:

> We learn from Becker, he says, that there are jazz musicians, where they work, whom they work with, what they earn, how they get their jobs, what the audience size and composition is,...but, he says, nowhere in the article can it be read and no interrogation of the article can supply that it is just those places, with just those persons with just who is there and, at just that time, with the materials, and under the circumstances at hand, must in and as their local work, make music together. A curiosity of the reportage, he argues, is that Becker's articles speak of musicians' work and do so by omitting entirely and exactly the practices that for those engaged in them makes of what they are doing the recognizably just so, just what, just this going on: making music together! (Garfinkel, 1976, pp. 35-6)

Garfinkel takes this to be a case of "*the missing what*" so typical of conventional sociological studies. So, how are we to 'get at' this?! As this approach aims to be done *from within the settings they describe*, the researcher is required to acquire a fair amount of first-hand knowledge of the activity-being-studied. He refers to this as the "*unique adequacy requirement of methods*" involving the researchers' mastering the practices of and developing a competence in the activities, rather than simply learning to talk about them (Lynch, 1993: 274).

For our purposes, however, we could combine this very 'micro' approach with Becker's type of approach and investigate, perhaps through interviews, just how musicians in the Maritimes, support themselves, we can ask how they get their jobs, how do they work their connections, which other parts of their "art worlds" do they work with, such as recording studios. To what extent do they base their livings on operating their own? How do they relate to other musicians whom we might classify as "semi-professional", i.e. competent musicians who do this part-time. Finally, we need to explore their diverse uses of digital technology in various forms of musical collaboration, as I have mentioned.

It is hoped that this presentation, with its combination of reporting on research findings and raising new avenues of inquiry has been a useful and stimulating point of departure for new directions for research on musical collaboration in the Maritimes.

BIBLIOGRAPHY:

Becker, Howard S. (1951). The Professional Dance Musician and His Audience. *American Journal of Sociology,* 57: 136-144.

Garfinkel, Harold (1967). *Studies in Ethnomethodology*. Englewood Cliffs, N.J.: Prentice-Hall.

Garfinkel, Harold (1976). *Manual for Studies of Naturally Organized Activities*. Unpublished manuscript, Department of Sociology, University of California.

Jeddeloh, Steven C. (2003). *Chasing Transcendence: Experiencing "Magic Moments" in Jazz Improvisation*. Unpublished Ph.D. dissertation, Fielding Graduate Institute.

Jones, Steve (1992). *Rock Formation: Music, Technology and Mass Communications*. Newbury Park, CA: Sage Publications.

Lynch, Michael (1985). *Art and Artifact in Laboratory Science: A Study of Shop Work and Shop Talk in a Research Laboratory*. Boston: Routledge & Kegan Paul.

Lynch, M. (1993) *Scientific Practice and Ordinary Action: Ethnomethodology and Social Studies of Science*. New York: Cambridge University Press.

Struthers, Stephen (1987). Recording Music: Technology in the Art of Recording. In White, Avron Levine (ed.), *Lost in Music: Culture, Style and the Musical Event* (pp. 241-258). London & New York: Routledge & Kegan Paul.

Weeks, Peter A.D (1990). Musical Time as a Practical Accomplishment: A Change in Tempo. *Human Studies*, 13: 323-359.

Weeks, Peter A.D. (1996a). A Rehearsal of a Beethoven Passage: An Analysis of Correction Talk. *Research on Language and Social Interaction*, 29: 247-290.

Weeks, Peter A.D. (1996b). Synchrony Lost, Synchrony Regained: The Achievement of Musical Co-ordination. *Human Studies*, 19: 199-228.

Weeks, Peter A.D. (2002). Performative Error-Correction in Music: A Problem for Ethnomethodological Description. *Human Studies*, 25: 359-385.

Page 98

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

GAMES WITH AN AGENDA BEYOND ENTERTAINMENT

Ann Greyborn

School of Applied Computing and Engineering Sciences, Sheridan Institute, Oakville, Ontario, L6H 2L1
a.greyborn@sheridanc.on.ca
Castaways Productions Inc., 90 University Street, Charlottetown, PE, C1A 4K9
agreyborn@castawaysproductions.com

1. INTRODUCTION

Games are everywhere in our social, educational and leisure life. New genres of games such as newsgaming, advergaming, public policy gaming, political gaming and simulations and the addition of words such as ludology into our current vocabulary have the potential to influence communication, persuasion and education.

The concept of newsgaming can be compared to traditional political cartoons. They are short, controversial, and inconclusive and are intended to jar biased ideological messages. This presentation is planned to demonstrate a few new genre games with focus on the newsgame September 12th whose purpose is to analyze 'War on Terror'. As the game proceeds the player and audience come to realize that violence generates more violence. The game is not meant to entertain but to encourage the player to think and to promote discussion among those who are players and/or those who are observers. As these new genres appear in the public domain there has been a shift in the demographics of players online. Research points towards a growing representation of women and seniors (grays) participating in computer online gaming.

2. LUDOLOGY

Ludology is a word derived from the Latin word 'ludus' meaning game. The word came into use from the necessity to refer to the yet non-existent "discipline that studies games and play activities" (http://www.ludology.com). The topics studied are from disciplines such as psychology, sociology, and political sciences and are independent from the computer and Internet that supports the games. The word ludolgy is taking on a broader view and GAME-Research.com's dictionary of game studies states that ludology is "The study of games, particularly computer games".

3. GAMES WITH AN AGENDA

Games with an agenda go beyond their entertainment value. They are fun but they also are designed to make a point, share knowledge, or change the player's opinion. Examples of new game genres are advergames, political games, political games, social games, public policy games and newsgaming.

3.1 Support the Dean for Iowa Campaign
Persuasion Game, Political Game

Figure 1. http://slate.msn.com/id/2094039/

Make a virtual trip to Iowa and help campaign for a Dean win in the important Iowa Caucus. Recruit your real friends to join you in Iowa, where you'll canvas neighbours, pass out pamphlets, and wave Dean signs to encourage Iowans to attend the caucus and stand in support of Howard Dean. The goal of the game is to get as many people as possible to go to Iowa and support Dean.

To play, click on a person and drag it to a region on the map. The darker blue the region, the more support other players have already generated in that region. A game will pop-up and you can reach out to more Iowans to join you.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 99

Figure 2. Strategically place campaigners on a virtual map to reach out to more Dean supporters

 Harry Truman once said, "Politics is a fascinating game." Truman wasn't the first person to note the similarities between play and affairs of state, but these days the connection seems almost too strong. With its gangs of people in team jackets frantically racing around soliciting votes, a modern political campaign reads like a chase game.

3.2 Wild Earth
     Social Game, Public Policy and Education Game

Figure 3. http://www.superxstudios.com

        Wild Earth won the grand prize at the 2003 Independent Games Festival, which is considered the best showcase for innovation in the computer game industry, winning three prestigious awards.

As a photojournalist for one of the world's biggest nature magazines, your job is to stalk big game on the plains of Africa, explore the wild, and take photos of animals in their natural habitats. When you're done, your photos are woven into an article mock up.

Figure 4. Experience a photo-safari for all ages

Wild Earth is distinctive because of its design using an interactive 3D environment, which brings the Serengeti to life with amazingly realistic wildlife. It is a non-violent game, targeted for the family market.
Wild Earth will be released in 2004.

3.3 Poacher
     Activism and Public Policy Game

Figure 5. http://exileworks.com/games.htm

        The developer Exileworks has produced a game that might be considered a satire. In this game the player is a poacher fighting and struggling in the jungle, hunting the most endangered species, such as rhinos, tigers and elephants. The game is designed so that players can choose the hunting ground and can upgrade their character as time goes on. The objective is to capture as many animals as you can while avoiding capture and death by the Game Wardens. The player then trades and sells the goods on the black market to gain more money and power.

The violence in this game is not any greater than the robot shoot'em up games that have dominated the game world. The strong reaction from conservationists is in part due to the realism of the imagery and the consequences of poaching.

Page 100

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

4. SEPTEMBER 12

Newsgame

Press release: – Monrevideo, Uruguay – Sep. 29, 2003 – NewsGaming.com launched today its first online video game based on current international events: September 12th. The game analyzes the current situation of the United States' war on terror. The game uses traditional videogame aesthetics to model a political paradox: current US tactics on the war on terror affect the civilian population and generate more terrorism. "The basic idea behind September 12th can be described as 'violence generates more violence'. As you try to kill the terrorists, you will always kill civilians (collateral damage). Other civilians will mourn their dead and turn into terrorists. After a couple of minutes of play, the screen is full of terrorists", says Gonzalo Frasca, NewsGaming.com lead designer.

Figure 6. Screen shot of stage
http://www.newsgaming.com/

"Our games are original because they are not meant just to entertain. We want to encourage players to think critically about the efficacy of the United States' current strategy against terrorism. Terrorism is a terrible problem and we think it should be fought in a more intelligent way". Gonzalo Frasca is a professional game designer and a video game theorist. He is also the editor of Ludology.org, a major online academic resource for game researchers.

The game is classified as a newsgame, based on news events. I prefer to extend the description list to include political, public policy and activism games. This game is of special interest as its methodology is inspired by principles and designs from the writings of Sherry Turkle (Turkle, 1995) and Augusto Bocal (Boal, 1992). Sherry Turkle observed how people reacted and responded to simulations and suggests the possibility of using simulations where players could analyse and question their own ideologies "It would take as its goal

the development of simulations that actually help players challenge the model's built–in assumptions as a means of consciousness-raising". Dramatist Augosto Boal tried new techniques that would not keep the audience immersed in the play without giving them a chance to take a step back and critically think about what is happening on the stage. This non-immersive experience reminded the spectators that they were experiencing a representation, forcing them to think about what they were watching. To enforce this methodology, the scenes were short and enacted without showing a solution to the problem. Frasca states that his goal was to use these techniques as a source of inspiration and influence in the design and development of the September 12th game. The game has no timing device, no scoring system, and one scene. The player cannot win or lose. The game has already begun and there is no ending. Only one rule: the player can shoot or not.

Figure 7. Characters in the game

The game models a Middle Eastern town with civilians and some terrorists walking around. The player tries to bomb the terrorists without generating any collateral damage. However, every time a civilian dies his friends mourn him and suddenly more terrorists are on the scene. It is impossible to bomb a terrorist without collateral damage, so the terrorists increase in number. I have observed players trying different moves and techniques to reduce the damage to buildings and people. What Gonzalo Frasca does not state in the introduction to the game is the obvious solution. He does not suggest a solution but lets the player migrate to the position of observer and finally come to a possible resolution.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 101

This game has generated a lot interest. Within a few weeks of its launch more that 100 thousand people from all over the world had played September 12th. The game has also generated criticism, and is often dismissed as too simplistic and therefore is of no help in understanding reality. Frasca believes that we need more games that make statements. Games will always be biased, and will always be interpreted and manipulated in ways that the author never foresaw. Frasca sees September 12th as a small experiment and believes that there is great potential for videogames that sponsor critical thinking and debate.

5. CHANGE IN GAMING DEMOGRAPHICS

Research points towards a growing representation of women and seniors (grays) participating in computer online gaming causing a shift in the demographics of players online. Douglas Lowenstein is quoted in an article (The Salt Lake Tribune Tuesday December 30, 2003) "One reason 17 percent of game players are over age 50 is because there are more titles that are uniquely appealing to them, and the World War II games certainly fall into that category". Codemasters, one of Britain's largest game developers is coming out with Wartime Command, a game that allows players to develop strategies for some of the best-known World War II conflicts.

According to Anne-Marie Hurre and the International Game Developers Association, working women spend more than 14 hours a week online, and women are attracted to games that provide a sense of community. Ian Bogost's comments on the Water Cooler Games site trivialize women's online gaming activity. He acknowledges that women were more likely to play online games every day than men or teens of either gender, but he has questions regarding the type of games played. His impression is that women play casual games and that they play these games while doing other things such as talking on the phone or watching TV. As expected, there were comments posted to the contrary on the Water Cooler site.

6. CONCLUSION

Ludology is gaining interest and support. As a consequence, games have grown more diverse and will continue to do so in order to appeal to all generations and all kinds of players. Game companies say consumers can expect to see more cerebral-type games and less of the violent type games as they reach out to players of both genders and all ages.

7. REFERENCES

1. The New York Times. Ludology. Thursday, February 26 2004
2. The Salt Lake Tribune. Seniors taking to computer games. Tuesday December 30, 2003
3. Girl Game Advance http://www.gamegirladvance.com/
4. Howard Dean for America http://www.deanforamericagame.com/
5. Poacher http://www.exileworks.com/games.htm
6. September 12th http://www.newsgaming.com/
7. Water Cooler Games http://www.watercoolergames.org
8. Anne-Marie Hurre. What Women Want. http://www.idga.org/toronto/toronto_summary_dec4.htm
9. Wild Earth http://www.superxstudios.com/Products/WildEarth/home.htm
10. Frasca, Gonzalo. Rethinking Agency and Immersion: videogames as a means of consciousness-raising Georgia Institute of Technology
11. Turkle, Sherry. Life on the Screen. Identity in the Age of the Internet. Simon and Schuster, New York, 1995.
12. Boal, Augusto. Games for actor and non-actors. Routledge, London, 1992.

8. ACKNOWLEDGEMENT

Page 102

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

ILLINIQATIGIIT

Sandy McAuley
Faculty of Education, University of Prince Edward Island, 550 University Ave., Prince Edward Island, Canada, C1A 4P3

Between its creation in 1985 and its dissolution shortly following the creation of Nunavut in 1999, the Baffin Divisional Board of Education (BDBE) administered the formal education of about 3000 K-12 students of the Baffin region of Canada's Northwest Territories. Most students were Inuit and spoke Inuktitut as their first language. During its fifteen-year existence the BDBE initiated a number of culture-based programs intended to build on and enhance students' knowledge and appreciation of Inuit language and culture while providing them with the knowledge and skills required for productive participation in 21st century Canada. Of particular interest in addressing this challenge was the effort to explore the potential of CSILE/Knowledge Forum, an online collaborative multimedia knowledge-building environment in this bilingual, bicultural context.

Originating in applied cognitive research on the development of writing expertise, CSILE/Knowledge Forum revolves around a collaborative database accessible over a LAN or the Internet. Empty at first, the database is populated by notes contributed members of a group working on a joint investigation. Notes may contain text, graphics, and links to external URLs, but the CSILE/Knowledge Forum environment also provides a suite of software tools to enable group members to search, sort, classify, and build hypertext references between database contributions. Additional tools allow for the creation of alternative views into which contributions from across the database can be imported to support construction of new knowledge.

Because a CSILE/Knowledge Forum database is originally empty, it has the potential to support collaborative investigations that spring from students' questions and interests as opposed to prepackaged and preconceived curricula. This potential may be especially valuable in cross-cultural classrooms in which teachers from a dominant cultural group work to create a learning environment that builds on what students from a subordinate cultural group know and want to know. Implemented in four Baffin schools between 1992 and 2000, CSILE/Knowledge Forum explored the extent to which a computer-based medium designed on cognitive principles could be used to support the mutually beneficial interaction of traditional Inuit knowledge and language on the one hand with English language and western Eurocentric concepts of knowledge on the other.

Early Baffin implementations of CSILE/Knowledge Forum were structured around Cummins' intervention for collaborative empowerment, focusing on additive cultural linguistic incorporation, community involvement, transformative pedagogy, and advocacy-based assessment (Cummins 1986). Selected from the locally developed *Piniaqtavut* program of studies, topics of study included such things as the Dorset and Thule peoples, traditional Inuit practices and beliefs, and local wildlife. Building on students' questions and interests and drawing on the expertise of community members and elders to supplement the scanty and often inappropriate text-based resources, they used the collaborative CSILE/Knowledge Forum database to plan investigations and to record, share, and reflect on the information gathered. Initial versions of CSILE/Knowledge Forum supported only English so, although the offline portion of their work may have been conducted in Inuktitut, the majority of students were working in their second language in the online portion. In this context, CSILE/Knowledge Forum's integrated computer graphics tools provided a non-verbal supplement to language intensive notes to help illustrate ideas. More sophisticated technologies later allowed graphics to be used as conceptual organizers as well as illustrations and supported the syllabic fonts in which Inuktitut is written. In conjunction with Internet connectivity that allowed participation by remote resource people and facilitated joint investigations by geographically diverse groups, these technological advances allowed CSILE/Knowledge Forum in the Baffin to serve as a bicultural, bilingual knowledge-building environment.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 103

While this development is worthwhile in itself, what may be even more interesting are the implications it raises. For one thing, the use of new media and new technologies to support a successful bilingual and bicultural knowledge-building environment suggests that they may create as much as they are perceived. In this context, cultural differences in perceiving new media must be tempered by the potential of new media to shape new forms of cross-cultural interactions, in other words, to mitigate cultural differences. For another thing, new media and new forms of computer-mediated interaction may facilitate new forms of cognition. The final Baffin CSILE/Knowledge Forum implementation, for example, illustrates a shift a shift from individual responsibility for teaching on the part of educators and learning on the part of the students to a collective cognitive responsibility (Scardamalia 2002) for the creation of a community in which the object is the joint advancement of knowledge (McAuley 2004).

Cummins, J. (1986). "Empowering minority students: A framework for intervention." Harvard Educational Review **56**(1): 18-36.

McAuley, A. (2004). Illiniqatigiit: Implementing a knowledge building environment in the eastern Arctic. Department of Curriculum, Teaching and Learning. Toronto, Ontario Institute of Studies in Education of the University of Toronto**:** 171.

Scardamalia, M. (2002). Collective cognitive responsibility for the advancement of knowledge. Liberal education in a knowledge society. B. Smith. Chicago and LaSalle, Ill, Open Court**:** 67-96.

