

CANADIAN TRANSPORTATION AGENCY

BETWEEN:

GÁBOR LUKÁCS

Applicant

- and -

AIR CANADA

Respondent

REPORT OF PROFESSOR JEREMY R. COOPERSTOCK

I, Jeremy R. Cooperstock, Associate Professor of Electrical and Computer Engineering, of the City of Westmount, in the Province of Quebec, SAY THAT:

I. INTRODUCTION

1. I am an Associate Professor in the Department of Electrical and Computer Engineering at McGill University. Part of my expertise involves data structures and databases.

2. I am submitting this Report to provide my expert opinion on access to data contained in Air Canada's databases. More specifically, the Applicant provided me with a statement of Mr. Gordon Ng, dated September 17, 2012, and asked me the following questions:

(a) How long would it take for a person familiar with the structure of Air Canada's databases to prepare a query such as the one referred to in paragraph 6 of Mr. Ng's statement?

(b) How long would it take for such a query to complete, that is, to output all requested data?

3. This Report is prepared for the purpose of the above-noted proceeding before the Canadian Transportation Agency. I have been retained by the Applicant, Gábor Lukács.

4. I acknowledge and agree to abide by the following code of conduct:

(a) An expert witness named to provide a report for use as evidence, or to testify in a proceeding, has an overriding duty to assist the tribunal or court impartially on matters relevant to his or her area of expertise.

(b) This duty overrides any duty to a party to the proceeding, including the person retaining the expert witness. An expert is to be independent and objective. An expert is not an advocate for a party.

II. QUALIFICATIONS

5. I reside at 392 Avenue Grosvenor, Westmount, Quebec, H3Z 2M2.

6. I am an Associate Professor in the Department of Electrical and Computer Engineering at McGill University. I manage a lab of 12 students, research professionals, and staff, with an annual research budget obtained through a combination of research grants and contracts averaging approximately \$200,000. A copy of my Curriculum Vitae is attached and marked as Exhibit "A". My expertise includes considerable background in data structures and databases, which constitute an integral component of several of our research projects and for which I have instructed courses at the undergraduate level. As such, I am qualified to address the questions asked by the Applicant.

7. I have been providing consulting services to both academic and industrial organizations on a variety of subjects. I have provided expert opinions on software-related intellectual property disputes in the Court of Quebec.

III. INSTRUCTIONS PROVIDED AND NATURE OF OPINION BEING SOUGHT

8. On September 19, 2012, I was contacted by the Applicant, Gábor Lukács. He asked me to review the statement of Mr. Gordon Ng, dated September 17, 2012, and to answer two questions outlined in paragraph 2 of this Report. Mr. Lukács instructed me to:

- (i) acknowledge and abide by the “General Duty” section of the Code of Conduct for Expert Witnesses of the *Federal Court Rules*;
- (ii) attach an up-to-date Curriculum Vitae to the Report.

IV. MATERIALS REVIEWED

9. In the process of preparing this Report, I have reviewed the statement of Mr. Gordon Ng, dated September 17, 2012, a copy of which is attached and marked as exhibit “B”.

V. FINDINGS

First Question

10. For an individual reasonably acquainted with the structure and organization of Air Canada’s database, the task of formulating a query to extract all passengers’ fares within a specified range of dates would likely take a few minutes of time. Such queries, typically consisting of a conjunction of logical operators expressed in a Structured Query Language (SQL) are conceptually very simple to express and take advantage of the power of the underlying database engine to perform the actual processing.

Second Question

11. The answer to this question inherently dependent on the size of the database, the data transfer speed of the storage devices (typically hard drives), the computer architecture

on which the query will be executed, and the number of concurrent tasks running on the given machine.

12. It is worth noting that a query to Google's search engine, which must work with data orders of magnitude greater than that of Air Canada's systems, invariably completes in a fraction of a second.

13. Assuming that Air Canada's equipment meets industry norms, the completion time of the query should be in the order of magnitude of a few hours at the most.

14. It should be emphasized that query execution is entirely autonomous in that once the query is submitted to the database engine, there is no further need for human involvement in the process, and the computer can run unattended.

September 24, 2012


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LIST OF EXHIBITS

- A. Curriculum Vitae of Jeremy Cooperstock.
- B. Statement of Mr. Gordon Ng, dated September 17, 2012.

Exhibit “A”

CURRICULUM VITAE

Jeremy R. Cooperstock

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CURRICULUM VITAE

Jeremy R. Cooperstock

BACKGROUND

PERSONAL

Nationality Canadian
Languages English, French and Hebrew
Address Department of Electrical and Computer Engineering
McGill University
3480 University Street, Montreal, QC, H3A 2A7, Canada
Telephone (514) 398-5992
email jer@cim.mcgill.ca

EDUCATION

Ph.D. Electrical and Computer Engineering, University of Toronto, 1996.
Thesis: "Reactive Environments and Augmented Media Spaces."
(Nominated for NSERC Doctoral Dissertation Award)
Advisors: Prof. K.C. Smith and Prof. W. Buxton

M.Sc. Computer Science, University of Toronto, 1992.
Thesis: "Neural Network Operated Vision-Guided Mobile Robot Arm
for Docking and Reaching."
Advisor: Prof. E. Miliotis.

B.App.Sc. Electrical Engineering, Computer Engineering Option, University of
British Columbia, 1990 (Honours)

AWARDS AND DISTINCTIONS

- 2012 Canadian Internet Registry Association .CA Impact Award (Applications category) for In-Situ Audio Services Project
- 2009, 2010 Nominee, NSERC Brockhouse Canada Prize for Interdisciplinary Research in Science and Engineering Award
- 2005 ACM/IEEE Supercomputing, International Conference for High Performance Computing, Networking, Storage and Analysis, Award for Most Innovative Use of New Technology
- 2001 Audio Engineering Society Distinction Award
- 2000 ExCESS award for Best Technological Innovator, ECE department, McGill University
- 1999 Petro-Canada Young Innovator Award
- 1996 Departmental Selection for NSERC Doctoral Dissertation Award, University of Toronto
- 1995 Information Technology Research Center of Ontario (now CITO), Innovation Award for Increasing Awareness in Leading Edge Technology

WORK EXPERIENCE

ACADEMIC EXPERIENCE

- Aug. 2011** – **University of Auckland, New Zealand**
Jul. 2012 Invited Professor, Department of Computer Science
- May–June 2009** **Bang & Olufsen, Denmark**
Visiting Professor, World Opera Project
- Jan 2009** – **Bielefeld University, Germany**
present Virtual Member, Center of Excellence Cognitive Interaction Technology (CITEC)
- June 2003** – **McGill University, Montreal, QC**
present Associate Professor, Electrical and Computer Engineering.
Presently supervising 3 research associates, 3 post-doctoral fellows, 3 Ph.D. students, 1 M.Eng. student, and 2 B.Eng. students
- Sep. 2004** – **Université de Paris VI, Paris France**
Aug. 2005 Invited Professor, Laboratoire des Instruments et Systemes d’Ile-de-France
- Apr. 2000** – **McGill University, Montreal, QC**
present Associate Member, Faculty of Music, Department of Theory.
Founding member of the Centre for Interdisciplinary Research in Music Media and Technology. Actively participated in preparation of the CFI and VRQ grant applications that brought in a total \$8.7M. Developed technology for use in distance music teaching trials. Advised the faculty on networks issues for the new Music building. Served on three thesis committees.
- Nov. 1997** – **McGill University, Montreal, QC**
May 2003 Assistant Professor, Electrical and Computer Engineering.
Supervised 6 M.Eng. students and 3 research staff. Instructed courses in human-computer interaction, artificial intelligence, operating systems, and supervised the computer architecture laboratory. Conducted original research in the areas of high-bandwidth communication, augmented reality, and intelligent environments. Developed the technology behind the “Intelligent Classrooms” and maintained these rooms since their deployment. Served on nine thesis committees and numerous department and university committees.

INDUSTRIAL AND CONSULTING EXPERIENCE

- August 2012** **Tamaggo Inc.**
Provide guidance and advice on digital imagery
- May 2012** **York University**
Reviewer of draft application to Canada Excellence Research Chairs program
- May – Nov. 2007** **Boucher Harper**
Analysis and expert testimony in intellectual property case (software-related)
- Feb. – Oct. 2004** **Crawford Adjusters Canada**
Analysis of artifacts in high definition video
- May 2002 – Nov. 2003** **Solicitor General of Canada**
Media streaming configuration and user interface design.
- May 2001** **National Research Council**
Instructor of short course in Soft Computing, Institut des Materiaux Industriels.
- Jan. – Sep. 1999** **Audio Engineering Society**
Technical leader of a demonstration of multichannel and multimedia audio distribution, sponsored by the Audio Engineering Society's Technical Committee for Network Audio Systems
- Jan. – Aug. 1999** **Ontario Science Center**
Scientific Director of Timescape Millenium Exhibit
- July 1998** **Nortel**
Instructor of short course in videoconferencing systems for the Nortel International SL-1 User's Association (ILUA), Long Beach
- Sep. 1996 – Oct. 1997** **Sony Computer Science Laboratory**
Visiting Researcher at the Sony Computer Science Laboratory, Tokyo, Japan.
Developed speech-interface controlled VCR with visual tape database functionality. Wrote two patent applications, one filed. Supervised a research intern.
- June – Aug. 1990** **Fibronics Research**
Visiting Researcher at the Fibronics Advanced Research Center, Haifa, Israel.
Developed and tested an FDDI-to-token ring bridge, reverse engineering the control protocol used for a LAN manager.
- May – Aug. 1989** **IBM T.J. Watson Research Center**
Research Intern at the IBM T.J. Watson Research Center, Yorktown Heights, NY.
Developed a VLIW architecture simulator.

RESEARCH DISSEMINATION

Note that in the following listings, authors whose names are in bold were under my supervision at the time of writing.

JOURNAL ARTICLES (IN REVIEW)

- [JU1] **D. Dansereau**, N. Brock, and J. R. Cooperstock. “A Particle Filter for Predicting an Orchestral Conductor’s Baton Movements.” In: *Computer Music Journal* (in review).
- [JU2] **J. Blum**, **H. Sun**, **A. Olmos**, **S. Pelletier**, and J. R. Cooperstock. “A camera array architecture for multi-perspective live viewing of surgical procedures.” In: *Transactions on Sensor Networks* (in review).
- [JU3] **N. Bouillot** and J. R. Cooperstock. “Quality of Experience-Based Evaluation of Distributed Mobile Audio Applications.” In: *IEEE Transactions on Multimedia* (in review).
- [JU4] **S. Panëels**, **D. Varenne**, **J. Blum**, and J. R. Cooperstock. “The Walking Straight Mobile Application: Helping the Visually Impaired Avoid Veering.” In: *Transactions on Accessible Computing* (in review).

JOURNAL ARTICLES (PUBLISHED OR IN PRESS)

- [J1] J. M. Black, R. F. Hess, J. R. Cooperstock, **L. To**, and B. Thompson. “The measurement and treatment of suppression in amblyopia.” In: *Journal of Visualized Experiments (in press)* (2012).
- [J2] B. L. Giordano, **Y. Visell**, H.-Y. Yao, V. Hayward, J. R. Cooperstock, and S. McAdams. “Identification of walked-upon materials in auditory, kinesthetic, haptic and audio-haptic conditions.” In: *Acoustical Society of America* 131.5 (May 2012). URL: <http://www.cim.mcgill.ca/sre/publications/2012-JASA.pdf>.
- [J3] R. F. Hess, B. Thompson, J. M. Black, G. Maehara, P. Zhang, W. R. Bobier, **L. To**, and J. R. Cooperstock. “An iPod for treating amblyopia: a pilot study.” In: *Optometry (in press)* (2012). URL: <http://newsfromaoa.files.wordpress.com/2012/01/optmd1100034.pdf>.
- [J4] **A. Olmos**, **N. Bouillot**, **T. Knight**, **N. Mabire**, and J. R. Cooperstock. “A High-Fidelity Orchestra Simulator for Individual Musicians’ Practice.” In: *Computer Music Journal (in press)* 36.2 (2012), pp. 55–73.
- [J5] **D. El-Shimy**, F. Grond, **A. Olmos**, and J. R. Cooperstock. “Eyes-Free Environmental Awareness for Navigation.” In: *Springer Journal on Multimodal User Interfaces, Special Issue on Interactive Sonification* (2012), 11 pages. DOI: 10.1007/s12193-011-0065-5. URL: <http://www.springerlink.com/content/857h542884084q12/>.
- [J6] **G. Cirio**, M. Marchal, A. Lécuyer, and J. R. Cooperstock. “Vibrotactile Rendering of Fluids.” In: *Transactions on Haptics (in press)* (2012).
- [J7] **S. Pelletier** and J. R. Cooperstock. “Preconditioning for Edge-Preserving Image Super-Resolution.” In: *IEEE Transactions on Image Processing* 21.1 (Jan. 2012). URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5898412>.

- [J8] **S. Pelletier** and J. R. Cooperstock. “Real-time free viewpoint video from a range sensor and color cameras.” In: *Machine Vision and Applications (in press)* (2012). URL: <http://www.springerlink.com/content/b53j468736j34060/?MUD=MP>.
- [J9] **Z. Qi** and J. R. Cooperstock. “Towards Dynamic Image Mosaic Generation With Robustness to Parallax.” In: *IEEE Transactions on Image Processing* 21.1 (Jan. 2012). URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5959979>.
- [J10] J. R. Cooperstock. “Multimodal Telepresence Systems: Supporting Demanding Collaborative Human Activities.” In: *IEEE Signal Processing* 28.1 (Jan. 2011), pp. 77–86.
- [J11] **L. To**, B. Thompson, **J.R. Blum**, G. Maehara, R. Hess, and J. R. Cooperstock. “A game platform for treatment of amblyopia.” In: *IEEE Transactions on Neural Systems and Rehabilitation Engineering* 19.3 (June 2011), pp. 280–289. URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5713843>.
- [J12] **Y. Visell**, B.L. Giordano, **G. Millet**, and J. R. Cooperstock. “Vibration Influences Haptic Perception of Surface Compliance During Walking.” In: *PLoS ONE* 6.3:e17697 (2011). DOI: doi : 10 . 1371 / journal . pone . 0017697. URL: <http://dx.plos.org/10.1371/journal.pone.0017697>.
- [J13] **R. Pellerin**, **N. Bouillot**, **T. Pietkiewicz**, M. Wozniowski, Z. Settel, E. Gressier-Soudan, and J. R. Cooperstock. “SoundPark: Exploring Ubiquitous Computing through a Mixed Reality Multi-player Game Experiment.” In: *Studia Informatica Universalis* 8.3 (2010), 21 pages. URL: <http://www.cim.mcgill.ca/sre/publications/2009-NOTERE.pdf>.
- [J14] R. H. Ellaway, D. Topps, K. Lachapelle, and J. R. Cooperstock. “Integrating Simulation Devices and Systems.” In: *Studies in Health Technology and Informatics* 142 (Jan. 2009). Ed. by James D. Westwood, Susan W. Westwood, Randy S. Haluck, Helene M. Hoffman, Greg T. Mogel, Roger Phillips, Richard A. Robb, and Kirby G. Vosburgh, pp. 88–90. URL: <http://www.cim.mcgill.ca/sre/publications/2009-MMVR-Ellaway.pdf>.
- [J15] V. N. Salimpoor, **M. Benovoy**, G. Longo, J. R. Cooperstock, and R. J. Zatorre. “The Rewarding Aspects of Music Listening are Related to Degree of Emotional Arousal.” In: *PLoS ONE* 4.10:e7487 (2009). DOI: 10.1371/journal.pone.0007487. URL: <http://dx.plos.org/10.1371/journal.pone.0007487>.
- [J16] **G. Wang**, L. Mercier, D. L. Collins, and J. R. Cooperstock. “A Comparative Study of Monoscopic and Stereoscopic Display for a Probe-Positioning Task.” In: *Studies in Health Technology and Informatics* 142 (Jan. 2009). Ed. by James D. Westwood, Susan W. Westwood, Randy S. Haluck, Helene M. Hoffman, Greg T. Mogel, Roger Phillips, Richard A. Robb, and Kirby G. Vosburgh, pp. 417–419. URL: <http://www.cim.mcgill.ca/sre/publications/2009-MMVR-Wang.pdf>.
- [J17] **N. Bouillot**, E. Cohen, J. R. Cooperstock, A. Floros, N. Fonseca, R. Foss, M. Goodman, J. Grant, K. Gross, S. Harris, B. Harshbarger, J. Heyraud, L. Jonsson, J. Narus, M. Page, T. Snook, A. Tanaka, J. Trieger, and U. Zanghieri. “AES White Paper AESTD1003V1: Best Practices in Network Audio.” In: *Journal of the Audio Engineering Society* 57.9 (Sept. 2009), pp. 729–741. URL: <http://www.aes.org/e-lib/browse.cfm?elib=14839>.

