CENTRE FOR INTELLIGENT MACHINES (CIM)

Centre de recherche sur les machines intelligentes

www.cim.mcgill.ca

Annual Report 2011

Director

Professor Benoit Boulet

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SUMMARY

The McGill Centre for Intelligent Machines (CIM) is a multi-disciplinary, inter-departmental, inter-faculty research group formed in 1985 to provide an enriched mentoring and training environment for graduate students studying in the field of robotics and intelligent systems.

For close to 3 decades, CIM has been a pioneering force in cross-disciplinary research. The Centre is primarily located in contiguous space where labs and student offices are shared. CIM's membership and students have been universally recognized over the years for their highest standards of excellence - exceptional scientific achievements and outstanding contributions to society and industry.

CIM's management design and organizational structure have been studied, emulated and adopted by various units, both within the university and outside of McGill, notably in the academic sector. CIM continues to be regarded by its peers as a model for "best practices" in a world now heavily populated by research organizations.

CIM recently celebrated its 25th Anniversary with an international guest speaker series and a scientific symposium.

For the year 2011:

The Centre was comprised of 19 members from both the Faculties of Engineering and Science --the Department of Electrical and Computer Engineering, Department of Mechanical Engineering and the School of Computer Science. CIM also has 13 associate members representing a diversity of research collaborations, such as within the Faculty of Medicine -- the Royal Victoria Hospital and the Montreal Neurological Institute.

The Centre was home to a diverse population of about 160 graduate students, post-docs, research assistants and associates, as well as visiting scholars and undergraduate students from various disciplines.

PhD		Master's		U/Grads		Post-Docs		
69.5		48.5		16		11		145

The CIM members were collaborators and co-collaborators in grants and contracts totally about $600M.

		PI		Co-PI
Total Value		7M		555M

REPARTI - Regroupement pour l'étude des environnements partagés intelligents répartis

http://reparti.gel.ulaval.ca/en/REPARTI/index.chtml (website currently under reconstruction)

Centre REPARTI is a $2.4M inter-institutional, interdisciplinary collaborative venture comprised of 8 Quebec institutions, 33 members and over 200 students. The McGill node of REPARTI is represented by 14 members from the McGill Centre for Intelligent Machines (CIM). The members of the McGill node collaborate in grants and contracts valued in excess of $5M.

The institutions participating in REPARTI are - Université Laval (host institution), Université de Sherbrooke, Ēcole Polytechnique, Université de Montréal, Université du Québec à Rimouski, Université du Québec à Chicoutimi and École de technologie supérieure (ÉTS).

Supported by the Quebec government's *Fonds de recherche Nature et technologies (FRNT*), this regroupement stratégique builds on some unique precedents:

(1) The historical and concrete partnership that developed over the past 25 years between prominent researchers in U. Laval and McGill (CIM) as a result of the NSERC National Centres of Excellence program, the interuniversity-industrial consortium IRIS-Precarn, and the FQRNT Réseau QERRAnet.

(2) The long and productive relationship established between the McGill Centre for Intelligent Machines (CIM) and the Quebec government through the former FCAR Centre de recherche programme.

The formal renewal process for REPARTI will begin in the year 2012.

NEW MEMBERS

****Professor Aditya Mahajan became a member of CIM in 2011**

Professor Mahajan is an assistant professor in the Department of Electrical and Computer Engineering. He is a graduate of the University of Ann Arbour, Michigan, where he completed his PhD in Electrical and Computer Engineering in 2008, and then went on to complete a post-doctoral fellowship at Yale University.

The main focus of Dr. Mahajan's research is to develop an axiomatic framework for sequential decision making in decentralized multi-agent systems. Such systems arise in almost all technological systems including control systems, communication systems, sensor networks, and robotics.

