CENTRE FOR INTELLIGENT MACHINES (CIM)

Centre de recherche sur les machines intelligentes
www.cim.mcgill.ca

Annual Report 2013

Director
Professor James J. Clark

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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 almost 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.

The Centre is comprised of 20 full 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 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 is home to a diverse population of researchers: in addition to the 20 full members, at the end of 2013 the centre boasted a complement in excess of 200 graduate students, post-docs and undergraduate students, as well as visiting scholars, research assistants and associates from various disciplines.

Ph.D	Masters (Thesis)	Masters (non-thesis)	U/Grads	Post-Docs	**Total**
55	53	4	86	12	**210**

The 2013 calendar year brought a number of noteworthy events for the Centre. These include:

- Renewal for 6 years of the REPARTI regroupment stratégique funded by the Québec FRQNT. This grant provides much of the financial support for the Centre's operations.
- Appointment of a new director of the Centre, Professor James Clark of the Department of Electrical and Computer Engineering, replacing Professor Benoit Boulet who stepped down after serving as Centre director for six years.
- Addition of two new associate members, Professor Haibo Zeng of McGill's department of Electrical and Computer Engineering, and Dr. Marco Hamann, from the Dresden University of Applied Sciences.

- Awarding of a major ($4.7 Million) research grant from the NSERC Automotive Partnership Canada program to a team headed by CIM member Benoit Boulet.
- Awarding of a number of significant honours, including the *IEEE Canada Women in Engineering Prize* and the *Google Anita Borg Memorial Scholarship* to Ph.D. student Malika Meghjani. Professor Peter Caines was named as a recipient of the Queen Elizabeth Diamond Jubilee Medal.
- CIM researchers were very productive, having presented their research results and developments in more than 150 publications in major conferences and journals.

Section I – Membership

Full Members

Angeles, Jorge	James McGill Professor, Mechanical Engineering
Arbel, Tal	Associate Professor, Electrical and Computer Engineering
Boulet, Benoit	Associate Professor, William Dawson Scholar, ECE
Caines, Peter	MacDonald Professor, Electrical and Computer Engineering
Clark, James	Professor, Electrical and Computer Engineering
Cooperstock, Jeremy	Associate Professor, Electrical and Computer Engineering
Cortelezzi, Luca	Associate Professor, Mechanical Engineering
Dudek, Gregory	James McGill Professor, Computer Science
Ferrie, Frank	Professor, Electrical and Computer Engineering
Kovecses, Jozsef	Associate Professor, Mechanical Engineering
Kry, Paul	Assistant Professor, Computer Science
Langer, Michael	Associate Professor, Computer Science
Levine, Martin	Professor, Electrical and Computer Engineering
Mahajan, Aditya	Assistant Professor, Electrical and Computer Engineering
Michalska, Hannah	Associate Professor, Electrical and Computer Engineering
Nahon, Meyer	Professor, Mechanical Engineering
Pineau, Joelle	Associate Professor, Computer Science
Sharf, Inna	Associate Professor, Mechanical Engineering
Siddiqi, Kaleem	Professor, Computer Science
Zsombor-Murray, Paul	Associate Professor, Mechanical Engineering

Associate Members

Cecere, Renzo	Associate Professor, Cardiac Surgery (RVH), McGill University
Collins, Louis	Professor, Neurology & Neurosurgery/Biomedical Engineering
Forbes, James	Assistant Professor, Aerospace Engineering, University of Michigan
Hamann, Marco	Professor, Math/Informatics, Dresden University of Applied Sciences
Hayward, Vincent	Professor, ISIR, Université Pierre et Marie Curie, Paris France
Husty, Manfred	Professor, Geometry and CAD, University of Innsbruck, Austria
Liu, Xue	Associate Professor, Computer Science, McGill University
Misra, Arun	Professor, Mechanical Engineering, McGill University
Mongrain, Rosaire	Associate Professor, Mechanical Engineering, McGill University
Musallam, Sam	Associate Professor, CRC chair in Bioengineering, ECE, McGill University
Panangaden, Prakash	Professor, Computer Science, McGill University
Pike, Bruce	Professor, Faculty of Medicine, University of Calgary
Precup, Doina	Associate Professor, Computer Science, McGill University
Zeng, Haibo	Assistant Professor, ECE, McGill University

