IEEE CCECE 2011

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Ontario

Premier of Ontario - Premier ministre de l'Ontario

Du 8 au 11 mai 2011

MESSAGE DU PREMIER MINISTRE DE L'ONTARIO

Au nom du gouvernement de l'Ontario, j'aimerais transmettre mes plus chaleureuses salutations aux participants et participantes à la 24e Conférence canadienne de génie électrique et génie informatique, parrainée par l'Institut des ingénieurs électriciens et électroniciens.

Le talent et la créativité des ingénieurs électriciens, électroniciens et informaticiens ont grandement contribué à la construction, à l'entretien et à l'amélioration des infrastructures qui enrichissent la qualité de vie des Canadiens et des Canadiennes. Cette année, la conférence invite les participantes et participantes à approfondir le thème suivant : « Électrifier un avenir vert ». Je suis certain que ce thème sera pour eux l'occasion idéale de discuter des enjeux les plus récents relatifs à leur secteur d'activité et de partager les éléments clés de leur expertise professionnelle en matière de recherche et développement.

Aux participants et aux participantes : « Bienvenue à Niagara Falls! » Ville empreinte d'histoire et d'une grande beauté naturelle, Niagara Falls offre aux visiteurs et aux visiteuses des activités touristiques extraordinaires dont ils se souviendront à jamais. Que vous connaissiez peut-être déjà cette ville pittoresque ou que vous la visitiez pour la toute première fois, soyez assurés que vous serez accueillis chaleureusement partout où vous irez.

Je vous souhaite une conférence instructive et couronnée de succès.

Le premier ministre de l'Ontario,

Dalton McGuinty

Ontario

Premier of Ontario - Premier ministre de l'Ontario

May 8 – 11, 2011

A Personal Message from the Premier

On behalf of the Government of Ontario, I am delighted to extend warm greetings to everyone attending the 24th Canadian Conference on Electrical and Computer Engineering, sponsored by the Institute of Electrical and Electronics Engineers.

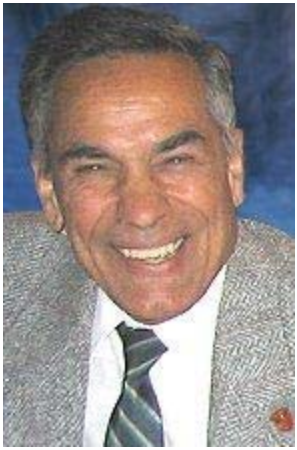
The talent and creativity of electrical, electronics and computer engineers have aided greatly in building, maintaining and improving the infrastructure that supports the quality of life we enjoy as Canadians. This year's convention invites participants to explore the theme Electrifying a Green Future. I am confident that this topic will provide an ideal forum for the discussion of the latest issues affecting the industry and for sharing vital research and development expertise.

To all attendees: Welcome to Niagara Falls! Steeped in history and rich in natural beauty, Niagara Falls offers visitors many wonderful experiences to take home with them. Whether a first-time or frequent visitor to this picturesque city, I assure you that a warm welcome awaits you wherever you go.

Please accept my best wishes for a memorable and informative conference.

Dalton McGuinty
Premier

Welcome message from IEEE Canada President



It is a pleasure to welcome all attendees to the 2011 Canadian Conference on Electrical and Computer Engineering (CCECE) being held in the scenic location of Niagara Falls, Ontario. CCECE is the flagship conference of IEEE Canada (IEEE Region 7) and is held under its sponsorship. The origins of CCECE can be traced back to 1988 when the first conference was held in Vancouver. It has been held annually since then in various parts of Canada with the 2011 CCECE being the twenty fourth in the series.

The objectives of starting this conference were to foster interaction and networking among the electrical and computer engineering R&D community within Canada. Its continued success has now led to a significant component of the presentations and attendees coming from all parts of the world. However, the original objectives of the conference have not changed. This is quite evident from the program that includes variety of plenary talks on topics of current interest by leaders in their own technical areas from the industry and academia.