****Professor James Richard Forbes became a new associate member of CIM in 2011**

Dr. Forbes is an assistant professor in the Department of Mechanical Engineering. He completed a B.A.Sc. in Mechanical Engineering from the University of Waterloo and went on to complete both a M.A.Sc. Aerospace Science and Engineering and a PhD Aerospace Science and Engineering from the University of Toronto.

Dr. Forbes studies control and estimation techniques for mechanical, aerospace, and robotic systems. In particular, his interests lie in vibration control, spacecraft attitude control, the control of (flexible) robotic manipulators, and mobile robot localization. His research focuses on fundamental theoretical developments, as well as the application of new and existing control theories to practical, real-world problems, as well as synthesis of controllers, for example, robust yet optimal controllers, using numerical techniques. Professor Forbes' research is primarily motivated by (but not exclusively) aerospace problems; he seeks to develop better control and estimation techniques thus enabling Earth science, astronomy, and the commercial development of the Canadian aerospace industry.

Section I – MEMBERSHIP

FULL MEMBERS

Name	Title	Department	Office	Phone	Email
Angeles, Jorge	Professor	Mechanical Engineering	Workman 452	(514) 398-6315	angelesATcimDOTmcgillDOTca
Arbel, Tal	Associate Professor	Electrical and Computer Engineering	McConnell 425	(514) 398-8204	arbelATcimDOTmcgillDOTca
Boulet, Benoit	Associate Professor	Electrical and Computer Engineering	McConnell 509	(514) 398-1478	bouletATcimDOTmcgillDOTca
Caines, Peter	Professor	Electrical and Computer Engineering	McConnell 512	(514) 398-7129	petercATcimDOTmcgillDOTca
Clark, James	Professor	Electrical and Computer Engineering	McConnell 422	(514) 398-2654	clarkATcimDOTmcgillDOTca
Cooperstock, Jeremy	Associate Professor	Electrical and Computer Engineering	McConnell 424	(514) 398-5992	jerATcimDOTmcgillDOTca
Cortelezzi, Luca	Associate Professor	Mechanical Engineering	McConnell 369	(514) 398-6299	crtlzATcimDOTmcgillDOTca
Dudek, Gregory	Professor	Computer Science	McConnell 419	(514) 398-4325	dudekATcimDOTmcgillDOTca
Ferrie, Frank	Professor	Electrical and Computer Engineering	McConnell 441	(514) 398-6042	ferrieATcimDOTmcgillDOTca
Kovecses, Jozsef	Associate Professor	Mechanical Engineering	Macdonald 163	(514) 398-6302	kovecsesATcimDOTmcgillDOTca
Langer, Michael	Associate Professor	Computer Science	McConnell 329	(514) 398-3740	langerATcimDOTmcgillDOTca
Levine, Martin	Professor	Electrical and Computer Engineering	Workman 451	(514) 398-7115	levineATcimDOTmcgillDOTca
Mahajan, Aditya	Assistant Professor	Electrical and Computer Engineering	McConnell 533	(514) 398-4470	adityaDOTmahajanATmcgillDOTca
Michalska, Hannah	Associate Professor	Electrical and Computer Engineering	McConnell 514	(514) 398-3053	hannahDOTmichalskaATmcgillDOTca
Nahon, Meyer	Professor	Mechanical Engineering	McConnell 421	(514) 398-2383	mnahonATcimDOTmcgillDOTca
Pineau, Joelle	Associate Professor	Computer Science	McConnell 106N	(514) 398-5432	jpineauATcsDOTmcgillDOTca
Sharf, Inna	Associate Professor	Mechanical Engineering	McConnell 214	(514) 398-1711	isharfATcimDOTmcgillDOTca
Siddiqi, Kaleem	Professor	Computer Science	McConnell 420	(514) 398-3371	siddiqiATcimDOTmcgillDOTca
Zsombor-Murray, Paul	Associate Professor	Mechanical Engineering	Workman 454	(514) 398-6311	paulATcimDOTmcgillDOTca