New Members

Professor **Haibo Zeng** became an associate member of CIM in March 2013. He has been an assistant professor in the department of Electrical and Computer Engineering at McGill University since 2011, where he teaches introduction courses in software and computer engineering, as well as a specialized graduate course on recent research topics in electrical engineering. His research interests include the design of cyber physical systems, embedded systems and real-time systems, as well as the modeling, analysis and optimization of these systems. He is also interested in other topics of cyber physical systems, including cyber-security and smart grid. Prof. Zeng has published two books and over 40 papers in several high-impact journals in his field over the last four years. He is the first author of two best papers at IEEE Symposium on Industrial Embedded Systems in 2009 and 2011, and another one at Euromicro Conference on Real-Time Systems in 2013. He has organized and served on the technical committees of over 20 conferences and workshops on design automation, embedded systems, cyber-physical systems and real-time systems. Before joining McGill, Prof. Zeng was a senior researcher at General Motors R&D for 3 years. He has a Ph.D in Electrical and Computer Sciences from University of California, Berkeley, and he obtained his Master's and Bachelor's degrees in Electrical Engineering at Tsinghua University in Beijing, China.

Professor **Marco Hamann** joined CIM as an associate member in March 2013. He is a professor in the faculty of Mathematics and Informatics at Dresden University of Applied Sciences (Hochschule für Technik und Wirtschaft Dresden). Previously, he taught at the Dresden University of Technology (Technische Universitat Dresden) in the department of Mathematics. During that time, he was a research assistant at the Institute of Applied Geometry at the University Linz in Austria from September 2008 to February 2009 and he also spent time at the Department of Geometry at Aristotle University of Thessalonica in Greece in 2007. Prof. Hamann studied Mathematics and Physics in Germany at the University of Leipzig, and held a teaching position there before moving to Dresden. His research interests include theoretical kinematics, Euclidean and non-Euclidean geometry and computational line geometry. He was on the organizing committee for the International Workshop on Line Geometry & Kinematics in Paphos Cyprus, where he was also an invited speaker on the topic of Computational Geometry for Efficient Motion Design by Implementation through Mechanisms.

Visitors

The following researchers were long-term (one month or longer) visitors to CIM, working in the labs of one or more CIM members:

Arthur Bouton	Arts et Metiers Paris Tech, France – hosted by Jozsef Kovecses
Guido Gerig	University of Utah, USA – hosted by Kaleem Siddiqi
Salvatore Grande	University of Cassino & Southern Lazio, Italy – hosted by Jorge Angeles
Takashi Harada	Kinki University, Japan – hosted by Jorge Angeles
Dileepan Joseph	University of Alberta – hosted by James Clark
Jon Sporring	University of Copenhagen, Denmark – hosted by Kaleem Siddiqi
Damian Trezieres	ICAM Toulouse, France – hosted by Jorge Angeles
Sebastian Zehe	Bielefeld University, Germany – hosted by Jeremy Cooperstock

Section II – Awards

Professor **Peter Caines** was a recipient of the *Queen Elizabeth the 2nd Diamond Jubilee Medal*, from the Office of the Lieutenant Governor. This is awarded for services to Canada with citation specifying scientific contributions.

Professor **Tal Arbel** received an *Outstanding Reviewer Award* for the 2013 IEEE Conference on Computer Vision and Pattern Recognition, Portland, Oregon, June 2013. (awarded to 50 out of 1000 reviewers)

Professor **Aditya Mahajan** was honored as *Exemplary Reviewer* for IEEE Wireless Communications Letter 2012, awarded by IEEE Communications Society, Feb 2013.

Malika Meghjani, a PhD student in the Mobile Robotics lab supervised by Professor Gregory Dudek, was the recipient of the *IEEE Canada Women in Engineering prize* for 2013. IEEE Canada annually awards the IEEE Canada Women in Engineering prize to recognize the excellence in young women engineer professionals. It is awarded to a person who has demonstrated substantial academic success and volunteer service to the IEEE. Malika Meghjani was the Students' Activities and Women in Engineering representative for McGill IEEE Student Branch, 2012-2013.

Malika Meghjani also won the *Google Canada Anita Borg Memorial Scholarship*. Dr. Anita Borg (1949-2003) devoted her adult life to revolutionizing the way we think about technology and dismantling barriers that keep women and minorities from entering computing and technology fields. Her combination of technical expertise and fearless vision continues to inspire and motivate countless women to become active participants and leaders in creating technology. The Google Canada Anita Borg Memorial Scholarship, which is set up in her honor, recognizes outstanding female graduate students based on the academic excellence and demonstrated leadership.