- [J18] **Y. Visell, A. Law**, and J. R. Cooperstock. “Touch Is Everywhere: Floor Surfaces as Ambient Haptic Interfaces.” In: *IEEE Transactions on Haptics* 2.3 (July 2009), pp. 148–159. DOI: 10.1109/TOH.2009.31. URL: http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5166445.
- [J19] **W. Sun** and J. R. Cooperstock. “An Empirical Evaluation of Factors Influencing Camera Calibration Accuracy Using Three Publicly Available Techniques.” In: *Machine Vision and Applications Journal* 17.1 (Feb. 2006), pp. 51–67. DOI: 10.1007/s00138-006-0014-6. URL: <http://www.springerlink.com/content/5824738r1w66v6w1/>.
- [J20] W. Woszczyk, J. R. Cooperstock, J. Roston, and W. Martens. “Shake, Rattle and Roll: Getting Immersed in Multisensory, Interactive Music via Broadband Networks.” In: *Journal of the Audio Engineering Society* 53.4 (Apr. 2005), pp. 336–344. URL: <http://www.aes.org/e-lib/browse.cfm?elib=13416>.
- [J21] **J. Yin** and J. R. Cooperstock. “Color Correction Methods with Applications to Digital Projection Environments.” In: *Journal of Winter School of Computer Graphics* 12.3 (2004), pp. 499–506. URL: <http://www.cim.mcgill.ca/sre/publications/2004-WSCG-color.pdf>.
- [J22] L. R. Winer and J. R. Cooperstock. “The “Intelligent Classroom”: Changing teaching and learning with an evolving technological environment.” In: *Journal of Computers and Education* 38 (2002), pp. 253–266. URL: <http://www.cim.mcgill.ca/sre/publications/2002-CAE.pdf>.
- [J23] **A. Xu**, W. Woszczyk, Z. Settel, B. Pennycook, R. Rowe, P. Galanter, J. Bary, G. Martin, J. Corey, and J. R. Cooperstock. “Real-Time Streaming of Multichannel Audio Data over Internet.” In: *Journal of the Audio Engineering Society* 48.7/8 (July 2000), pp. 627–641. URL: <http://www.cim.mcgill.ca/sre/publications/2000-JAES.pdf>.
- [J24] J. R. Cooperstock, S. S. Fels, W. Buxton, and K. C. Smith. “Reactive Environments: Throwing Away Your Keyboard and Mouse.” In: *Communications of the ACM* 40.9 (Sept. 1997), pp. 65–73. URL: <http://www.cim.mcgill.ca/sre/publications/1997-CACM.pdf>.
- [J25] J. R. Cooperstock and E. Milios. “Self-supervised learning for docking and target reaching.” In: *Journal of Robotics and Autonomous Systems* 11 (1993), pp. 243–260. DOI: 10.1016/0921-8890(93)90029-C. URL: <http://www.cim.mcgill.ca/sre/publications/1993-JRAS.pdf>.

REFEREED CONFERENCE PUBLICATIONS (PUBLISHED OR IN PRESS)

- [C1] K. Kim, J. Bolton, A. Girouard, J.R. Cooperstock, and R. Vertegaal. “TeleHuman: Effects of 3D Perspective on Gaze and Pose Estimation with a Life-size Cylindrical Telepresence Pod.” In: *SIGCHI Conference on Human factors in computing systems*. Austin, Texas: ACM Press/Addison-Wesley Publishing Co., May 2012, pp. 2531–2540. URL: <http://www.cim.mcgill.ca/sre/publications/2012-CHI.pdf>.
- [C2] **D. El-Shimy**, T. Hermann, and J. R. Cooperstock. “A Reactive Environment for Dynamic Volume Control.” In: *New Interfaces for Musical Expression (NIME)*. Ann Arbor, Michigan, May 2012. URL: <http://www.cim.mcgill.ca/sre/publications/2012-NIME.pdf>.

- [C3] **T. Knight, N. Bouillot,** and J. R. Cooperstock. “Visualization feedback for musical ensemble practice: A case study on phrase articulation and dynamics.” In: *Visualization and Data Analysis*. IS&T/SPIE Symposium on Electronic Imaging, Jan. 2012, 9 pgs. URL: <http://www.cim.mcgill.ca/sre/publications/2012-VDA.pdf>.
- [C4] F. Bérard, **G. Wang,** and J. R. Cooperstock. “On the Limits of the Human Motor Control Precision: the Search for a Device’s Human Resolution.” In: *INTERACT*. Lisbon, Portugal, Sept. 2011, pp. 107–122. URL: <http://www.cim.mcgill.ca/sre/publications/2011-INTERACT.pdf>.
- [C5] J. R. Cooperstock. “From Rehearsal to Performance: Ensemble Learning in Open Orchestra and Distributed Rehearsal for World Opera.” In: *Music Anywhere, Anytime: International Symposium on Synchronous Distance Learning*. Oct. 2011, (refereed presentation).
- [C6] **A. Olmos,** P. Rushka, D. Ko, G. Foote, W. Woszczyk, and J. R. Cooperstock. “Where do you want your ears? Comparing performance quality as a function of listening position in a virtual jazz band.” In: *Sound, Music and Computing*. July 2011, 6 pgs. URL: <http://www.cim.mcgill.ca/sre/publications/2011-SMC.pdf>.
- [C7] **G. Millet, M. Otis, G. Chaw,** and J. R. Cooperstock. “Initial Development of a Variable-Friction Floor Surface.” In: *Canadian Medical and Biological Engineering Conference*. Festival of International Conferences on Caregiving, Disability, Aging and Technology, June 2011, 4 pgs.
- [C8] **G. Wang,** M. McGuffin, F. Bérard, and J. R. Cooperstock. “Pop-up Depth Views for Improving 3D Target Acquisition.” In: *Graphics Interface*. St. John’s, NL, May 2011, pp. 41–48.
- [C9] **I. Garcia-Dorado** and J. R. Cooperstock. “Automatic multi-projector calibration with an uncalibrated camera.” In: *International Workshop on Projector-Camera Systems*. Colorado Springs: IEEE, June 2011, pp. 29–36.
- [C10] **J. Blum, H. Sun, A. Olmos,** and J. R. Cooperstock. “End-User Viewpoint Control of Live Video from a Medical Camera Array.” In: *International Conference on Distributed Smart Cameras*. Ghent, Belgium, Aug. 2011, pp. 1–6. URL: <http://www.cim.mcgill.ca/sre/publications/2011-ICDSC.pdf>.
- [C11] **J. Blum, M. Bouchard,** and J. R. Cooperstock. “What’s around me? Spatialized audio augmented reality for blind users with a smartphone.” In: *Mobile and Ubiquitous Systems (MobiQuitous), (best paper award)*. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering. Springer, Dec. 2011. URL: <http://www.cim.mcgill.ca/sre/publications/2011-MOBIQUITOUS.pdf>.
- [C12] **J. Ip** and J. R. Cooperstock. “To Virtualize or Not? The Importance of Physical and Virtual Components in Augmented Reality Board Games.” In: *International Conference on Entertainment Computing*. Vancouver, BC, Canada: Springer-Verlag, Oct. 2011.
- [C13] **M. Otis, G. Millet, S. Beniak,** and J. R. Cooperstock. “Modeling of Lower Limbs for Vibrotactile Compensation.” In: *Canadian Medical and Biological Engineering Conference*. Festival of International Conferences on Caregiving, Disability, Aging and Technology, June 2011, 4 pgs.

- [C14] **N. Bouillot, M. Tomiyoshi**, and J. R. Cooperstock. “Extended User Control over Multi-channel Content Delivered over the Web.” In: *Conference on Audio Networking*. San Diego: Audio Engineering Society, Nov. 2011, 5 pgs. URL: <http://www.cim.mcgill.ca/sre/publications/2011-AES.pdf>.
- [C15] R. Ellaway, J. R. Cooperstock, and B. Spencer. “Simulation Integration for Healthcare Education, Training and Assessment.” In: *Fifth International Conference on Digital Information Management*. Thunder Bay, ON, Canada, July 2010, pp. 484–489. URL: <http://www.cim.mcgill.ca/sre/publications/2010-DIM.pdf>.
- [C16] **A. Olmos**, K. Lachapelle, and J. R. Cooperstock. “Multiple Angle Viewer for Remote Medical Training.” In: *Proceedings of the Second ACM International Workshop on Multimedia Technologies for Distance Learning*. Firenze, Italy: ACM, Oct. 2010, pp. 19–24. ISBN: 978-1-4503-0158-9. DOI: 10.1145/1878052.1878058. URL: <http://www.cim.mcgill.ca/sre/publications/2010-MTDL.pdf>.
- [C17] **M. Benovoy** and J. R. Cooperstock. “Psychophysiological signal analysis and classification.” In: *CHI 2010 Brain Body and Bytes Workshop*. Atlanta, GA, USA, 2010, pp. 75–78. URL: <http://www.cim.mcgill.ca/sre/publications/2010-BRAIN-BODY-BYTES.pdf>.
- [C18] **R. Rajalingham, Y. Visell**, and J. R. Cooperstock. “Probabilistic Tracking of Pedestrian Movements via In-Floor Force Sensing.” In: *Seventh Canadian Conference on Computer and Robot Vision (CRV)*. Ottawa, ON, Canada, May 2010, pp. 143–150. DOI: 10.1109/CRV.2010.26. URL: <http://www.cim.mcgill.ca/sre/publications/2010-CRV.pdf>.
- [C19] **Y. Visell** and J. R. Cooperstock. “Design of a Vibrotactile Display via a Rigid Surface.” In: *IEEE Haptics Symposium (best paper award)*. Waltham, MA, USA, Mar. 2010, pp. 133–140. DOI: 10.1109/HAPTIC.2010.5444664. URL: <http://www.cim.mcgill.ca/sre/publications/2010-HAPTICS-SYMPOSIUM.pdf>.
- [C20] **Y. Visell, A. Law, J. Ip, S. Smith**, and J. R. Cooperstock. “Interaction Capture in Immersive Virtual Environments via an Intelligent Floor Surface.” In: *IEEE Virtual Reality (VR)*. Waltham, MA, USA, Mar. 2010, pp. 313–314. DOI: 10.1109/VR.2010.5444748. URL: <http://www.cim.mcgill.ca/sre/publications/2010-VR.pdf>.
- [C21] **Y. Visell, S. Smith, A. Law, R. Rajalingham**, and J. R. Cooperstock. “Contact Sensing and Interaction Techniques for a Distributed, Multimodal Floor Display.” In: *IEEE 3D User Interfaces (3DUI)*. Waltham, MA, USA, Mar. 2010, pp. 75–78. DOI: 10.1109/3DUI.2010.5444718. URL: <http://www.cim.mcgill.ca/sre/publications/2010-3DUI.pdf>.
- [C22] F. Bérard, **J. Ip, M. Benovoy, D. El-Shimy, J. Blum**, and J. R. Cooperstock. “Did ‘Minority Report’ Get it Wrong? Superiority of the Mouse over 3D Input Devices for a 3D Placement Task.” In: *IFIP TC13 Conference in Human-Computer Interaction (INTERACT)*. Uppsala, Sweden, Aug. 2009, pp. 400–414. URL: <http://www.cim.mcgill.ca/sre/publications/2009-INTERACT.pdf>.
- [C23] J. R. Cooperstock and **G. Wang**. “Stereoscopic Display Technologies, Interaction Paradigms and Rendering Approaches for Neurosurgical Visualization.” In: *Stereoscopic Displays and Applications*. San Jose, CA, USA, Jan. 2009, 11 pgs. URL: <http://www.cim.mcgill.ca/sre/publications/2009-SDA.pdf>.