Page 104

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

THE CO-ORDINATION AND COLLABORATIVE PROCESS IN NEW MEDIA PROJECTS USING ARTICIEL

Jason Martin, Sabri Boutemedjet, Omar Cherkaoui, Louise Poissant, and Michel Fleury
Laboratoire téléinformatique, Université du Québec à Montréal,
PO BOX 8888, Downtown Branch, Montreal, Quebec, Canada, H3C 3P8   www.teleinfo.uqam.ca

1. INTRODUCTION

Prior to ARTICIEL[1], collaboration between artists who were creating in the field of 3D design was very limited. Collaboration was simply a process of assigning artists to a special operation in a series of actions in the design activity for which they were responsible. Or, we qualified the work as collaboration when artists worked together on the same operation but still separated the project, virtually speaking, in order to work on their parts. With ARTICIEL, we wanted to take collaboration one-step further.

The possibility of two or more artists working concurrently on the same project while keeping it intact was close to impossible. Thanks to ARTICIEL, there is now a whole new chapter in the realm of collaboration between these types of artists.

1.1 The collaboration problematic in 3D design

In an era, where team concepts were a familiar notion and pipeline productions were encouraged, there was no system available to bring artists together in their work. There was a need for a platform that would help them speed up the development process and unite their efforts. We were still at a point where each artist was only a link in a chain.

The challenge was to establish the *real* limits of collaboration[2] in the development process between 3D artists. Moreover, to determine how artists could best optimise 3D modelling development though collaboration.

1.2 A collaborative proposition

To answer these challenges, artists, new media researchers and computer scientists gathered to discuss the possibility of a project where we could build a structure to meet this demand. The ARTICIEL project was born based on the idea that an artist could model with other artists using a collaborative software platform.

2. METHOD

The project consists in developing two tools that work together toward one objective: a collaboration process designed specifically for 3D artists. The first tool is a platform where artists would meet to co-ordinate the projects and share files. The second tool is a plug-in for 3D

modelling software called Maya (Alias). This software captures the history of commands performed by an artist onto a 3D shape.

Combining these two tools results in a special feature that distinguishes ARTICIEL from other similar platforms that is the collaboration among artists.

2.1 Creation of the ARTICIEL Platform

The ARTICIEL platform is a web-based application. It gives artists the ability to access it remotely and have instant contact with a community. A community is the virtual workplace of a company.

The platform supports multiple languages. It is flexible. The community has the ability to impact and change the platform's vocabulary. For example, if the artists are called designers or studios called forums, the platform can adapt to that workplace terminology. This makes the ARTICIEL platform convivial and comfortable to the community.
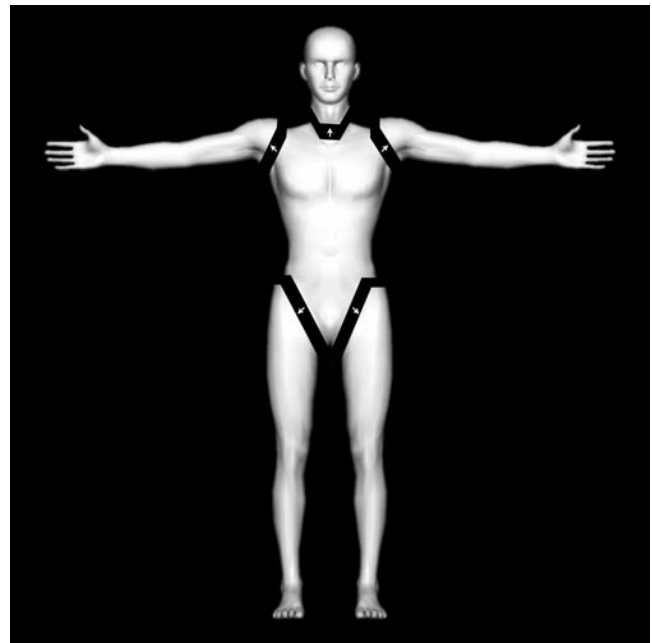

Fig. 1. Prior to ARTICIEL, artists would have to cut up the 3D character, work their part and reattach it all. The process was lengthy. With ARTICIEL this procedure is no longer required.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 105

The platform acts as a virtual workplace for the selected community of artists. The first purpose of the platform is to co-ordinate projects. The second is to allow artists to communicate. Thirdly, there is the final merging stage of artists' contributions.

Within project co-ordination, a project manager is identified. It could be the studio manager, the artistic director or a fellow artist. The first responsibility of the project manager is to manage the virtual community: the project is defined by creating a virtual studio, the workload is distributed by assigning artists to the virtual studio and by giving them a role and tasks. Through the ARTICIEL platform, the project manager has a global view of the project and is able to track the progress of the project and view the contributions and annotations uploaded by the artists in the community.

The artists have a series of tools for communication with the project manager and fellow artists. They each have a public and private space to save and share their files or projects. They have a group and personal calendar for organizational purposes. They can send messages or chat with others to communicate rapidly. Via the platform they will gain an understanding of the project, of their role and their tasks that were assigned to them by the project manager. This is the basic level of collaboration that is effective communication among a community of artists inside the framework of a project.

Our view of collaboration is to have artists working on a same shape without separating it into detached pieces. The objective is to work in parallel on a 3D shape. Each artist will contribute work as assigned to them by the project manager. Their modeling of the shape will be monitored and saved by the ARTICIEL plug-in. When completed, the project manager will have a number of contributions from each of the artists. Through the ARTICIEL platform, the manager can easily search for them and merge the contributions together to finalize a project.

How can this be done? Contributions come in a form of algorithms that can be treated by the computer. We call this type of document "computable data". The ARTICIEL plug-in is essential to take collaboration to the next level.

2.2 ARTICIEL Plug-in

The ARTICIEL plug-in is software that works in synergy with Maya (Alias). The plug-in is hosted on the Maya platform.

Purposes of the plug-in

This plug-in captures MEL (Maya Embedded Language) that is responsible for the transformation of a shape in Maya. In this article when we talk about the history of commands, we are referring to this generated list of MEL.

MEL tends to create huge files, slow Maya software and is volatile. For some artists it is important to keep track of MEL commands for analysis or for practical development reasons. The ARTICIEL creators wished to capture every MEL command and save it in an independent file to the platform. By doing so the artists get to have an extractable file of the history of MEL during a work session and Maya is less encumbered.

Since MEL is computable data, it is treatable. It can be filtered and MEL can be re-applied to shapes. It is possible to combine the MEL generated from one artist with another.

Qualities of the plug-in

The ARTICIEL plug-in is operated transparently through a multi-language user-friendly interface. It communicates directly with the ARTICIEL platform. By the simple push of a few buttons, the artist enables the capture of his MEL commands. Because the procedures are simple and do not interfere unnecessarily with the artist's work habits it allows him to model freely a 3D shape.

Finally the plug-in will automatically generate an annotation and a contribution.

2.3 Key Concepts of ARTICIEL

What distinguishes ARTICIEL from other collaborative platforms are three key concepts. The first is the concept of annotations, the second is contributions and the third is merging. By putting these three concepts together the artists will get a virtual tool unlike any other.

Annotations

Annotations are a key feature of ARTICIEL. An annotation is a computer file that contains complementary information that attaches itself to each contribution made by the artist. This annotation is adaptable to the artist's specific needs and field of activity. For example it could be the name of the creator of the file, the project name, the object's name, the context, the task assigned, etc. Like the platform, annotations have the characteristics of being flexible and adaptable to the community's vocabulary. This annotation file is created automatically by ARTICIEL each time the artist uploads a contribution.

The purpose of these annotations is to enrich a contribution. Since annotations are computable data, it gives contributions a traceable history. This means that the computer can monitor the way the artist works and help the artist with repetitive tasks. But on a simpler level, this also gives the artist the possibility to search through the annotations to retrieve original contributions. This is an essential part of the process of merging contributions.

Page 106

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Contributions

Each artist can upload to the ARTICIEL platform any type of digital document. It could be an image, sound, music, text, graphic, datasheet, etc. The purpose is to enrich the community by sharing with other fellow artists. As it was mentioned previously, each of these documents would have an annotation attached to it.

There is one type of contribution that is unique to ARTICIEL. Through the plug-in ARTICIEL, the artist can capture the history of his MEL commands and send it to the platform. We call these types contributions "Author Contributions". Artists can also save a whole project to the platform through the ARTICIEL plug-in (Maya 3D file and other attached files). Specifically, the Author Contributions will be extremely useful during the merging phase.

Merging

Once artists contribute their history of MEL commands, the project manager can merge two contributions at a time and repeat this action as often as required. These merged contributions are then called a "Group Contribution". The project manager or a designated artist can then through the ARTICIEL plug-in apply Group Contributions to the 3D project tasks that the artists were assigned to develop.

3. RESULTS

3.1 A Practical example of Coordinating and Merging Contributions

Let's examine the case of a common 3D shape: a virtual character. To demonstrate this procedure we grouped a project manager and three artists. The base shape is that of a basic man. We wish to alter this basic man to another character: his burly brother.

Creating a virtual studio

First the project manager creates a virtual studio on the ARTICIEL platform. He gives it the project name, "burlesque". This name gives the project an identification that is useful for annotations and comprehension.

Assigning artists to virtual studio

The project manager selects artists needed and invites them to this studio. The pool of artists is made up of the members of the same community. Once the project manager sends out the invitation to the artists they must in return accept or decline the invitation. All this is done via the ARTICIEL platform.

Assigning tasks to artists

Once the artists confirm the acceptance of the invitation the project manager then assigns the tasks to be performed. Among the three artists he distributes the workload. Artist A will be in charge of modeling the head, artist B will model the body and artist C will model the limbs.

Applying tasks to model based 3D character for contribution

Inside the Maya application each artist enables the ARTICIEL plug-in. They log on by filling in the appropriate fields (artist's name, password, community name, studio name, model name, task, etc.). This procedure will supply the basic information for the annotations. From there, they start ARTICIEL and begin to capture their transformations.

Each artist works in parallel on the same base shape of the basic man. They model their part while keeping an overall view of the 3D character. They make sure not to overlap their modeling over the part designated to another artist.

One artist can make multiple contributions. In this way, they can see the improvement of their modeling and decide if they want to keep it as it is, go further in the development or go back one step. Later, all these contributions can be merged into one grouped contribution.

Finally when the artists have performed their task they stop ARTICIEL and save their contribution to the ARTICIEL platform. An annotation file is instantly saved with it.
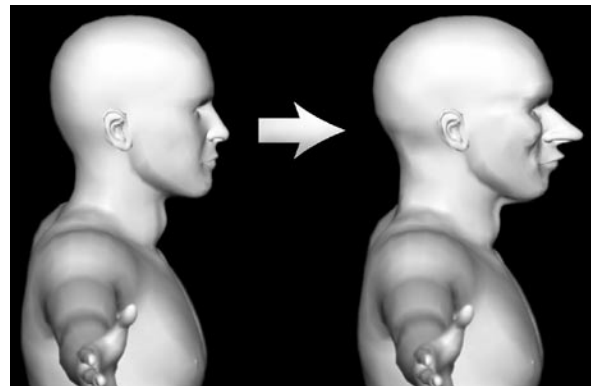
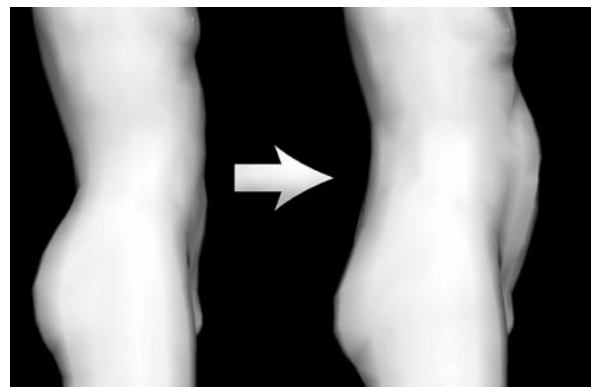Fig. 2. Illustration of the contribution by artist A to the head. Nose, mouth, jaw, cheeks and neck have been amplified.

Fig. 3. Illustration of the contribution by artist B to the midsection. Stomach and arch of the back have been amplified.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 107

Searching contributions with annotations

The project manager searches through the annotations via the platform interface to find the appropriate contribution from each artist. He can search by either the name of the artist, or by date, model name, task, comment, or any other specified field.
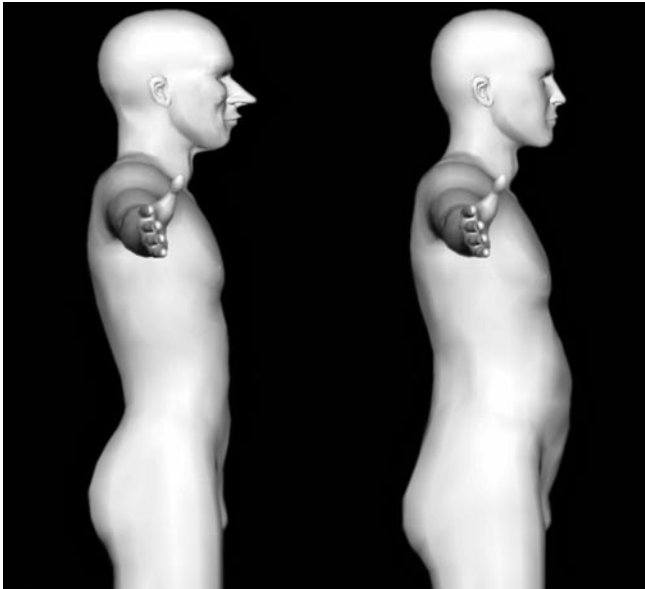

Fig. 4. Illustration of the contributions by artist A (left) and B (right). Note that artist A kept the body intact as for artist B kept the head intact.

Applying the merged contributions to the model based 3D character for contribution

The project manager or an assigned artist launches the Maya application with the enabled ARTICIEL plug-in and opens the base shape of the basic man. Through the ARTICIEL plug-in, the manager downloads the Group contribution. It will automatically apply itself algorithmically to the 3D character. This will transform our basic man into his burly brother.

It is possible to save the whole project back to the ARTICIEL platform. It is saved in a virtual library that can be shared with fellow artists of the same community.

4. DISCUSSION

4.1 The possibilities of collaboration with ARTICIEL

With the previous example we demonstrated one of many ways that ARTICIEL can help with co-ordination and collaboration in the development of a 3D virtual character. The ARTICIEL process of collaboration is achieved through effective communication with the help of annotations, intelligent contribution by the artists and an innovative way of merging contributions.

4.2 The limits of collaboration with ARTICIEL

ARTICIEL at this point is limited to the communicating, contributing and merging processes. In the future ARTICIEL will incorporate more features to improve and revolutionise the way artists work together.
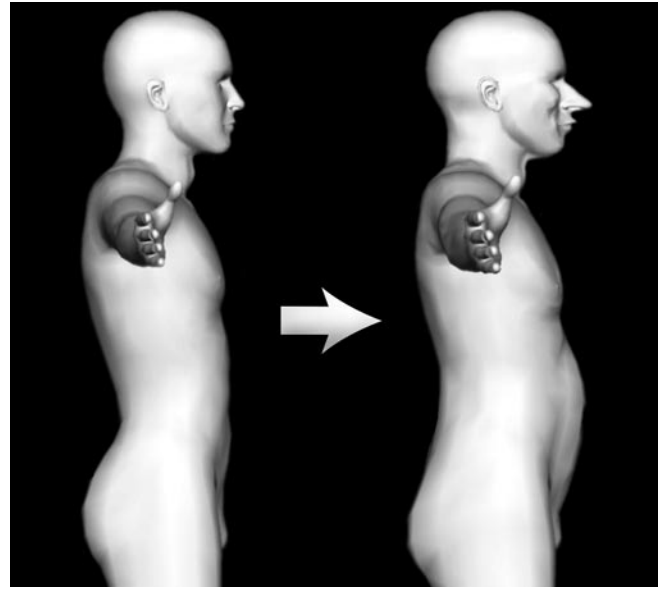
Fig. 5. Illustration of the shape of the basic man compared to the shape of his burly brother generated by the merged and applied contributions of artists A, B and C.

The biggest limitation ARTICIEL faces is in the acceptance by the artists themselves: some artists have an established creation routine and ARTICIEL affects this work habit by imposing itself to it. Not because ARTICIEL is complicated to use but because ARTICIEL has a strict methodology that has to be respected for it to work properly.

REFERENCES

[1] Fayçal, A., Cherkaoui, O., Boutemedjet, S., Lemire, G., Gauthier, G. (2004). "Merging Contributions in Cooperative Creation of 3D Persons" Article presented at The 2004 International Symposium on Collaborative Technologies and Systems (CTS'04) held in San Diego (California), January 8 to 23, 2004.

[2] Larsson, A. (2003). "Making sense of collaboration: the challenge of thinking together in global design teams". AMC Press. Proceedings of the 2003 international ACM SIGGROUP conference on Supporting group work.

ACKNOWLEDGEMENTS

Page 108

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

THE THERAPEUTIC IMAGE:
ARGUING THE CASE FOR FACELESS WORDS AND BODY LANGUAGE IN THE PSYCHOSOCIAL PROCESSING OF TRAUMA

Montanez, Joel
École de psychologie, Université de Moncton, Moncton, Nouveau-Brunswick, E1A 3E9, Canada
montanj@umoncton.ca

1. INTRODUCTION

New media can be employed to induce and sustain therapeutic work at the individual and at the social level. As such, the use of new media to reflect culture, history and deep psychological issues can be exemplified in the creatio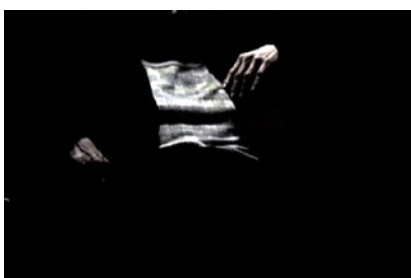n of audiovisual tools to help the integration of traumatic experiences on specific groups. The construction of media tools to facilitate the processing of traumatic information can be compared to their counterpart in cognitive therapy, where certain techniques demand that patients picture themselves, as if watching on a screen, working on the traumatic incidents that brought them to psychotherapy. With the help of new media, digital documents directly related to traumatic experiences can be introduced into the healing process. And when these traumatic situations involve an entire cohort or community, these tools can then be employed at the individual as much as at the social level. The content of these audiovisual tools, which may be called "clinical media", can be of help for those affected with traumatic disorders when such media is shown and viewed within therapeutic conditions. These media can then facilitate the integration of large or specific parts of traumatic situations, therefore helping groups of patients to better understand and organize themselves on behalf of their social interests.