The Technical Program Committee of CCECE has done a very good job with its Call for Papers, review of papers and putting together an excellent technical program that will be interesting and relevant to all attendees. Original technical papers and tutorials by experts on state-of-the-art topics cover the entire spectrum of electrical and computer engineering. The Technical Program Committee works hard to ensure that the presentations at the conference meet a high technical standard. One important part of CCECE is the Awards Ceremony where IEEE Canada recognizes the achievements and special contributions of its members. Attending the awards ceremony will make you aware of the great work being done within Canada and give you the opportunity to congratulate the winners. The organization of 2011 CCECE is a joint effort between all six Sections of the Central Canada Area of IEEE Canada. I would like to take this opportunity to congratulate the Central Canada Area and all six Sections for coming together in this joint effort, and also members of the Local Organizing Committee for their efforts in organizing the conference. I would also like to thank the plenary speakers, tutorial presenters and all authors who submitted their work for presentation at 2011 CCECE as without their contributions there will be no CCECE. Niagara Falls is known around the world for its beauty. I welcome all attendees to Niagara Falls and hope that you all will have a wonderful time both at the conference and in exploring Niagara Falls, also known as the honeymoon capital.

Dr. O. P. Malik, LFIEEE, FEIT, FCAE, FEIC, FEC, FWIF
Professor Emeritus, ECE, University of Calgary
President IEEE Canada, 2010-2011
Director/Delegate IEEE Region 7 2010-2011
Ph: +1-403-220-6178
Fax: +1-403-282-6855
e-mail: maliko@ucalgary.ca

Welcome message from CCECE General Chair

On behalf of the organizing committee, I would like to extend to you a warm welcome to CCECE 2011, to be held in scenic Niagara Falls, Canada - one of the seven natural wonders of the world. The 24th Canadian Conference on Electrical and Computer Engineering is the flagship event for IEEE Canada. This year, the IEEE Canada Central Region, along with the Hamilton, Kingston, Kitchener/Waterloo, London, Peterborough and Toronto Sections, have the pleasure of hosting this important conference. CCECE is Canada's premier networking forum for leading researchers in the broad area of Electrical and Computer Engineering.

This year's theme is "Electrifying a Green Future". Each day will be opened by a plenary session. This year, we are honored to have three excellent speakers. Prof. Peter Frise, University of Windsor, Scientific Director & CEO - Auto21, Canada's Network Centers of Excellence, will address current status and future opportunities in "Automotive Research in Canada". Prof. Richard J. Marceau, Provost, University of Ontario Institute of Technology, will introduce the "PEEC: The Power Engineering Education Consortium". Finally, Chris Ouslis, Vice President and Founder, Fresco Microchip, Markham, ON will provide a motivational talk on "Why don't we have more high-tech entrepreneurs in Canada?"

CCECE 2011 will include 40 oral sessions, 1 poster session, and 5 tutorials and 3 workshops. Papers are organized into 8 technical tracks: "Circuits, Devices and Systems", "Computers, Software and Applications", "Control and Robotics", "Power Electronics and Energy Systems", "Communications and Networking", "Signal and Multimedia Processing", "Biomedical and Health Informatics", and "Engineered & Natural Complex Systems: Modeling, Simulation & Analysis". The diversity of the technical program ensures that the conference will be interesting and relevant to our attendees.

I would like to express our deepest gratitude to the large number of volunteers who helped shape CCECE-2011. In particular I like to personally acknowledge Prof. Scott Yam (Queens University) and Prof. Andy Ye for going far beyond their duties to help us to organize an excellent and rich technical program. Special thanks also go to Prof. Xavier Fernando for his dedication on the tutorial and workshops. Whether this is your first or returning visit to the Niagara Falls, I strongly recommend you to extend your stay and visit some of the countless attractions in the region.
I look forward to personally meeting you at CCECE 2011.