ASSOCIATE MEMBERS

Name	Title	Unit	Office	Phone	Email
Cecere, Renzo	Associate Professor	Cardiac Surgery (RVH)	RVH S8-44	(514) 843-1463	renzoDOTcecereATmuhcDOTmcgillDOTca
Collins, Louis	Associate Professor	Neurology and Neurosurgery/Biomedical Engineering	MNI WB-315	(514) 398-4227	louisDOTcollinsATmcgillDOTca
Forbes, James Richard	Assistant Professor	Mechanical Engineering	Macdonald 156	(514) 398-9675	jamesDOTrichardDOTforbesATmcgillDOTca
Hayward, Vincent	Professor	Electrical and Computer Engineering	McConnell 440	(514) 398-5006	haywardATcimDOTmcgillDOTca
Husty, Manfred	Professor	Geometry and CAD, University of Innsbruck, Austria		+43-512-507/6830	manfredDOThustyATuibkDOTacDOTat
Kry, Paul	Assistant Professor	Computer Science	McConnell 113N	(514) 398-2577	kryATcsDOTmcgillDOTca
Liu, Xue	Assistant Professor	Computer Science	Macdonald 318	(514) 398-1819	xueliuATcsDOTmcgillDOTca
Misra, Arun	Professor	Mechanical Engineering	Workman 455	(514) 398-6288	misraATcimDOTmcgillDOTca
Mongrain, Rosaire	Associate Professor	Mechanical Engineering	Macdonald 369	(514) 398-1576	rosaireDOTmongrainATmcgillDOTca
Musallam, Sam	Assistant Professor	ECE/Dept. of Physiology	McConnell 645	(514) 398-1702	samDOTmusallamATmcgillDOTca
Panangaden, Prakash	Professor	Computer Science	McConnell 108	(514) 398-7074	prakashATcsDOTmcgillDOTca
Pike, Bruce	Professor	Neurology and Neurosurgery/Biomedical Engineering	MNI WB-315	(514) 398-1929	bruceDOTpikeATmcgillDOTca
Precup, Doina	Associate Professor	Computer Science	McConnell 326	(514) 398-6443	dprecupATcsDOTmcgillDOTca

Section II – HONOURS AND AWARDS

* CIM founding Director**, Professor Martin D. Levine**, awarded a *Canadian Academy of Engineering CAE Fellow* in June 2011 in Vancouver. CAE recognizes Professor Levine for being a pioneer of computer-based image processing techniques and computer vision.

***** CIM-REPARTI member **Professor Frank Ferrie** received the Award for Research Excellence from the *Canadian Image Processing and Pattern Recognition Society CIPPRS/ACTIRF*, held during the 8th Annual *Canadian Conference on Computer and Robot Vision (CRV 2011*), May 25-May 27, 2011 in St. John's Newfoundland.

*CIM-REPARTI member **Professor Jim Clark** was awarded *Outstanding Reviewer Award, 2011 International Conference on Computer Vision (ICCV*), held in November 2011 in Barcelona Spain.

*CIM-REPARTI member **Professor Aditya Mahajan** received the *Peter Silvester Faculty Research Award* awarded by the Department of Electrical and Computer Engineering, February 2011.

*CIM-REPARTI member **Professor Gregory Dudek** was the recipient of the following:

- *Fessenden Professorship* award in December 2010 for Science Innovation (held throughout 2011)
- the *CS/EMB/RA Joint Societies* Chapter of IEEE Kingston Section award of appreciation for Technical Presentation on October 27, 2011
- *McGill Bravo* 2011 Award-Winning Researchers honoree on May 5, 2011 for exceptional recognition in the previous year.