- [C24] V. N. Salimpoor, **M. Benovoy**, G. G. Longo, K. Larcher, A. Dagher, J. R. Cooperstock, and R. J. Zatorre. “The Rewarding Aspects of Music Listening Involve the Dopaminergic Striatal Reward Systems of the Brain: An Investigation with [C11]Raclopride PET and fMRI.” In: *15th Annual Meeting of the Organization for Human Brain Mapping*. San Francisco, CA, USA, June 2009.
- [C25] Z. Settel, M. Wozniowski, **N. Bouillot**, and J. R. Cooperstock. “Audio Graffiti: A location based audio-tagging and remixing environment.” In: *International Computer Music Conference*. Montreal, QC, Canada, Aug. 2009. URL: <http://www.cim.mcgill.ca/sre/publications/2009-ICMC.pdf>.
- [C26] **A. Law**, **J. Ip**, **B. Peck**, **Y. Visell**, P. Kry, and J. R. Cooperstock. “Multimodal floor for immersive environments.” In: *ACM SIGGRAPH Emerging Technologies*. New Orleans, LA, USA: ACM, Aug. 2009, 16:1–16:1. DOI: 10.1145/1597956.1597972. URL: <http://www.cim.mcgill.ca/sre/publications/2009-SIGGRAPH.pdf>.
- [C27] **A. Olmos**, **M. Brulé**, **N. Bouillot**, **M. Benovoy**, **J. Blum**, **H. Sun**, N. W. Lund, and J. R. Cooperstock. “Exploring the role of latency and orchestra placement on the networked performance of a distributed opera.” In: *12th Annual International Workshop on Presence*. Los Angeles, CA, USA, Nov. 2009, 9 pgs. URL: <http://www.cim.mcgill.ca/sre/publications/2009-PRESENCE.pdf>.
- [C28] **D. El-Shimy**, G. Marentakis, and J. R. Cooperstock. “Multimodal Feedback in 3D Target Acquisition.” In: *IEEE 3D User Interfaces (3DUI)*. Lafayette, LA, USA, Mar. 2009, pp. 95–98. URL: <http://www.cim.mcgill.ca/sre/publications/2009-3DUI.pdf>.
- [C29] **J. Anlauff**, T. Hermann, T. Grosshauser, and J. R. Cooperstock. “Modular tacTiles for Sonic Interactions with Smart Environments.” In: *Haptic and Audio Interaction Design (HAID), Fourth International Workshop*. Dresden, Germany, Sept. 2009, pp. 100–108. URL: <http://www.cim.mcgill.ca/sre/publications/2009-HAID.pdf>.
- [C30] **N. Bouillot** and J. R. Cooperstock. “Challenges and Performance of High-Fidelity Audio Streaming for Interactive Performances.” In: *New Interfaces for Musical Expression (NIME)*. Pittsburgh, PA, USA, June 2009, pp. 135–140. URL: <http://www.cim.mcgill.ca/sre/publications/2009-NIME.pdf>.
- [C31] **N. Bouillot**, **M. Brulé**, and J. R. Cooperstock. “Performance metrics for network audio systems: Methodology and a preliminary comparison.” In: *Audio Engineering Society 127th Convention*. New York, NY, USA, Oct. 2009. URL: <http://www.aes.org/e-lib/browse.cfm?elib=15134>.
- [C32] **R. Pellerin**, **N. Bouillot**, **T. Pietkiewicz**, M. Wozniowski, Z. Settel, E. Gressier-Soudan, and J. R. Cooperstock. “SoundPark: Exploring Ubiquitous Computing through a Mixed Reality Multi-player Game Experiment.” In: *9e Conférence Internationale sur Les Nouvelles Technologies de la REpartition (best paper)*. Montreal, QC, Canada, 2009, 9 pgs. URL: <http://www.cim.mcgill.ca/sre/publications/2009-NOTERE.pdf>.

- [C33] **R. Pellerin, N. Bouillot, T. Pietkiewicz**, M. Wozniowski, Z. Settel, E. Gressier-Soudan, and J. R. Cooperstock. “SoundPark: Towards Highly Collaborative Game Support in a Ubiquitous Computing Architecture.” In: *9th IFIP International Conference on Distributed Applications and Interoperable Systems*. Lisbon, Portugal, June 2009, pp. 22–45. URL: <http://www.cim.mcgill.ca/sre/publications/2009-DAIS.pdf>.
- [C34] **Y. Visell, A. W. Law**, and J. R. Cooperstock. “Toward Iconic Vibrotactile Information Display Using Floor Surfaces.” In: *Third Joint Eurohaptics Conference and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*. Salt Lake City, UT, USA, Mar. 2009, pp. 267–272. URL: <http://www.cim.mcgill.ca/sre/publications/2009-WHC.pdf>.
- [C35] B. L. Giordano, S. McAdams, **Y. Visell**, J. R. Cooperstock, H.-Y. Yao, and V. Hayward. “Non-visual identification of walking grounds.” In: *Acoustics’08*. Vol. 123. 5. Paris, France, June 2008, p. 3412. URL: <http://www.cim.mcgill.ca/sre/publications/2008-ACOUSTICS.pdf>.
- [C36] V. N. Salimpoor, **M. Benovoy**, G. Longo, J. R. Cooperstock, and R. J. Zatorre. “Music and the Reward System: Characterizing Intensely Pleasurable Responses to Music.” In: *The Neurosciences and Music – III*. Montreal, QC, Canada, June 2008.
- [C37] **A. Law W., B. Peck V., Y. Visell**, P. Kry, and J. R. Cooperstock. “A Multi-modal Floor-space for Experiencing Material Deformation Underfoot in Virtual Reality.” In: *International Workshop on Haptic Audio Visual Environments and Games*. Ottawa, ON, Canada: IEEE, Oct. 2008. URL: <http://www.cim.mcgill.ca/sre/publications/2008-HAVE.pdf>.
- [C38] **E. Cupellini, C. Rizzuti**, E. Bilotta, P. Pantano, **M. Wozniowski**, and J. R. Cooperstock. “Exploring Musical Mappings and Generating Accompaniment with Chaotic Systems.” In: *International Computer Music Conference*. Belfast, UK, Aug. 2008. URL: <http://www.cim.mcgill.ca/sre/publications/2008-ICMC.pdf>.
- [C39] **M. Benovoy**, J. Deitcher, and J. R. Cooperstock. “Biosignals Analysis and its Application in a Performance Setting: Towards the development of an Emotional-Imaging Generator.” In: *IEEE International Conference on Bio-Inspired Systems and Signal Processing (BIOSIGNALS)*. Madeira, Portugal, Jan. 2008. URL: <http://www.cim.mcgill.ca/sre/publications/2008-BIOSIGNALS.pdf>.
- [C40] **M. Benovoy**, M. Zadel, R. Absar, M. Wozniowski, and J. R. Cooperstock. “Towards immersive multimodal gameplay.” In: *GAMEON-NA*. Montreal, QC, Canada, Aug. 2008. URL: <http://www.cim.mcgill.ca/sre/publications/2008-GAMEON.pdf>.
- [C41] **M. Wozniowski, N. Bouillot**, Z. Settel, and J. R. Cooperstock. “An Augmented Reality Framework for Wireless Mobile Performance.” In: *5th International Mobile Music Workshop*. Vienna, Austria, May 2008. URL: <http://www.cim.mcgill.ca/sre/publications/2008-MMW.pdf>.
- [C42] **M. Wozniowski, N. Bouillot**, Z. Settel, and J. R. Cooperstock. “Large-Scale Mobile Audio Environments for Collaborative Musical Interaction.” In: *New Interfaces for Musical Expression (NIME)*. Genova, Italy, June 2008. URL: <http://www.cim.mcgill.ca/sre/publications/2008-NIME-Wozniowski.pdf>.

- [C43] **N. Bouillot**, **M. Wozniowski**, Z. Settel, and J. R. Cooperstock. “A Mobile Wireless Augmented Guitar.” In: *New Interfaces for Musical Expression (NIME)*. Genova, Italy, June 2008. URL: <http://www.cim.mcgill.ca/sre/publications/2008-NIME-Bouillot.pdf>.
- [C44] **S. Pelletier** and J. R. Cooperstock. “Fast image restoration with the Huber-Markov prior model.” In: *International Conference on Image Processing*. San Diego, CA, USA, Oct. 2008. URL: <http://www.cim.mcgill.ca/sre/publications/2008-ICIP.pdf>.
- [C45] **Y. Visell**, B. Giordano, J. R. Cooperstock, K. Franinovic, **A. Law**, S. McAdams, **K. Jathal**, and F. Fontana. “A Vibrotactile Device for Display of Virtual Ground Materials in Walking.” In: *EuroHaptics*. Madrid, Spain, June 2008. URL: <http://www.cim.mcgill.ca/sre/publications/2008-EUROHAPTICS.pdf>.
- [C46] **Z. Qi** and J. R. Cooperstock. “Depth-based Image Mosaicing for Both Static and Dynamic Scenes.” In: *International Conference on Pattern Recognition (ICPR)*. Tampa, FL, USA, Dec. 2008. URL: <http://www.cim.mcgill.ca/sre/publications/2008-ICPR.pdf>.
- [C47] J. R. Cooperstock, **M. Wozniowski**, and Z. Settel. “Towards mobile spatial audio for distributed musical systems and multi-user virtual environments.” In: *Spatial Audio for Mobile Devices, Workshop in conjunction with International Conference on Human Interaction with Mobile Devices and Services (MobileHCI)*. Singapore, Sept. 2007. URL: <http://www.cim.mcgill.ca/sre/publications/2007-SAMD.pdf>.
- [C48] Y. Kinoe and J. R. Cooperstock. “Peripheral Telecommunications: Supporting Distributed Awareness and Seamless Transitions to the Foreground.” In: *International Conference on Smart Homes and Health Telematics (ICOST)*. Nara, Japan, June 2007. URL: <http://www.cim.mcgill.ca/sre/publications/2007-ICOST.pdf>.
- [C49] J. Roston, C. Bradley, and J. R. Cooperstock. “Underwater Window: High Definition Video on VENUS and NEPTUNE.” In: *Oceans '07*. Vancouver, BC, Canada, Sept. 2007, pp. 1–8. DOI: 10.1109/OCEANS.2007.4449327. URL: http://ieeexplore.ieee.org/xpls/abs_a11.jsp?arnumber=4449327.
- [C50] **M. Wozniowski**, Z. Settel, and J. R. Cooperstock. “AudioScape: A Pure Data library for management of virtual environments and spatial audio.” In: *PureData Convention*. Montreal, QC, Canada, Aug. 2007. URL: <http://www.cim.mcgill.ca/sre/publications/2007-PDCONV.pdf>.
- [C51] **M. Wozniowski**, Z. Settel, and J. R. Cooperstock. “User-specific audio rendering and steerable sound for distributed virtual environments.” In: *International Conference on Auditory Display*. Montreal, QC, Canada, June 2007. URL: <http://www.cim.mcgill.ca/sre/publications/2007-ICAD-Wozniowski.pdf>.
- [C52] **S. Audet** and J. R. Cooperstock. “Shadow Removal in Front Projection Environments using Object Tracking.” In: *IEEE Projector-Camera Systems (ProCams)*. Minneapolis, MN, USA, June 2007. URL: <http://www.cim.mcgill.ca/sre/publications/2007-PROCAMS.pdf>.
- [C53] **S. Pelletier** and J. R. Cooperstock. “Fast super-resolution for rational magnification factors.” In: *International Conference on Image Processing (ICIP)*. San Antonio, TX, USA, Sept. 2007. URL: <http://www.cim.mcgill.ca/sre/publications/2007-ICIP.pdf>.

- [C54] **Y. Visell** and J. R. Cooperstock. “Enabling Gestural Interaction by Means of Tracking Dynamical Systems Models and Assistive Feedback.” In: *IEEE Systems, Man and Cybernetics*. Montreal, QC, Canada, Oct. 2007. URL: <http://www.cim.mcgill.ca/sre/publications/2007-SMC.pdf>.
- [C55] **Y. Visell** and J. R. Cooperstock. “Modeling and Continuous Sonification of Affordances for Gesture-Based Interfaces.” In: *International Conference on Auditory Display*. Montreal, QC, Canada, June 2007. URL: <http://www.cim.mcgill.ca/sre/publications/2007-ICAD-Visell.pdf>.
- [C56] **Y. Visell**, J. R. Cooperstock, and K. Franinovic. “Toward an Architectural Platform for Audio-Haptic Simulation in Walking.” In: *Enactive Interfaces (ENACTIVE’07)*. Grenoble, France, Nov. 2007. URL: <http://www.cim.mcgill.ca/sre/publications/2007-ENACTIVE.pdf>.
- [C57] **Z. Qi** and J. R. Cooperstock. “Automated Change Detection in an Undersea Environment using a Statistical Background Model.” In: *Oceans ’07*. Vancouver, BC, Canada, Sept. 2007, pp. 1–6. DOI: 10.1109/OCEANS.2007.4449201. URL: <http://www.cim.mcgill.ca/sre/publications/2007-OCEANS.pdf>.
- [C58] **Z. Qi** and J. R. Cooperstock. “Overcoming Parallax and Sampling Density Issues in Image Mosaicing of Non-Planar Scenes.” In: *British Machine Vision Conference (BMVC)*. Warwick, UK, Sept. 2007. URL: <http://www.cim.mcgill.ca/sre/publications/2007-BMVC.pdf>.
- [C59] **F. Cayouette** and J. R. Cooperstock. “Generic Real-Time Tracking Method on Semi-Dynamic Scenes.” In: *International Conference on Pattern Recognition (ICPR)*. Hong Kong, Aug. 2006, pp. 711–714. DOI: 10.1109/ICPR.2006.602. URL: http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=1698991.
- [C60] **F. Rudzicz**. “Clavius: bi-directional parsing for generic multimodal interaction.” In: *Proceedings of the 21st International Conference on computational Linguistics and 44th Annual Meeting of the Association for Computational Linguistics: Student Research Workshop*. COLING ACL ’06. Sydney, Australia: Association for Computational Linguistics, 2006, pp. 85–90. URL: <http://portal.acm.org/citation.cfm?id=1557856.1557875>.
- [C61] **F. Rudzicz**. “Put a grammar here: bi-directional parsing in multimodal interaction.” In: *CHI ’06 Extended Abstracts on Human Factors in Computing Systems*. Montreal: ACM, 2006, pp. 1277–1282. ISBN: 1-59593-298-4. DOI: <http://doi.acm.org/10.1145/1125451.1125689>. URL: <http://doi.acm.org/10.1145/1125451.1125689>.
- [C62] **M. Wozniowski**, Z. Settel, and J. R. Cooperstock. “A framework for immersive spatial audio performance.” In: *New Interfaces for Musical Expression (NIME)*. Paris, France, June 2006. URL: <http://www.cim.mcgill.ca/sre/publications/2006-NIME.pdf>.
- [C63] **M. Wozniowski**, Z. Settel, and J. R. Cooperstock. “A Paradigm for Physical Interaction with Sound in 3-D Audio Space.” In: *International Computer Music Conference*. New Orleans, LA, USA, Nov. 2006. URL: <http://www.cim.mcgill.ca/sre/publications/2006-ICMC.pdf>.