2. METHOD
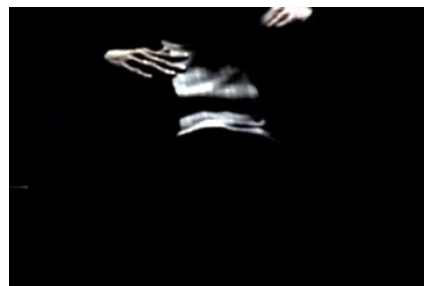
In the fall of 2001 a group of Quebec Inuit from four distinct northern regions were interviewed on-camera. They had all attended the Canadian Residential School system. They presented different social and work conditions, as well as various degrees of motivation to speak about the residential school issue. In order for the project to be possible, a psychological and aesthetic compromise had to be worked out. As such, a binary condition guided the process: the faces of the interviewees were not to be clearly shown, but their body language was to be recorded on tape. With the help of a discreet digital-camera operator, these Inuit spoke individually about their experiences before, during and after their residential-school period. The result was a four-hour documentary with a variety of opinions reflecting the history of the Residential-School system in Nunavik, the cultural, educational and traumatic experiences of the students, the social and healing processes following the return to their land, and their recommendations to themselves and to the government about the outcomes of these schools.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 109

3. RESULTS AND DISCUSSION

Up to now, this documentary has become an instrument for the understanding, healing and empowerment of a group of Residential School survivors. This document has also turned into the survivors' gift for their descendants.

Because the descendents of these interviewees have shown the need to feel the images and sounds of the journey of their ancestors, in order for these descendants to understand their own history, triumphs and symptoms. For the purposes of this conference, an excerpt of this documentary, as well as the logics and description of the project, will be presented and discussed with the audience.

ACKNOWLEDGEMENTS

Page 110

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

PRELIMINARY STUDY FOR A MULTIMEDIA DATABASE

Chadia Moghrabi [1], Tang-Ho Lê [2], Jean Roy [3], Johanne Hachey [4]
Department of Computer Science, ARts-Netlantic CMTC, Université de Moncton, 165 Massey avenue,
Moncton, N. B., Canada, E1A 3E9
{[1] moghrac, [2] letangho, [3] royje, [4] hacheyj}@umoncton.ca

1. INTRODUCTION

The Atlantic Research Network on Culture, Multimedia, Technology and Cognition (ARts-Netlantic CMTC) is a collective initiative of three universities in Atlantic Canada that have a common interest in encouraging the creation and the appreciation of new media art, as well as digitizing and conserving local traditional art. One of the network's projects concentrates on the design of a multimedia database containing an inventory of local artists and their works of art. The Université de Moncton and the Centre d'études acadiennes represent a mostly francophone community within the network. For the time being, artists are welcome to use our facilities and to upload their works of art to our server. Eventually, this database is to be developed into a full digital library and to make it accessible on the web for the schools and other members of the community.

This paper describes the preliminary study that was conducted and the decisions that were made for the design of this web based multimedia database. It addresses some underlying concerns for the creation of a user-friendly tool for the artists and the researchers, for storing new media resources with their appropriate descriptions, and for easy administration. In addition, the design had to address issues of the longer-term full digital library development. All this will require the choice of an adequate web server operating system, a dynamic web programming language, and the use of standards for indexing, interoperability and accurate information gathering. The following sections will detail each of these choices.

2. THE OPERATIONG SYSTEM

The first step is the choice of an operating system, which in turn depends on the planned activities. These include [Moghrabi et al.; 2004b]:

- Managing user accounts for artists working on-site
- Managing the content of the database
- Managing the web server
- Alimenting the database automatically and hence the need for a dynamic programming language such as PHP, ASP, JSP or Cold Fusion. Those languages will be presented later in this paper.

Some other important criteria to take into consideration concerning the choice of the operating systems are reliability, efficiency, and time spent in setting up the system. Another useful criterion is the recycling of existing applications.

The two main available operating systems are Linux and Windows server. In our case, time considerations were a big issue. The first thing which makes us hesitate to go with Linux is the time that we have to set up the server, install the software and develop our web site. Linux is a complex operating system, which would take longer than a Windows server to install and configure to our needs [Low Cost Web Hosting; 2002]. The second reason is that we already have some work that was previously done on an MS Access Database, which would not be totally supported if we decide to use a Linux Operating System.

A well-known practice among system designers is to "Choose your applications, then choose your platform" [Low Cost Web Hosting; 2002]. Therefore, taking a look at what applications (i.e. software) are needed for our server will help us decide between the two options.

The following is a list of applications needed to cover the activities mentioned earlier:

- A dynamic web programming language such as PHP, ASP, JSP or Cold Fusion. The comments and characteristics for those languages will be presented later.
- A database management software; for now we have Microsoft Access, but we are counting on a BD2 Content manager from IBM for the longer term.
- Few more general-purpose applications.

All items listed above are easily available on both platforms. And since reliability, speed and functionality are almost the same on both systems, Hostway - a web hosting company- suggests to decide on an operating system from its features. If the price is an issue, it suggests going with a Unix/Linux platform because of all the open source software that is available.

Due to time constraints, we have decided to proceed in two steps:

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 111

- Immediate creation of user accounts in order to allow artists that use our facilities to store their works.
- Continue our design for the database creation and the longer-term digital library.

3. THE PROGRAMMING LANGUAGES

A number of prototypes and test bed suites were created in order to compare the different dynamic programming languages. The results of this experimentation are presented in table 1 which contains time related attributes for each of the languages.

Table 1. Programming languages evaluation

Language	Learning curve	Time of development
JSP	▲ ▲ ▲ ▲ ▲	▲ ▲ ▲ ▲ ▲
ASP	▲ ▲ ▲	▲ ▲ ▲
PHP	▲ ▲ ▲	▲ ▲ ▲
Cold Fusion	▲	▲

As seen in the table above, the hardest language is JSP due to its Object Oriented nature and the complexity of the language itself. In contrast, Cold Fusion (CFML) was, according to our experience, by far the simplest to implement and learn.

Also, according to Ebiz-Intellect, the simplicity of CFML allows for rapid application development, while the functionality provided by this technology exceeds the requirements of most applications. It is supported on several platforms, and has proven to be reliable, flexible, and scalable, as evidenced by its wide acceptance in the marketplace [Ebiz-Intellect; 2003].

4. THE DATABASE

The planned database has to contain the information about the artists and their work as well as the digital form of the actual work of art (the digital resource). Since the Project was considering a MS Access Database, which has a size limitation of around 2GB, the idea of storing the digital resources files in the databases itself as OLE objects was not an option. However, if only the file hierarchy is to be stored, some approximations had to be made, to see if the Database would exceed the size limitation.

Since such a database will have only textual and numerical fields about the artists and their work, the size of each entry is estimated at a maximum of 5KB.

# of entries = 2 GB / 5 KB = 419 430 entries

Figure 1. Maximum entries

The maximum number of entries is ± 400 000. Now an estimation on the number of submissions that could be submitted is necessary to guarantee that 400 000 entries is enough for the Database (figure 2).

```
# Artists = 2000 approximately
# Submissions /year = 2 approx.
# Active years = 40 years
# of entries = 2000 * 2 * 40
             = 160 000 entries
```

Figure 2. Expected number of entries

The conclusion on this issue was to store the files in a hierarchy of files and directories, which will allow us to adhere to the above mentioned size limitation.

5. DESCRIPTION OF THE RESOURCES

Many organizations are allowing access to their information through the web. The information itself is often described in a standardized manner in order to allow for easier and faster access.

Metadata is structured data about data. It works like information provided in a library catalogue. Instead of describing the data contained in the books and journals, this metadata provides searchable, standardized information about digital objects" [Friesen; 2001]. Metadata could also be defined as the description and categorization of digital resources that make them discoverable, accessible or searchable [Downes; 2003].

The description (metadata) of the works of art in our project will adopt the Dublin Core Meta tag elements set as required by the Department of Canadian Heritage [Canadian Culture Online; 2002], which financed our project, but also for its simplicity, and because it has been approved in January 2003 as ISO 15836 [Caldelli; 2003]. However, this tag set was not specific enough for representing new media. Our research lead us to define additional necessary descriptions for this particular context. The XML language (eXstensible Markup Language) will be used to specify the additional properties of new media art that the Dublin Core meta tags could not describe.

5.1 Description of standards

Dublin Core (DC) is a Metadata language used for the description of objects. It has only fifteen different optional and repeatable description tags, which could be attributed for its popularity. Only the regular object

Page 112

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

description needs for our project could be satisfied by this standard.

The following list comprises the fifteen DC tag set: Title, creator, subject, description, publisher, contributor, date, type, format, file name, reference, reference, language, coverage, and rights .

5.2 XML additional attributes

The description of new media art could only be partially described with Dublin Core. However, with our approach, XML files will be generated in order to complete the essential attributes needed [Moghrabi, Lê, Roy & Hachey; 2004a], as specified in the following:

1. *FileSize*: Physical file size on the disk. Ex: Image Size = 17 000 Bytes (*17 KB*)

2. *CreationTool*: Any tool used for the creation of the work of art. Ex: A video file was created with *Avid Adrenaline* software

3. *Timeline*: Video or audio duration. For image and text it is an automatic zero. Ex: A video is 5 minutes 22 seconds long (*5:22*)

4. *Discipline*: The category that best represents the work of art. Ex: A sculpture is a *visual art* work

5. *ContentType*: The type of content of the work of art can be animated or static. Ex: video and audio are animated/ *dynamic* while text and image are *static*.

6. GENERATING XML FILES

The XML files describe the works of art inserted by the artists through form submissions. A few file management tags are available with Cold Fusion among which is the <cffile> tag for the automatic generation of the XML files. A template Cold fusion file has been created to generate such XML files. The template file includes all the tags (attributes) necessary for the description of the work of art.

The variables from the form submission during insertion are used to fill in the attributes. A variable containing the whole XML file is then created (#xml#). After the generation of the #xml# variable, the <cffile> tag will be responsible for writing the file to the disk.

```
<cfset path="C:/Inetpub/wwwroot/xmlFiles/">
<cfset filetowrite= #path# & #nomF# & ".xml">
    <cffile action="write"
            file="#filetowrite#"
            output="#xml#">
```
Thus, the above procedure creates the XML file with all the attributes according to the form submitted.

7. SEARCHING

Our search engine will be developed with Cold Fusion. The users, whether artists or researchers, could search the database according to any attribute. These search fields could include: Artist, discipline, format of resource (image, video, audio, text), title, size, etc. The queries to the database are built and executed automatically after the submission of a web form to the search engine. The search results will be supplied in response to SQL queries to the database.

The search could be based on a single field or on multiple fields. In an advanced search, the query is expected to take longer to execute due to the number of extra conditions included in the query, but on the other hand it allows a better accuracy of the search.

7.1 Minimizing loading time

The time it takes to load a web page is an issue to be examined by every Webmaster. The time needed to completely load a page is inversely proportional to the size of the page to be loaded. Therefore, the page size has to be reduced to the minimum.

The first attempt to reduce loading time was to manage the file size by providing a reduced size file preview (thumbnail), for search results as an example. This option was only available for images, which causes a lack of consistency with other file types. The use of thumbnails could also have irritated some artists due to the fact that it also reduces the file quality and could lead to a misrepresentation of the work of art. In order to overcome those problems, a decision was made to use file type icons for audio, video, image and text to preview the type of file:

Image =

Video =

Text =

Audio =

The icons illustrated above are used to preview every file in the digital library when required.

8. SECURING INFORMATION

Web sites and web servers have to be protected with the maximum possible security.
The four aspects for consideration are as follow [Wayne; 2003]:

8.1 Authentication

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 113

Authentication is an important issue when it comes to giving access to users. There are two main ways to authenticate a user, either by IP filtering or by giving user names and passwords [VADS; 2004]. In our project, the users are authenticated with a user name and a password. IP's cannot be filtered due to the fact that members should be able to access their account information from anywhere, not only from our facilities.

8.2 Authorization

Authorization is the accessibility given to the users. Users have to be restricted from certain areas, and by authenticating them; it is possible to define the restrictions accordingly. Different sessions will be created depending on the user's role (member or administrator). The session variable will authorize (or not) the users to view the pages according to their role.

8.3 Encryption

Encryption is the protection of the data sent either from the client to the server or from the server to the client. The encryption of data is essential for users accounts. Every password, username and other sensitive information have to be encrypted, when sent through the web.

8.4 Intrusion prevention

This prevention is also important and is hard to control, but the Lockdown software designed by Microsoft protects the IIS server from intrusion.

The security measures will be evaluated, but have not been implemented yet to the web site and web server. More research on this aspect will be done before the final development of the database.

CONCLUSION

The design of a test bed for the multimedia database is presently in progress. It will be programmed with Cold Fusion for its simplicity, on an IIS web server using a MS Access Database system. The choice of the database management system was made in an effort to recycle an existing application with MS Access.

Standards mentioned in this paper will also be applied, for better accessibility and discoverability of the resources. The database shall be designed according to user's goals and needs. Those considerations lead us to innovate on the specifics for new media art. We hope that our database will help disseminate our traditional and new media art outside the Atlantic region.

REFERENCES

Baker, Thomas (2000), A Grammar of Dublin Core, D-Lib Magazine, Vol. 6, no 10, p. 3. http://www. dlib.org/dlib/october00/baker/10baker.htm

Berry, Wayne (2002), Security in IIS 6.0, MSDN Magazine, Vol. 17, no 9, http://msdn.micro soft.com/ msdnmag/issues/02/09/ SecurityinIIS60/ default.aspx

Caldelli, Roberto (2003), Standard Metadata Embedding in a Digital Image, 14th International Workshop on Database and Expert Systems Applications, Italy.

Canadian Culture Online (2002), Standards and Guidelines for Digitization Projects, Version 2.4. http://www.pch.gc.ca/progs/pcce-ccop/ pubs/ccop-pcceguide_e.pdf

Downes, Stephen (2003), One Standard For All: Why We Don't Want it Why We Don't Need It, National Research Council. http://www.downes.ca/files/ one_standard_files/frame.htm.

Ebiz-Intellect http://www.ebiz-intellect.com/ page.cfm?onumber=36

Friesen, Norm (2001), What are Educational Objects, Interactive Learning Environment, Vol. 9, no 3, pp 219-230. http://www.careo. org/documents/ objects. html

Low Cost Web Hosting Guide (2002), Windows Vs Unix. http://www.low-cost-web-hosting-guide.com/ windows-vs-unix.html

Moghrabi, Chadia; Lê, Tang-Ho; Roy, Jean & Hachey, Johanne (2004a), Digital Library Resources Description, Proceedings of the International Conference on Information Technology Coding and Communications, IEEE publications, USA (In Press)

Moghrabi, Chadia; Lê, Tang-Ho; Roy, Jean & Hachey, Johanne (2004b), A Case Study for the Design of a Digital Library, Proceedings of the 10th International Conference on Industry, Engineering, and Management Systems, USA. (In Press)

VADS, Creating Digital Resources for the Visual Arts: Standards and Good Practice, Resource Delivery and User Issues, Section 6. http://vads.ahds.ac.uk/ guides/ creating_guide/ contents.html

Page 114

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

CONTEXT, CULTURE AND COGNITION:
PLAYSTATION BEHAVIOUR IN A CULTURAL DATABASE

Anne Furlong

Department of English, University of Prince Edward Island,
550 University of Prince Edward Island, Charlottetown, PE, Canada, C1A 4P3, afurlong@upei.ca

1. INTRODUCTION

The goals of the Arts-Netlantic project include the creation of an inventory of the arts and cultural artifacts in PEI and New Brunswick. These goals raise questions about the interpretation of art in an environment that is governed by strategies of gaming rather than communication. I am interested specifically in the theoretical and practical issues that arise from digitising artworks generally. I will not be dealing with "new media" art—that is, art created originally in a digital environment—but with art works and cultural objects that have been represented digitally.[1] In this paper, I will describe these issues, explain why I think we should care about them, and close with some suggestions as to how to take advantage of gaming behaviour to preserve not just cultural artifacts, but their meaning and effect. I will do so within a relevance-theoretic framework, for it is also my contention that relevance theory, developed by Dan Sperber and Deirdre Wilson, provides a description of cognition and communication that sheds light on the processes of interpretation, and allows us to think through the social and cultural implications of the decontextualised digital representation of art and culture.

2. DIGITAL DATABASES AND THE PRESERVATION OF ART AND ARTIFACTS

Digital representations of cultural artifacts and art works preserve these objects within a database, typically accessed by the individual viewer seated in front of a single computer screen. It doesn't really matter whether we are talking about a computer in someone's home or office, or about one of a bank of computers for common use, say in a university or library. What matters is that it is not a shared viewing experience. Instead, the viewer is an isolate, an audience of one. He[2] may have many contextual assumptions in common with other isolated viewers; he may even share a common physical environment with other isolates; but he is not engaged in a shared experience in the way that a theatregoer, or moviegoer, or museum visitor is. His physical environment has not been designed in order to reinforce or convey a context specific to the artwork or cultural object; instead, a representation of that work or object has been made digitally accessible in an environment designed for other kinds of experiences—work, or home

life, or play. Some of the ramifications of the physical environment and the cognitive isolation of the individual audience will be taken up in sections (6-7).

A gallery encourages a shared viewing experience; it is a physical environment designed with the aim of presenting the culture, art and history of a group of people. In a museum or gallery, curation not only conserves these works physically, but provides a context for interpreting them—i.e., recognising their meaning. But there are physical limits to curated spaces: they can only accommodate so many people at a time; they demand that the viewer come to them; and they limit how much of an object can be seen, and how closely it can be inspected, and they forbid touching the objects. Minority cultures or obscure artists are even less readily accessible. A lack of financial resources, the physical marginalisation or isolation of the people, and neglect by the dominant culture may mean that few people ever know of the existence of these cultural artifacts or artworks, and fewer still come to appreciate them.