Prof. Wai Tung Ng
CCECE-2011 General Chair

Mayor Jim Diodati

City Hall
4310 Queen Street
P.O. Box 1023
Niagara Falls, ON L2E 6X5
web site: www.niagarafalls.ca
(905) 356-7521 Ext. 4201
Fax: (905) 374-3557
jdiodati@niagarafalls.ca

GREETINGS

On behalf of the Niagara Falls City Council, I am excited to extend my best wishes to all those attending the 24th Canadian Conference on Electrical and Computer Engineering (CCECE) from May 8 - 11, 2011. It is a pleasure to be the host city and we wish you an event filled with success.

I would like to thank the organizers for all their hard work planning this conference, and I hope everyone who is attending has the opportunity to check out the wide variety of experiences, sights and activities that our city and region have to offer.

Sincerely,

James M. Diodati
Mayor

IEEE

Canadian Conference on Electrical and Computer Engineering

Plenary Sessions

Congrès Canadien en Génie Électrique et Informarique

IEEE

Plenary 1:

"Canada's Transportation Sector and Collaborative Automotive Research & Education in Canada"

Date: Monday, May 9, 2011 at 8:15am in Oakes Ballroom

Presented by Prof. Peter R. Frise, Scientific Director and CEO – AUTO21 Network of Centers of Excellence and Professor of Automotive Engineering and Executive Director of Automotive Research & Studies at the University of Windsor

Abstract: The automotive industry is Canada's largest single business sector providing high value employment to over 400,000 people across the country including over 135,000 direct jobs mainly in Ontario and Quebec. In addition, this $110B business provides nearly a quarter of Ontario's trade and is the largest source of exports in our economy as well as being a key component of Canada's transportation sector. Automotive manufacturing is one of the largest consumers of materials in our economy and present and future automobiles are extremely high technology articles which represent one of the largest purchases for most Canadians. The North American automotive sector is presently under significant competitive pressures and so we must innovate to continue to provide these benefits to Canada. The presentation will describe the present status of automotive-related research globally and in Canada and will illustrate with examples in vehicle safety, advanced materials and manufacturing and cleaner power trains and will highlight the opportunities for electrical and electronics engineers in the future automobile.

Speaker's Biography: For many years, Peter R. Frise, Ph.D., P.Eng., FCAE, has selflessly used his expertise as an engineering educator and researcher to serve PEO's governance and the country's future engineers. He served on PEO Council as Lieutenant Governor Appointee for two three-year terms and one year-long term, beginning in 1997. For the past 11 years he has also played a strong role on the Complaints Committee, where he has provided the benefit of his background in engineering practice and governance as well as his specialty in mechanical engineering. He also chaired PEO's Fundamental Review Implementation Task Group charged with investigating emerging areas and multidisciplinary groups in the profession. At the national level, Peter chaired a then Canadian Council of Professional Engineers' (now Engineers Canada) Vision Task Force Working Group's Environmental Scan on the Engineering Profession in Canada. He also served on the Founding Council of the Association of Professional Geoscientists of Ontario as a Lay Member. In addition to service on PEO Council, Peter worked to improve engineering education and research through his initiatives at the University of Windsor. A devoted and respected educator, he established Canada's first university-level program in Automotive Engineering in 1998 at the University of Windsor, providing students with the skills needed for the highly competitive automotive industry, while satisfying accreditation requirements. "Every student is their family's pride and joy," he says, "and it is essential that educators join with those families in helping our young people to achieve at their highest potential." As a result of his knowledge and connections in the automotive industry, Peter was elected by nearly 30 universities to lead the AUTO21 Network of Centres of Excellence in 2000.

Plenary 2:

“PEEC The Power Engineering Education Consortium”

Date: Tuesday, May 10, 2011 at 8:15am in Oakes Ballroom

Presented by Prof. Richard J. Marceau
Provost, University of Ontario Institute of Technology

Abstract: To address Ontario’s shortage of electric Power Engineers, seven universities (McMaster University, Queen’s University, Ryerson University, University of Toronto, University of Waterloo, University of Western Ontario and University of Ontario Institute of Technology (UOIT)) have resolved to create the “Power Engineering Education Consortium (PEEC)”. In partnership with these universities are key representatives from industry and labor in the electricity sector and beyond: the Canadian District Energy Association, CANDU Owners’ Group, Electricity Distributors’ Association, Hydro One Networks (Hydro One), Ontario Power Authority (OPA), Ontario Power Generation (OPG), Power Workers’ Union, and the Society of Energy Professionals. PEEC aspires to increase the number of highly qualified personnel at the Bachelor and Graduate levels in electric Power Engineering in Ontario and thereby provide needed talent for Ontario’s electricity sector. The presentation will provide an overview of the gap between the supply and demand of electric power engineers for Ontario. The presentation will also describe the PEEC partnership and how it aims to address this gap.