- [C64] **M. Wozniowski**, Z. Settel, and J. R. Cooperstock. “A Spatial Interface for Audio and Music Production.” In: *International Conference on Digital Audio Effects (DAFx)*. Montreal, QC, Canada, Sept. 2006. URL: <http://www.cim.mcgill.ca/sre/publications/2006-DAFX.pdf>.
- [C65] **S. Arseneau** and J. R. Cooperstock. “An Asymmetrical Diffusion Framework for Junction Analysis.” In: *British Machine Vision Conference (BMVC)*. Edinburgh, UK, Sept. 2006. URL: <http://www.cim.mcgill.ca/sre/publications/2006-BMVC-Arseneau.pdf>.
- [C66] **S. Arseneau** and J. R. Cooperstock. “An Improved Representation of Junctions through Asymmetric Tensor Diffusion.” In: *International Symposium on Visual Computing*. Lake Tahoe, NV, USA, Nov. 2006. URL: <http://www.cim.mcgill.ca/sre/publications/2006-ISVC.pdf>.
- [C67] **S. Pelletier** and J. R. Cooperstock. “Preconditioning for temporal video superresolution.” In: *British Machine Vision Conference (BMVC)*. Edinburgh, UK, Sept. 2006. URL: <http://www.cim.mcgill.ca/sre/publications/2006-BMVC-Pelletier.pdf>.
- [C68] **Z. Qi** and J. R. Cooperstock. “Wide-Baseline Image Mosaicing for Indoor Environments.” In: *International Conference on Pattern Recognition (ICPR)*. Hong Kong, Aug. 2006. URL: <http://www.cim.mcgill.ca/sre/publications/2006-ICPR.pdf>.
- [C69] J. R. Cooperstock. “Integrating Communication with Interaction: Computer Vision Challenges for Interactive and Intelligent Environments.” In: *Workshop on Computer Vision for Interactive and Intelligent Environments (CV4IIE)*. Lexington, KY, USA, Nov. 2005. URL: <http://www.cim.mcgill.ca/sre/publications/2005-CV4IIE.pdf>.
- [C70] J. R. Cooperstock. “Interacting in Shared Reality.” In: *HCI International, Conference on Human-Computer Interaction*. Las Vegas, NV, USA, July 2005. URL: <http://www.cim.mcgill.ca/sre/publications/2005-HCI.pdf>.
- [C71] **J. Yin** and J. R. Cooperstock. “A New Photo Consistency Test for Voxel Coloring.” In: *Canadian Conference on Computer and Robot Vision*. Victoria, BC, Canada: IEEE Computer Society, May 2005, pp. 566–570. DOI: 10.1109/CRV.2005.9. URL: http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=1443180.
- [C72] **S. Pelletier**, **S. Spackman**, and J. R. Cooperstock. “High-Resolution Video Synthesis from Mixed-Resolution Video Based on the Estimate-and-Correct Method.” In: *IEEE Workshop on Applications of Computer Vision (WACV)*. Breckenridge, CO, USA, Jan. 2005. URL: <http://www.cim.mcgill.ca/sre/publications/2005-WACV-Pelletier.pdf>.
- [C73] **W. Sun** and J. R. Cooperstock. “Requirements for Camera Calibration: Must Accuracy Come with a High Price?” In: *IEEE Workshop on Applications of Computer Vision (WACV)*. Breckenridge, CO, USA, Jan. 2005. URL: <http://www.cim.mcgill.ca/sre/publications/2005-WACV-Sun.pdf>.
- [C74] J. R. Cooperstock, J. Roston, and W. Woszczyk. “Broadband Networked Audio: Entering the Era of Multisensory Data Distribution.” In: *18th International Congress on Acoustics*. Kyoto, Japan, Apr. 2004. URL: <http://www.cim.mcgill.ca/sre/publications/2004-ICA.pdf>.

- [C75] **F. Aubé** and **R. Shield**. “Modeling the Effect of Leadership on Crowd Flow Dynamics.” In: *Cellular Automata*. Ed. by Peter Sloot, Bastien Chopard, and Alfons Hoekstra. Vol. 3305. Lecture Notes in Computer Science. originally presented in International Conference on Cellular Automata for Research and Industry. Amsterdam: Springer Berlin / Heidelberg, Oct. 2004, pp. 601–611. URL: http://dx.doi.org/10.1007/978-3-540-30479-1_62.
- [C76] **F. Rioux**, **F. Rudzicz**, and **M. Wozniowski**. “The Modellers’ Apprentice – The Tool-glass Metaphor in an Immersive Environment.” In: *British HCI Group Annual Conference*. Leeds, UK, Sept. 2004.
- [C77] **J. Yin** and J. R. Cooperstock. “Improving Depth Maps by Nonlinear Diffusion.” In: *12th International Conference on Computer Graphics, Visualization and Computer Vision*. Plzen, Czech Republic, Feb. 2004, pp. 305–311. URL: <http://www.cim.mcgill.ca/sre/publications/2004-WSCG-diffusion.pdf>.
- [C78] **M. Hilario** and J. R. Cooperstock. “Occlusion Detection for Front-Projected Interactive Displays.” In: *Advances in Pervasive Computing. A Collection of Contributions Presented at the 2nd International Conference on Pervasive Computing (Pervasive 2004)*. Vol. 176. Vienna, Austria: Austrian Computer Society (OCG), Apr. 2004, pp. 265–271. ISBN: 3-85403-176-9. URL: <http://www.cim.mcgill.ca/sre/publications/2004-PERVASIVE.pdf>.
- [C79] **Y. Boussemart**, **F. Rioux**, **F. Rudzicz**, **M. Wozniowski**, and J. R. Cooperstock. “A Framework for Collaborative 3D Visualization and Manipulation in an Immersive Space using an Untethered Bimanual Gestural Interface.” In: *VRST ’04: Proceedings of the ACM Symposium on Virtual Reality Software and Technology*. Hong Kong: ACM Press, Nov. 2004, pp. 162–165. ISBN: 1-58113-907-1. DOI: <http://doi.acm.org/10.1145/1077534.1077566>. URL: <http://www.cim.mcgill.ca/sre/publications/2004-VRST.pdf>.
- [C80] J. Usher, J. R. Cooperstock, W. Woszczyk, and J. R. Cooperstock. “A multi-filter approach to acoustic echo cancellation for teleconferencing.” In: *75th Meeting of the Acoustical Society of America*. New York, May 2004.
- [C81] W. Woszczyk, J. R. Cooperstock, J. Roston, and W. Martens. “Environment for immersive multi-sensory communication of music using broadband networks.” In: *23rd Tonmeister-tagung VDT International Audio Convention*. Leipzig, Germany, Nov. 2004. URL: <http://www.cim.mcgill.ca/sre/publications/2004-TONMEISTER.pdf>.
- [C82] J. R. Cooperstock. “Intelligent Classrooms need Intelligent Interfaces: How to Build a High-Tech Teaching Environment that Teachers can use?” In: *American Society for Engineering Education*. Nashville, TN, USA, June 2003. URL: <http://www.cim.mcgill.ca/sre/publications/2003-ASEE.pdf>.
- [C83] E. Cohen, J. R. Cooperstock, and C. Kyriakakis. “The Challenges of Archiving Networked Based Multimedia Performances.” In: *Journal of the Acoustical Society of America*. Vol. 112. 5. Cancun, Mexico, Nov. 2002, p. 2280. URL: <http://link.aip.org/link/?JAS/112/2280/1>.

- [C84] **J. Yao** and J. R. Cooperstock. “Arm Gesture Detection in a Classroom Environment.” In: *IEEE Workshop on Applications of Computer Vision (WACV)*. Orlando, FL, USA, Dec. 2002, pp. 153–157. URL: <http://www.cim.mcgill.ca/sre/publications/2002-WACV.pdf>.
- [C85] **S. Arseneau** and J. R. Cooperstock. “Automated Feature Registration for Robust Tracking Methods.” In: *IEEE International Conference on Pattern Recognition (ICPR)*. Vol. 2. Quebec City, QC, Canada, Aug. 2002, pp. 1078–1081. DOI: 10.1109/ICPR.2002.1048492. URL: <http://doi.ieeecomputersociety.org/10.1109/ICPR.2002.1048492>.
- [C86] J. R. Cooperstock. “The Classroom of the Future: Enhancing Education through Augmented Reality.” In: *HCI International, Conference on Human-Computer Interaction*. New Orleans, LA, USA, 2001, pp. 688–692. URL: <http://www.cim.mcgill.ca/sre/publications/2001-HCI.pdf>.
- [C87] J. R. Cooperstock and **S. Spackman**. “The Recording Studio that Spanned a Continent.” In: *IEEE International Conference on Web Delivering of Music (WEDELMUSIC)*. Florence, Italy, Nov. 2001, pp. 161–167. DOI: 10.1109/WDM.2001.990172. URL: <http://www.cim.mcgill.ca/sre/publications/2001-WEDELMUSIC.pdf>.
- [C88] **C. Côté**, **S. Arseneau**, and J. R. Cooperstock. “Telepresence with no Strings Attached: An Architecture for a Shared Reality Environment.” In: *Second International Symposium on Mixed Reality (ISMR)*. Yokohama, Japan, Mar. 2001. URL: <http://www.cim.mcgill.ca/sre/publications/2001-ISMR.pdf>.
- [C89] L.R. Winer and J. R. Cooperstock. “The “Intelligent Classroom”: Changing teaching and learning with an evolving technological environment.” In: *Computers and Learning*. Coventry, UK, Apr. 2001.
- [C90] **A. Xu** and J. R. Cooperstock. “Real Time Streaming of Multi-Channel Audio Data over Internet.” In: *108th Audio Engineering Society Convention*. Paris, France, 2000, 14 pgs. URL: <http://www.cim.mcgill.ca/sre/publications/2000-AES.pdf>.
- [C91] **L. Hochstein**, **S. Lerner**, J. J. Clark, and J. R. Cooperstock. “Soccer-Swarm: A Graphical Framework for Soccer-Player Design.” In: *International Symposium on Robotics*. Montreal, QC, Canada, May 2000, pp. 108–113. URL: <http://www.cim.mcgill.ca/sre/publications/2000-ISR.pdf>.
- [C92] **S. Arseneau**, **W. Sun**, **C. Zhao**, and J. R. Cooperstock. “Inter-layer Learning Towards Emergent Cooperative Behavior.” In: *17th Annual Conference on Artificial Intelligence, American Association of Artificial Intelligence*. Austin, TX, USA, 2000, pp. 3–8. URL: <http://www.cim.mcgill.ca/sre/publications/2000-AAAI.pdf>.
- [C93] J. Blatter, J. R. Cooperstock, and R. Harris. “Designing Tools, Designing Learning Opportunities: Issues in Developing a CSCL System for the Technical Communication Classroom.” In: *Computer Supported Cooperative Learning Conference*. Stanford, CA, USA, Dec. 1999. URL: <http://www.cim.mcgill.ca/sre/publications/1999-CSCL.pdf>.
- [C94] **S. Arseneau** and J. R. Cooperstock. “Presenter Tracking in a Classroom Environment.” In: *IEEE Industrial Electronics (IECON’99), Session on Cooperative Environments*. Vol. 1. San Jose, CA, USA, Nov. 1999, pp. 145–148. URL: <http://www.cim.mcgill.ca/sre/publications/1999-IECON.pdf>.

- [C95] S. Arseneau and J. R. Cooperstock. “Real-Time Image Segmentation for Action Recognition.” In: *IEEE Pacific Rim Conference on Communications, Computers and Signal Processing (PACRIM’99)*. Victoria, BC, Canada, Aug. 1999, pp. 86–89. DOI: 10.1109/PACRIM.1999.799484. URL: <http://www.cim.mcgill.ca/sre/publications/1999-PACRIM.pdf>.
- [C96] J. R. Cooperstock. “From the Flashing 12:00 to a Usable Machine: Applying UbiComp to the VCR.” In: *ACM Conference on Human Factors in Computing Systems (CHI)*. Atlanta, GA, USA, Mar. 1997, pp. 281–282. URL: <http://www.cim.mcgill.ca/sre/publications/1997-CHI.pdf>.
- [C97] J. R. Cooperstock. “Rethinking the Remote Control.” In: *HCI International, Conference on Human-Computer Interaction*. San Francisco, CA, USA, Aug. 1997, p. 116.
- [C98] J. R. Cooperstock and S. Kotsopoulos. “Why Use a Fishing Line When You Have a Net? An Adaptive Multicast Data Distribution Protocol.” In: *USENIX*. San Diego, CA, USA, 1996, pp. 343–352. URL: <http://www.cim.mcgill.ca/sre/publications/1996-USENIX.pdf>.
- [C99] K. Yamaashi, J. R. Cooperstock, T. Narine, and W. Buxton. “Beating the Limitations of Camera-Monitor Mediated Telepresence with Extra Eyes.” In: *ACM Conference on Human Factors in Computing Systems (CHI)*. Vancouver, BC, Canada, May 1996, pp. 50–57. URL: <http://www.cim.mcgill.ca/sre/publications/1996-CHI.pdf>.
- [C100] A. Chou, J. R. Cooperstock, R. El-Yaniv, M. Klugerman, and T. Leighton. “The Statistical Adversary Allows Optimal Money-Making Trading Strategies.” In: *ACM-SIAM Symposium on Discrete Algorithms (SODA)*. San Francisco, CA, USA, Jan. 1995, pp. 467–476. URL: <http://www.cim.mcgill.ca/sre/publications/1995-SODA.pdf>.
- [C101] J. R. Cooperstock. “Making the User Interface Disappear: The Reactive Room.” In: *IBM Center for Advanced Studies (CASCON)*. Toronto, ON, Canada, 1995, pp. 241–250. URL: <http://portal.acm.org/citation.cfm?id=781915.781930>.
- [C102] J. R. Cooperstock and S. Kotsopoulos. “Exploiting Group Communications for Reliable High Volume Data Distribution.” In: *IEEE Pacific Rim Conference on Communications, Computers, Visualization and Signal Processing (PACRIM)*. Victoria, BC, Canada, May 1995. URL: <http://www.cim.mcgill.ca/sre/publications/1995-PACRIM-AFDP.pdf>.
- [C103] J. R. Cooperstock, K. Tanikoshi, G. Beirne, T. Narine, and W. Buxton. “Evolution of a Reactive Environment.” In: *ACM Human Factors in Computing Systems (CHI)*. Denver, CO, USA, May 1995, pp. 170–177. URL: <http://www.cim.mcgill.ca/sre/publications/chi95/chi95.html>.
- [C104] J. R. Cooperstock, K. Tanikoshi, and W. Buxton. “Turning Your Video Monitor into a Virtual Window.” In: *IEEE Pacific Rim Conference on Communications, Computers, Visualization and Signal Processing (PACRIM)*. Victoria, BC, Canada, May 1995. URL: <http://www.cim.mcgill.ca/sre/publications/1995-PACRIM-HT.pdf>.
- [C105] A. Gujar, S. Daya, J. R. Cooperstock, K. Tanikoshi, and W. Buxton. “Talking Your Way Around a Conference: A speech interface for remote equipment control.” In: *IBM Center for Advanced Studies (CASCON)*. Toronto, ON, Canada, 1995, p. 289. URL: <http://portal.acm.org/citation.cfm?id=781915.781941>.