The representation of these works in a digital database would seem to overcome many of these difficulties. Digital representation preserves cultural artifacts and artworks in a pristine condition.[3] It makes these objects, and by extension, the culture that produced them, available to anyone with access to the database. We can see how the Arts-Netlantic inventory could extend the life and reach of cultural and artistic works and in so doing help preserve the culture, art and history of an entire region, or of a minority people.

However, I have concerns about the process of representation and the behaviour of those who use these databases. Digital representation does indeed extend the life and reach of cultural and artistic works. But the database is not a curated context; viewers whose behaviour has been conditioned by web-searching and gaming will tend to treat the artworks and artifacts as phenomena, rather than as part of the complex communicative act that is culture. There is also a technical difficulty that bears thinking about. Digitisation always involves loss of information, about texture, scale, surface, colour, and presence. Both of these problems have to do with the process of interpretation—that is, they involve both context and cognition—and therefore I

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 115

propose to treat them within the framework of relevance theory.

3. RELEVANCE THEORY

I want to draw a distinction between phenomena, on one hand, and communicative acts (artworks) and objects meaningful within a particular culture (artifacts), on the other. The interpretation of the second category is constrained in a way that the first is not. Relevance theory, developed by Dan Sperber and Deirdre Wilson, addresses this distinction at a fundamental level.[4]

Relevance theory makes two fundamental claims about cognition and communication. It claims that "human cognition tends to be organised so as to maximise relevance", and that "every act of ostensive communication communicates a presumption of its own optimal relevance" (Sperber and Wilson 1986, 1995, 260). [This second claim is also called the Second Principle of Relevance.] "Relevance" is a property (261), and is quantifiable: something is relevant to the extent that the cognitive effects it produces are large, and to the extent that the cognitive effort needed to achieve these effects is small. The greater the cognitive effects that a stimulus, e.g., produces, the more relevant it is; and the more effort it takes to achieve these effects, the less relevant it is (122-132). Relevance thus involves a dynamic balance between effort and effect; when there are no longer adequate effects for the effort expended, we stop processing the stimulus—we stop paying attention.

Relevance theory assumes the modular view of human cognition; thus, the interpretation of utterances is fast, automatic, and encapsulated.[5] So, too, is the interpretation of phenomena. However, different constraints operate in each situation. In both cases, relevance is understood as that which has positive cognitive effects on or for us. When we pay attention to our surroundings—that is, when we interpret phenomena—their relevance is not a property of our environment, but of its relation to us (265-271). We stop paying attention to the phenomenon when it is no longer producing these positive cognitive effects for minimal cognitive effort (though it may become relevant to us again if the situation changes).

The interpretation of utterances is constrained by the presumption of optimal relevance that every utterance conveys. Every utterance makes manifest the speaker's intention to make something manifest, and the hearer's interpretation is geared toward recognising what it was the speaker was trying to make manifest—i.e., her informative intention, the set of assumptions she wanted her hearer to recognise (155-163). Communication is successful if the hearer recognises an adequate subset of that set of assumptions. "Adequacy" is determined by individuals involved and the situation at hand. We should remember that what the speaker thinks will be relevant to her hearer may not, in fact, be worth his while paying attention to; in

that case he will consider what she said not relevant—as a phenomenon. Still, the interpretation of utterances, being an encapsulated process, is automatic—which is why we can find ourselves unable to stop "hearing" a bore, even when we have stopped "listening".

I want to stress the difference between the relevance of a phenomenon, and that of an utterance or other communicative or ostensive or meaningful act. It's not that they are very different objects in the world: after all, I can programme a computer to produce random grammatical sentences in English, no different from a set of sentences drawn from actual texts. But the first set of sentences is a phenomenon, while the second set constitutes communication. If we bear this distinction in mind, we can return to the situation created by the digitisation and access of artworks and artifacts. We can now frame the problem as involving evidence for and the construction of interpretation.

4. THE INTERPRETATION OF ARTWORKS

I'm treating an artwork as a communicative act, and there is no principled reason why I should not.[6] The artist has created her piece to provide evidence for a set of assumptions, both propositional and non-propositional, ranging from narrowly determinate to broadly impressionistic. So, in the case of a painting of a rural scene,[7] the painter may want the viewer to produce an interpretation that includes ideas about rural scenes, such as
 (1) Rural scenes are peaceful and inspiring.
or, conversely,
 (2) Rural scenes are desolate and depressing.
She may want the viewer to pay attention to the scene represented by the painting:
 (3) There are no houses represented in this painting.
or to the technical elements of the work itself:
 (4) There is a pink patch in the upper right hand corner of the section of the painting that represents the sky.
The painting will present evidence for a very wide range of assumptions, which will help to guide the viewer in constructing the context in which he will interpret, and think about, the artwork. The context is crucial, since it is the context which produces the implications and implicatures which make up the interpretation (132-142). The implications are those assumptions that are warranted by the evidence, and form a very large set; the implicatures are those assumptions that the viewer believes have been implicitly communicated by the artist. As we can imagine, it's not always easy to draw a hard and fast line between these two. Relevance theory is less interested in identifying any particular assumptions as implicatures than it is in explicating the process by which a viewer arrives at his decision about them.

Page 116

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Since artworks are a form of indirect communication, they provide evidence that requires sensitive interpretation. 'Sensitivity' here includes identifying the context in which this evidence will yield a reading of the work that is an adequate subset of the one intended by the artist. In turn, artworks are communicative in a way that cultural objects and artifacts are not. These occupy a middle position between communication and phenomenon. Nevertheless, a cultural object is produced within a particular cultural context that contains information about the use of the object, its reception, and its treatment.

Take the example of a communion chalice, or an Iroquois "false face" mask. Both of these are objects produced for use during ceremonies considered sacred by the participants, and both are objects of great cultural value, and of considerable veneration. Members of these cultures will know what these artifacts are used for, who is supposed to handle them during sacred ceremonies, and the restrictions on their display and treatment. And indeed, in galleries and museums where these objects are displayed, there is usually some indication—besides written explanations—of the cultural importance of these objects: they will usually be placed in cases where they cannot be touched, they will be specially lit, and they are often placed with related cultural objects. This curation allows the visitor access to a tiny fraction of the material culture in which these artifacts were created, and to recognise that, if nothing else, he should not treat them merely as cups or costumes.

But cultural and artistic works can also be treated as phenomena, rather than as communicative acts (artworks) or objects meaningful within a particular culture (artifacts). This is of course the situation we all accept when we make communicative acts available to a non-specific public audience; we risk misunderstanding, misinterpretation, and rejection. An artist recognises that out of all potential viewers, there will only be a fraction who recognise an adequate subset of the assumptions (impressions, effects, propositions, images, associations) that she intended the artwork to provide evidence for. But generally she can assume that her audience—potential and actual—is a member of her culture, and so shares common cultural assumptions. These assumptions can be quite specific— e.g., the assumption that a bicycle seat and handlebars can represent a bull's head—or rather vague—e.g., the assumption that non-figurative artworks are more likely to be suggesting ideas or states of mind than specific objects or entities in the world.

Consider what happens when the artist (or creator) and the audience are from different cultures. This is not as exotic as it may sound. All past cultures are to an extent different from our own, and historical criticism and reader-reception theory aim to reproduce the cultural context in which, say, John Donne's poems were first read. Because the language of Donne's sonnets is only minimally distinct from

contemporary English, and because we have extensive information about our cultural past (or past cultures) in the English-speaking world, we may overlook the cultural disjunction between England of 1550 and Charlottetown of 2004. At the very least, we are used to searching for clues as to the context in which the writer assumed his work would be interpreted.

The artist or creator whose culture differs radically from that of her audience, however, can have little confidence that the viewer will understand the context in which the artwork was originally intended to be interpreted, or in which the artifact was meaningful. For this artist, and for these works and artifacts, a digital representation may exacerbate the difficulties of appreciating or understanding the artwork or object. Not only is the viewer already significantly distanced from the cultural context, but the viewing experience—in cognitive and social isolation—encourages the treatment of these things as phenomena, rather than as part of a rich communicative relationship.

This situation is made worse when the evidence for the artist's intention, or of the significance of the artifact, is diminished or altered by the process of representation. I will now consider issues arising from the loss or distortion of information that occurs with re-representation.

5. REPRESENTATION, RE-REPRESENTATION AND METAREPRESENTATION

To think through the issues which the digital library presents, and to suggest some ways of countering the impoverishment of cultural and artistic works, I would first like to discuss the relationship between kinds of representation.

There are two kinds of representation I am interested in: the representation of a phenomenon, and the representation of an artifact. A phenomenon simply exists: we treat it as information about our environment. So, e.g., a tree is an object; so is sunshine; so is the flu. An artifact is anything that human beings have made for some purpose. So, e.g., a path is an artifact; so is the *Mona Lisa*; so is a sentence. Interestingly, we can treat phenomena as meaningful, which is what we do when we count crows. Or we can treat communicative acts as phenomena, which is what linguists do when they parse sentences. But we should recognise that there is a distinction; certainly, relevance theory distinguishes in principle between the relevance of a phenomenon, and the relevance of a communicative act. Let's consider the case of the represented object.

Objects can be represented, both physically and mentally. Every representation exists in a relation of resemblance to the object represented; a representation which resembles the "original" in every possible point is "identical". However, a relation of identity is very rare, and most representations

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 117

aim only at adequate resemblance.[8] Representations can themselves be represented; this involves a re-representation of the original object. These secondary representations can be represented, so that we have third-order representations of the original. Every re-representation—except in cases of identical re-representation—involves a loss of information from the original. So, where the tree outside my window makes manifest so much information about itself, the scale model of the tree makes manifest less of that information. The painting of that scale model presents even less, and the photograph of the painting of the model of the tree less again. Finally, digitally representing the photograph of the painting of the model of the tree entails a drastic reduction in information about the tree, and means that the context has been significantly altered.

Now, there has been some information added, in the form of selection, interpretation, the composition of the images, colour, verisimilitude, but this is no longer information about the tree, but rather about the way in which each successive representer interpreted the tree. We move from representation to metarepresentation. Each operation adds "value", so to speak, in that each metarepresentation involves a propositional attitude (e.g., "I believe that this tree is a beech" as opposed to "This tree is a beech"). A metarepresentation can itself be metarepresented ("I know that I believe that this tree is a beech"), with propositional attitudes expressed by the speaker or attributed to others ("Peter knows that I believe that this tree is a beech"). Metarepresentations give us more to think about, while re-representations give us less—because of loss of detail, or of spatial context, or of knowledge or experience of social function.

What is the result of this loss of information? When there is significant loss or distortion of information, we may not be able to construct an accurate mental representation of the object. This can affect our ability to mentally represent the world around us.[9] But consider what happens when we re-represent an artifact or artwork.

The artwork is not a representation of an object in the world, even if it is a photograph, or a meticulously "realistic" artistic rendering; it is evidence for the set of assumptions the artist wanted the viewer to recognise. That is to say, it is already a particular kind of metarepresentation: the public representation of a private representation (see Sperber 2000, 3). The artwork is the public representation, and the intended interpretation is the private representation. Moreover, this metarepresentation is intended as evidence for private representations constructed by the viewer. Since all these metarepresentations are affected by the distortion or loss of information involved in re-representation, each successive re-representation increases the probability that we are lacking the evidence that will allow us to construct the context in which we can produce the intended interpretation. This means, of course, that we will be less

likely to produce or construct the intended interpretation; and will not experience the cognitive effects (very rich indeed in the case of artworks) which access to the original would have made possible.

This strongly suggests that we need strategies for ensuring that the loss or distortion of information, the impoverishment of evidence through second, third, or fourth orders of representation, is minimised. I will deal with this issue in sections (7-8). For now, I would like to return to the concern that began this paper: not the diminished context which digital (re)representation risks, but the more radical problem raised by the shift from artifact to object, from intentional act to phenomenon. That is, I want to turn to how the actual process of accessing the cultural database encourages the viewer to shift strategies, moving from treating the art and artifacts as public representations of private representations, and toward treating them as public representations of phenomena.

6. COGNITIVE AND COMMUNICATIVE RELEVANCE

As I indicated in sections (4-5), relevance theory differentiates between the relevance of a phenomenon, and the relevance of a stimulus. Sperber and Wilson make the distinction at the level of principle:

Relevance of a phenomenon (classificatory)
A phenomenon is relevant to an individual if and only if one or more of the assumptions it makes manifest is relevant to him. (Sperber and Wilson 1986, 1995, 152).

Cognitive relevance—i.e., the relevance of a phenomenon— is achieved with reference only to the interpreter's cognitive environment, "a set of facts that are manifest to" an individual at a given time (39). In relevance theory, "manifestness" means capable of being represented mentally and accepting that representation as true or probably true (39). The relevance of the phenomenon is determined entirely by the interpreter. He does not treat the assumptions which the phenomenon makes manifest to him as having been intended, nor does he use these to construct an intended context; neither is his interpretive process constrained by the presumption of optimal relevance. None of these constraints applies, because he is not treating the object as a communicative act.

Communication is governed by the second principle of relevance, which I have already described: the claim that "every act of ostensive communication communicates a presumption of its own optimal relevance" (260). Optimal relevance differs from the relevance of a phenomenon because of this presumption.

Presumption of optimal relevance (revised)
(a)   The ostensive stimulus is relevant enough for it to be worth the addressee's effort to process it.
(b)   The ostensive stimulus is the most relevant one compatible with the communicator's abilities and preferences. (270)

And further:

"The presumption is that, of all the stimuli that are available to her and acceptable as a means of achieving her particular communicative goal, the communicator will choose the one that is as relevant as possible to the addressee." (270)

That is, the process of interpretation is constrained by what the hearer thinks the communicator thinks is relevant, and not just by what is relevant to the audience.

We can treat artworks as communicative acts, since it is clear that the artist intended her work to have some effect on the audience, and that, moreover, she had some idea of what that effect would—optimally—be. Had she not cared at all, she would not have bothered to revise her work. While the line between communication and display is here quite fuzzy, we can at least say with conviction that she hoped, by displaying her work, to have some set of effects on her audience, and these constitute a minimal interpretation. Few artists have a specific (that is, identifiable) audience in mind. And while the creators of cultural objects usually do intend them to be used by somebody (a specific individual in the case of commissioned works), they generally assume that any member of their culture will understand the object and its meaning. That is, both artist and artisan can have non-specific audiences in mind. Does this affect the process of interpretation?

On the issue of "non-specific audiences", Sperber and Wilson argue that "the addressees of an act of ostensive communication" (or ostensive display) "are the individuals whose cognitive environment the communicator is trying to modify. They can be specific individuals, … or they may be individuals falling under a certain description… The communicator is then communicating her presumption of relevance to whoever is willing to entertain it." (158) This description certainly covers the cases I am considering here, of the audiences for artworks and artifacts.

Note that the distinction does not lie in the object itself, but in the way the audience treats it. What I have observed is that the relation between the computer user and the digital representation invites the user to treat what he sees—other than text, of course, which is automatically constrained by the second principle of relevance—as a phenomenon rather than as a communicative act. As I have argued, this change has important ramifications for the interpretation of artworks, and even more for the interpretation of artifacts. In fact, artifacts—especially those from cultures significantly different from the audience's—are even more likely to be treated as phenomena, since the audience lacks most of the contextual assumptions in which the artifact originally had meaning. We are talking about two issues: context and process, and it is to context that I now turn.

7. CONTEXT, COGNITION AND THE CULTURAL DATABASE

Imagine someone accessing the Arts-Netlantic database, and in particular, someone looking at digitally represented images of cultural artifacts, such as Mi'kmaq baskets or Acadian *ceintures flechées*. Put aside for one moment that the images themselves are degraded, and lack information about true colour, texture, and surface. Let us imagine instead that all these have been optimally represented. There is still no way to accurately gauge size and scale, or to convey information about non-visual information such as weight, odour, sound (does the material rustle?) and so forth. Leaving these considerations aside, there is still the tendency for the viewer to decontextualise the images, to regard them as "just" a basket or "just" a sash (or scarf, or belt). And the less he knows about the culture out of which they emerged, the more likely he is to decontextualise them, or at least to construct a context without any reference to the one in which they first appeared.

This situation is well known to anthropologists, curators, and literary critics (who deal with it within reception theory, among other interpretive frameworks). But the issues that these specialists identify are made more acute, and harder to address, when the objects are not physically available for inspection (as in a museum or gallery) or presented within an explicatory context (as in a book or article). The tendency to treat these meaningful objects as phenomena is strengthened by the "gaming behaviour" which governs so much of the behaviour of computer users, and consequently the design of websites.[10]

In relevance theoretic terms, the key distinction is in the construction of context, rather than in the effects that are achieved, or the interpretation produced. A person engaged in gaming behaviour is trying to achieve optimal relevance for the accomplishment of a particular goal: getting to the next level, e.g., or achieving a high score, or—in multiple player games—defeating opponents or strengthening one's team's position. He will look at the digital environment as an extension of the world, and his gaming persona as an extension of himself. He is not interested—or at least, not while he is employing gaming strategies—in what the designers had in mind, nor in determining what if any assumptions they wanted him to recognise as having been intended by them. He is not treating the digital representation as communication, and therefore the context consists of whatever assumptions can be used to achieve optimal relevance.

This behaviour amplifies the disposition to appropriate images of cultural objects for treatments not foreseen by the creators or intended users of the original. We see this all the time, as people take images from the web and put them into new contexts. While we are always free to rework images and representations (within the limits of copyright law), I believe that it is the responsibility of those making the representations available to do all they can to ensure that the intended context—or as much of it as we can manage to

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 119

convey—is at least accessible to those who want to understand the meaning of the artifact, and the context of the artwork.

8. RECOMMENDATION: THE CURATED INVENTORY

We lose enough in the process of re-representation. It should be the goal of the Arts-Netlantic digital inventory to work toward providing what context is possible for the reception and understanding of cultural objects. This leads me to recommend a "curated" inventory: a cultural inventory designed, from the outset, with the goal of guiding viewers away from a decontextualised treatment of artworks and artifacts. The aim should be to invite viewers to construct a context in which the interpretation of these images will resemble more closely the intended interpretation. I am not suggesting that we should try to limit viewers' interpretation of these objects, which is both impossible and undesirable.