CIM in the MEDIA

***** CIM - REPARTI member **Professor Joelle Pineau's** work on the Smartwheeler, a smart wheel chair that is designed to help people with disabilities get around, is featured in the *Summer 2011 edition of McGill Headway* magazine. http://publications.mcgill.ca/headway/section/workspace/

***** CIM-REPARTI members **Professors Gregory Dudek** and **Philippe Giguère** (U. Laval), and members of the Mobile Robotics Lab, featured in *Canal Savoir June 2011. Canal Savoir: Aqua - le robot sous-marin.* http://www.canal.qc.ca/emission.php?id=10113

***** CIM-REPARTI member **Professor Tal Arbel** and her group in the Medical Imaging Lab featured in *Faculty of Engineering's Dean's Report - Fall 2011 - bio-engineering is booming at McGill!* http://publications.mcgill.ca/engineering/2011/12/28/bioengineering-is-booming-at-mcgill/

***** CIM-REPARTI PhD graduate student **Carmen Au's** work, under the supervision of *Professor Jim Clark*, was featured in *New Scientist* recently -- *Find your way around in a world of virtual mirrors 9 September 2011.* http://www.newscientist.com/blogs/onepercent/2011/09/find-your-way-around-in-a-worl.html

CIM-REPARTI student,* **Yogesh Girdhar**, PhD candidate under the supervision of *Professor Gregory Dudek*, was featured in the *McGill Reporter, November 2011*, in an article entitled "*Teaching Robots How to be Surprised*' http://publications.mcgill.ca/reporter/2011/11/teaching-robots-how-to-be-surprised/

Section II – PUBLICATIONS

PUBLICATIONS - Department of Electrical and Computer Engineering

ARBEL, Tal

Articles in refereed publications

• K. Murphy, …, D. De Nigris, D. L. Collins, T. Arbel, et. al., "Evaluation of Registration Methods on Thoracic CT: The EMPIRE10 Challenge", IEEE Transactions on Medical Imaging, Vol. 30, Issue 11, pp. 1901-1920, Nov. 2011.

• M. Shah, Y. Xiao, N. Subbanna, S. Francis, D. L. Arnold, D. L. Collins, and T. Arbel, "Evaluating Intensity Normalization on MRIs of Human Brain with Multiple Sclerosis", Medical Image Analysis, Volume 15, Issue 2, pp. 267-282, April 2011.

• C. Laporte and T. Arbel, "Learning to estimate out-of-plane motion in ultrasound imagery of real tissue", Medical Image Analysis, Volume 15, Issue 2, pp. 202-213, April 2011.

Papers in Refereed Conference Proceedings

• M. Demirkus, B. Oreshkin, J. Clark, and T. Arbel, "Spatial and probabilistic codebook template based head pose estimation from unconstrained environments", 2011 IEEE International Conference on Image Processing (ICIP 2011), Brussels, Belgium, Sept. 2011.

• N. Subbanna, S. Francis, D. Precup, D.L. Collins, D. L. Arnold and T. Arbel, "Adapted MRF Segmentation of MS Lesions Using Local Contextual Information", Conference on Medical Image Understanding and Analysis (MIUA '11), London, U.K., July 2011.

BOULET, Benoit

Articles in refereed publications

H. Azarnoush, S. Vergnole, B. Boulet, and G. Lamouche, "Real-time Control of Angioplasty Balloon Inflation Based on Feedback from Intravascular Optical Coherence Tomography: Preliminary Study on an Artery Phantom," IEEE Transactions on Biomedical Engineering, 10.1109/TBME.2011.2172685

[2] V. Raissi Dehkordi and B. Boulet, Robust Controller Order Reduction, International Journal of Control, Vol. 84, No. 5, May 2011, pp. 985–997.

Other refereed contributions

3] M. M. I. Chy and B. Boulet, “Development of an Improved Mathematical Model of the Heating Phase of Thermoforming Process” IEEE Industrial Application Society Annual Meeting, Orlando, Florida, Oct 9-13, 2011.