Dr. **Hervé Lombaert**, Post-Doctoral Fellow in Professor Kaleem Siddiqi's Shape Analysis Group, was awarded the *Francois Erbsmann Prize* at the 23rd biennial International Conference on Information Processing in Medical Imaging held in Asilomar CA. This is awarded for the best paper presented by a young scientist aged 35 or less.

Waqas Khan, Ryan Caverly and **Meyer Nahon** were the winners of the *Best Paper Award* at the AIAA Modeling and Simulation Technologies Conference, Boston, Aug. 19-23, 2013.

Timothy Drews, **Paul Kry, James Forbes,** and Clark Verbrugge were the winners of the *Best Paper Award* at the Conference on Computer and Robot Vision (CRV), Regina, May 2013.

Section III – Research Funding

The research carried out in the Centre is funded from a wide range of sources, including the Governments of Canada and Quebec (primarily through NSERC Discovery and Partnership grants and FRQNT grants) as well as industry (through research contracts and contributions to governmental partnership programs). These programs are too numerous to list individually. However, there are some large programs that affect a significant proportion of the researchers in the Centre, and we provide some details on these in the following section.

REPARTI

Regroupement pour l'étude des environnements partagés intelligents répartis

Regroupement REPARTI is a $4M inter-institutional, interdisciplinary collaborative venture comprised of 8 Quebec institutions, 35 members and over 300 students. The McGill node of REPARTI is represented by 13 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 annually. This FRQNT regroupement is a primary funding source for the McGill Centre for Intelligent machines (CIM).

The institutions participating in REPARTI are: Université Laval (host institution), McGill University, Université de Sherbrooke, École Polytechnique, Université de Montréal, 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 regroupement REPARTI was successfully renewed in 2013 for 6 years until 2019.

CREATE-MIA

NSERC Collaborative Research and Training Experience in Medical Image Analysis

The CREATE-MIA, funded by NSERC, was started in 2012, with the aim of training students for research careers in both academia and industry. The program employs a collaborative and multi-faceted approach including:

- experts from academia, industry and/or medicine to oversee a trainee's progress throughout the program
- a selection of advanced courses from different academic departments to provide a comprehensive background in medical imaging
- internships with our industrial partners on company premises to give first-hand real-world industry experience
- participation in events such as seminars, workshops, and a summer school to broaden and enrich their knowledge-base
- participation in SKILLSETS training seminars offered by McGill University to gain professional skills that will be useful when entering the workforce or starting businesses of their own.

The institutions participating in CREATE-MIA are: McGill University (host institution), Université de Sherbrooke, and École de technologie supérieure (ÉTS). Currently, the program supports 16 graduate students, 4 of whom are currently supervised by CIM members.

The director of the CREATE-MIA program is CIM member **Kaleem Siddiqi**. The program faculty includes CIM member **Tal Arbel**, CIM associate members **Louis Collins, Bruce Pike**, and CIM alumni **Catherine Laporte** (now assistant professor at ETS) and **Maxime Descoteaux** (now an assistant professor at Universite de Sherbrooke).

APC

Automotive Partnership Canada

CIM is home to a three-year, $4.7 million project, funded by the NSERC Automotive Partnership Canada program. The goal of this project is to combine electric motor technology obtained from Quebec-based TM4 Electrodynamic Systems with a multi-speed drive train from Ontario-based Linamar Corporation. This project aims to improve electric vehicle efficiency, speed and driving range without increasing drains on batteries. The research will reduce costs of electric vehicle engines through the development of multi-speed drivetrains that are smaller and lighter than the single-speed drivetrains currently in use.

The McGill APC project was announced in February 2013, and is led by CIM member Professor **Benoit Boulet**.

NCFRN

NSERC Canadian Field Robotics Network

The NCFRN is a Canada-wide network spanning 8 universities and 14 partner organizations. The network brings together academic, government, and industrial researchers in the area of field robotics, to develop the science and technologies to eventually allow teams of heterogeneous robots (on land, in the air, on the surface of or under water) to work collaboratively in outdoor environments, and to communicate critical information to humans who operate them or use them.

The NCFRN supports the work of 11 researchers from 8 different universities. It connects the academic participants with 10 industrial partners and 4 government agencies to leverage their complementary experience and capabilities. The network investigates fundamental issues in robotics science as well as develops technologies developed addressing particularly Canadian problems such as environmental monitoring and maintenance, border surveillance, cleanup of environmental disasters, and assisting and caring for senior citizens.