Instead, I am proposing that we strive to ensure that the intended interpretation should form part of the context in which the contemporary viewer processes the information available. In the case of First Nations artifacts, it is helpful to know, e.g., whether the basket whose representation we are looking at was ornamental, or utilitarian; whether its design is occasional or represents patterns specific to a group, an area, a culture, or a historical period; whether the basket is a reproduction intended for sale, or an actual household object no longer in use. The answers to these questions function as assumptions in the context in which the artifact is thought about; and while it is still possible (and, as I indicated, entirely legitimate) for the audience to treat the object as relevant only to himself, he has at least access to a context in which it is (or was) differently relevant to the original users.

And I think that the model for how to curate such an inventory can be provided by games and gaming behaviour. Video and computer games work by constructing a world in which the agent makes discoveries about the virtual environment; these discoveries allow him to decide what is relevant to him, and how to adapt his behaviour. Similar strategies can be employed in the construction of the inventory, so that—rather than having to read a set of texts about the object (which has serious limitations, not the least being that most gamers do not "waste" their time reading)—the viewer looking at a representation of a cultural artifact has the option of a set of links that present the information through video clips, audio files, images of similar objects in use, interactive games, and so on. The viewer looking at a representation of an artwork might have the option of a set of links that present very close views of the object, views from a variety of angles (especially those not normally available in galleries or museums), other works by the same artist, images of the artwork *in situ*, clips of the artist at work or discussing her work, and so on. These could begin

as "hyperlinks", but an inventory might be structured so as to allow these contextual representations to form a cohesive experience—a digital world in which the object or artwork makes sense. The technical and design challenges are formidable, but the opportunities are immense.

My recommendation is that, as the Arts-Netlantic inventory grows, there be serious consideration given to enlisting the talents and expertise of gaming designers and programmers. They can devise ways in which access to the database can be constructed so as to give users access to the contexts in which these works and artifacts will be treated, meaningfully, as communicative acts.

9. CONCLUSION

This paper has raised questions associated with the preservation of cultural and artistic works in a digital database. I have argued that relevance theory provides a way to think about these questions, to understand the processes at work, and to begin to address the problems of cultural appropriation. Furthermore, it is my conviction that thinking clearly about these issues is productive, not only of solutions to the situations I have identified as problematic, but of approaches to any situation in which audiences are likely to treat communicative acts purely as phenomena. If we curate digital inventories as we curate actual ones, we can extend the notion of conservation beyond the physical museum, and make the riches of cultural heritage more fully available to every member of the community.

References

Blakemore, Diane. (1992). *Understanding Utterances. An Introduction to Pragmatics*. Oxford: Basil Blackwell.

Carston, Robyn and Seiji Uchida, eds. (1998). *Relevance Theory: Applications and Implications*. Amsterdam/Philadelphia: John Benjamins.

Carston, Robyn. (1997). Relevance-theoretic pragmatics and modularity. *UCL Working Papers in Linguistics* 9: 29-53.

Carston, Robyn. (2000). The relationship between generative grammar and (relevance-theoretic) pragmatics. *Language and Communication* 20: 87-103.

Carston, Robyn. (2002). *Thoughts and Utterances: The Pragmatics of Explicit Communication*. Oxford: Blackwell Publishing.

Davis, Steve, ed. (1992). *Pragmatics: A Reader*. Oxford: Oxford University Press.

Dennett, Daniel. 2000. Making Tools for Thinking. In Sperber, Dan, ed. *Metarepresentations: A Multidisciplinary Perspective*, 17-30. Oxford: Oxford University Press.

Fodor, Jerry. (1983). *The Modularity of Mind*. Cambridge, MA: MIT Press.

Page 120

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Fodor, Jerry. (2000). *The Mind Doesn't Work That Way*. Cambridge, MA: MIT Press.

Kempson, Ruth, ed. (1988). *Mental Representations: The Interface Between Language and Reality*. Cambridge: Cambridge University Press.

Pilkington, Adrian. (2002). *Poetic Effects: A Relevance Theory Perspective*. Amsterdam: John Benjamins.

Schama, Simon. (1999). *Rembrandt's Eyes*. Toronto: Random House of Canada.

Sperber, Dan. (1994). The modularity of thought and the epidemiology of representations. In Hirschfeld, L., and S. Gelman, eds. *Mapping the Mind: Domain Specificity in Cognition and Culture*, 39-67. Cambridge: Cambridge University Press.

Sperber, Dan.(2000). Introduction. In Sperber, Dan, ed. *Metarepresentations: A Multidisciplinary Perspective*, 3-16. Oxford: Oxford University Press.

Sperber, Dan and Deirdre Wilson. (1986, 1995). *Relevance: Communication and Cognition*. 2nd ed. Oxford: Basil Blackwell.

Wilson, Deirdre. (1996). Grammar, pragmatics, and knowledge. Paper presented at conference on "The interface between language and cognition", Keio, Tokyo, March.

Wilson, Deirdre. (2000). Metarepresentation in linguistic communication. In Sperber, Dan, ed. *Metarepresentations: A Multidisciplinary Perspective*, 411-48. Oxford: Oxford University Press.

Wilson, Deirdre and Dan Sperber. (1988). Representation and relevance. In Kempson, Ruth, ed., *Mental Representations: The Interface Between Language and Reality*, 133-153. Cambridge: Cambridge University Press.

Wilson, Deirdre and Dan Sperber. (1993). Linguistic form and relevance. In Carston, Robyn and Seiji Uchida, eds. *Relevance Theory: Applications and Implications*, 1-22. Amsterdam: John Benjamins.

AUTHOR NOTES

[1] The theoretical and practical issues that I am interested in this article have to do what happens when non-digital works are digitized; in particular, I am interested by the loss of information that necessarily occurs when objects are re-represented digitally. "New media" art works, having been created digitally, for digital representation, are not affected in this way. They may, of course, have been created for viewing on a particular platform (Mac, e.g.) and an audience without access to that platform may not see (or hear) exactly what the artist intended; and the quality of reproduction may be affected by inferior (or superior) equipment. However, these are issues that can be resolved, typically, by ensuring at least an adequate consistency of equipment and "staging". So, for example, a visual/musical work created to be seen and heard in an environment dedicated to the work—a single terminal in the centre of a darkened room, with speakers set at particular positions on the periphery—will not be experienced as the artist intended at a home computer set up in the kitchen with only the built in speakers. But it is possible to create a viewing context that resembles the "original" or intended one to a high degree of fidelity. Here, it is not the work but the equipment and environment that the curator or presenter will focus on. This situation differs not just in degree but in kind from that of an audience looking at a digital representation of a Helen Frankenthaler painting on a desktop computer with a 17" screen, even with the highest resolution normally commercially available for PCs. These points are taken up in greater detail in section 5.

[2] In accordance with the conventions established in the literature of pragmatics, I refer to the communicator as "she" and the addressee or audience as "he".

[3] In the case of works of art that have been lost or physically damaged, representations may be all that we have left. Consider the case of Rembrandt's *Danaë*, held at the Hermitage, which was severely vandalized in 1985. As Simon Schama (1999, 384) points out, the painting, though still "heartbreakingly beautiful" "is not the same painting that was seen before". "[T]he flood of golden light" that once distinguished this masterwork can now only be approximated from high-quality photographic reproductions.

[4] The source text for relevance theory is *Relevance: Communication & Cognition* (Sperber and Wilson, 1986, 1995). Other important texts are Blakemore (1992), Carston and Uchida (1998) and Carston (2002). For an overview of the discipline of pragmatics, see Davis (1992). For applications of a general pragmatics (if strongly relevance-theoretic) approach to questions of culture and representation, see Sperber (1994, 2000).

[5] See Fodor (1983, 2000). Without accepting all the arguments and concepts that Fodor has advanced, relevance theorists generally assume that something like this model represents the way the mind works. We should note that this model of the mind is consistent with the generative model of language developed by Chomsky, which relevance theorists—especially linguists—also accept as broadly true. For more detailed discussions of the ways in which these two models underpin relevance theory, see Carston (1997, 2000, 2002), Kempson (1988), Wilson (1996, 2000), and Wilson and Sperber (1988, 1993).

[6] I am not addressing the question of what constitutes the intention of a work of art; unlike verbal communication—in which there is logical form, and propositional form, to act as evidence—non-verbal communication makes manifest a very wide range of assumptions, largely non-propositional. These include colour, texture, composition, scale, hue, material, and (possibly) representation in visual arts; tone, melody, instrumentation, pitch, rhythm, repetition, and (possibly) imitation in the musical arts; and still more kinds of assumptions in dance, installations, and so forth. The non-propositional nature of many of these assumptions means that it is likely that the artist intended that the intended interpretation should consist largely of non-propositional assumptions, the kinds of contextual effects that comprise "impressions" or "poetic" or "aesthetic" effects. For a discussion of poetic and aesthetic effects, see Sperber and Wilson (1986, 1995, 217-224) and Pilkington (2000). In any case, I am claiming that the artist intends that the audience recognizes that the work is intended to make manifest a set of assumptions which the artist

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 121

intended him to recognize or construct. The audience aims at recognizing an adequate subset of the set of assumptions intended by the artist; given that there is virtually no propositional content, and that the interpretation will consist largely of impressions, the standard for "adequacy" will be much lower than for the interpretation of utterances; nevertheless, the criterion by which an audience determines the intended interpretation—the second principle of relevance—still holds.

[7] The painting I have in mind is *Trinity Bay*, by Newfoundland artist Sylvia Bendza (private collection).

[8] "Adequate" here can refer to minimal adequacy, i.e. "allowing recognition of the class of object represented". So, for example, a Braque painting of a cup is an adequate representation if it provides enough information to allow the audience to recognise that a cup is being represented, rather than providing sufficient information for the audience to identify the specific cup that Braque used as his model.

[9] I have in mind some of the issues and arguments raised by Dennett in Sperber (2000, 20-24).

[10] The development of hypertext and the critical literature that has grown up around it responds to some of the observations about web users' behaviour. This behaviour was satirized in Ver Hoeven's 1998 movie *Starship Troopers*, where "Fed Net" transmissions were set up to allow viewers to follow trains of thought stimulated by the most recent information; the design also acted to discourage focused thought on a single topic. The "hypertext" acted as distraction, and effectively worked to keep viewers from asking questions, thus reinforcing the dominant ideology at the level of technology. Early attempts at hypertextuality met the same difficulties; readers were less likely to gain depth of understanding than they were to follow a series of transient topics. The concern can be addressed by setting the links so that they loop back to the point of origin (rather than dead-ending, or leading into an open-ended string of hyperlinks).

Page 122

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

PRINCIPLES OF EFFECTIVE WEB DESIGN
INCREASING THE EFFECTIVENESS OF INTERNET COMMUNICATIONS

B. Leigh McFarlane
Castaways Productions Inc, 90 University Avenue, Suite 225, Charlottetown, PE, Canada, C1A 4K9
lmcfarlane@castawaysproductions.com

1. INTRODUCTION

In 1989 visionary Tim Berners-Lee created the World Wide Web, a world-changing creation that, "*was fueled by a highly personal vision of the Web as a powerful force for social change and individual creativity.*" (Berners-Lee, Fischetti, 1999). Berners-Lee believed that, "*The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect.*" (Berners-Lee, 2004).

Since 1989 the Web has been increasingly used to send messages of all kinds to audiences throughout the world. Web sites and other interactive media are used for a variety of communicative purposes (to promote, educate, entertain, and/or inform) and content is being offered to audiences in much wider varieties of formats (text, video, audio, animation, interactive activities, etc.).

The Web is a phenomenon that has grown with unprecedented speed. It is highly grassroots in nature and has benefited from a high level of global collaboration in the development of standards and best practices. As such, it is an evolutionary creation. Developers continually challenge themselves to make more things possible on the Web, and end-users drive enhancements and ever-greater levels of interactivity by demanding more complex functionality and increasing ease of use.

This paper is intended for a lay-audience consisting of web site end-users, not web producers. The design of an interface (what end-users see and interact with), and how site components are created and connected is of critical importance to the successful delivery of intended messages. The concepts addressed in this paper are not technical in nature, but instead are meant to stimulate critical awareness of what does and what does not make an effective web site. The following topics will be covered in this document:

- Planning a Web Site
- Audience Considerations
- Rules to Design By
- Technical Requirements
- Aesthetic Requirements
- Structural Requirements

2. PLANNING A WEB SITE

"*Web design is like music. It isn't how many notes you can play, it's playing the right notes. It's the silences that are important.*" (Flanders, 2002).

The act of planning a web site involves all stakeholders in a project. Of critical importance is the involvement of the organization for which the web site is being built. The successful outcome of a web development effort is directly related to how involved clients and subject matter experts are in critical planning and development stages. Without their appropriate involvement it is highly unlikely that the end result will accurately reflect the organization's communicative needs.

This section includes information from a workbook entitled "New Media Production Demystified" (McFarlane, 2000). This workbook is a tool designed for web design lay-people (decision-makers, subject matter experts, committee members, etc.) to help them increase their confidence when planning new media productions for their work place and community organizations. To that end, it compares the steps needed to plan and build a house with the steps needed to plan and build a web site. Surprisingly, the processes are quite similar!

For example, a good house must have a solid foundation and be built using a set of plans that take into account the needs and lifestyle of the eventual inhabitants. A good web site is no different in that it must be planned carefully taking into account what messages need to be sent and the characteristics of the target audience.

When planning a house the home owners are very much involved with the architect and/or contractor in order to ensure a successful end result. Likewise, successful web sites cannot be planned properly without the full involvement of clients and subject matter experts from the outset of the planning process.

The following information describes at a fairly high level the steps involved in any new media production, the expertise required within the production team, and the level of involvement of these team members throughout the production process.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 123

2.1 The Four Steps of New Media Production

It is important to note that the following descriptions are of a fairly high level and somewhat general in nature. The intention here is to provide an overall view of the process of planning and producing a web site (McFarlane, 2000).

Step #1 – Plan

During this step the planning team works co-operatively to produce the entire project plan. At the end of the planning process all flowcharts, storyboards, content lists (text, graphic, audio, video, interface elements), schedule, etc. would be complete. As well, programming theories would have been tested and perfected. Some tasks involved in this step are:

- Set Schedule
- Set Budget
- Design Structure
- Design "Look"
- Create List of "Elements"
- Create Material & Equipment List
- Gather Content
- Hire Subcontractors

Step #2 – Gather Resources

This next step involves producing all of the elements needed for the final product, and will often overlap Step #3. The design plan developed in Step #1 will determine in what order the elements are created, and from that will flow the process of putting the elements together in the site or software structure. Some of the resources to gather in this step are:

- Scripts
- Text Elements
- Graphics
- Video
- Audio
- Animation
- Structural Templates
- Programming Templates

Step #3 – Assemble/Do

In Step #3 all elements created in Step #2 are inserted into the skeleton (structural template) of the project. At the end of Step #3 the project will be complete and ready for alpha testing. This phase will most likely overlap Step #2, because as elements are produced they will be inserted into the templates. If the previous two steps have been executed thoroughly, this part in the production should be almost mechanical. **There is very little room for creativity at this point in a project.** Two tasks involved in this step are:

- Insert all of the elements created in Step #2 into the structural template
- Debug ("alpha test") at regular intervals as new elements are added

Step #4 – Test

This is the point at which the project as a whole is tested. If the previous steps have been done correctly, particularly Step #1, then this should be a fairly simple process with few challenges or surprises. The final step is to send the production to the client for final, or "beta" testing. In many cases the client would have been testing demos during the production process. Some tasks are:

- Once complete, the entire project is "alpha" tested by checking every step and button, and by clicking different key combos to see results
- "Beta" testing is done at the client's office
- Corrections are made as needed

2.2 The Expertise Required for a New Media Project

Sometimes a very large team is needed to successfully plan and produce a project, and sometimes just one person will wear all of the "hats". Regardless, the specialists described below represent (generally) the various roles that need to be filled for any project (McFarlane, 2000).

Project Manager	Oversees entire project and acts as liaison between the client and team. Responsible for tracking project milestones and ensuring the project is kept within budget.
Production Manager	Responsible for the operation of the project including arranging for sub contractors, equipment, scheduling, and budgeting.
Software / Site Designer	Develop flow charts and lists of elements. Work with Art Director to develop GUI[1] storyboards. Develop and test programming theories (reduce problems in Step #2). Create templates and naming protocols for all project elements. Follow the "If I die tomorrow" approach to documentation preparation.
Art / Media Director	Responsible to ensure that all GUI and video storyboards are created, as well as the storyboards for the entire project. Responsible to ensure that all graphic, video, and audio elements are produced according to the plan.
Technical / Creative Writer	In Step #1 the technical writer is responsible for creating the lists of text and interactive, video and audio script elements needed for the project. During Step #2 this person actually writes the text and different script elements.
Subject Matter Expert (SME)	A person who is qualified to write and/or approve content for a new media production. **In many cases this person is from the client's organization,** and may therefore work with the team on an advisory basis only.

---

[1] GUI – Graphical User Interface – pronounced like "gooey" – A technical term for what *users* see on-screen (*graphic*) that they interact with (*the interface between user and computer*) in order to use the site

Page 124

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

2.3 Team Member Involvement at Different Steps

The chart below depicts the level of involvement of each of the different areas of expertise throughout the planning and production process of a new media project. "Involvement" is relative to the person's level of participation at a particular step in the production process. The steps correspond to the steps described in section 2.1 (McFarlane, 2000).

Team Member		Step #1	Step #2	Step #3	Step #4
Project Manager		High	Medium	Medium	Medium
Production Manager		High	High	High	Medium
Software / Site Designer		High	High	High	High
Art / Media Director		High	High	Low	Low
Technical / Creative Writer		High	High	Low	Low
Subject Matter Expert (SME)		High	High	Low	Low

(Clipart – Microsoft Word)

2.4 Planning a Web Site – Summary

The steps, lists of tasks, areas of expertise and levels of involvement described above are all important to the process of effectively planning and producing a web site or any other new media product.