[4] M. M. I. Chy and B. Boulet, “Estimation and control of temperature profile over a sheet in thermoforming process using non-equidistant temperature sensor” IEEE Industrial Application Society Annual Meeting, Orlando, Florida, Oct 9-13, 2011.

[5] R. Modirnia and B. Boulet, “Model-Based Virtual Sensors and Core Temperature Observers in Thermoforming Applications” IEEE Industrial Application Society Annual Meeting, Orlando, Florida, Oct 9-13, 2011.

[6] A. Haddadi, A. Shojaei and B. Boulet, “Enabling High Droop Gain for Improvement of Reactive Power Sharing Accuracy in an Electronically-Interfaced Autonomous Microgrid” 2011 IEEE Energy Conversion Congress and Exposition , Phoenix, Arizona, Sept 17-22, 2011.

[7] M. M. I. Chy, A. Haidar and B. Boulet, “A model predictive controller of plastic sheet temperature for a thermoforming process” American Control Conference, June 29-July 1, 2011, San Francisco, California, pp. 4410-4415.

[8] A. Salehiomran, S. R. Modirnia, B. Boulet, M. Rochette, “Single-longitudinal-mode fiber optic parametric oscillator based on Smith predictor control scheme” Photonics North 2011, Ottawa, Canada, May 16, 2011, Proc. SPIE 8007, 80070E (2011); doi:10.1117/12.905717

[9] H. Azarnoush, S. Vergnole, B. Boulet, and G.Lamouche, Optical coherence tomography layer thickness characterization of a mock artery during angioplasty balloon inflation, Proc. SPIE, Feb. 15, 2011, 7963, 796328 (2011); doi:10.1117/12.877995

[10] G. Lamouche, H. Azarnoush, S. Vergnole, V. Pazos, C. E. Bisaillon, P. Debergue, B. Boulet, and R. Diraddo, "Assessing mechanical properties with intravascular or endoscopic optical coherence tomography," Proc. SPIE, vol. 7897, p. 789708, 2011.

[11] H. Azarnoush, S. Vergnole, M. Hewko, B. Boulet, M. Sowa, and G. Lamouche, "Detection of inflating balloon in optical coherence tomography images of a porcine artery in a beating heart experiment," Proc. SPIE, vol. 7964, p. 79641V, 2011.

[12] H. Azarnoush, S. Vergnole, M. Hewko, B. Boulet, M. Sowa, and G. Lamouche, "Detection of inflating balloon in optical coherence tomography images of a porcine artery in a beating heart experiment," Proc. SPIE, vol. 7964, p. 79641V, 2011.

11] H. Azarnoush, S. Vergnole, M. Hewko, B. Boulet, M. Sowa, and G. Lamouche, "Detection of inflating balloon in optical coherence tomography images of a porcine artery in a beating heart experiment," Proc. SPIE, vol. 7964, p. 79641V, 2011.

[12] H. Azarnoush, S. Vergnole, M. Hewko, B. Boulet, M. Sowa, and G. Lamouche, "Detection of inflating balloon in optical coherence tomography images of a porcine artery in a beating heart experiment," Proc. SPIE, vol. 7964, p. 79641V, 2011.

CAINES, Peter

Articles in refereed publications

M. Nourian, R. P. Malhame', M.Y. Huang, P. E. Caines, "Mean Field (NCE) Formulation of Estimation Based Leader-Follower Collective Dynamics''. Frank Lewis Festschrift edition of the International Journal of Robotics and Automation, Special Issue on New Advances in Nonlinear and Optimal Controls of Robotic and Autonomous Systems, Vol. 26, No. 1, 2011, pp. 120-129.