The NCFRN primarily provides direct support for students, thereby training highly qualified new researchers, engineers and technicians able to work in robotics-related industry.

The NCFRN network management is hosted by McGill and CIM, with CIM member **Greg Dudek** serving as scientific director. CIM member **Joelle Pineau** serves as the leader of the thematic area “Human”. CIM member **Inna Sharf** is also a research member of the NCFRN.

Section IV – Plans for the Coming Year

Some activities that are planned for 2014 include:

- Formation of an advisory board for the Centre.
- Review and updating of the Centre bylaws.
- Institution of a day-long research showcase for students. This will include short 3-minute presentations by graduate student members of CIM as well as a networking event with industrial partners. This event is planned to be held in September.
- Development of an industrial affiliate membership category. Contacting of select companies with long-standing interaction with the Centre to become inaugural affiliate members.
- Creating a “Case for Support” in collaboration with the Faculty of Engineering Development and Alumni Relations office to be shared with potential donors to the Centre.

Section V – Industrial Partners

Many of the centre's research activities are carried out in collaboration with industrial partners. A (partial) list of these partners is given in the following table.

- Alta Precision Inc.
- Bombardier Inc.
- CAE
- Canadian Space Agency
- Cirque du Soleil
- Clear Path Robotics
- CMLabs
- CMLabs Simulations
- ConsumerReport
- Crosswing
- Elekta
- Google
- General Motors Canada
- Genetec
- Hewlett-Packard
- HoloLabs Studio Inc.
- Imeka
- Immersion
- Independent Robotics
- Infolytica
- Intelerad
- IREQ - HydroQuebec
- Kinsol
- Linamar
- MDA
- Mokko Studios
- Neptec
- NeuroRX
- Nokia
- Nuance
- Object Research Systems
- Open Source Robotics Foundation
- ORS
- Placage Unique Inc.
- Pratt and Whitney Canada
- Rogue Research
- Synaptive Medical

- TandemLaunch Inc.
- Technospin Inc.
- Telemars
- Thermo FS
- TM4
- True Positive
- Vecna

Section VI – Publications

(note: publications listed are those that appeared during the calendar year of 2013)

ANGELES, Jorge

Articles in Refereed Publications

1. A. Azimi, J. Kövecses, J. Angeles. "Wheel-soil interaction model for rover simulation and analysis using elasto-plasticity theory." IEEE Transactions on Robotics, Vol. 29, No. 5, 2013, pp. 1271-1288.

2. V. Chopra, S. Hajzargarbashi, J. Angeles. "Parameter identification of the testbed of a novel gearless pitch-roll wrist." Mechanical Systems and Signal Processing, 2013. DOI: 10.1016/j.ymssp.2013.06.038.

3. G. Figliolini, H. Stachel, J. Angeles. "On Martin Disteli's spatial cycloidal gearing." Mechanism and Machine Theory, Vol. 60, 2013, pp. 73-89.

4. D. Alizadeh, J.Angeles, S. Nokleby. "Optimum design of a spherical quasi-homokinetic linkage for motion transmission between orthogonal axes." Mechanism and Machine Theory, Vol. 59, 2013, pp. 107-118.

5. A. Taghvaeipour, J. Angeles, L. Lessard. "Constraint-wrench analysis of robotic manipulators." Multibody System Dynamics, Vol. 29, No. 2, 2013, pp. 139-168.

6. A. Taghvaeipour, J. Angeles, L. Lessard. "On the Elastostatic Analysis of Mechanical Systems." Mechanism and Machine Theory, Vol. 58, 2013, pp. 202-216.

Chapters in Books:

7. J. Angeles. "Foundations for the approximate synthesis of RCCC motion generators," in Thomas, F. and Pérez Gracia, A., Editors, Computational Kinematics, Springer, Berlin-Heidelberg, 2013, pp. 331—338.

Full-length Papers in Conference Proceedings:

8. A. Azimi, D. Holz, J. Kövecses, J. Angeles, M. Teichmann. "Dynamics simulation of rovers on soft terrain: modelling and experimental validation.'' Int. Soc. for Terrain-Vehicle Systems (ISTVS) 7th Americas Conference, Tampa, FL, Nov. 4-7, 2013.