Speaker's Biography: Richard J.Marceau obtained his B.Eng. from McGill University in December 1977. In January 1978, he began his career with MONENCO Inc., a consulting engineering firm. In 1982, he joined Hydro-Québec as an operations engineer. In June 1983, he obtained his Master's in Electrical Engineering while studying part time at École Polytechnique de Montréal. In 1984, he became a researcher at the Hydro-Quebec Research Institute (IREQ) in electromagnetic induction heating. Between September 1990 and June 1993, he pursued full-time doctoral studies, and obtained his Ph.D. in electrical energy transmission and security. The same year, he began a university career at École Polytechnique de Montréal. In 1998, he was elected Chair of the Department of Electrical and Computer Engineering, and led the Department through transformational change. In June 2001, he became Dean of the Faculty of Engineering of the Université de Sherbrooke where he again led the Faculty through paradigm-shifting change. In January 2005, he became Provost and VP Academic of the University of Ontario Institute of Technology (UOIT) where he has overseen the successful academic start-up of this new university. He is currently Chair of the Board of Parkwood National Historic Site, Fellow of the Canadian Academy of Engineering, member of the Board of Directors of the Canadian Academy of Engineering and Chair of its New Directions and Public Policy Committee, and senior member of the IEEE.

Plenary 3:

“Why don't we have more high-tech entrepreneurs in Canada?”

Date: Wednesday, May 11, 2011 at 8:15am in Oakes Ballroom

Presented by: Chris Ouslis, Vice President and Co-founder, Fresco Microchip, Markham, ON

Abstract: Why aren’t there more successful Canadian high-tech startups?! Find out why. Hear about characteristics that can improve chances of entrepreneurial success. Learn what is being done to change Canada’s high-tech entrepreneurial philosophy.

Speaker’s Biography: Chris Ouslis is a co-founder of Fresco Microchip Inc. which supplies demodulator and tuner components or the television industry. Television sets from LG, Panasonic, Sanyo, and Samsung include Fresco components. In 2010, Fresco shipped almost 30 million units from virtually no sales in 2009. Fresco Microchip is funded by Celtic House Venture Partners, Ventures West Capital, and private capital. Chris also co-founded Xentec, a supplier of silicon intellectual property and provider of integrated circuit design contracting. Xentec was acquired by InSilicon after having grown to 16 staff with no external capital over 3 years. Over the next 2 years, the business unit’s success continued and staff doubled until Synopsys acquired Insilicon. The silicon intellectual property group continued its growth, in Canada and world-wide through products from firms including AMD, Apple, Toshiba, and Samsung. Chris received his B.A.Sc. degree in Engineering Science and M.A.Sc. degree in Electrical Engineering from the University of Toronto. He was a Research Associate and Lecturer at the University of Toronto.

Notes

IEEE

Canadian Conference on Electrical and Computer Engineering

McNaughton Lecture

Tuesday May 10, 12:30 Oakes Room

Congrès Canadien en Génie Électrique et Informarique

IEEE

2011 IEEE Canada A.G.L. McNaughton Gold Medal

For outstanding contributions to the development of design methodsfor communication protocols and services

Gregor v. Bochmann (FIEEE) is professor at the School of Information Technology and Engineering at the University of Ottawa since 1998, after 25 years at the University of Montreal. He is a Fellow of IEEE, ACM and the Royal Society of Canada. After initial research work on programming languages and compiler design, he started work on communication protocols around 1974 and developed the field of "protocol engineering," applying software engineering principles to communication protocols.