- [C106] J. K. Tsotsos, S. Dickinson, M. Jenkin, E. Milios, A. Jepson, B. Down, E. Amdur, S. Stevenson, M. Black, D. Metaxas, J. R. Cooperstock, S. Culhane, F. Nufflo, G. Verghese, W. Wai, D. Wilkes, and Y. Ye. “The PLAYBOT Project.” In: *IJCAI Workshop on AI Applications for Disabled People*. Montreal, QC, Canada, Aug. 1995.
- [C107] J. R. Cooperstock and E. Milios. “An Efficiently Trainable Neural Network Based Vision-Guided Robot Arm.” In: *IEEE Robotics and Automation*. Vol. 2. Atlanta, GA, USA, May 1993, pp. 738–743. DOI: 10.1109/ROBOT.1993.291946. URL: http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=291946.
- [C108] J. R. Cooperstock and E. Milios. “Self-Supervised Learning for Docking and Target Reaching.” In: *Intelligent Autonomous Systems*. Pittsburgh, 1993, pp. 582–591.
- [C109] J. R. Cooperstock and E. Milios. “Adaptive Neural Networks for Vision-Guided Position Control of a Robot Arm.” In: *IEEE Intelligent Control*. Glasgow, UK, 1992, pp. 397–403. DOI: 10.1109/ISIC.1992.225124. URL: http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=225124.
- [C110] J. R. Cooperstock and E. Milios. “Neural Network Control for a Vision-Guided Mobile Robot Arm.” In: *IASTED Control and Robotics*. Vancouver, BC, Canada, 1992, pp. 278–281.

BOOK CHAPTERS

- [B1] **Y. Visell, R. Rajalingham**, and J. R. Cooperstock. “A review of nonvisual signatures of human walking with applications to person tracking in augmented environments.” In: *Walking with the senses: Perceptual techniques for walking in virtual environments*. Ed. by Y. Visell and F. Fontana. Logos Verlag, 2012.
- [B2] **Y. Visell, S. Smith**, and J. R. Cooperstock. “Distributed human-computer interaction with augmented floor surface.” In: *Walking with the senses: Perceptual techniques for walking in virtual environments*. Ed. by Y. Visell and F. Fontana. Logos Verlag, 2012.
- [B3] M. Wozniowski, Z. Settel, and J. R. Cooperstock. “Sonic Interaction via Spatial Arrangement in Mixed Reality Environments.” In: *Sonic Interaction Design (in press)*. Ed. by K. Franinovic and S. Serafin. MIT Press, 2012.
- [B4] J. R. Cooperstock. “Human-Computer Interaction.” In: *Wiley Encyclopedia of Computer Science and Engineering*. Ed. by Benjamin W. Wah. Vol. 3. Wiley-Interscience, 2008, pp. 1529–1542. DOI: 10.1002/9780470050118.ecse524. URL: <http://onlinelibrary.wiley.com/doi/10.1002/9780470050118.ecse524/abstract>.

PATENTS

- [P1] J. R. Cooperstock, **L. To**, and R. Hess. “Binocular vision assessment and/or therapy.” Pat. 8,057,036 (United States). Nov. 2011.
- [P2] J. R. Cooperstock, Y. Visell, **A. Law**, and K. Franinovic. “Floor-based haptic communication system.” Pat. 12/794,045, in review (United States). June 2009.

- [P3] J. Roston, J. R. Cooperstock, J. MacDougall, and **S. Spackman**. “Remote language interpretation system and method.” Pat. 7395200, subsequently issued to J. Roston (United States). Feb. 2003.
- [P4] J. R. Cooperstock, **G. Millet**, and M. Otis. “A Method and Apparatus for Variable Friction Surfaces.” Pat. provisional application 61/577,148 (United States).

OTHER REFEREED CONTRIBUTIONS

- [O1] **Y. Visell**, **G. Millet**, and J. R. Cooperstock. *Haptic Display via a Vibrating, Rigid Surface*. Demonstration in IEEE Haptics Symposium. Waltham, MA, USA, Mar. 2010.
- [O2] **A. Law**, **J. Ip**, **B. Peck**, **Y. Visell**, P. Kry, and J. R. Cooperstock. *A Multimodal Floor for Virtual Environments*. SIGGRAPH Emerging Technologies. Aug. 2009.
- [O3] V. N. Salimpoor, **M. Benovoy**, G. Longo, J. R. Cooperstock, and R. J. Zatorre. *Qualifying the Chills Response: Differences between Transient and Prolonged Chills in Response to Music*. Auditory Perception, Cognition, and Action Meeting. Chicago, IL, USA, 2008.
- [O4] **M. Wozniowski**, Z. Settel, and J. R. Cooperstock. *Ménagerie Imaginaire*. Artwork Performance in New Interfaces for Musical Expression (NIME). New York, NY, USA, June 2007.
- [O5] J. R. Cooperstock. *Novel Video Encoding Algorithms for Remote Monitoring and Distributed Human-Human Interaction*. 8th International Symposium on Artificial Intelligence, Robotics and Automation in Space. Munich, Germany, Sept. 2005.
- [O6] **C. Côté**, **S. Arseneau**, and J. R. Cooperstock. *Telepresence with no Strings Attached: An Architecture for a Shared Reality Environment*. International Symposium on Mixed Reality. Yokohama, Japan, Mar. 2001.
- [O7] A. Saroyan, R. Harris, and J. R. Cooperstock. *Applying pedagogical principles to teaching and learning with technology*. Multi-cultural perspectives on the use of technology in education. Montreal, QC, Canada, 2000. URL: <http://www.education.mcgill.ca/NAFTA>.
- [O8] **S. Arseneau** and J. R. Cooperstock. *Automated Camera Tracking in a Real-World Environment*. Graphics Interface. Montreal, QC, Canada, 2000.

NON-REFEREED CONTRIBUTIONS

- [N1] **Benovoy, M.**, J.R. Cooperstock, and M. Levine. *Real-Time Facial Recognition*. Phase II Project Report for Department of National Defence. 2010.
- [N2] M. Levine, **Benovoy, M.**, and J.R. Cooperstock. *An Automatic Real-Time Facial Recognition System*. Phase I Project Report for Department of National Defence. 2009.
- [N3] J.R. Cooperstock. “Plus de largeur du bande, s’il vous plaît.” In: *L’interdisciplinarité dans les sciences et technologies de la musique*. Montreal: Association francophone pour le savoir (ACFAS), May 2006.

- [N4] J.R. Cooperstock. “Integrating Communication with Interaction: Computer Vision Challenges for Interactive and Intelligent Environments.” In: *Workshop on Computer Vision for Interactive and Intelligent Environments (CV4IIE)*. Lexington, KY, Nov. 2005.
- [N5] J.R. Cooperstock, J. Roston, and Woszczyk. “Broadband Networked Audio: Entering the Era of Multisensory Data Distribution.” In: *18th International Congress on Acoustics*. Kyoto, Apr. 2004.
- [N6] **Cayouette, F. and Sud, D. and Patel, K. and Sarikaya, D.** and J.R. Cooperstock. “McGill Reddogs Final Report.” In: *Robocup*. 2002.
- [N7] J.R. Cooperstock. “Classroom of the Future: Enhancing Education through Augmented Reality.” In: *HCI International, Conference on Human-Computer Interaction*. New Orleans, 2001.
- [N8] **Sud, D. and Cayouette, F. and Gu, J.** and J.R. Cooperstock. “McGill Reddogs Final Report.” In: *Robocup*. 2001.

PUBLIC AWARENESS

Research Demonstrations

- D1 Distributed Musical Practice and Performance, I Medici di McGill, Oscar Peterson Hall, Montreal, April 28, 2008.
- D2 Wide Screen Window on the World: Life Size HD Videoconferencing. Supercomputing 2005, Bandwidth Challenge, Seattle, November 16, 2005.
- D3 Streaming DSD Audio comes to the AES. Audio Engineering Society 117th Convention, San Francisco, October 31, 2004.
- D4 Cross-continental low-latency ultra-videoconferencing. McGill-Stanford jazz jam, June 13, 2002.
- D5 Remote master’s class using SDI video and multichannel audio. McGill-National Research Council session with Pinchas Zukerman, March 25, 2002.
- D6 SDI video and multichannel audio. CANARIE’s 7th Advanced Networks Workshop, Toronto, November 28, 2001.
- D7 Low-latency distributed violin duet in full-frame video. RISQ 2001 Conference, Montreal, November 5, 2001.

The Globe and Mail noted that “*Cooperstock’s demonstration was a watershed event for the elite club of the world’s computer network engineers. No one had ever before been able to demonstrate that, under the right conditions, it is possible for natural, normal human interaction to occur over the Internet.*”

D8 The Recording Studio that Spans a Continent. Audio Engineering Society 109th Convention, Los Angeles, September 23, 2000.

The Audio Engineering Society noted that this *“Landmark demonstration shows cost effective and high performance transmission systems for high quality 24-bit, 96kHz uncompressed multichannel audio are on horizon”*

D9 Dolby Digital 5.1 audio with MPEG-2 video around the world. Internet Global Summit INET 2000 Conference, Yokohama, July 20, 2000.

CBC Radio noted that *“McGill University in Montreal has made Internet history by setting up the first intercontinental netcast of a live concert in surround sound and full-screen video.”*

D10 Dolby Digital 5.1 audio with MPEG-2 video. CANARIE’s 5th Advanced Networks Workshop, Toronto, November 29, 1999.

D11 First real-time Multichannel Audio Internet demo. Audio Engineering Society 107th Convention, New York, September 26, 1999.

The Learning Technologies Networked noted that *“The performance marked the first real time multichannel audio Internet transmission, a feat made possible by software developed at McGill University by a team under the leadership of Professor Jeremy Cooperstock.”*

Invited Talks

T1 “They don’t use Skype on the Holodeck”, Department of Computer Science, University of British Columbia, July 4, 2012.

T2 “But can the Holodeck do a good Shiraz?”, School of Computer Science and IT, Royal Melbourne Institute of Technology, February 17, 2012.

T3 “But can the Holodeck do a good Shiraz?”, School of Information Technologies, University of Sydney, February 15, 2012.

T4 “Distributed Music Performance and Latency Issues”, School of Drama, Fine Art and Music, University of Newcastle (Australia), February 13, 2012.

T5 “But can the Holodeck do a good Pinot noir?”, Department of Computer Science, University of Otago, January 23, 2012.

T6 “Shared Reality: Toward perceptually convincing computer-mediated environments”, Department of Computer Science, University of Auckland, August 25, 2011.

T7 “This is your brain on Shared Reality: Toward perceptually convincing computed-mediated environments”, Vanier College, Science Week Presentation, March 24, 2011.

T8 “Around the World in 80 ms.” Panel presentation in Workshop of the Audio Engineering Society Convention, San Francisco, November 5, 2010.

T9 “UltraVideo and Virtual Presence: A Video Perspective.” Presentation on Teaching in Distributed Performance, Tromsø, Norway, October 15, 2010.

- T10 “Future Interfaces for Audio.” Panel presentation in Workshop of the Audio Engineering Society Convention, New York, October 10, 2009.
- T11 “World Opera Technologies and Tests”, Danish Sound Technology Network, Aalborg University, June 8, 2009.
- T12 “This is your brain on Shared Reality: Toward perceptually convincing computed-mediated environments”, Simula Lab, Oslo, May 15, 2009.
- T13 “The Montreal World Opera Experiments”. Presentation at the World Opera Symposium, Struer, Denmark, May 12, 2009.
- T14 “Audio-Visual-Haptic-Tactile: Putting them all together for an engaging immersive experience”. Panel presentation in Workshop of the Audio Engineering Society Convention, Munich, Germany, May 10, 2009.
- T15 “New Technologies for Audio over IP”. Panel presentation in Workshop of the Audio Engineering Society Convention, Munich, Germany, May 10, 2009.
- T16 “This is your brain on Shared Reality: Toward perceptually convincing computed-mediated environments”, Ambient Intelligence Group, CITEC, Bielefeld University, May 6, 2009.
- T17 “Distributed and Multimodal Interaction in Virtual and Augmented Reality Environments”, McGill University, School of Physical and Occupational Therapy, November 25, 2008.
- T18 “A Platform to Create and Support Ocean Science Virtual Organizations (Oceans 2.0)” and “HSVO Health Services Virtual Organization”, RISQ 2008 Colloquium, Montreal, November 14, 2008.
- T19 “Shared Reality: Effective Interaction for (Demanding) Distributed Tasks”, University of Victoria, September 16, 2008.
- T20 “The Future of VC: Music Teaching and High Fidelity Video”, Elevate 2008: Reaching New Heights in Educational Video-conferencing, Banff, August 27–28, 2008.
- T21 “Bidirectional video communication for real-time applications”, Institut für Telematik, University of Lübeck, Germany, May 15, 2008.
- T22 “Shared Reality: Effective Interaction for (Demanding) Distributed Tasks”, Aalborg University, Esbjerg, Denmark, May 14, 2008.
- T23 “Distributed Multimodal Interaction”, Bang & Olufsen, Struer, Denmark, May 13, 2008.
- T24 “Creating an immersive video space”, International Symposium on The World Opera: When the Opera stage becomes worldwide, Tromsø, Norway, May 9, 2008.
- T25 “Distributed Musical Practice and Performance”, Biology and Music Lecture, I Medici di McGill, April 28, 2008.

- T26 “Multimodal Streaming and Distributed Audio Interaction”, High Quality Audio over Networks (ANET II) Summit, Banff Centre, April 12, 2008.
- T27 “Shared Reality: Effective Interaction for (Demanding) Distributed Tasks”, Arts, Media and Engineering, Arizona State University, February 29, 2008
- T28 “Music and Games: How Fun Applications Stimulate Core Technologies”, Canadian University Software Engineering Conference, January 19, 2008.
- T29 “From Videoconferencing to Shared Reality.” Department of Electrical and Computer Engineering, University of British Columbia, October 4, 2007.
- T30 “From Teleoperation to Teleimmersion: Design Challenges for Distributed Interaction”, Canadian University Software Engineering Conference, January 19, 2007.
- T31 “CANARIE sur UCLP et ROADM, deux technologies qui changent le monde des télécoms”, Round Table panel, RISQ Annual Conference, Quebec City, October 16, 2006.
- T32 “La recherche sur en ultra-videoconference”, Panel on “Vitrine technopédagogique sur la vidéoconférence”, RISQ Annual Conference, Quebec City, October 16, 2006.
- T33 “Broadband transmission of multimodal content at the Centre for Interdisciplinary Research in Music Media and Technology (CIRMMT)”, RISQ-CA*net4 Advanced Networking Day, Montreal, October 24, 2005.
- T34 “Low-Latency Ultra-Videoconferencing and Shared Reality.” Interfaces Montreal, Rencontre du Génie numérique et des Affaires. Montreal, October 11, 2005.
- T35 “Shared Spaces.” Asia-Pacific Advanced Networks (APAN) Conference, Taipei Aug. 22–27, 2005.
- T36 “Engaging Technolog(ies) for Effective Interaction.” Keynote speaker. World Conference on Educational Multimedia, Hypermedia and Telecommunications, Montreal, June 29, 2005.
- T37 “Broadband Distance Education in 2007: Views from the Demand Side.” Invited Panelist. World Conference on Educational Multimedia, Hypermedia and Telecommunications, Montreal, June 29, 2005.
- T38 “Ultra-Videoconferencing and Intelligent Classrooms.” Keynote speaker. Canadian Higher Education and Information Technology Conference, Montreal, June 28, 2005.
- T39 “Engaging Technolog(ies) for Effective Interaction.” Department of Computer Science, Hebrew University of Jerusalem, April 19, 2005.
- T40 “Engaging Technolog(ies) for Effective Interaction.” Intelligence, Agents, Multimedia Group, University of Southampton, UK, March 7, 2005.
- T41 “From Videoconferencing to Shared Reality.” l’Institut de Recherche et Coordination Acoustique/Musique (IRCAM), Paris, November 25, 2004.