9. A. Azimi, D. Holz, J. Kövecses, J. Angeles, M. Teichmann. “High-fidelity and efficient rover mobility modelling and simulation based on plasticity theory.” Int. Soc. for Terrain-Vehicle Systems (ISTVS) 7th Americas Conference, Tampa, FL, Nov. 4-7, 2013.

10. T. Harada, J. Angeles. “Kinematics and singularity analysis of a CRRHHRRC parallel Schönflies motion generator.” Proc. CCToMM Symposium on Mechanisms, Machines, and Mechatronics, May 30-31, Montreal, Paper 12, 10 pp., 2013.

11. Y. G. Garneau, J. Angeles, A. Salerno. “The modeling of a mobile robot and its feedback control via pole-placement.” Proc. ECCOMAS Thematic Conference on Multibody Dynamics, July 1-4, Zagreb, Croatia, Paper 185, 10 pp., 2013.

12. T. Zou, J. Angeles. “Design of isotropic accelerometer strapdowns for rigid-body pose-and-twist estimation.” Proc. ASME 2013 Int. Design Engineering Technical Conferences & Computers and Information in Engineering Conference IDETC/CIE 2013, August 4-7, Portland, OR., Paper DETC2013-12496, 9 pp.

13. B. Ghotbi, F.González, J. Kövecses, J. Angeles. “Experimental Validation of Multibody Algorithms for Dynamics Analysis of Mobile Robots.” The 4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM), Montréal, Canada, July 23-26, 2013.

Extended Abstracts in Conference Proceedings:

14. B. Ghotbi, F. González, A. Azimi, W. Bird, J. Kövecses, J. Angeles, R. Mukherji. “Analysis, optimization, and testing of planetary exploration rovers: challenges in multibody system modelling.” ECCOMAS Conf. Multibody Dynamics, Zagreb, Croatia, July 1-4, 2013, 2 pp.

15. J. Angeles. “Revisiting the skew-symmetry property of mechanical systems.” Proc. The 4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM 2013) July 23-26, 2013, Montreal, Extended abstract Paper 869, 2pp.

16. F. Javid, N. Shahmansouri, R. Mongrain, D. Pasini, J. Angeles. “Characterization of the toughness properties of mitral valve leaflets.” Proc. ASME 2013 Summer Bioengineering Conference, SBC2013, June 26-29, Sunriver, OR, Paper SBC2013-14738, 2 pp., 2013.

17. N. Shahmansouri, F. Javid, D. Pasini, J. Angeles, R. Mongrain. “Investigation of the fatigue properties of mitral valve leaflets.” Proc. ASME 2013 Summer Bioengineering Conference, SBC2013, June 26-29, Sunriver, OR, Paper SBC2013-14758, 2 pp., 2013.

18. A. Azimi, D. Holz, J. Kövecses, J. Angeles, M. Teichmann. “Wheel-terrain interaction modelling for dynamics simulation and analysis of wheeled mobile robots.” Proc. CCToMM Symposium on Mechanisms, Machines, and Mechatronics, May 30-31, Montreal, 2 pp., 2013.

19. T. Harada, J. Angeles. “Kinematics and singularity analysis of a CRRHHRRC parallel Schönflies motion generator.” Proc. CCToMM Symposium on Mechanisms, Machines, and Mechatronics, May 30-31, Montreal, Paper 12, 10 pp., 2013.

20. Y. G. Garneau, J. Angeles, A. Salerno. “The modeling of a mobile robot and its feedback control via pole-placement.” Proc. ECCOMAS Thematic Conference on Multibody Dynamics, July 1-4, Zagreb, Croatia, Paper 185, 10 pp., 2013.

21. T. Zou, J. Angeles. “Design of isotropic accelerometer strapdowns for rigid-body pose-and-twist estimation.” Proc. ASME 2013 Int. Design Engineering Technical Conferences & Computers and Information in Engineering Conference IDETC/CIE 2013, August 4-7, Portland, OR., Paper DETC2013-12496, 9 pp., 2013.

ARBEL, Tal

Articles in Refereed Publications

22. B. Oreshkin and T. Arbel. "Uncertainty Driven Probabilistic Pixel Selection for Image Registration." IEEE Transactions on Medical Imaging, Vol. 32, No. 10, Oct. 2013.

23. C. Elliott, D. L. Arnold, D. L. Collins, and T. Arbel. "Temporally Consistent Probabilistic Detection of New Multiple Sclerosis Lesions in Brain MRI." IEEE Transactions on Medical Imaging, Vol. 32, No. 8, pp. 1490-1503, Aug. 2013.