The information has been presented here in a fairly linear fashion, but it is important to note that the process of new media production is evolutionary, and that at times work will be underway concurrently in more than one step. Key, however, to the success of any project is the complete and thorough execution of Step #1 – Planning.

3. AUDIENCE CONSIDERATIONS

"*Designing Web sites needs careful thinking and a lot of planning. The most important thing is to KNOW YOUR AUDIENCE.*" (Refsnes Data 1999 – 2004).

Ultimately, audiences need to be able to access and interact with a web site in order to get the message being sent. It is important, therefore, to have an excellent understanding of the target audience in order to increase the effectiveness of a site. The following is a checklist to help focus target audience information gathering:

3.1 What is the purpose of the site?
- What message are users looking for?
- What message is to be communicated?
- Is user feedback wanted and/or sought?
- How is it to be collected, sorted and measured?

3.2 Who is the audience?
- Age
- Gender
- Nationality
- Language

3.3 What capabilities does the audience have?
- Level of manual dexterity
- Level of eyesight
- Level of hearing
- Level of web site use experience
- Level of reading ability / comprehension

3.4 What are the technical and system requirements?
- Level and type of browser available
- Level and type of scripting languages supported
- Bandwidth and type of connection available
- Ability to view images
- Plug-ins requirement
- Sound card requirement
- Video player requirement
- Voice activation support
- Other software requirements

4. RULES TO DESIGN BY

A few basic rules (McFarlane, 2001):
- "*Plan, Plan, Plan*" – See Section #2 above
- "*If I die tomorrow*" – Emphasizes the importance of legible, complete and current documentation
- "*GIGO*" (garbage in, garbage out) – Good code!
- "*KISS*" – Keep is simple, seriously!
- "*Less is More*" – Include features because you should, not just because you can
- "*Pixel Perfect*" – Eliminate distractions caused by elements that jump or shift unpredictably
- "*Don't make me think!*" – Krug's 1st Law of Usability (Krug, 2000)

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 125

5. TECHNICAL REQUIREMENTS

5.1 Definition

"Technical Requirements" refers to all of the aspects of a web site that are behind the scenes and/or required to support, display and allow access to the site. For example, a site that is difficult to use, is slow to download, or that has built-in distractions will not be a successful means of communicating messages.

5.2 Related Audience (End-User) Considerations

These target audience considerations are related to the technical requirements of web development:

What are the technical and system requirements?
- Level and type of browser available
- Level and type of scripting languages supported
- Bandwidth and type of connection available
- Ability to view images
- Plug-ins requirement
- Sound card requirement
- Video player requirement
- Voice activation support
- Other software requirements

What is the purpose of the site?
- Is user feedback wanted and/or sought?
- How is it to be collected, sorted and measured?

What capabilities does the audience have?
- Level of eyesight
- Level of hearing
- Level of web site use experience

5.3 Related Principles of Effective Web Design

- Compress images to reduce download time
- Use appropriate image formats (jpg, gif, png)
- Use alternate text code for images
- Include ability for users to control text size
- Provide various user calls-to-action to collect data and seek feedback (e.g. e-mail links, forms)
- Use 'clean' or 'tidy' code to create technically sound, highly accessibile sites
- Use preloads for embedded applications (e.g . Flash) including progress bars and interesting content to keep users engaged (DiNucci, 2003)
- Include Meta tags to maximize searchability
- Include relevant titles to label bookmarks
- Provide various quality levels of audio and video to make content accessible to users on low, medium and high bandwidths
- Make sound and video available in various formats to maximize accessibility
- Include links to download required plug-ins
- Include tests for browser compatability and notification of issues where applicable

6. AESTHETIC REQUIREMENTS

6.1 Definition

"Aesthetic Requirements" refers to all of the aspects of a web site that graphically support the communicative goals, enhance audience success at getting the message(s) and increase user satisfaction with the site. For example, highly readable text and branding consistency increases communicative effectiveness.

6.2 Related Audience (End-User) Considerations

These target audience considerations are related to the aesthetic requirements of web development:

What is the purpose of the site?
- What message are users looking for?
- What message is to be communicated?

Who is the audience?
- Age
- Gender
- Nationality
- Language

What capabilities does the audience have?
- Level of manual dexterity
- Level of eyesight
- Level of hearing
- Level of reading ability / comprehension

6.3 Related Principles of Effective Web Design

- Ensure the purpose and primary message of the web site is utterly clear at first glance
- Use sans serif fonts (e.g. Arial, Helvetica) for large bodies of print to enhance the comfort level of users when reading information on-screen
- Ensure there is a significant contrast between text and background colour and/or image
- Eliminate any elements that may distract viewers or detract from the message being sent (e.g. animated gifs and background music)
- Eliminate the need to scroll horizontally, and reduce the need to scroll vertically
- Create the site to fit a minimum resolution of 800 pixels by 600 pixels
- Use white space to visually separate content
- Use appropriate and consistent branding "look and feel" elements (corporate colours, logo, etc.)
- Make content available in relevant languages and provide access from one language to the other(s)
- Ensure that text and image sizes are appropriate
- Ensure that the level of comprehension required for text is appropriate for the target audience
- Provide alternate ways of "getting the message" to ensure that a maximum number of learning styles and levels of comprehension are satisfied

7. STRUCTURAL REQUIREMENTS

7.1 Definition

"Structural Requirements" refers to all of the aspects of a web site that allow users to navigate through a site to access specific sections and pages. For example, a site with clearly marked menus and navigational tools that serve to orient and direct users will reduce end-user frustration and increase communicative effectiveness.

7.2 Related Audience (End-User) Considerations

These target audience considerations are related to the structural requirements of web development:

What is the purpose of the site?
- Is user feedback wanted and/or sought?
- How is it to be collected?

Who is the audience?
- Age

What capabilities does the audience have?
- Level of manual dexterity
- Level of web site use experience

What are the technical and system requirements?
- Level and type of browser available
- Level and type of scripting languages supported
- Bandwidth and type of connection available
- Ability to view images

7.3 Related Principles of Effective Web Design

- Keep users always within two clicks of "Home"
- Ensure that menus are consistently placed and available throughout
- Ensure excellent organization of categories within a menu item to allow for logical, intuitive, and easy access to all sections of a topic
- Provide comprehensive site maps
- Provide multiple ways to find specific information and/or topics
- Include redundant text links for all image menu items and image buttons/links
- Make e-mail addresses and URLs visible to users
- Advise users when a new window will be opened
- Apply appropriate control of new windows
- Include FAQ and/or Help sections
- Avoid tricky-to-use menu styles (e.g. dropdown)
- Include alternative methods of accessing information where appropriate (e.g. printer-friendly HTML documents, Microsoft Word, WordPerfect, Notepad, and/or PDF format)
- Divide the interface into logical areas of desktop real estate (e.g. banner, footer, body, main and sub menus, and a utility menu for user tools such as contact, site map, home, faqs, help, etc.)

8. DISCUSSION

This paper, *Principles of Effective Web Design – Increasing the Effectiveness of Internet Communications,* is intended to help readers understand just how important their involvement is to the effective evolution of the Web.

Web site users are able to directly contact web producers, resulting in unprecedented levels of global collaboration. Consequently, end users are able to submit questions and suggestions for improved usability and functionality easily through forms and e-mail. The end result is that users have become grassroots team members who are driving the demand for continual Web improvement.

This paper also addressed the various steps involved in any new media production, the expertise required and the level of involvement of team members throughout the planning and production processes. It cannot be understated just how important it is for clients, decision-makers and subject matter experts to become fully engaged in the development of a new media project (web site or otherwise) for their organization. In "The Humane Interface" Jef Raskin succinctly states the case for investing in interface design. He writes:

"*It is difficult to create a good interface when management does not think that interface design is important. In the short-term view, careful interface design may appear to add to the expense of creating a product and to lengthen the development time. In my experience, the short-term view is wrong even in the short term; improving the user interface often simplifies the design. Careful design and detailed specifications do not hinder but rather speed implementation. A superior interface is also an exceptional long-term investment that returns:*
- *Higher productivity for the customer*
- *Increased customer satisfaction*
- *A greater perceived value*
- *A lowered cost of customer support*
- *Faster and simpler implementation*
- *A competitive marketing advantage*
- *Brand loyalty*
- *Simpler manuals and online help*
- *Safer products*" (Raskin, 2000)

Participants in this interactive presentation, *Principles of Effective Web Design – Increasing the Effectiveness of Internet Communications,* will be encouraged to ask questions and offer insights throughout. Real-life examples will be used to illustrate good and bad practices.

The end-goal of this presentation will be to plant seeds of critical assessment that will grow and flourish as participants continue their individual journeys throughout the digital domain.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 127

9. REFERENCES

Berners-Lee, T. *Web Accessibility Initiative (WAI)*. W3C. www.w3.org/WAI (Last revised: 2004/02/09).

Refsnes Data. *Web Site Design*. W3C Schools. www.w3schools.com/site/site_design.asp (© 1999-2004).

McFarlane, B.L. *Principles of Effective Web Design*. Learn HTML. www.batsabode.com/html (© 2001-2004).

McFarlane, B.L. *Rules to Design By*. Learn HTML. www.batsabode.com/html (© 2001-2004).

Krug. SD. *Krug's First Law of Usability*. Don't Make Me Think. circle.com Library. New Riders Publishing. (2000)

Berners-Lee, T. *Tim Berners-Lee*. W3C. http://www.w3.org/People/Berners-Lee (© 2004).

Berners-Lee, T. Fischetti M. *Overview*. Weaving the Web. www.w3.org/People/Berners-lee/Weaving/Overview.html (1999).

McFarlane, B.L. *New Media Production Demystified*. Workbook. (2000).

Flanders, V. *Interview*. Web Pages That Suck. http://www.webreference.com/new/020516.html (2002).

DiNucci, D. *Macromedia Flash Interface Design*. A Macromedia Showcase. Macromedia Press. Peachpit Press. (2003).

Raskin, J. *The Humane Interface*. New Directions for Designing Interactive Systems. Addison Wesley. (2000).

10. ACKNOWLEDGEMENTS

Ideally, web design is a collaborative activity that involves all stakeholders to varying degrees. I am grateful, therefore, for the input, critical assessment and objective critique of the teachers, colleagues, clients and students who have provided me with important insights and constantly challenged me to improve. I look forward to learning where this collaborative journey will lead me.

11. AUTHOR NOTES

Many online resources offer information related to various aspects of web design. Some are listed here, and are also included as resources in the author's 'Learn HTML' site at: www.batsabode.com/html/resources.htm.

Several sections of the World Wide Web Consortium's (W3C) site are also included below. The W3C i s "an open forum of companies and organizations with the mission to lead the Web to its full potential." (W3C – Berners-Lee 2004).

Watchfire Corporation's Bobby Online Free Portal – An online tool to test and report on web page accessibility
http://bobby.watchfire.com/bobby/html/en/index.jsp

W3C World Wide Web Consortium - Main Site
http://www.w3.org

W3Schools' Web Site Design
http://www.w3schools.com/site/site_design.asp

W3C Tutorial - about the World Wide Web Consortium, and how the Web is standardized.
http://www.w3schools.com/w3c/default.asp

W3C Web Accessibility Initiative (WAI)
http://www.w3.org/WAI

W3C Architecture Domain
http://www.w3.org/Architecture

W3C Interaction Domain
http://www.w3.org/Interaction

Clean up your Web pages with HTML TIDY
http://www.w3.org/People/Raggett/tidy

Canadian Government Common Look and Feel Standards and Guidelines
http://www.cio-dpi.gc.ca/clf-upe/a_e.asp

Industry Canada's Assistive Devices Industry Office
http://strategis.ic.gc.ca/sc_mangb/asstdev/burst.html

Web Pages That Suck
http://www.webpagesthatsuck.com

Jakob Nielsen on Usability and Web Design
http://www.useit.com

Tomalak's Realm : Daily Links to Internet and Technology News
http://www.tomalak.org

textbased.com **-** *a blog by Jarrod Piccioni about web design, usability, simplicity and other such things*
http://textbased.com/

Advanced Common Sense[sm]
http://www.sensible.com/

Page 128

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

MUSIC IN 12-POINT PANORAMIC SPACE

Annabel J. Cohen [1,2], Coralie Vincent[1], Robert Drew[1,2], Shawn McCormack[1], & Jeff Porter[1]
[1]Arts-Netlantic, & [2]Department of Psychology, University of Prince Edward Island, Charlottetown, PE C1A 4P3
acohen@upei.ca

Tones in music differ from each other in pitch (highness, lowness), loudness, and quality or timbre. Another dimension in which tones can differ is spatial location. Space has been used occasionally for musical aesthetic purposes in past centuries. However, until the advent of recent technology, space has been more difficult to manipulate than other attributes of tones like pitch and intensity. Multichannel audio sources under computer control, coupled with multichannel amplifiers and speakers provide a mechanism for changing the location of a sound. This technology is typically used to stream music along different spatial pathways, or to develop three-dimensional effects.

The present demonstration of 12-point panoramic chromatic music exploits a different principle of spatial music than what has gone before. Here, 12 audio speakers are distributed at equal intervals around a circumference. To each speaker is assigned one tone of the chromatic scale. Every time that tone is notated in the music it is presented at that location. In this way, the pitch structure of the music is correlated with structure in audio space. The replication of the structure in space and pitch can potentially serve to emphasize that structure and can potentially heighten the aesthetic effect. In addition to capitalizing on well-established musical structures such as tonality, the circular array of speakers can create new aesthetic effects. For example, rapid sequencing from speaker to speaker can create illusory motion.

To explore the effects of 12-point Panoramic Chromatic music, in the Arts-Netlantic presentation studio, several classical musical pieces available as computer MIDI files were decomposed in such a way that all tones of one chroma (e.g., all C's, or all C#'s) were directed out of the same speaker. Thus, all C's emanated from one speaker, and all C#'s from the speaker to its right, and all D's from its right and so on to the B which emanated from the left of the original "C" speaker.

Previous psychoacoustic research conducted by A. J. Cohen and colleagues used a similar set-up within a sound-attenuated testing booth in the Department of Psychology at the University of Prince Edward Island. Cohen, Lamothe, MacIsaacs, Fleming, & Lamoureux (2001) and Cohen, Lamothe, Doucette, & Monthony (2002) determined the listener's accuracy of identifying locations in space and their ability to determine whether the illusory auditory motion of two consecutive

tones/speakers was clockwise or counterclockwise. The systematic pattern of results supports the assumption that listeners under the present realistic listening conditions are also able to localize the source of the 12 audio speakers as they were in the less naturalistic testing booth. Cohen and Lamothe (2001) also observed that a number of listeners could hear sounds only from behind them. For those listeners, the differentiation of the locations for spatial audio would be limited, if this front-back confusion remains under the more musical and realistic conditions.

The demonstration with 12 audio speakers under independent control was first established at the University of Waterloo, Department of Psychology, by A. J. Cohen in 1977. Several renditions have since followed, including a wearable headband of 12 speakers run by a Commodore 64 in the 1980's. In December, 2003, Coralie Vincent, tested the concept of presenting real music through the 12-point panoramic audio space, under the direction of A. J. Cohen. Three selections by Bach, Shostakovich & Debussy were used. Subsequently, with assistance of Robert Drew, a contemporary work for flute by Richard Gibson of the University of Moncton was employed using MIDI files created by Dale Sorenson. This Gibson piece *Rossignol* seems to illustrate well the new aesthetic dimensions of the 12-point panoramic sound.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 129

ACKNOWLEDGEMENT

NOTE

[1]Popular and classical music offer enormous stylistic variety from a repertoire of just 12 tones. These 12 tones divide the octave into 12 equal units, known as semitones. Each semitone represents a frequency ratio of one-twelfth of an octave. The 12 successive semitones, commonly referred to as C, C#, D, D#, E, F, F#, G, G#, A, A#, B, make up the chromatic scale. Much music typically relies on only a subset of 7 tones from the chromatic scale. The most common of these 7-note subsets is the major scale, familiar as *doh, re, me fa, sol, la, ti, doh*. The distance between the successive tones in the major scale is 2, 2, 1, 2, 2, 2, 1 semitones. Within a piece of music, the tones of the scale are used with unequal probabilities. In other words some tones are used more often than others. This unequal weighting of the tones leads to expectations on the part of the listener about what tone is to be presented next. Predictable characteristics of music, such as frequent sounding of a particular note, enable the mental establishment of a reference structure for the musical piece. The establishment of a central reference tone in music is referred to as tonality. Tonality can arise through the presence of a variety of cues, be it repetition of a central tone, high intensity of a particular tone, or learned cues such as the a relation like *ti doh* which has come to signify the structural significance of the final note, *doh*.

REFERENCES

Cohen, A. J., Lamothe, M. J. R., MacIsaacs, R., Fleming, R., & Lamoureux, M. (2001). Does proximity govern judgments of auditory direction in the azimuthal plane? *Journal of the Acoustical Society of America, 109*, No. 5, Pt. 2, pMUa3 Abst.

Cohen, A. J., Lamothe, M. J. R., Doucette, S. M., & Monthony, J. F. (2002). Absolute identification of azimuthal sound location and judgment of auditory circular direction. *Canadian Acoustics, 30*, 144-145.

Page 130

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

A VIDEO DOCUMENTARY DESCRIBING AN EARLY EXPERIMENT IN ART AND TECHNOLOGY

JoDee Samuelson[1], Copthorne Macdonald[2]
[1] Artist-Technologist, Prince Edward Island, Canada
[2] Artist-Technologist, PO Box 2941, Charlottetown, PE, Canada C1A 8C5   email: cop@cop.com

1. DESCRIPTION OF THE 1967 PROJECT

In 1967, electronic engineer Copthorne Macdonald and artist Roberta Phillips collaborated to produce a work of art that was exhibited first in Boulder, Colorado and then in New York City at the Brooklyn Museum's 1968 Experiments in Art and Technology exhibition. Entitled *"Speak that I may see,"* the work was a multimedia creation which integrated a classical human-figure sculpture with music and the electronic generation of constantly changing visual patterns.

The work was a center of interest at the Brooklyn Museum show, and the New York Times chose to photograph it for its article about the show.