F. Taringoo, P. E. Caines, "Gradient geodesic and Newton geodesic HMP algorithms for the optimization of hybrid systems" (D. Q. Mayne Festschrift edition),
Annual Reviews in Control, Volume 35, Issue 2, December 2011, pp.187-198

F. Taringoo and P.E.Caines, ``On the Extension of the Hybrid Maximum Principle to Riemannian Manifolds.'' Proc. 50th IEEE Conference on Decision and Control, 2011, Orlando, FLA. pp 3301-3306

M. Nourian, P. E. Caines, R. P. Malhame', "An Evolution Mean Field Equation System for Initial Mean Consensus Behaviour: A Stability Analysis", Proc. 50th IEEE Conference on Decision and Control (CDC) and European Control Conference, Orlando, Florida, December 2011, pp 5029-5034

M. Nourian, P. E. Caines and R. P. Malhame', `` A Solution to the Consensus Problem Via a Continuum Based Mean Field Control Approach.'' Proc. 50th IEEE Conference on Decision and Control (CDC) and European Control Conference, Orlando, Florida, December 2011, pp 5808-5713

A. C. Kizilkale and P.E. Caines, ``Mean Field (NCE) Stochastic Control: Populations of Major and Egoist-Altruist Agents, '' Proc. 50th IEEE Conference on Decision and Control, Orlando, Florida, December 2011, pp 5547--5552

D. Gromov and P.E. Caines, "Stability of Interconnected Thermodynamic Systems", Proc. 50th IEEE Conference on Decision and Control (CDC) and European Control Conference, Orlando, Florida, December 2011, pp 6730 - 6735

M. Nourian, P. E. Caines, R. P. Malhame', "Mean field analysis of Controlled Cucker-Smale Type Flocking: Linear Analysis and Perturbation Equations", Proc. 18th IFAC World Congress, Milan, Italy, August 2011, pp. 4471-4476.

D. Gromov and P.E.Caines, "Interconnection of Thermodynamic Control Systems." Proc. 18th IFAC World Congress, Milan, Italy, August 2011, pp 6091-6097

F. Taringoo and P.E.Caines, ``Hybrid Optimal Control on Riemannian Manfiolds and Geometric Optimization Algorithms'', Journe'es de l'Optimisation 2009, HEC, Montreal, 2 - 4 May, 2011. Abstracts p. 19.

D. Gromov and P.E.Caines, ``Optimization of Hybrid Thermodynamic Control Systems with Phase Transitions", Journe'es de l'Optimisation 2009,HEC, Montreal, 2 - 4 May, 2011. Abstracts p. 20

A.C. Kizilkale and P.E. Caines, ``Initial Investigations of the Emergence of Coalitions in Mean Field Stochastic Systems,'' Journe'es de l'Optimisation 2009, HEC, Montreal, 2 - 4 May, 2011. Abstracts p. 25

M. Nourian, P. E. Caines, R. P. Malhame', "An Evolution Mean Field Equation System of the Consensus Problem", Journe'es de l'Optimisation 2009,HEC, Montreal, 2 - 4 May, 2011. Abstracts p. 25

M. Nourian, P. E. Caines, R. P. Malhame', "A Continuum Mean Field Stochastic Control Approach to the Consensus Problem," SIAM Conference on Control& its Application (CT'11), Baltimore, Maryland, July. 2011, Abstract p.35.

A. C. Kizilkale and P.E. Caines, ``Mean Field (NCE) Stochastic Control: Populations of Major and Egoist-Altruist Agents, '' Proc. 50th IEEE Conference on Decision and Control, Orlando, Florida, December 2011, pp 5547--5552

D. Gromov and P.E. Caines, "Stability of Interconnected Thermodynamic Systems", Proc. 50th IEEE Conference on Decision and Control (CDC) and European Control Conference, Orlando, Florida, December 2011, pp 6730 - 6735

M. Nourian, P. E. Caines, R. P. Malhame', "Mean field analysis of Controlled Cucker-Smale Type Flocking: Linear Analysis and Perturbation Equations", Proc. 18th IFAC World Congress, Milan, Italy, August 2011, pp. 4471-4476.