24. D. De Nigris, D.L. Collins, and T. Arbel. "Fast Rigid Registration of Pre-Operative Magnetic Resonance Images to Intra-Operative Ultrasound for Neurosurgery based on High Confidence Gradient Orientations." International Journal of Computer Assisted Radiology and Surgery, Feb. 2013.

25. M. Demirkus, J. J. Clark and T. Arbel. "Robust Semi-automatic Head Pose Labeling for Real-World Face Video Sequences." Multimedia Tools and Applications, Jan. 2013.

Papers in Refereed Conference Proceedings

26. N. Subbanna, D. Precup, D. L. Collins and T. Arbel. "Hierarchical Probabilistic Gabor and MRF Segmentation of Brain Tumours in MRI." Proceedings of the 16th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI '13), Nagoya, Japan, Sept. 2013, Lecture Notes in Computer Science, Springer, Vol. 8149, pp. 751-758.

27. Z. Karimaghaloo, H. Rivaz, D. L. Arnold, D. L. Collins and T. Arbel. "Adaptive Voxel, Texture and Temporal Conditional Random Field for Detection of Gad-Enhancing Multiple Sclerosis Lesions in Brain MRI." Proceedings of the 16th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI '13), Nagoya, Japan, Sept. 2013, Lecture Notes in Computer Science, Springer, Vol. 8151, pp. 543-550.

BOULET, Benoit

Articles in Refereed Publications

28. A. Salehiomran, R. Modirnia, B. Boulet, M. Rochette. “Optical parametric oscillator longitudinal modes suppression based on Smith predictor control scheme.” IEEE Trans. on Control Systems Technology, Vol. PP, No. 99, Nov. 2013. doi 10.1109/TCST.2013.2289934

29. A. Haddadi, A. Yazdani, G. Joos, B. Boulet. “Gain-Scheduled Decoupling Control Strategy for Enhanced Transient Performance and Stability of an Islanded Active Distribution Network.” IEEE Trans. on Power Delivery, Vol. PP, No. 99, Nov. 2013.

30. A. Haidar, L. Legault, M. Dallaire, A. Alkhateeb, A. Coriati, V. Messier, P. Cheng, M. Millette, B. Boulet, R. Rabasa-Lhoret. "Glucose-responsive insulin and glucagon delivery (dual-hormone artificial pancreas) in adults with type 1 diabetes: a randomized crossover controlled trial." Canadian Medical Association Journal, March 5, 2013 vol. 185 no. 4.

31. R. Modirnia, B. Boulet. “Model-based virtual sensors and core temperature observers in thermoforming applications.” IEEE Trans. on Industry Applications, Vol. 49, No. 2, 2013, pp. 721-730.

32. T. Liesk, M. Nahon, B. Boulet. “Design and Experimental Validation of a Nonlinear Low-Level Controller for an Unmanned Fin-Less Airship.” IEEE Trans. on Control Systems Technology, Vol. 21, No. 1, 2013.

Other Refereed Contributions

33. A. Haddadi, A. Yazdani, G. Joos, B. Boulet. "A Generic Load Model for Simulation Studies of Microgrids." 2013 IEEE Power and Energy Society General Meeting, Vancouver, BC, July 21-25, 2013.

34. A. Haddadi, R. Modirnia, B. Boulet. "Robust Mu-Synthesis Control of a Four-Wire Autonomous Electronically-Interfaced Distributed Generation Unit for Mitigation of Harmonic Voltage Disturbance." American Control Conference, June 17- 19, 2013, Washington, D.C., pp. 3906-3911.

CAINES, Peter

Publications in Journals

35. M. Nourian, P. E. Caines. "Epsilon-Nash Mean Field Games Theory for Nonlinear Stochastic Dynamical Systems with Major and Minor Agents." SIAM Journal on Control and Optimization, 2013, 50(5), pp. 2907-2937.

36. F. Taringoo, P. E. Caines. "On the Optimal Control of Impulsive Hybrid Systems on Riemannian Manifolds." SIAM Journal on Control and Optimization, 2013, 51(4), pp. 3127-3153.

37. B. Passenberg, P.E. Caines, M. Leibold, O. Stursberg, M. Buss. "Optimal Control for Hybrid Systems with Partitioned State Space." IEEE Trans. on Automatic Control, 2013, 58(8), pp. 2131-2136.