- T42 “From Videoconferencing to Shared Reality.” Bell University Laboratories’ Annual Conference, Toronto, November 3, 2004.
- T43 “History of Internet Audio Experiments at McGill.” High Quality Audio over Networks (ANET) Summit, Banff Centre, August 20–22, 2004.
- T44 “From Videoconferencing to Shared Reality.” Taiyuan University, Taiyuan, China, April 18, 2004.
- T45 “From Videoconferencing to Shared Reality.” Tsinghua University, Beijing, China, April 14, 2004.
- T46 “From Videoconferencing to Shared Reality.” Beijing University, Beijing, China, April 14, 2004.
- T47 “From Videoconferencing to Shared Reality.” Beihuan University, Beijing, China, April 12, 2004.
- T48 “From Videoconferencing to Shared Reality.” Advanced Telecommunications Research (ATR), Nara, Japan, April 9, 2004.
- T49 “From Videoconferencing to Shared Reality.” Dept. of Industrial Engineering, Musashi Institute of Technology, April 5, 2004.
- T50 “Advanced Video Applications: Developments in Extreme Video.” Southeastern Universities Research Association Video Development Initiative (SURA/ViDe) 6th Annual Digital Video Workshop. Indianapolis, March 24, 2004.
- T51 “High-fidelity telepresence.” Graphics and Geometric Computing Seminar Series, Technion – Israel Institute of Technology, January 1, 2003.
- T52 “The Democratic Revolutions – Peer to Peer Meets Open Source: Design, Philosophy, Engineering.” Intimate Technologies/Dangerous Zones. Banff New Media Institute, Banff Centre, April 27, 2002.
- T53 “The Development of Ultra VC Applications and Technology.” Southeastern Universities Research Association Video Development Initiative (SURA/ViDe) 4th Annual Digital Video Workshop. University of Alabama at Birmingham, April 25, 2002.
- T54 “The Virtual Studio.” Royal Conservatory of Music, Toronto, February 25, 2002.
- T55 “Building a Shared Reality.” Department of Computer Science, University of Toronto, February 25, 2002.
- T56 “Distributed Concerts and Shared Reality: Just how much streamed data and computation do we need to support effective interaction?” Department of Computer Science, Clarkson University, November 1, 2001.
- T57 “High quality wide-screen SDI video and multichannel audio over CA*net3.” CANARIE’s 7th Advanced Networks Workshop, Toronto, November 28, 2001.

- T58 “Low-latency comes to videoconferencing: The Frères Jacques duet at a distance.” RISQ 2001 Conference, Montreal, November 5, 2001.
- T59 Advanced Networking and the Arts: Innovations in Outreach, Collaboration, and Performance. Panel Discussion at Internet Global Summit INET 2001 Conference, Stockholm, June 6, 2001.
- T60 “The McGill - Calgary Advanced Learnware Network.” CANARIE’s 6th Advanced Networks Workshop, Montreal, November 29, 2000.
- T61 “Networks and Music Instruction.” Panel Discussion with Pinchas Zukerman and Wieslaw Woszczyk, CANARIE’s 6th Advanced Networks Workshop, Montreal, November 29, 2000.
- T62 “Tools for Distributed VR.” Canadian Working Group on Virtualized Reality Systems, Montreal, November 28, 2000.
- T63 “Evolution of the Intelligent Classroom.” Multicultural Perspectives on the use of Technology in Education. Montreal, October 2, 2000.
- T64 The Brave New World of Ubiquitous Bandwidth.” Internet Global Summit INET 2000 Conference, Yokohama, July 20, 2000.
- T65 “Multichannel Audio over the Internet: The Next Phase.” RISQ 2000 Conference, May 31, 2000.
- T66 “Robotics and Design.” Round Table Panel, Centre Design UQAM, February 9, 2000.
- T67 “Multichannel Audio over the Internet.” CANARIE’s 5th Advanced Networks Workshop, Toronto, November 29, 1999.
- T68 “The Shared Reality Environment.” Department of Electrical and Computer Engineering, Ecole Polytechnique, Montreal, May 28, 1999.
- T69 “When Telemedicine feels like Regular Medicine.” Communications and Information Technology Ontario (CITO) Healthcare for the Future: Telemedicine, February 18, 1999.

Media Exposure

- M1 Club Social (TV5), Feb. 4, 2011
- M2 Global TV (National), Jan. 29, 2009
- M3 Global TV (Montreal), Jan. 27, 2009
- M4 CBC Radio, As it Happens, Jan. 27, 2009
- M5 National Post, Jan. 27, 2009
- M6 Montreal Gazette, Jan. 27, 2009
- M7 Montreal Gazette, Feb. 20, 2009
- M8 Inside Higher Education, Sept. 3, 2008

- M9 CBC Radio (Daybreak), Sept. 3, 2008
- M10 CJAD radio, Sept. 2, 2008
- M11 Cabling Networking Systems, Jan. 2006
- M12 McGill Reporter, Nov. 24, 2005
- M13 CTV Quebec, Global News, Dec. 23, 2002
- M14 New York Times, Technology Section, Dec. 19, 2002
- M15 Discovery Channel, Daily Planet, Oct. 30, 2002
- M16 CFCF (CTV Quebec) Global News, June 19, 2002
- M17 National Post, June 15, 2002
- M18 CBC Television, The National, May 3, 2002
- M19 McGill Reporter, Learning the Strings, April 11, 2002
- M20 Ottawa Citizen, March 29, 2002
- M21 Montreal Gazette, March 27, 2002
- M22 Globe & Mail, Dec. 1, 2001
- M23 Canal Z, La Revanche des Nerdz, Nov. 13, 2001
- M24 Montreal Gazette, Nov. 10, 2001
- M25 CJAD Radio, The World Today, July 31, 2001
- M26 McGill Reporter, April 5, 2001
- M27 Globe & Mail Report on Business, Oct. 28, 2000
- M28 TQS Double Clic!, Oct. 7, 2000
- M29 McGill Reporter, Sept. 21, 2000
- M30 UPath.com, Vol 40, 2000
- M31 CBC (Montreal) Home Run, Aug. 22, 2000
- M32 Montreal Gazette, Aug. 22, 2000
- M33 CFCF (CTV Quebec) Pulse News, Aug. 21, 2000
- M34 CBC Radio The Arts Report, July 20, 2000
- M35 Elle Quebec, June 2000
- M36 Journal Le Monde des Affaires, May 2000
- M37 Canal Z, Technofolie, May 3, 2000
- M38 TQS Double Click, April 29, 2000
- M39 McGill Reporter, April 6, 2000
- M40 Briefing Digital, April 2000
- M41 Interface: La Revue de la Recherche, Vol. 21, No. 2, March-April 2000
- M42 American Society of Mechanical Engineers, Mechanical Advantage, Vol 9, No 3, March 2000

- M43 Canal Z, La Revanche des Nerdz, Feb. 2000
- M44 CFCF (CTV Quebec) Pulse News, Feb. 29, 2000
- M45 Canal Vox: CityMag, Jan. 15, 2000
- M46 Montreal Mirror, Jan. 6, 2000
- M47 Plan Mega: La revue du genie québécois, Ordre des ingenieurs du Québec. Vol 1, Jan. 2000
- M48 Radio Corporation of Singapore: Science and Technology Watch, Dec. 1999
- M49 Radio Canada (CBC French) Les Annees lumiere, Nov. 28, 1999
- M50 Financial Times Life/Technology, Nov. 25, 1999
- M51 CBC Radio: As it Happens, Nov. 22, 1999
- M52 Journal de Montreal, Nov. 19, 1999
- M53 Le Devoir, Nov. 18, 1999
- M54 TVA CyberClub, Nov. 13, 1999
- M55 La Presse, Sept. 26, 1999
- M56 CJAD Radio, April 11, 1999
- M57 Montreal Mirror, April 8, 1999
- M58 McGill Reporter, Jan. 14, 1999
- M59 High-Tech Shower International, Nov. 26, 1997
- M60 CBC Newsworld "Futureworld", Oct. 5, 1996
- M61 Discovery Channel, Sept. 18, 1996
- M62 Toronto Star, Sept. 15, 1996
- M63 University of Toronto Varsity, Sept. 3, 1996
- M64 TV Ontario "Studio Two", June 26, 1995

RESEARCH SUPERVISION

RESEARCH PROFESSIONALS

Name	Period	Tasks	Present Position
Bouchard, Mathieu	Jan. 2011 – present	research assistant under MSG project	
Chen, Guangyi	Jan. 2010 – Jul. 2010	research associate under Canarie NEP	
Vincent, Coralie	Oct. 2010 – Mar. 2011	research assistant	CNRS, France
Dansereau, Don	June 2009 – Jan. 2010	research associate under FQRNT grant	Ph.D. student, U. Sydney, Australia
To, Long	Jan. 2009 – Sep. 2011	research associate under NSERC I2I	
Blum, Jeff	Oct. 2008 – present	research assistant under MSG project	
Olmos, Adriana	Sept. 2008 – present	user interface engineer under Canarie NEP	
Sun, Haijian	Sept. 2008 – Oct. 2010	computer engineer under Canarie NEP	programmer, Desjardins
Soukhodolski, I.	Oct. 2005 – Dec. 2007	web services programmer under Canarie IIP	Owner, W4 Technology
Kiewe, Howard	Oct. 2005 – Dec. 2007	user interface developer under Canarie IIP	consultant
Spackman, S.	2000 – 2006	research associate on Canarie and VRQ projects	Google, Mountain View
Sarikaya, Deniz	2003 – 2004	research assistant on VRQ projects	deceased
Soucy, Gilbert	1999	research associate on CFI project	Imaging Specialist, 36pix Inc., Montreal

POST-DOCTORAL FELLOWS

Name	Period	Tasks (Funding Program)	Present Position
Panéels, S.	Jan. 2011 – Dec. 2011	Natural Interactive Walking and In-Situ Audio Services	Post-doc, Commissariat à l'énergie atomique et aux énergies alternatives (CEA)
Pelletier, S.	Jan. 2011 – Jun. 2011	Parallax Barrier Display rendering software optimization (NSERC ENGAGE)	Game Programmer, Behaviour Interactive
Otis, Martin	Jan. 2010 – Dec. 2010	Natural Interactive Walking (FQRNT Scholarship)	Asst. Professor, U. Québec à Chicoutimi
Millet, G.	Nov. 2009 – Mar. 2012	Natural Interactive Walking	Research Engineer, University of British Columbia
Bouillot, Nicolas	Oct. 2009 – Dec. 2011	Open Orchestra (Canarie NEP-2 Project)	Research Engineer, Société des arts technologiques
Pelletier, S.	Nov. 2009 – Jun. 2010	Real-time Image-based Rendering (Canarie NEP)	(see above)
Darolti, Cristina	Jan. – Dec. 2009	Real-time Image-based Rendering (Canarie NEP)	Patent Examiner, EPO, The Hague
Bouillot, Nicolas	2007 – 2009	Mobile Audio Interaction (NSERC New Media Initiative)	(see above)
Wang, Guangyu	Sep. 2007 – Mar. 2011	Neurosurgical Visualization and Virtual Presence (NSERC Strategic and NCE)	Associate, ISG Technology Division, Morgan Stanley
Wang, Yan	2002 – 2003	Channel and spatial view allocation for videoconferencing (VRQ)	V.P. Marketing, AMH Canada

PH.D. STUDENTS

Name	Period	Thesis title	Present Position
Xie, Meng	Sep. 2012 – present	TBD	
Anlauff, Jan	Jan. 2011 – present	Multimodal Interaction (McGill Engineering Doctoral Award Student)	
Tordini, F.	Jan. 2011 – present	Auditory Attention Steering	
Ghourchian, N.	Jan. 2010 – Apr. 2011	Affective Evaluation (McGill Engineering Doctoral Award Student)	transferred to another group
El-Shimy, D.	Jan. 2009 – present	Reactive Environment for Network Music Performance (NSERC PGSD Scholarship)	
Benovoy, M.	Oct. 2007 – Aug. 2010	Biosignals analysis and pattern recognition (CIRMMT Student Award and NSERC PGSD Scholarship)	transferred to another group
Visell, Yon	Sept. 2005 – Mar. 2011	Walking on virtual ground: physics, perception, and interface design	Post-Doc, Université Pierre et Marie Curie, France
Qi, Zhi	Jan. 2004 – Dec. 2008	Towards dynamic mosaic generation with robustness to parallax effects	Assistant Professor (EE), Southeast University, China
Pelletier, S.	Jan. 2003 – Oct. 2009	Acceleration methods for image super-resolution (Precarn Scholarship)	
Yin, Jianfeng	Sept. 2000 – Aug. 2008	Toward an Alternative Approach to Multi-Camera Scene Reconstruction	Component design engineer, Intel
Sun, Wei	2002 – 2006	Multi-camera Object Segmentation in Dynamically Textured Scenes Using Disparity Contours	Apple Inc., Cupertino
Cayouette, F.	2003 – 2006	(NSERC Scholarship – withdrew from program)	Programmer, Behaviour Interactive, Montreal
Arseneau, S.	2000 – 2006	Representing Junctions through Asymmetric Tensor Diffusion	Chief Engineer for R&D, Laser Shot, Houston

ADDITIONAL PH.D. SUPERVISORY SERVICE

I co-supervised a portion of the thesis work of the following students:

- Grond, F. (Jul-Dec 2010), visiting student from Bielefeld University, Germany
- Zambon, S.. (Jul-Oct 2010), visiting student from Verona University, Italy
- Cirio, G. (Jun-Aug 2010), visiting student from INRIA-IRISA, France
- Rizutti, C. (Sep-Oct 2008), visiting student from Università della Calabria, Italy

- Bossi, E. (Sep-Oct 2008), visiting student from Università della Calabria, Italy
- Pellerin, R. (Jun-Sep 2008), visiting student from Conservatoire Nationale des Arts et Métiers, France
- Cupellini, E. (Jul-Aug 2007), visiting student from Università della Calabria, Italy
- Usher, J. (2003-2004), Ph.D. student, Faculty of Music, McGill University
- Mohammadi, M. (Feb-Aug 2004). visiting student from Sharif University, Iran

I served as external reviewer of the following theses:

- Alexandre Plouznikoff, École Polytechnique de Montréal (2009)
- Xiaoyong Sun, School of Information Technology and Engineering, University of Ottawa (2007)
- Nicolas Bouillot, Conservatoire Nationale des Arts et Métiers, France (2006)
- Harold Okai-Tettey, Computer Science, Rhodes University, South Africa (2006)

I served on the supervisory and/or examination committees of the following students:

- Department of Electrical and Computer Engineering: Andrew Phan, Dante De Nigris Moreno, Marc Boulé, Carmen Au, Jun Ouyang, Wei Chu, Vincent Levesque, Jerome Pasquero, Rui Ma, Dingrong Yi, Ala Qumsieh, Harkirat Sahambi, Muhua Li, Yick Kei Wong, Oliver Astley, Edouard Antoniou, Wei Sun
- Faculty of Music: Cory McKay, Vanessa Yarmechuk, Mark Zadel, Sean Olive, Jason Corey, Dale Stammen
- Grad. School of Library and Information Studies: Charles-Antoine Julien
- Department of Educational Psychology and Counselling: Adam Finkelstein
- Department of Mechanical Engineering: Zahir Albadawi
- School of Computer Science: Paul Haroun

MASTERS STUDENTS

Name	Period	Thesis title	Present Position
Hieda, Naoto	Sep. 2012 – present	TBD	
Viswanathan, R.	Jan. 2010 – present	A VR-based Approach to Investigating the Two-Stream Hypothesis in Neurophysiology (McGill Recruitment Award)	
Knight, Trevor	Jan. 2010 – Sep. 2011	Music Visualization for Open Orchestra (CIRMMT Student Award)	Software Developer, Noteloop Systems, Inc.
Li, Weizhong	Sept. 2008 – May 2009	(recommended alternative supervision)	
Ip, Jessica	Sept. 2008 – Mar. 2011	An Augmented Reality Prototype for Interactive Play in a Virtual and Physical Environment	UI developer, SAP, Montreal
El-Shimy, D.	Sept. 2007 – Dec. 2008	Gestural interaction for complex tasks	(reclassified as Ph.D. student)
Law, A.	Sept. 2007 – Sept. 2010	A Vibrotactile Floor for Enabling Interaction through Virtual Walking Spaces	Applications Engineer, Lumerical Solutions, Vancouver
Benovoy, M.	Sept. 2006 – Oct. 2007	Biosignals analysis and its application in a performance setting	(reclassified as Ph.D. student)
Audet, Samuel	2005-2007	Shadow Removal from Multi-Projector Displays via Three-Dimensional Modeling and Object Tracking (NSERC Scholarship student)	Ph.D., Tokyo Institute of Technology; Software Engineer, Fixstars, Japan
Wozniowski, M.	2003-2006	A framework for interactive three-dimensional sound and spatial audio processing in a virtual environment	research engineer at la Soci�t� des arts technologiques, Montreal
Rudzicz, Frank	2004-2006	CLAVIUS: Understanding Language Understaing in Multimodal Interaction (FQRNT Scholarship student)	Assistant Professor, University of Toronto
Rioux, Francois	2003-2005	Software Framework for Parsing and Interpreting Gestures in a Multimodal Virtual Reality Context (NSERC Scholarship student)	Ph.D., Laval University; Software Architect, Thales Canada
Chan, Siu-Chi	2002-2005	Hand and Fingertip Tracking for Gesture Recognition	Software Engineer, AMD Toronto
Hilario, Nadia	2002-2005	Occlusion Detecion in Front Projection Environments based on Camera-Projector Calibration (FCAR Scholarship student)	Software Developer, Bluestreak Technology

MASTERS STUDENTS (CONT.)

Name	Period	Thesis title	Present Position
Perez, Michael	2002-2005	A Study of Multimodal Human-Computer Interaction for a Public Kiosk System	User Interface Designer, Nuance Communications
Sud, Daniel	2002-2005	Design of a Multi-Projector Display System	Programmer, Behaviour Interactive, Montreal
Boussemart, Y.	2002-2005	Design and Implementation of Framework for Immersive Environments in a Shared Context	Post-doctoral fellow, MIT
Pelletier, S.	2001-2003	High-Resolution Video Synthesis from Mixed-Resolution Video Based on the Estimate-and-Correct Method	(see above)
Gu, Jinhua	2000-2002	A distributed software architecture for the Shared Reality Environment.	Assistant VP, Radian Asset Assurance Inc., NY
Yao, Jie	2000-2002	Human Arm Gesture Detection and Recognition in a Classroom Environment.	Ph.D. student, Concordia University
Zhang, Yuan	2000-2002	An efficient coding method for spatial data: the rotating, hierarchical, overlapping representation.	Ph.D. student, University of Delaware
Doutriaux, S.	1998-1999	(withdrew in 1999 to launch start-up company)	
Arseneau, S.	1998-2000	Robust Image Segmentation Towards an Action Recognition Algorithm.	(see above)
Xu, Aoxiang	1998-2000	A High-Performance Audiovisual Communication System.	QNX Software Systems, Ottawa

ADDITIONAL MASTERS SUPERVISORY SERVICE

I co-supervised a portion of the thesis work of the following students:

- Penin, O. (Jul-Aug. 2011). visiting student from Paris-Sud 11, France
- Mabire, N. (Apr-Sep. 2010). visiting student from Supélec, Metz, France
- Brulé, M. (Feb.-Aug. 2009). visiting student from Université de Louis Pasteur, Strasbourg, France
- Anlauff, J. (Dec. 2008-Mar. 2009). visiting student from Bielefeld University, Germany
- Delattre, G. (Apr.-Aug. 2007). visiting student from Université Paris VI, France

I served on the supervisory and/or examination committees of the following students:

- Anne-Marie Burns, Faculty of Music, McGill University

- Frank Riggi, Electrical and Computer Engineering, McGill University
- Eric Benzacar, Electrical and Computer Engineering, McGill University
- Oles Protsiym, Faculty of Music, McGill University

FUNDING

INDIVIDUAL RESEARCH GRANTS AND CONTRACTS

Date	Agency	Amount	Title/Description
2012-2017	NSERC	\$210,000	<i>Improved Shared Reality for Multi-Party, Multimodal Simulation and Interaction.</i> Discovery grant.
2012	Toyota	\$30,000	<i>Haptic interaction with an augmented steering wheel.</i> Toyota Infotechnology Centre
2011	HP	\$60,950	<i>Capturing attention via spatialized audio cues.</i> HP Labs Innovation Research Program (IRP)
2011	NSERC	\$25,000	<i>Improved Parallax Barrier Autostereoscopic Display Software.</i> Engage Grants Program with Industrial Partner, Holoptick Technologies Inc.
2010-2011	Google	\$50,000	<i>A Spatialized Audio Map System for Mobile Blind Users.</i> Google Research Awards.
2010-2011	Honda	\$30,000	<i>Facial Expression Recognition for Machines.</i> Honda Research Institute.
2010	UVic	\$8,000	<i>NEPTUNE Pleora streamer.</i> University of Victoria software license
2008-2012	MDEIE	\$367,195	<i>Natural Interactive Walking.</i> Support for International Research and Innovation Initiatives, Ministère du Développement économique, de l'Innovation et de l'Exportation; for Canadian participation in EU FP-7 program with partners in France, Italy, and Denmark.
2007-2010	MDEIE	\$15,000	<i>Un environnement virtual pour la création de musique et de son à partir de systèmes chaotiques.</i> Support for International Research and Innovation Initiatives, Ministère du Développement économique, de l'Innovation et de l'Exportation.
2006-2009	NSERC	\$317,785	<i>A pervasive multi-user augmented space for mobile immersive interaction with sound and music.</i> (additional funding for artist collaborator received from Canada Council for the Arts) New Media Initiative STPGP 337999-06.
2006-2011	NSERC	\$100,000	<i>Enhanced video for shared reality environments.</i> Discovery grant.
2004-2006	NSERC	\$136,600	<i>Soundscape performance works via interactive environment for immersive audiovisual scene generation.</i> (additional funding for artist collaborator received from Canada Council for the Arts) New Media Initiative NMIPJ 307934-04.
2002-2006	NSERC	\$100,000	<i>Shared Reality Interaction over High Bandwidth Connectivity.</i> Discovery grant.
2000	LUB	\$100,000	<i>Distributed Visualization Environment.</i> Laboratoire universitaire Bell Equipment Grant.

INDIVIDUAL RESEARCH GRANTS AND CONTRACTS (CONT.)

Date	Agency	Amount	Title/Description
1999-2000	Petro-Canada	\$20,500	<i>Interactive Web Tools for Critique of Presentation Skills and Evaluation of Student Learning.</i> Young Innovator Award.
1999-2002	FCAR	\$45,000	<i>Augmenting an Electronic Classroom for Improved Instructor-Student Interaction.</i> New Researchers Award.
1999	FCAR	\$15,700	<i>Augmenting an Electronic Classroom for Improved Instructor-Student Interaction.</i> Equipment Grant.
1999	AES	\$25,000	<i>Multichannel audio over Internet.</i> Audio Engineering Society.
1999	OSC	\$15,000	<i>Timespace Exhibit.</i> Ontario Science Center contract.
1999	MFM	\$10,000	<i>Intelligent Classroom tools.</i> McGill Faculty of Management.
1998-2002	NSERC	\$76,000	<i>Reactive Hospital Environment.</i> Discovery research grant.
1998	FGSR	\$20,000	McGill Graduate Studies and Research Development Fund

TEAM RESEARCH GRANTS AND CONTRACTS (PERCENTAGES REFER TO MY PORTION)

Date	Agency	Amount	Title/Description
2011	CIRMMT	\$10,000 (90%)	* <i>Acoustic Sculptures</i> CIRMMT Strategic Innovation Fund Award (with A. Olmos and 3 others)
2010-2011	NSERC	\$49,815 (90%)	* <i>Novel Portable Treatment Device for Lazy Eye</i> Idea to Innovation (I2I) Booster (Phase Ib) (with R. Hess)
2009-2011	MSG	\$200,000 (80%)	* <i>Location-Based Spatialized Audio Interaction for the Blind and Visually Impaired</i> Programme Appui au passage à la société de l'information (Support for the transition to an information society program), Ministère des Services gouvernementaux (MSG) (with M. Wozniowski and Z. Settel)
2010-2014	CHRP	\$327,000 (?)	<i>Computational and statistical tools for image guided neurosurgery of brain tumors</i> NSERC Collaborative Health Research Projects (with L. Collins and 7 others)
2009-2010	CCSIP	\$48,000 (4%)	* <i>Digitally Merged Environments</i> California-Canada Strategic Initiatives Program (with S. Brown, UCSD and 20 co-applicants)
2009-2011	Canarie	\$927,648 (40%)	† <i>Open Orchestra</i> Network-Enabled Platforms 2 (with J. Roston and W. Woszczyk)
2010-2014	NCE	\$23,000,000 (2%)	<i>GRAND: Graphics, Animation and New Media</i> Networks of Centres of Excellence (With K. Booth and 49 others)
2009	DND	\$47,500	† <i>Video-Based Facial Recognition - Algorithm and Demonstration</i> Department of National Defence Contract (with M. Levine)
2008-2009	NSERC	\$120,250 (90%)	* <i>Novel Portable Treatment Device for Lazy Eye</i> Idea to Innovation (I2I) (with R. Hess)
2008-2010	Canarie	\$1,397,758 (7%)	<i>NEPTUNE: A Platform to Create and Support Ocean Science Virtual Organizations</i> Network-Enabled Platforms (with B. Pirenne and J. Roston)
2008-2010	Canarie	\$2M (18%)	<i>Health Services Virtual Organization</i> Network-Enabled Platforms (with R. Ellaway and 8 others)
2008-2010	NSERC	\$196,000 (50%)	* <i>3-D Visualization and gestural interaction with multimodal neurological data</i> Strategic Projects (with 5 others)
2006-2009	FQRNT	\$146,550 (50%)	* <i>Unités agenceables: Réseau d'Environnements Immersifs pour Collaboration à Distance</i> Recherche en équipes (with X.-W. Sha)
2005-2006	Canarie	\$825,000 (50%)	<i>Undersea Window - High Definition Video Online</i> Intelligent Infrastructure Program. (with J. Roston)
2005-2006	SAT	\$1,276,000 (1%)	<i>TOT2: Nouveau Territoires de la Création-Diffusion en Réseau</i> Heritage Canada New Media Research. (M. Savoie, PI)
2004-2006	Canarie	\$568,971 (33%)	<i>Shared Spaces - High Definition Ultra-Videoconferencing</i> Advanced Applications Program. (with J. Roston)
2003-2004	SAT	\$792,082 (1%)	<i>TOT1: Nouveau Territoires de la Création-Diffusion en Réseau</i> Heritage Canada New Media Research. (M. Savoie, PI)

TEAM RESEARCH GRANTS AND CONTRACTS (CONT.)

Date	Agency	Amount	Title/Description
2002-2005	IRIS	\$573,000 (25%)	* <i>Parallel Distributed Camera Arrays for Intelligent Environments</i> (with J. Clark, S. Fels, R. Vertegaal)
2002-2005	VRQ	\$2,180,000 (20%)	<i>Real-time Communication Of High-res. Multi-sensory Content via Broadband Networks.</i> (with W. Woszczyk and others)
2001-2002	Canarie	\$391,000 (30%)	<i>Remote Video Sign-Language Interpreting.</i> Advanced Networking Apps. Services & Technologies. (with J. Roston and others)
2000-2002	Canarie	\$808,000 (35%)	<i>McGill Advanced Learnware Project.</i> Advanced Networking Applications Services and Technologies. (with B. Pennycook)
2000-2003	LUB	\$150,000 (50%)	* <i>Distributed Shared Visualization Environment.</i> Laboratoire universitaire Bell. (with B. Ozell)
2000-2001	Royal Bank	\$2,000 (80%)	* <i>Improving Teaching through an Interactive Critiquing System.</i> Teaching Improvement Fund Award. (with R. Harris and J. Blatter)
1999-2002	CFI	\$400,000 (50%)	† <i>The Shared Reality Environment.</i> New Opportunities Award. (with J. Clark)
1999-2000	Royal Bank	\$10,000 (80%)	* <i>Interactive Web Tools for Critique of Presentation Skills and Evaluation of Student Learning.</i> TIF (with R. Harris)

*Indicates grants on which I am project leader. †Grant on which I am co-investigator.