The work is described in the catalog of the Brooklyn Museum show as follows:

"The face of this plaster and electronic sculpture in the form of a life-size seated nude woman is a cathode ray tube. The time-varying waveforms present in recorded stereophonic music are used to generate patterns which appear simultaneously on this screen. A tape loop cartridge stores the information, giving a continuous presentation which is repeated every 15 minutes."

Copthorne Macdonald adds additional detail:

The electron gun in the cathode ray tube caused a bright spot to appear on the face of the tube. The music in one stereo channel caused the spot to move back and forth horizontally in response to the music. The music in the other channel caused the spot to move vertically. If the musical content in the two channels was identical, the visual display was just a boring diagonal line. But in many stereo music recordings quite different sounds are recorded in the two channels, and this caused visually interesting dynamic patterns to appear on the statue's "face." The stereo music selected for the tape loop cartridge was of this latter kind.

2. DESCRIPTION OF THE 2004 VIDEO DOCUMENTARY ABOUT THE WORK

The Arts-Netlantic Partnership was perfect match for both Cop Macdonald and JoDee Samuelson. Both of us are artists and both are technologists, though with different areas of expertise and interest. We felt that a record of this early experiment in art and technology would be a valuable addition to the archives of the Arts-Netlantic project. Because of this we made a short digital video documentary in which Cop talked about his 1967 Art and Technology partnership and the 1968 EXPERIMENTS IN ART AND TECHNOLOGY show at the Brooklyn Museum, and shared with us some of his views on the artist/ technologist collaboration process.

A variety of visual images were used in the documentary. These included 2004 video footage of Cop telling the story of the 1967 collaboration, a videotaped demonstration of the pattern-creation process using an oscilloscope, and a variety of 1967-68 artifacts including photographs of the work, photographs of Cop and Roberta, the catalog of the Brooklyn Museum show, and the New York Times photograph of the work.

The documentary by was shot by JoDee Samuelson using a Canon digital video camera, and was edited using the Avid suite in the Arts-Netlantic studio.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 131

3. BIOGRAPHY OF COPTHORNE MACDONALD

Copthorne Macdonald is a writer, independent scholar, and former communication systems engineer. He writes about the nature and development of wisdom, new perspectives on mental and physical reality, and creating a sustainable future. His published works include seven books (three that deal with the nature and development of wisdom) and over 130 articles, reviews, and column installments.

Copthorne Macdonald's first career was electronic engineering and R&D management. As a university student he developed a slow-scan TV system that enables radio amateurs to send pictures around the world using their short-wave voice radio equipment. The paper he wrote describing the system won the 1958 National Student Paper competition of the American Institute of Electrical Engineers. Later, at Westinghouse, he designed a system that transmitted weather radar images over phone lines and another that put voice and sequenced still pictures on ordinary 33 rpm phonograph records. In 1965 he became Manager of the Electronic Design Department at Ball Brothers Research Corporation in Boulder, Colorado, and in 1968, Director of Research at Vidcom Electronics in New York City. He holds five U.S. patents. In 1967-68 he collaborated with artist Roberta Phillips to create a work of electronic art that appeared in the 1968 "Experiments in Art and Technology" show at the Brooklyn Museum. The *New York Times* featured the work in its article about the show. His engineering-related publications include numerous articles on slow-scan TV, a contribution to *Specialized Communication Techniques* (Newington, CT: American Radio Relay League, 1975), and a 1997 book entitled *Bridging the Strait: The Story of the Confederation Bridge* (Toronto: Dundurn Press, 1997). Copthorne is a member of The Association of Professional Engineers of Prince Edward Island and the Tau Beta Pi and Eta Kappa Nu engineering honor societies.

In 1972 Copthorne founded New Directions Radio to foster socially-relevant communication, and in 1995 established an Internet-based compilation of wisdom-related resources called The Wisdom Page. He has done extensive educational work in the field of energy alternatives and energy conservation. Formerly a columnist with two U.S. national magazines and Associate Editor of one of them, he is currently on the Editorial Board of Integralis: Journal of Integral Consciousness, Culture, and Science. He is a citizen of both the U.S. and Canada, and lives in Prince Edward Island, Canada.

4. BIOGRAPHY OF JODEE SAMUELSON

Born and raised in the Canadian prairies, filmmaker and artist JoDee Samuelson now lives on the beautiful south shore of Prince Edward Island, Canada. In 1971 she was a co-founder of the Island's first health food store, The Root Cellar.

She has made many film and video productions, plus two award-winning animated films: The Bath (a*n elderly woman takes a bath and feels rejuvenated*); and The Sandbox (c*hildren create an imaginary world: things go awry when their teddy bear gets lost in the confusion and busy-ness of modern life)*.

Recently JoDee completed a new short animation, Mabel's Saga. In this fifteen minute film, purple-haired heroine Mabel is going through menopause. As all those baby boomers out there know, this is a rather complicated -- and surprisingly humorous! -- phase of life. Look for it coming soon to a film festival near you.

Mabel's Saga was created on a Mac computer using a drawing tablet, scanner, good monitor, comfortable chair and lots of tea. It is a co-production of Canoe Cove Productions Ltd. and the National Film Board of Canada.

JoDee also paints, and most summer mornings she can be found out in the porch painting cheerful scenes of Island life.
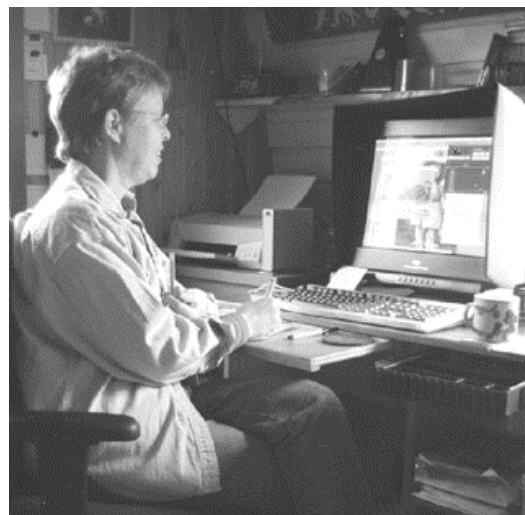
JoDee at work on Mabel's Saga

Page 132

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Lift
Trisha Clarkin

As an artist, I have been living here in Charlottetown, for the past 4 years. Though, I have been making annual pilgrimages here all my life. Both my parents were of the Island, and were part of the great out migration of Islanders that took place following the Second World War. My fathers death, while serving in the Canadian Forces, when I was only two, left me with a powerful sense of belonging to this place of his childhood.

Ten years ago, at the age of thirty, I developed a progressive neurological disorder called Spinal Muscular Atrophy which is a form of Muscular Dystrophy. This brought about my return to Prince Edward Island. I had been living in Toronto and latterly, Portland ,Oregon, where I was working in apparel, textile, and interior design. Since returning to P.E.Island my work has been one of both personal discovery and challenge, married to greater understanding of the importance of community, even if often experienced by it¹s absence.

Art Exhibits
Charlottetown, P.E.I., Canada

Curated
€Levi Cannon¹s ALL OUR RELATIVES, at the Keir Gallery, September. 2000
Healing show series-
€ANATOMY, at the Gallery in the Guild, April 2001
€ART WITH HEALING, at the Confederation Centre, September 2002
€lift, the healing continues, at the Confederation Centre, October 2003-January 2004

Exhibited
€GARDEN OF THE GULF EXHIBITION, juried group show at the Confederation Art Gallery, April 2000
€IT EXPO ART EXHIBIT, UPEI sport center, May 2000
€ONE CLUE OVER THE CROW¹S NEST BUSH, a group show with clues, an exercise of the f.artss (artist group) at the Guild Gallery, March 2001
€ANATOMY, a group show at the Gallery in the Guild, April 2001
€RESIDENTS OF JAMAICA, a show of photography at the Farmer's Market, April 2001
€ILLUMINATIONS, a group show of the f.artss (artist group) in Luenburg, Nova Scotia, Sept. 2001
€Group Island Artist Show at the ArtZone, December 2001
€Lightworks, new media exhibit at the Delta, September 2002
€Climate Change Expo at the Confederation Centre, September 2003

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 133

Technology Experience

Developed and built two web sites for trishaclarkin.com. On web from 1998-2002. The later site included flash technology to view textile designs. I work with Flash, Adobe Illustrator, Adobe Photoshop, Dreamweaver, Photo Show and Claris Works.

Main Goals

To build, and be in community. To create, learn, and grow...to have fun, heal. To be.

I am exploring new ways of developing collaborative artistic expression. In particular, Healing, a series of yearly currated group shows, exploring the process of healing and it's relationship to art: its process and expression.

Project Description

Continuing with the Healing series, I will video tape lift, the healing continues, and compile images of artist's work to create a virtual show to be mounted on the web.

My purpose is to explore the technology of the 21st century by working with the technology and technicians available at the university in creating a virtual show.

My vision, to marry the artists, their art, the technolgy and technologist in the new paradigm of community. (Cybersphere).

This combined arts-tech is innovative in that by marrying the skills of artist and technologist we create more than was before.

This project is inspired by the philosophy of Teilhard De Chardin and the concept of Noosphere .

"Pushed one against the other by the growth of their number and by the proliferation of their connections, approached one to the other by the reawakening of a common force and by the feeling of a common anxiety, the future human kind will form nothing but an unified consciousness".
Teillhard De Chardin

Page 134

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

CLIMATE CHANGE WEB PAGE ARTSNETLANTIC ARTIST/TECHNOLOGIST AWARD PRESENTATION JAN MOLLISON/NIGEL CUTHBERTSON IN ASSOCIATION WITH THE SOUTHEAST ENVIRONMENTAL ASSOCIATION

Purpose:

Our purpose was to interpret Climate Change issues as they relate to Prince Edward Island residents.

Vision:

Our vision is to share local concerns about Climate Change (where Climate Change is defined as, "...a change in the "average weather" that a given region experiences,") and to instigate dialogue between artists and individuals concerned about changing climate through the development of an interactive, new media production.

Outcome:

We have produced a multi-level web page which highlights activities undertaken by Prince Edward Island individuals, groups, organizations and governments to reduce the use of fossil fuels and foster environmentally friendly, sustainable solutions to our current energy crisis.

The site opens with a page that asks the viewer what climate change is, whether it is really happening, etc. When the curser is placed over one of the questions, a short answer pops up. The answers are designed to give viewers a general idea of the issues surrounding climate change. A button entitled, "The Island Connection" is located at the bottom of the page. When the visitor clicks on this, the main page of the site is launched.

The main page is divided into 5 sections with the headings:

How will it affect PEI.

What can we do?

What we're doing.

What Islanders Think.

What do you think?

When the visitor clicks on the "How will it affect PEI, a page containing information about local changes which may occur if the climate continues to change is displayed.

When "What can we do?" is clicked, a page containing suggestions to lower individual green house gas emissions is displayed.

The "What we're doing." page features examples of initiatives undertaken by individuals, groups, organizations, governments and businesses to lower green house gas emissions.

Each of the pages contains photographs of PEI relevant to the answers being provided. Island landscapes, shots of energy efficient buildings and the providers of "alternative" energy are featured. There are also a number of photographs of symbols of local initiatives such as the Island Waste Watch program, recycling efforts and lifestyle changes which will help reduce greenhouse gas emissions.

When "What Islanders Think." is activated, a page containing four questions (Is our climate changing? Is climate Change good or bad? What Can we do about it? Do you think it will affect the "Island Way of Life?) Appears. When the visitor clicks one of the questions, videotaped answers from Islanders are triggered. The answers reflect individual perceptions about climate change and its effect on the Island.

When the question, "What do you think?" is activated, a page containing a climate change "rant" opens. At the end of the rant the visitor is encouraged to submit personal observations or interpretations about climate change to the site, the more creative the better.

All but two photographs and all videos in the web page were taken by Jan Mollison over the course of the last eight months. The video segments were captured by Jan Mollison during and after "White Juan" and edited on the AVID Adrenaline system at the UPEI Arts-Netlantic studio in Charlottetown. The footage was adapted for the web by Nigel Cuthbertson at Computronics in the West Royalty Industrial Park..

The web page research, story boarding and scripting was done by Jan Mollison and the web page formatting and final design was executed at Computronics.

While the general execution of the project went smoothly, we did run into a few minor hitches along the way. The original proposal submitted to Arts-Netlantic contained a sample of a slide presentation I planned to adapt to the web which featured Luis Armstrong's "What a Wonderful World." Despite many enquiries, at the time of writing this, I have been unable to contact the copyright owners of the song and therefore cannot obtain permission to use it on the web page. I have, however, obtained permission to adapt music written and produced by Penny Little of "The Away Team," a rock group based in Santa Monica, California, to create an alternative presentation which will appear on the web site when production is completed.

This project would not have been possible without the support of Arts-Netlantic, which provided both funding and incredible media production facilities at no charge, and Nigel Cuthbertson, who took time from his busy schedule to lend his expertise to the project. It wouldn't have been completed without their encouragement and support.

-Jan Mollison

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 135

Jan Mollison
Artist/Communicator
e-mail: artsy@isn.net ;
http://www.isn.net/~artsy

Jan is a visual, multiple-media artist with a penchant for sculpture and the use of computer graphics programs in the production of fine and commercial art work. Although a Prince Edward Islander by birth, she spent many of my formative years in Toronto where I was exposed to a wide range of visual and performing arts. Jan saw one of the first video synthesizers while studying at OCAD and fell in love with the versatility of the medium. Since then, she have taken advantage of every opportunity to enhance her understanding of this electronic medium.

Her education in the arts includes:

• Associate degree from Ontario College of Art and Design, Toronto, Ontario.

• Diploma from the Desktop Publishing program, Business Training Centre, Charlottetown.

Jan's work has been included in numerous Holland College, Great George Street Gallery and Arts Guild Gallery exhibitions as well as several annual juried Garden of the Gulf exhibitions.

• Two of her pieces are in the permanent collection of the Confederation Centre Art Gallery and Museum: "A Look Back" ("Tea for Two"), a bronze table setting with bronze pastries, tea pot, dishes, napkins and cutlery... And..."The Adoration, with archivally preserved possible Anne bone fragment," a multiple media triptych exploring the relationship of the storybook character and the Island way of life.

When not creating slide shows and press releases at work, Jan spends her spare time working on "light" works - abstract works created using the PC version of Corel Draw 9 program as a tool. She also makes images in other mediums, scans them into Photoshop, and manipulates them before printing them on an Epson Stylus 640 printer.

Jan's career goals include developing and implementing effective, interactive communications products which incorporate visual and aural learning processes.

Nigel Cuthbertson   I.S.P.
Technologist
(nigel@make-it-simple.com)

Born in Yorkshire England, Nigel spent his early years living between Willowdale, Ontario and Charlottetown P.E.I. He developed early talents in small business by assisting the family tourist establishment on PEI. He received his formal education at Seneca College and the University of British Columbia. He took the vocational education path of formal education gearing him to a more practical approach to business.

Nigel has led a team in developing a healthcare information delivery system for mentally handicapped people called Smart Access Method (S.A.M.) Multimedia - Healthcare and Life skills.(www.make-it-simple.com). This product was marketed and sold across North America.

In 1993, Nigel was recognized by INTEL Corp. of Santa Clara, CA. the world leader in computer technology, for his unique application of digital video imaging in learning modules. He has been recognized as an "Internet Pioneer" by Industry Canada. He has also been recognized by The New Brunswick Community College in Miramichi, New Learning Technology Dept. for the development of student entrepreneurs, and The Halifax Group for development strategies on the New Media Learning Material development in Canada. In 2000 he was recognized as one of the 50 best CEO's in Atlantic Canada by Atlantic Progress Magazine. He received accreditation as an Information System Professional of Canada (I.S.P.) from The Canadian Information Processing Society and is an active member of the organization. He lives in Winsloe P.E.I. with his wife and three children. Contact phone (902)566-2714

THINK LIKE A FISH:ATLANTIC CANADA IN ANIMATED DIGITAL PAINTINGS

Daniel Ledwell and Patrick Ledwell

Purpose

 "Think Like A Fish" is an animated narrative that reflects, in a fantastical, whimsical style, the hardships and humour of life in modern Atlantic Canada. While the narrative is told in a storybook fashion, the themes are expressed in a manner that appeals to audiences of all ages, stressing the elements of trickery and perseverance that underlie the work of the Maritime raconteur.

New media, particularly digital video and audio, offer a broad, vibrant palette for working with these traditional themes. The animation is carried out by transforming traditional paintings into layered and moving canvases, and builds collages of traditional and electronic music. "Think Like A Fish" aims to pursue storytelling in its most contemporary mode, but toward the end of capturing the distinctive aural, visual, and cultural landscape of the Maritimes.

Patrick Ledwell has a background that blends literature, new media, and graphic arts. He holds Masters degrees in English Literature and in Information Design and Technology from Georgia Tech. He collaborated on a NEH funded CD-ROM project, "Griffith in Context," which aimed to surround the controversial 1914 film *Birth of a Nation* with commentaries fleshing out its filmic, historical, and cultural underpinnings.

Presently, he co-ordinates the Interactive Multimedia program at Holland College. The program accepts students from a wide range of educational and professional backgrounds, ranging from fine art to computer programming to business marketing.

He also enjoys writing and comedic acting.

Danny Ledwell is a visual artist and musician. He was a student of Fine Arts at Mount Allison University from 1998 until 2002. As an artist, he has recently been exploring the Island way of life through the use of childhood memories and animals. He is currently preparing for a fall solo exhibition, "Agropolis," with support from the P.E.I. Council of the Arts.

Danny is also active in the New Brunswick and P.E.I. music scenes, embracing styles ranging from funk to roots-rock to traditional. His original compositions have appeared on "Conduct Becoming: Mount Allison Voices Against Cancer" and has a solo album in production. Using digital technology, he has supported numerous local musicians in recording projects.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 137

Passages

Yolande Desjardins

ydesjardins@rogers.com

http://creationsflash.com/cv/

Description :

Cette œuvre digitale tentera de recréer l'expérience du fœtus dans le sein de la mère et ce jusqu'à sa naissance. Période de gestation, de confort (si les éléments extérieurs le permettent), ensuite étape de la naissance souvent pénible mais essentielle et incontournable si le fœtus veut naître.