In the early eighties, he participated in standardization committees of ISO and ITU and took a leading role in the standardization of Formal Description Techniques for communication protocols and services at the Canadian and international levels. He is internationally well recognized for his innovative work on modeling the behavior of distributed systems by extended finite state machines, and on their verification and testing. He has had many research collaborations with industry and, from 1989 to 1997, held the Hewlett-Packard - NSERC - CITI Industrial Research Chair on communication protocols at the University of Montreal.

Dr. Bochmann has received many prizes for his work, including the Thomas W. Eadie Medal of the Royal Society, the Award for Excellence in Research of the University of Ottawa, and in 2005 was recognized as a "Pioneer of Computing in Canada" at the CASCON conference organized by IBM and NRC. His recent work has been in the areas of software engineering for distributed applications, peer-to-peer systems, quality of service and security management for Web applications, and control procedures for optical networks.

Notes

Awards Presentation

Remise des prix

24th Canadian Conference on Electrical and Computer Engineering

24ième Conférence canadienne de génie électrique et informatique

IEEE Canada

May 9—9 Mai, 2011; Niagara Falls, ON

http://www.ieee.ca/awards

Conference Chair
Dr. Amir G. Aghdam
Concordia University

Technical Program Chairs
Dr. Scott Yam
Queen's University
Dr. Lacra Pavel
University of Toronto
Dr. Gerry Moschopoulos
University of Western Ontario

Tutorials and Workshops
TBD

Finance
TBD

Local Arrangements
Dr. Anader Benyamin-Seeyar
Concordia University

Publications
TBD

Publicity
TBD

Registration
TBD

Industrial Exhibits
TBD

Sponsorships
TBD

Translation
Christian Pepin
Université du Québec à Trois-Rivières

Student Activities
TBD

Webmaster
Mr. Seyed Kian Jalaleddini
McGill University

Conference Advisory
Dr. Sri Krishnan
Ryerson University

IEEE Canada President
Dr. Keith Brown
Ontario Power Generation

Contact
Amir G. Aghdam
contact@ccece2012.org
CCECE 2012
Department of Electrical and Computer Eng., Concordia Univ.
1455 de Maisonneuve Blvd. W., EV005.139
Montreal, Quebec
Canada H3G 1M8

IEEE Canada

CCECE 2012 (Silver Anniversary)

25th Annual Canadian Conference on Electrical and Computer Engineering

April 29–May 2, 2012, Montreal, Quebec

Call for Papers and Proposals

The 2012 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2012) will be held in Montreal, Quebec, Canada April 29 to May 2. CCECE 2012 provides a forum for the presentation of electrical and computer engineering research and development from Canada and around the world. Plenary speakers include Vahid Tarokh from Harvard University and Peter Caines from McGill University.

Papers are invited, in French or English, for the following symposia:

- **Circuits, Devices and Systems**
  Chairs: Drs. Karim Karim (University of Waterloo), Shahriar Mirabbasi (University of British Columbia)
- **Control and Robotics**
  Chairs: Drs. Stephen Smith (University of Waterloo), Joshua Marshal (Queen's University)
- **Computers, Software & Applications**
  Chair: Dr. Jagath Samarabandu (University of Western Ontario)
- **Biomedical and Health Informatics**
  Chair: Dr. Carolyn McGregor (University of Ontario Institute of Technology)
- **Communications and Networking**
  Chairs: Drs. Anader Benyamin-Seeyar (Concordia University), Shahram Yousefi (Queen's University), Mark Coates (McGill University)
- **Power Electronics and Energy Systems**
  Chairs: Drs. Bala Venkatesh (Ryerson University), Olivier Trescases (University of Toronto)
- **Signal and Multimedia Processing**
  Chairs: Drs. Fabrice Labeau (McGill University) Xianbin Wang (University of Western Ontari

Authors wishing to submit papers that do not fit within any of the above topics are encouraged to do so to the "general interest" symposium.