38. A. Kizilkale, P. E. Caines. "Mean Field Stochastic Adaptive Control." IEEE Trans. on Automatic Control, 2013, 58(4), pp. 905-920.

39. M. Nourian, P. E. Caines, R. P. Malhame, M-Y. Huang. "Nash, Social and Centralized Solutions to Consensus Problems via Mean Field Control Theory." IEEE Trans. on Automatic Control, 58(3), 2013, pp. 639-653.

40. P. Jia, P. E. Caines. "Analysis of Decentralized Quantized Auctions on Cooperative Networks." 2013, IEEE Transactions on Automatic Control, 52(2), pp. 529-534.

Publications in Conference Proceedings

41. P. E. Caines, A. Kizilkale. "Recursive Estimation of Common Partially Observed Disturbances in MFG Systems with Application to Large Scale Power Markets." Proc. 52nd IEEE Conference on Decision and Control, Florence, Italy, 2013-12-10, pp 2505 – 2512.

42. P. Jia, P. E. Caines. "A Mean Field Games Formulation of Network Based Auction Dynamics." Paper, Proc. 52nd IEEE Conference on Decision and Control, Florence, Italy, 2013-12-10. pp 7844 – 7849.

43. F. Taringoo, P. E. Caines. "On the Optimal Control of Hybrid Systems on Lie Groups and the Exponential Gradient HMP Algorithm." Paper, Proc. 52nd IEEE Conference on Decision and Control, Florence, Italy, 2013-12-10. pp 2653 – 2658.

44. A. Pakniyat, P. E. Caines. "The Hybrid Minimum Principle in the Presence of Switching Costs." Proc. 52nd IEEE Conference on Decision and Control, Florence, Italy, 2013-12-10. pp 3831 – 3836.

CLARK, James

Articles in Refereed Publications

45. A. Haji-Abolhassani, J. J. Clark. "A computational model for task inference in visual search." Journal of Vision, special issue on visual search and selective attention, Vol. 13, No. 3, Article 29, September 26, 2013.

46. M. Demirkus, J. J. Clark, T. Arbel. "Robust Semi-automatic Head Pose Labeling for Real-world Face Video Sequences." Multimedia Tools and Applications. pp 1-29, 2013.

Other Refereed Contributions

47. M. Rezagholizadeh, J. J. Clark. "Maximum Entropy Spectral Modeling Approach to Mesopic Tone Mapping." 21st Color and Imaging Conference (CIC21), November 4-8, 2013, Albuquerque, NM.

48. Q. Tian, J. J. Clark. "Real-time Specularity Detection Using Unnormalized Wiener Entropy." 10th Conference on Computer and Robot Vision (CRV), May 2013.

49. M. Rezagholizadeh, J. J. Clark. "Edge-based and Efficient Chromaticity Spatio-Spectral Models for Color Constancy." 10th Conference on Computer and Robot Vision (CRV), May 2013.

50. M. Ziat, J. Fancher, K. Kilpela, J. Fridstrom, J. J. Clark. “InGrid: Rethinking the Embodied Space.” CHI 2013 Workshop on Blended Interaction: Envisioning Future Collaborative Interactive Spaces, May 2013.

COOPERSTOCK, Jeremy

Articles in Refereed Publications

51. G. Cirio, M. Marchal, A. Lécuyer, J. R. Cooperstock. “Vibrotactile Rendering of Splashing Fluids.” Transactions on Haptics, 6(1):117-122. 2013. (Selected as a "best paper" from the journal for 2013 for presentation at a special session of the 2014 IEEE Haptics Symposium.)

52. D. Dansereau, N. Brock, J. R. Cooperstock. “A Particle Filter for Predicting an Orchestral Conductor's Baton Movements.” Computer Music Journal, 37(2):28-45. 2013.

53. S. Pelletier, J. R. Cooperstock. “Real-time free viewpoint video from a range sensor and color cameras.” Machine Vision and Applications, 24(4):739-751. May 2013.

Papers in Refereed Conference Proceedings:

54. J. Anlauff, J. Fung, J. R. Cooperstock. “Augmented Feedback for Learning Single-Legged Stance on a Slackline.” In International Conference on Virtual Rehabilitation, Philadelphia, PA, August 2013.

55. D. El-Shimy, J. R. Cooperstock. “Reactive Environment for Network Music Performance.” In New Interfaces for Musical Expression (NIME), May 2013.

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