Toujours vu des yeux du fœtus, l'expérience de la naissance sera interprétée à l'aide de dessins, couleurs et textures appropriées, montage d'images et de sons (existants ou créés). Cette oeuvre numérisée se veut une recherche sur les possibilités d'expression des nouvelles technologies. Les images imaginées et/ou réelles s'allieront aux sons et musique pour recréer l'expérience du processus.

Cette œuvre se veut aussi l'illustration d'une philosophie de vie. Ce processus peut se répéter tout au long d'une vie : période ou l'on se développe dans un confort relatif (gestation), mais lorsque nous sommes arrivés à maturité, que notre apprentissage et développement est complet, nous devons sortir de cette phase sécuritaire pour s'en aller vers l'inconnu (naissance). Le passage est parfois difficile, et l'insécurité de laisser un milieu connu peut être traumatisant, mais c'est un point de non retour dans notre développement, autrement c'est la stagnation, la mort… Après viens l'éblouissement d'une nouvelle naissance et le début d'une nouvelle croissance.

Dans ce sens cette œuvre se veut mi-réaliste, mi-imaginaire recréant ainsi l'expérience de chaque passage.

Méthode:

Tout d'abord, approfondir les connaissances sur le processus de la gestation et de la naissance. Études récentes sur le fœtus, collecte d'images (photos, dessins, ultrasons, vidéos...), fabrication d'images , sélection des logiciels (ex : recherche sur divers logiciels de réalité virtuelle) à savoir lequel remplira de façon optimale l'effet recherché tout en respectant les contraintes budgétaires.

Les intentions du départ doivent être continuellement réajustées tout dépendant les trouvailles en cours de route et les contraintes techniques. On doit composer avec la compatibilité des filières et les capacités des divers logiciels. Lequel de ces logiciels rendra justice à l'effet ou l'émotion recherchée? Par exemple le logiciel de Macromedia (Flash MX) serait souhaitable pour de l'animation et bien d'autres fonctions (boutons etc.), mais ne rendra pas l'émotion d'une visite virtuelle (logiciel VR). Comment fusionner les deux? Il serait intéressant d'y ajouter des images vidéo réelles, mais est-ce que le logiciel Avid (montage vidéo) sera compatible avec ces derniers logiciels ou est-ce qu'il serait préférable de travailler le vidéo avec Flash? C'est une recherche et analyse continuelle ou les contraintes de la technologie nous force à faire des choix, des choix qui ne pénaliseront toutefois pas l'expérience esthétique. On éviterait certainement des casse-tête en réalisant l'œuvre avec seulement un logiciel, mais chaque logiciel a ses limites et l'apprentissage fait serait moins enrichissant.

Composer avec les limites de la technologie tout en gardant une souplesse et profiter des découvertes et accidents de parcours. Voilà la clef de succès du projet. .Le résultat sera probablement très différent de l'œuvre imaginée au départ mais le thème restera le même et possiblement plus riche.

Biographie

Yolande Desjardins

ydesjardins@rogers.com
http://creationsflash.com/cv/

Yolande Desjardins est née à Drummond Nouveau-Brunswick ou elle a fait ses études primaires et secondaires. Les passe-temps favori dès le jeune âge, sont le dessin (surtout pendant les classes) et créer des œuvres avec matériaux trouvés sur la ferme ou elle a grandit : reste de planches et de peinture, plume, etc. tout peut servir à créer une nouvelle image et une émotion. C'est l'exploration continuelle des matériaux et outils disponibles.

Après la douzième année elle poursuit ses études à l'université de Moncton en Sciences Familiales ou elle voit une très grande diversité de cours. Elle refuse d'être « formée » par les arts visuels voyant les travaux des étudiants et ne s'identifiant pas à ces œuvres. Mais la curiosité l'emporte et elle va toutefois faire des cours plus tard aux arts visuels à l'université de Moncton. Elle fait aussi une année de cours au CCAC (California College of Arts and Crafts) ou elle se spécialise en Environmental Design. Qu'elle est la différence entre les arts visuels et le design? Voilà la motivation du choix.

Elle devient par après artiste professionnelle en arts textiles ou elle fait quelques expositions solos avec l'aide du conseil des arts du Canada. Elle participe aussi à quelques expositions de groupe. Elle travail pendant ce temps sur des productions cinématographiques comme costumière, habilleuse, accessoiriste, assistante au montage, synchronisation. Elle cherche à exercer le plus de fonctions possibles, refusant d'être cantonnée dans une spécialité. N'ayant pas la chance d'assister à la caméra, elle se tourne vers le bénévolat au câble pour travailler sur la caméra en studio et à l'extérieur. Pendant ce temps elle fait aussi du dessin à la pige en cours de justice pour CBC et CBAFT.

Exerçant la vie d'artiste à la pige pendant quelques années, elle se tourne vers l'enseignement des arts visuels dans les écoles. ou elle remplace un professeur pour trois ans. Elle se tourne par après vers les arts commerciaux : les métiers d'arts.

Elle débute cette nouvelle aventure par l'exploration des possibilités commerciales du batik. Les batiks lumineux mis sur pieds de façon expérimentale (concours Assomption – voir porte folio) donne des réactions intéressantes aux salons de vente, mais en temps de récession et après observation elle se tourne plutôt vers des produits à prix plus abordables. De là est née l'entreprise Créatex ou elle s'adonne pour huit ans à la création de nouvelles techniques pour t-shirts : tie-dyeing, craftprinting, impression de batiks etc. En plus de la participation à des salons de vente nationaux et internationaux, elle offre aussi un service de sérigraphie sur produits textiles à la localité. C'est pendant ce temps qu'elle siège sur le conseil des arts du Nouveau-Brunswick comme membre du jury et qu'elle s'en va au Bénin comme consultante sous l'égide du ministère des Affaires Intergouvernementales du Nouveau-Brunswick.

Elle découvre un engouement pour l'informatique lors de l'acquisition d'un système pour Créatex en 1997. Elle doit travailler sur divers programmes comme Corel Draw, Photoshop etc… pour le service aux clients. Elle élabore aussi à l'aide de Front Page le premier site internet pour Créatex.

Elle vend l'entreprise Créatex en 1998 pour retourner aux études et cette fois-ci en informatique. Utiliser des logiciels on peut toujours se débrouiller si on y met le temps, mais qu'est-ce qui se passe dans le cerveau de l'ordinateur, qu'est-ce qu'est la programmation? Se familiariser avec le fonctionnement interne, voilà les motivations. Après une année d'études, elle devient webmestre à son compte ou elle travail à quelques projets et fait une recherche sur le 3D et le web.

L'exploration, voilà les motivations des choix. Reste un penchant évidant pour les arts et les nouvelles technologies où les défis sont sans limites.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 139

Time Travel In this Moment
Valerie Leblanc

Valerie LeBlanc's website www.timetravelinthismoment.com. and the DVD of videos contained on the site was launched on Friday, February 27, 2004. The site and DVD feature videos based LeBlanc's writing. Humanistic in sentiment, the texts attempt to look at the bigger picture of the 'New World Politic.'

The writing featured in the Time Travel in This Moment project was mainly completed during the Fall of 2002 and the spring of 2003. The first public stage of Time Travel in this Moment involved live broadcasts of Guest Readers over the Internet. The Readers were chosen to represent a cross section of gender, race, age and cultural backgrounds. Each person read the same selection of 10 works based upon mediation and cultural conditions. The broadcasts took place from EMMEDIA in March of 2003. The readings were used as the basis for most of the videos posted on the site.

 … On some days, it appears that the most that any individual can do is to be aware of the flood that we stand in. Some days it is easier to sift through and make sense of the world, some days it becomes overwhelming. Through it all, the forces of marketing insist that we keep it running on time for the quarterly report. At times, the disaster is so great that everyone has to stop and take a breath. On those days when attempting to ride the wave might instigate a news headline, it would be easier to walk along the shore and gather repose. For some of us, there is the option to go online and virtually invite Pandora over for pizza and wings. …

Page 140

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

do_wild_loops; do_wild_jumps; [big ceo's talking to small bugs]

Daniel Dugas

What do you know about insect politics?

In the spring of 2002, scientists were forecasting a severe infestation of grasshopper for Central Alberta. I quicklybecame interested in seeing how the farmers were going to deal with the situation.

The most common solution, insecticide is also the most hardcore. Chlorpyrifos, trade name Dursban, Lorsban and others, is primarily produced by the US multinational DOW Agro a subsidiary of the Dow Chemical Company and is used widely throughout the world. Chlorpyrifos is one of about 100 organophosphate insecticides on the market today. It is a neurotoxin used to kill insect pests by disrupting their nervous system. The organophosphates were developed during the World War Two by Nazi chemists. (1)

According to Dow, Chlorpyrifos, is one of the great success stories in pest control today. (2) As The Dow Chemical Company is the main player in this field, I started to look at the company itself; its products, triple bottom-line, history; and the most crucial element of all, its trading values. Dow is known for all sorts of chemistry feats; like the first commercial scale production of bleach in 1898, the production of silicones for the military in the 40?s, the introduction of the revolutionary Ziploc bag in 1968, the marketing of the first compact discs in 1983, and so on. In 1960, Dow introduced 23 new products. One of

them was destined to be a hit, one that would generate enormous profits for the company. The name of this amazing new product was Agent Orange.

In the 90?s Dow Chemical was involved in the silicone breast implants controversy. The Company dodged lawsuits by proving ? ? that it only owned half of the breast-implant manufacturer Dow Corning Corporation and that they did not develop, test or manufacture silicone breast implants. ? ? (3)

In 1999, Dow and the infamous Union Carbide Corporation merged to become the 2nd largest chemical company in the world. Union Carbide Corporation owned and operated the pesticide factory which caused the worst chemical accident in history. Located in Bhopal, India, over 40 tonnes of highly poisonous methyl isocyanate gas leaked out of the plant at midnight on December 2, 1984. More than 8,000 people died in the immediate aftermath of what is known as the Chemical Hiroshima. 10 more are dying every month due to exposure-related diseases. At present, Dow is divesting itself of any moral and financial responsibility related with this tragedy. (4)

May the force be with you

Through my research, I learned that one of the basic ways to curb the grasshopper population is to clean the ditches alongside of the roads, and to turn over the soil in the fields. The process would uproot and expose grasshopper eggs, consequently greatly reducing problem infestations. These solutions might be viewed as rather sissy compared to the product solutions proposed by the industry: Lorsban 4E, Warrior T, Capture 2EC, etc.

Some of those products, and especially the Genetically Modified Organisms are re-writing ecology FAST FORWARD. The desire to master the world has never been so tempting, while the power to resist such changes remains limited at best. A quote by Dr. Denis Waitley, Productivity Consultant for Monsanto, one of Dow?s largest competitors, sums up the situation in a vivid manner, There are two primary choices in life: to accept conditions as they exist, or accept responsibility for changing them.? (5)

I became interested in the interaction and the power relation between the ?head? and the ?tail?, the CEO?s and the bugs, the decision makers and the individuals. Dow has a Leadership web page with a thumbnail photo and a biographic description for each of its executives. I have copied and pasted everybody who?s somebody and I gave them a big cushy leather

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 141

executive chair right in the middle of my project. For several years, the focus of my work has been related to economy. Boom and bust alike. One economic tool that I have followed with regularity is the Map of the Market (6), which provides a colour coded map of current market values. This visual aid was inspirational for the do_wild_loops? project.

Last but not least, Kamandi, The last Boy on Earth .(7) During my research on ?insect politics? I came across this
1970?s comic cult favourite. The series presented the idea of a future world ruled by animals with great command over human slaves. A sort of variation of the Planet of the Lost Apes, the young Kamandi rides a giant grasshopper to outwit his evil captives. I managed to purchase No. 12 from December, 1973. It seems that the fear of losing control
over the natural world, the idea of a terrifying reversal of dominance in the Animal Kingdom has been a recurring
topic both in fiction, and in the real life. Maybe the inventors of insecticides and herbicides are combating such mythical demons as the dreaded Mr. Sacker.

Working with the Cycling74 AX/MSP and the Jitter programs I set up a series of mechanisms to download financial
information from The Dow Company (the latest price of a share, the percentage change and the dollar change of a share), setting up a custom ?map of the market.? I use this information to affect and inflict changes on the selected movies, images and sound files inside the program. I created a structure where the visitors could re-write, if not history, at least the biographies of the Leaders.
Visitors to the exhibition can select and erase the previous biography, write a new one and upload it on the server where the web site of this project is hosted. The new biographies and the image of the projections can be read and seen at: ttp://www.dandatadugas.com/dowild.html

Daniel Dugas
Calgary, March 23, 2003 information on Bhopal:http://www.bhopal.net/index.php
5 - Monsanto Products Overview: http://www.monsanto.com/monsanto/layout/products/default.asp
6 - SmartMoney.com: Map of the Market :http://www.smartmoney.com/marketmap/

7- Kamandi, The Last Boy on Earth Vol. 2. No. 12. Dec 1973.
Published by National Periodical Publications Inc. N.Y.
N.Y.

Page 142

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

RAM

Paul Henderson, Manager, Faucet Media Arts centre

RAM explores the beauty and the mundane of the everyday through split-screen juxtapositions and a hypnotic soundtrack built from sampled sounds. An open narrative is achieved without dialogue or narration.

SCOOTER TRAMPS, 4min, 2003, Super8 film/Digital Video.
Taking music, narration and images from three different sources, SCOOTER TRAMPS is another take on the classic Canadian road story. A not so nostalgic portrait of the foibles of youth and romantic idealism.

OUTOMODER, 3min, 2002, Super8 film/Digital Video. A homage to the spirit of DADA. Built from the frustrations of isolation in an overwhelming world, OUTOMODER attempts to reconcile the potential and inefectiveness of modern communictation.

Paul Henderson is a inter-disciplinary artist, graphic designer and the manager of Faucet Media Arts at STRUTS Gallery in Sackville, New Brunswick. Paul recently moved from Dawson City, Yukon, where he spent the last 4 years teaching art & design and doing a bunch of other things at the Klondike Institute of Art & Culture. Now in Sackville, Paul is enjoying programming a weekly radio show and taking long walks on the beautiful tantramar marsh while radio waves from CBC International pound his defenseless little brain. He recieved his BFA from the Alberta College of Art & Design in Calgary in 1999.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 143

IS IT BECAUSE?

W.L. Altman, Helen Pridmore and Donna Wawzonek

Conceived by W.L. Altman as a concert piece for solo voice with live electronics, it was originally commissioned as part of a concert for voice alone, The Naked Voice, first performed by Helen Pridmore at Sound Symposium XI in St. John's, Newfoundland. The piece addresses ideas of human isolation and need for contact, the infinite distance that separates even those in close physical and emotional proximity. It also deals with language's perplexingly dual functions as both a primary means of communication in a literate culture, and as the labyrinth we negotiate in search of meaning. Thus we "receive" meaning within language, more than directly through it. "Is it because?" presents language reflexively, as both ideal and phenomenal.

The live voice goes through a series of harmonic and rhythmic patterns which work with and against the patterns of the digital processing. The processing is quite simple and constant, but the evolving juxtaposition of the vocal patterns creates complicated inner relationships between several layers of text and rhythm. The text is sung in alternate splices of English, French and German (three of the dominant European languages of the past three centuries): "is it because I cannot understand, that I find your language so sexy?". The effect is that of a mesmerizing field of layered not-quite-comprehensible words dancing in slowly shifting harmonies and textures.

Ideally the sound would be experienced in a dark room or with eyes closed. But with a live performer on stage, adding a visual element that would work with the existing aesthetic seemed like a better means to round out the piece. So the composer asked Donna Wawzonek to create video that would draw the listener into the stratified sound field. The resulting mix of found and abstract images are layered in obscurely connected sequences that complement the structure of the existing musical piece, the live performer and her disembodied sound. The resulting audio-visual performance is definitively a collaboration between three artists. The origin and direction of the physical, sonic and visual materials are undermined by deconstruction, and enriched by polivalent juxtaposition. Our natural desire to understand objective content is supplanted by the even more natural human process of working through multiple angles and perspectives of independent phenomena to find meaning within the very process. The originally intended message is, depending on your interpretation, either lost or enriched by the multi-sensory experience.

Page 144

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

W.L. Altman is a composer, experimental musician and interdisciplinary artist. His work has been commissioned through the New Brunswick Arts Board, Meet the Composer, the Nebraska Arts Council, among others. He performs with and composes works for New Brunswick groups 5 Guys, Sbot N Wo (Spoiled brats of the New World order) and MOTION, PEI's eklektikos, as well as others in Canada and the US.

He and Donna Wawzonek are working on a new multi-media "opera", commissioned by MOTION for a premiere in spring 2004. He was also commissioned to contribute a work to be heard on the new CD "City Nights" released by Janice Jackson and Simon Docking.

Soprano Helen Pridmore has performed across Canada and the USA, as both soloist and chamber musician. With a special interest in new music, she has been a featured soloist at events like Newfoundland's Sound Symposium, and has premiered many works by Canadian and American composers. She is a member of Motion Ensemble, New Brunswick's new music ensemble, whose concerts include scored music, improvisations, and interactive electronic and visual media. Motion recently performed in New York City, and will tour in Ontario, Manitoba and Saskatchewan this spring.

Dr. Pridmore was born in England and studied voice and piano in Saskatchewan, Montreal, Toronto and the USA, earning a doctorate at the Eastman School of Music. She teaches voice and vocal topics at Mount Allison University in Sackville, NB.

Donna Wawzonek is a curator, writer and artist currently working as the Curator of the Dunlop Art Gallery in Regina, Sk. She has published for magazines and journals including Parachute and Fuse, and has recently written for Alternator and AKA Art galleries. She is currently working on a curated group show for Easter Edge, an artist-run centre in St. John's.

International Conference on New Media Research Networks, Charlottetown - March 26 - 27, 2004
Conférence sur les réseaux de recherche en nouveaux médias, Charlottetown - 26 - 27 mars, 2004

Page 145