NOTE: Selected papers accepted in this conference would be proposed for publication in IEEE *Systems Journal* and IEEE *Canadian Journal of Electrical and Computer Engineering*, after another round of review.

Regular Paper Submission

Please submit original full length paper(s) to the Technical Program Committee using the on-line submission process on our web site at http://www.ccece2012.org before January 7, 2012. Click on "Call For Papers" and follow the instructions provided.

Tutorial and Workshop Proposals Submission

Proposals for half-day tutorials and workshops should be submitted before December 2, 2011 to the Tutorials Chair at tutorials@ccece2012.org .

Important Dates

Tutorial or workshop proposals must be received by:	Friday, December 2, 2011
Full length papers must be received by:	Friday, January 7, 2012
Notification of acceptance will be sent out by:	Friday, February 24, 2012
Author's Registration ends by:	Friday, March 9, 2012
Advance Registration ends by:	Friday, March 30, 2012

Industrial Exhibits and Sponsorships

For industrial exhibits please contact the Industrial Exhibits Chair at exhibits@ccece2012.org.
For sponsorships please contact the Sponsorships Chair at sponsorship@ccece2012.org.

Questions or Comments

To volunteer as a reviewer, please contact Tech. Program Co-Chairs: Scott Yam (scott.yam@queensu.ca), Lacra Pavel (pavel@control.toronto.edu) and Gerry Moschopoulos (gmoschopoulos@eng.uwo.ca).

For any questions or comments, please contact the Conference Chair:
Amir G. Aghdam. Ph: 514 848-2424 Ext. 4137, Fax: 514 848-2802 Email: aghdam@ece.concordia.ca

http://www.ccece2012.org

Announcement

IEEE EPEC 2011

Electrical Power and Energy Conference

Advanced Technologies for Emerging Power Systems

October 3-5, 2011, Winnipeg, MB, Canada

Honorary Chair
Dennis Woodford
Electranix Inc.

General Chair
Ani Gole
University of Manitoba

Organizing Committee Chair
Haider Al-Saidi
Red River College

Technical Committee Chair
David Jacobson
Manitoba Hydro

Finance Chair
Hilmi Turanli
Manitoba Hydro

Steering Committee Chair
Ed Tymofichuk
Manitoba Hydro

Industry Program Committee Chair
Athula Rajapakse
University of Manitoba

Tutorial/Workshop Chair
Shaahin Filizadeh
University of Manitoba

Exhibits Program Chair
Hojat Norouzi
Red River College

Registration Chair
Kim Laing
Manitoba HVDC Research Center

Local Arrangements Co-Chairs
Christine Stuart-Edwards
RTDS Technologies
Traci Hofer
University of Manitoba

Webmaster
Dario Schor
University of Manitoba

IEEE Canada President
Om P. Malik

Conference Website
http://www.ieee.ca/epec11/

Secretariat
EPEC 2011
c/o Department of Electrical and Computer Engineering
University of Manitoba,
Winnipeg, MB Canada R3T 5V6

IEEE Canada

Cosponsored by: IEEE Canada and IEEE Winnipeg Section

Call for Papers

The annual Electrical Power and Energy Conference (EPEC 2011) will take place in Winnipeg, MB, Canada from October 3 to 5, 2011. Located in the center of Canada, Winnipeg is a culturally diverse, creative and cosmopolitan city with a warm, welcoming spirit that will make a unique and unforgettable meeting and convention destination. The objective of EPEC 2011 is to provide a forum for experts in Electrical Power and Energy to disseminate their recent research outcomes and exchange views on the future research directions of these fields. This year we are working with The Energy Services Alliance of Manitoba to bring in renowned experts to give keynote speeches related to the Smart Grid. Bring your family with your research findings to EPEC2011, enjoy our programs and appreciate the history of Winnipeg.