CENTRE RESEARCH GRANTS

Date	Agency	Amount	Title/Description
2008-2014	FQRSC/ FQRNT	\$1,800,000	Regroupement Stratégique: <i>Centre Interdisciplinaire de Recherche en Musique, Médias et Technologie.</i> (with S. McAdams and 23 others)
2007-2009	NSERC	\$57,630	Major Resources Support: <i>Centre for Interdisciplinary Research in Music Media and Technology (CIRMMT).</i> (with S. McAdams and 8 others)
2006-2012	FQRNT	\$1,530,000	Regroupement Stratégique pour <i>l'Étude des Environnements PARTagés Intelligents répartis (REPARTI).</i> (with D. Laurendeau and 23 others) \$100,000 per annum allocated to CIM.
2002-2005	FCAR	\$720,000	Regroupement Stratégique: <i>Réseau Québécois de Recherche en Réalité Artificielle Distribuée (QUERRAnet).</i> (with F. Ferrie, R. Bergevin, P. Cohen, and others)
2001	CFI	\$6,500,000	Major Facilities Award: <i>Centre for Integrated Research in Music Media and Technology.</i> (with W. Woszczyk and 11 others)
2000-2002	FCAR	\$113,500	Centre de Recherches. (with F. Ferrie and 17 others)
2000	NSERC	\$275,000	<i>Information Systems in Support of Intelligent Machine Research.</i> (with F. Ferrie and 17 others)

TEACHING

COURSES TAUGHT

Course title and number	Description	Semester
ECSE-526B <i>Artificial Intelligence</i>	Graduate level course in artificial intelligence with emphasis on machine learning and autonomous agents	Winter 1998–present
*ECSE-683 <i>Topics in Vision and Robotics</i>	Graduate level laboratory course for RoboCup projects	Fall 2000 Fall 2002
*ECSE-424B <i>Human-Computer Interaction</i> [†]	Undergraduate course in human-computer interaction with emphasis on new interface paradigms	Winter 2000–present
ECSE-487A/C <i>Computer Architecture Laboratory</i>	Undergraduate laboratory course	Fall 1999–present, Summer 2000–2002
ECSE-427A <i>Operating Systems</i>	Undergraduate course (core for Computer Engineering students)	Fall 1998
CSC-270 <i>Introduction to Modelling and Optimization</i>	Computer Science undergraduate course, University of Toronto	1993–1994
CEE 1714Y <i>Digital Systems and Computers</i>	Continuing Engineering Education course for the Association of Professional Engineers of Ontario	1993–1994
CSC-228 <i>File Structures and Data Management</i>	Computer Science undergraduate course, University of Toronto	1992–1995
COSC-3411 <i>File Structures and Data Management</i>	Computer Science undergraduate course, York University	1992

*Indicates new course that I created.

[†]In 2011, a project from this class placed third in the Usability Professionals Association International Student Design Competition. Note that graduate students have also enrolled in this course under the designation of ECSE-689, *Recent Advances in Electrical Engineering*.

UNDERGRADUATE SUPERVISION

Honors Undergraduate Projects (2 semesters)

Name	Year	Research topic
Gordon, Adam	2011-12	Virtual Presence
Warraich, Shahjahan	2010-11	Natural Interactive Walking
Lin, Nan	2008	Location sensing for mobile apps.
Wang, Letao	2007	Interactive Agent
Charlebois, Pierre-Olivier	2004–2005	Sound Objects in a Soundscape
Myer, Sam	2003	Automated Music Transcription
El-Refaei, Sameh	1998–1999	Shared Reality simulator

Undergraduate Projects (2 semesters)

Redel, Josh	2012	CSCW meeting room tools
Savchenko, Eugene	2010	3D interaction

Undergraduate Projects (1 semester)

Name	Year	Name	Year	Name	Year
Himmelman, Tristan	2009	Bancroft, David	2001	Lee, Garvin,	1999
Ephraim, Theo	2009	Glass, Emily	2001	Li, (Shao-Gi) Chris	1999
Peck, Benjamin†	2008	Asselin, Ramy	2001	El-Sharif, Osama	1999
Mankarios, Daniel	2007	Sud, Daniel	2001	Nasereddin, Hazem	1999
Konstantinidis, Alex	2007	Gapakov, Timofei	2001	Viridi, Gurpratap	1999
Pufahl, David	2005	Rosenblatt, Avi	2001	Shah, Ali	1999
Zhu, Ming-Zhang	2005	Pekofsky, Gregory	2001	Djihanian, Sylvie	1999
Chan, Keng Chi	2005	Kitisa, Anousack	2000	Moussaoui, Khaled	1999
Phan, Andrew	2004	Vial, Thibaut	2000	Dib Youssef	1999
Saifee, Ali-Akber	2004	Bernier, Martin	2000	Tam, H.	1999
Shield, Robert	2004	Agha, Khurram Z.	2000	Gagnon, Gabriel	1999
Aubé, Francois	2004	Bhattacharya S.	2000	Tjhin, P.	1999
Rudzicz, Frank	2003	Lavery, William	2000	Luong, Mai	1999
Sarikaya, Deniz	2002	Yeung, Jason	2000	Lau, Sau	1999
Vallianatos, K.	2002	Liao, Yuan Mei	1999	Tsai, Wanti	1999
Hassaine, Sofiane	2002	Yee, Amy	1999	Lerner, Sorin*	1999
Wyse, Marisa	2001	Pereira, David	1999	Hochstein, Lorin*	1999
		Ciambella, Gary	1999	Pollack, Jonathan	1998
		Kassouf, Nadim	1999	Nguyen, Bau	1998

*Co-supervised with James Clark

†Co-supervised with Paul Kry

Undergraduate Internships

Name	Year	Project
Greencorn, Dan	2011	Food Analysis Simulation
Redel, Josh	2011	Open Orchestra
Varenne, Dylan	2011	(Polytech Nice-Sophia), In-Situ Audio Services
Tomiyoshi, Marcio	2011	(ELAP Scholarship Student) Open Orchestra
Beniak, Stephane	2010	(NSERC Student) Natural Interactive Walking
Salenikovich, Stepan	2010	Natural Interactive Walking
Chaw, Gary	2010	Natural Interactive Walking
Redel, Josh	2010	Health Services Virtual Organization
Smith, Severin	2009-11	Natural Interactive Walking
Rajalingham, Rishi	2009	(NSERC Student) Natural Interactive Walking
Renner, Farid	2009	(SURE Student) Natural Interactive Walking
Bae, Sung	2009	Optical Tracking for Audio Graffiti
Jathal, Kunal	2007	Haptic and auditory perception in human walking
Lin, Nan*	2006	(NSERC Student) Interactive navigational control of a robotic wheelchair
Reiter, Philippe	2005	(VP USRA Student) Distributed Video Rendering for the SRE
Ariane Chan-You	2003	Region-of-Interest Control and Selective Bandwidth Allocation
Ariane Chan-You	2002	Data Reduction for Audiovisual Transport Quality Evaluation
Gupta, Greeshma	2000	(NSERC Student) Automated PowerPoint conversion & PAQ system
Cote, Christian	2000	(NSERC Student) Video perspective transformation with CAVE library
Ayatizadeh, Negah	2000	Network communication daemons
Swartz, Tanya	2000	Speech-based TV-tuner interface
Cohen, Ouri	2000	Classroom 2000 access control
Yeong, Jason Aw	1999	(Work Study) Previously Asked Questions system
Agha, Khurram Zubair	1999	(Work Study) URL access tracking
Lim, Weoi Peng	1999	(Work Study) Graffiti board
Agha, Haroon Ali	1999	(Work Study) Classroom 2000 minipres. system
Klinger, Zamir	2000	(NSERC Student) Automated Door Attendant
Hooshangi, Sara	2000	(NSERC Student) Intelligent Classroom interfaces
Liao, Yuan Mei	1999	Electronic Classroom control interfaces
Luo, Jiexin	1999	PowerPoint C2000 interface and image libraries
Zhao, Changpeng	1998-99	Seamless PowerPoint upload for Classroom 2000
Lakdawalla, Azeem	1998-99	Real-time conjugate-gradient based headtracking

*Co-supervised with Joelle Pineau

SERVICE

UNIVERSITY SERVICE

Department Committees

2005-ongoing	Scholarships Committee
2002	Ad hoc Committee on computing infrastructure for ECE/SOCS
2000-2009	College Liason
2001-2004	Information Technologies & Undergraduate Lab
2000-2002	Curriculum Committee
2000	Software Engineering subcommittee
2000-ongoing	Undergraduate Committee (Undergraduate Student Advisor)

Other University Committees

2009-ongoing	Member, CIRMMT Executive Committee
2007-ongoing	Co-chair, Multimodal Immersive Systems research axis, CIRMMT
2006-2008	Member, CIRMMT Board of Directors
2006	Advisory Committee for Dean of Music
2004	Tomlinson University Science Teaching Project adjudication
2003-2004	Royal Bank Teaching and Learning Innovation Fund adjudication
2003	Groupe de travail sur les normes et standards de la formation en ligne. Conférence des recteurs et des principaux des universités du Québec (CREPUQ), McGill University Representative
2002-2003	SC-IST Workgroup on Research Computing
2000-2003	SC-IST Workgroup on Classroom Design
1999-2004	Engineering Committee on Teaching and Learning
1999	SC-IST McGill Machine Project
1998	Workgroup on Educational Technology

Fundraising Activities

2002	RoboCup demonstration at McCord museum for Dean's Circle
2002	Corporate fundraising for McGill RoboCup team
2001-2002	Intelligent Classroom promotion with the Engineering Class of '50; helped raise \$274,000
2001	Trottier Building research promotion

Other Activities

2007-2010	Promotion of Academic Integrity
2001-2002	Design of new Intelligent Classroom systems for ENGMC 304
1999-2002	Maintenance of the Intelligent Classrooms, training other faculty in use of the technology
1999	Curriculum development of three new courses in software engineering

PROFESSIONAL ACTIVITIES**Editorial Service**

2012	IEEE Transactions on Haptics
2011	BMC Medical Informatics and Decision Making
2011	IEEE Software
2010	IEEE Transactions on Affective Computing
2010	IEEE Transactions on Robotics
2010	IEEE Signal Processing Magazine
2010	IEEE Transactions on Haptics
2009	IEEE Transactions on Robotics
2008	EURASIP Advances in Signal Processing
2008	EURASIP Image and Video Processing
2008	Audio Engineering Society (associate editor)
2007	IEEE Transactions on Systems, Man, and Cybernetics
2006	International Journal of Human-Computer Interaction
2006	Springer Virtual Reality
2005	Elsevier: Computers and Education
2005	Elsevier: Image and Vision Computing
2004	IEEE Pervasive Computing
2000, 2003	Wiley Journal of Robotic Systems
1999	ACM Transactions on Computer-Human Interaction
1999	IEEE Transactions on Robotics and Automation
1998	IEEE Personal Communications

Program Committees/Conference Review

2012	International Society for Presence Research
2012	IEEE Canadian Conference on Electrical and Computer Engineering
2011	AES 44th Conference on Audio Networking
2011	Intelligent Robots and Systems
2011	VRIC Wkshop on Haptics for Telepresence, Teleoperation & Collab. Environments
2009	IEEE Haptics Symposium
2009	International Computer Music Conference
2009	Stereoscopic Displays and Applications
2008, 2011-12	ACM SIGCHI conference
2008	Immersive Medical Telepresence
2006	International Conference on Digital Audio Effects
2006, 2007	IEEE Workshop on Projector-Camera Systems (part of CVPR)
2005-2009	Canadian Conference on Computer and Robot Vision
2004, 2009-12	Graphics Interface
2003, 2006	Audio Engineering Society
2003	New Interfaces for Musical Expression
2002	RoboCup International Symposium
2002	IEEE International Conference on Robotics and Automation
2001	ACM UbiComp
2001	IEEE International Conference on Computer Vision

Grant Review

2011	NSERC Collaborative Research and Training Experience Program (CREATE)
2011, 2009	Mathematics of Information Technology and Complex Systems (MITACS)
2009	NSERC Strategic Networks (Site Visit Chair)
2008	Peer review, NSERC Collaborative Research and Development Grants
2008	Peer review, CFI (Canada Foundation for Innovation)
2007-2008	NSERC Industrial Research Chair (Site Visit)
2007-2012	Research Grants Council, Hong Kong
2005	NSERC Steacie Memorial Fellowship
2005-2008	Panel member, NSERC/Canada Council, New Media Initiative
2002	Panel member, NSERC/Canada Council, New Media Initiative
2001-2011	Peer review, NSERC Discovery Grants
2001	Peer review, FCAR/CFI (Canada Foundation for Innovation)

Academic and Educational Committees

2010	Participant, NSF/CCC Workshop on Ultra-Large Scale Interaction
2010-ongoing	Theme Leader, Enabling Technologies, GRaphics Animation and New media (GRAND) Networks of Centres of Excellence
2010-ongoing	Voting Member, IEEE Communication Society Multimedia Communications Technical Committee (IEEE MMTC)
2009	Organizer and Chair, AES Workshop on Network Technologies for Audio over IP
2005-2006	Organizer, AES Tutorial and Workshop on Human Factors in Audio
2004	Founder, AES Technical Committee for Human Factors in Audio Systems
2003	Organizer, Workshop on LAN Delivery of Audio for AES
2002-2003	Comité Scientifique de Robofolies, Centre Science de Montreal
2001	Local Events Organizer, Autonomous Agents Conference, Montreal
2001-2009	Chair, AES Technical Committee for Network Audio Systems
2000-2004	Scientific Organizer, RoboCup Junior, Montreal
2000-2001	Organizing Committee, Robofesta International Robot Games Festival, Japan
1999-2000	Member and Webmaster, Canadian Virtualized Reality Working Group
1998	Co-organizer, AAAI Symposium on Intelligent Environments

Other Academic Service

2008	Tenure Portfolio evaluation, York University
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Exhibit “B”



AIR CANADA

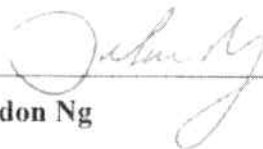
IN THE MATTER OF A COMPLAINT FROM GABOR LUKACS AGAINST AIR CANADA
- CANADIAN TRANSPORTATION AGENCY FILE NO. M4120-3/11-06673

I, GORDON NG, declare as follows:

1. I am the manager premium revenues for Air Canada.
2. I am also a part of the revenue management operations team and, therefore, participate in the establishment of commercial policies for Air Canada operations.
3. In this capacity, I provided a signed declaration on in support of Air Canada's submissions to the Agency dated August 15th, 2012.
4. I will, in the present declaration, further explain how the average domestic economy cabin fare is calculated:
 - a) The average domestic economy cabin fares provided in my previous declaration filed in support of Air Canada's in the submissions of August 15, 2012, were calculated by dividing the amount of revenue from domestic economy travel by the number of revenue passengers on board domestic Air Canada flights.
 - b) All economy fare types were accounted for in the determination of the average domestic economy cabin fare, without more or less weight being placed on certain fare types, including full economy cabin fares, which are the highest priced economy fares.
 - c) To my knowledge, the average economy cabin domestic fares, which were provided in my previous declaration in support of Air Canada's submissions of August 15, 2012, include Air Canada imposed surcharges.
5. Air Canada's commercial decision regarding the amount of domestic denied boarding compensation is based, notably, on the average fares calculated per paragraph 4(a) of the present declaration.
6. The consolidation of all passengers' fares between 2004 and 2012 would require that Air Canada compile specific data. Air Canada currently does not have a compilation of the specific data requested by Mr. Lukács as there has historically never been a need for this format by Air Canada. Consequently, Air Canada would need to create a specific query in order to obtain said information from its extensive databases.

7. In addition, Air Canada currently does not have the standard and average deviation amounts for its domestic economy fares. In order to obtain such information, this would require specific calculations based on a data set that has yet to be compiled, as explained in paragraph 6 of the present declaration.

And I have signed on this 17th day of September, 2012



Gordon Ng