D. Gromov and P.E.Caines, "Interconnection of Thermodynamic Control Systems." Proc. 18th IFAC World Congress, Milan, Italy, August 2011, pp 6091-6097

F. Taringoo and P.E.Caines, ``Hybrid Optimal Control on Riemannian Manfiolds and Geometric Optimization Algorithms'', Journe'es de l'Optimisation 2009, HEC, Montreal, 2 - 4 May, 2011. Abstracts p. 19.

D. Gromov and P.E.Caines, ``Optimization of Hybrid Thermodynamic Control Systems with Phase Transitions", Journe'es de l'Optimisation 2009,HEC, Montreal, 2 - 4 May, 2011. Abstracts p. 20

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M. Nourian, P. E. Caines, R. P. Malhame', "A Continuum Mean Field Stochastic Control Approach to the Consensus Problem," SIAM Conference on Control& its Application (CT'11), Baltimore, Maryland, July. 2011, Abstract p.35.

CLARK, James

Articles in refereed publications

Skaff, S. and Clark, J.J., "Spectral Color Constancy using a Maximum Entropy Approach", JOSA A, Vol. 28, Issue 11, pp. 2385-2399 (2011)

Au, C.E. and Clark, J.J., ``Integrating Multiple Views with Virtual Mirrors to Facilitate Scene Understanding'', ACM Transactions on Applied Perception, Volume 8 Issue 4, November 2011

Other refereed contributions

Au, C.E., Ng, V. and Clark, J.J., ``MirrorMap: Augmenting 2D Mobile Maps

with Virtual Mirrors'', 2011 Mobile HCI conference

Demirkus, M., Oreshkin, B., Clark, J.J. and Arbel, T., ``Spatial and probabilistic codebook template based head pose estimation from unconstrained environments'', IEEE International Conference on Image Processing (ICIP), Brussels, September 2011

Haji-Abolhassani, A. and Clark, J.J., ``Visual Task Inference Using Hidden Markov Models'', 2011 International Joint Conference on Artificial Intelligence (IJCAI), pp 1678-1683.

Haji-Abolhassani, A. and Clark, J.J., ``Realization of an Inverse Yarbus Process via Hidden Markov Models for Visual-Task Inference'', 2011 Vision Science Symposium (VSS).

COOPERSTOCK, Jeremy

Articles in refereed publications

J. R. Cooperstock. “Multimodal Telepresence Systems: Supporting Demanding Collaborative Human Activities.” In: IEEE Signal Processing 28.1 (Jan. 2011), pp. 77–86.

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.

S. Pelletier and J. R. Cooperstock. “Preconditioning for Edge-Preserving Image Super- Resolution.” In: IEEE Transactions on Image Processing (2011). url: http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5898412.

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:10.1371/journal.pone.0017697. url: http://dx.plos.org/10.1371/journal.pone.0017697.

Z. Qi and J. R. Cooperstock. “Towards Dynamic Image Mosaic Generation With Robustness to Parallax.” In: IEEE Transactions on Image Processing (2011). url: http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5959979.

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 (2011), 11 pages. doi: 10.1007/s12193-011-0065-5. url: http://www.springerlink.com/content/857h542884084ql2/.

Other refereed contributions

Papers in refereed conference proceedings:

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.

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.

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.

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.

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.

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.

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 (BEST PAPER AWARD). Published as Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering. Springer, Dec. 2011.

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.

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.

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.

Presentations in refereed conferences

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.

FERRIE, Frank

Articles in refereed publications

Phan, Andrew, and Ferrie, Frank. P., "Interpolating Sparse GPS Measurements Via Relaxation Labeling and Belief Propagation for the Redeployment of Ambulances,'' IEEE Transactions on Intelligent Transportation Systems, Volume 12, Number 4, December 2011, pp. 1587-1598.

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All departments submit an annual report to the university that contains updated information on grants and publications. Please see links below for CIM members and associates.

FACULTY OF SCIENCE

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