Topics: Papers are invited on all topics of interest related to electric power and energy and especially papers with the following focus:

1. HVDC & FACTS
   - Project developments, including voltage source converter (VSC) dc transmission
   - Application for renewable energy systems
   - Advances in study and analysis tools
   - Power quality issues and solutions
   - HVdc supergrids
2. Smart Grid
   - Smart Grid concepts and pilot projects
   - Electric vehicles (grid impacts, standards)
   - Advanced metering infrastructure
   - On-line dynamic security assessment
   - Smart sensors including dynamic equipment rating and condition assessment methods
   - Applications of phasor measurement units
   - Energy Storage
   - Distribution system automation and control
3. Wind Power & Solar
   - Challenges with integration of variable generation
   - New technology development
4. Computational Methods
   - Computational methods in power system planning, operation and control
   - Probabilistic planning and risk analysis
   - Reliability centered maintenance and asset management
5. Advanced Technology Developments
   - Fault current limiters
   - Energy conservation and efficiency

Paper Submission: The format of the paper should follow the IEEE conference papers style. EPEC 2011 will only accept the electronic submission of a full paper in English with maximum six pages (submission website address to be announced shortly). Detailed information on paper format and submission procedure can be found on the conference web. EPEC 2011 proceedings are included in EI Compendex, IEEEXplore and ISI.

Important Dates:

April 30	2011	Submission of full papers in PDF and organized session proposals
May 10	2011	Submission of tutorial and workshop proposals
May 15	2011	Notification of paper and tutorial/workshop acceptance
June 10	2011	Submission of final camera-ready papers

Exhibitions: There will be an exhibition site at the conference. Companies and institutions who are interested are encouraged to contact the exhibition chair for further information.

For more information on EPEC 2011, please contact:

Prof. Ani Gole, General Chair
Dept of Electrical and Computer Engineering
University of Manitoba
Winnipeg, MB, Canada R3T 5V6
Tel: +1(204) 474-9959
Fax:+1(204) 474-7522
E-mail: gole@ee.umanitoba.ca

Dr. David Jacobson, Technical Committee Chair
System Planning Department
Manitoba Hydro
Winnipeg, MB, Canada R3C 0J1
Tel: +1(204) 360-3765
Fax:+1(204) 360-6177
E-mail: dajacobson@hydro.mb.ca

London Hydro

Powering London.
Empowering You.

Welcome to London Hydro

For almost a century, London Hydro has enjoyed a history charged with challenges and opportunities. With a mandate to provide safe, affordable electricity to the general public, we began to power homes and businesses in November of 1910, and have continued to improve the way people live and work ever since.

Even in the early days, our forward-thinking approach brought new technology to London homes first. Our retail division was an instant success, supplying the public with the latest electric appliances to help save time and money.

Later, when we focused our energies on replacing the clutter of overhead wires in our cityscape with underground cable, London's Bellwood Park became the first underground-serviced subdivision in postwar Canada.

Our active role in the community includes developing a school curriculum that teaches grades five and six students here - and across Ontario - about electric power, conservation, and its proper use.

Both our fleet and electric meter departments have earned ISO 9001 registration, the most accepted quality management systems standards in the world. These accomplishments assure our customers of our commitment to providing a level of service in keeping with global standards.

The electric meter department has also achieved accreditation by Measurement Canada, which allows London Hydro to inspect, verify and seal electric meters.

Solar Power Generation for London, Ontario
93.43 MWh

Estimated Environmental Benefits to Date

117

23

4748

Click here for more info...

Quicklinks

- Ontario Power Authority - saveONenergy
- Ontario Energy Board
- Electrical Safety Authority - Find An Authorized Electrica Contractor
- Independent Electricity System Operator
- Ministry of Energy and Infrastructure
- Natural Resources Canada Office of Energy Efficiency
- Mayor's Sustainable Energy Council
- The Weather Network - London, Ontario

IEEE

Canadian Conference on Electrical and Computer Engineering

Technical Program Committee

Congrès Canadien en Génie Électrique et Informarique

IEEE

Technical Program Committee

Technical Program Committee Co-Chairs:
S. Yam, Queeens University
A. Ye, Ryerson University
G. Moschopoulos, Universtiy of Western Ontario

Symposia Chairs

Symposium on Biomedical Engineering and Health Informatics
Chair: James Smith, Ryerson University
Chair: Karthi Umapathy, Ryerson University
Chair: Syed Sibte Raza Abidi, Dalhousie University

Symposium on Circuits, Devices and Systems
Chair: Karim Karim, University of Waterloo
Chair: Shahab Ardalan, Gennum Corp.

Symposium on Communications and Networking
Chair: Mark Coates, McGill University
Chair: Alagan Anpalagan, Ryerson University
Chair: Min Dong, University of Ontario, Institute of Technology

Symposium on Computers, Software and Applications
Chair: Andreas Moshovos, University of Toronto
Chair: Natalie Enright-Jerger, University of Toronto

Symposium on Control and Robotics
Chair: Lacra Pavel, University of Toronto
Chair: Javad Lavaei, California Institute of Technology

Symposium on Power Electronics and Systems
Chair: Gerry Moschopoulos, University of Western Ontario
Chair: Bala Venkatesh, Ryerson University

Symposium on Signal and Multimedia Processing
Chair: Xianbin Wang, University of Western Ontario
Chair: Saeed Gazor, Queen's University

Symposium on Engineered & Natural Complex Systems: Modeling, Simulation & Analysis
Chair: Dr. Anna T. Lawniczak, University of Guelph

Technical Program Chairs' Overview

On behalf of the Technical Program Committee (TPC), we would like to welcome the delegates and their guests to the 24th annual Canadian Conference on Electrical and Computer Engineering (CCECE).

In a sustained effort to create the best forum for the Canadian ECE community, the CCECE 2011 inherited from previous years` the vigorous review process for all its technical track submissions. The conference consists of a symposium structure. Each of the seven symposia provides a technical focus for papers in related fields. Significant energy has been devoted to a thorough and diligent review process by experts in matching technical areas, averaging 2.6 reviews per article. We hope this structure will continue to provide a sense of community for the various research areas within the conference as a whole.

CCECE 2011 drew 434 full-paper submissions from 35 different countries around the world. The submissions were sent to the members of the TPC and to the over 100 additional reviewers for review. The chairs would like to thank the symposium chairs, TPC members and the reviewers for their hard work and dedication. Time and space limitations did not allow us to include many fine technical submissions to the program. The CCECE 2011 Technical Program includes 287 oral and 48 poster presentations, totalling an acceptance rate of 77%.

Accepted papers can be broken down among the seven symposia as follows: Biomedical and Health Informatics (16), Circuits, Devices & Systems (48), Communications & Networks (63), Computer Systems & Applications (37), Control & Robotics (25), Engineered and Natural Complex Systems (11), Power Electronics and Systems (72) Signal & Multimedia Processing (40), all to be presented in oral sessions. 6 parallel oral sessions span the morning, afternoon and evening slots, with about five or more presentations in each session. The oral sessions follow the symposium structure where each symposium has a designated room where possible. The poster session coincidences with the job fair and sponsorship exhibits to maximize interaction between different sectors of the Canadian engineer community.

Workshops are an integral part of CCECE and Xavier Fernando, the Tutorials and Workshops Chair, has prepared an excellent program for CCECE 2011. Six tutorials have been selected for presentation on Sunday, May 8, 2011. Three workshops have been organized to take place on Sunday, May 8, 2011, and Monday, May 9, 2011.

Finally, we would like to express our deep appreciation for the support received from Wai Tung Ng, the CCECE 2011 Conference Chair, the IEEE Canada Conference Advisory Committee (CONAC), and IEEE Canada.

We look forward to welcoming you in the Niagara Falls. We hope that you will enjoy the conference and find the Technical Program exciting.

Scott Yam, Andy Ye, and Gerry Moschopoulos
IEEE CCECE 2011, TPC Chairs

CCECE 2011 Organizing Committee

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Wai Tung Ng
University of Toronto

Technical Program
Scott Yam, Co-chair
Queens University

Andy Ye, Co-chair
Ryerson University

Gerry Moschopoulos, Co-chair,
University of Western Ontario

Tutorial Workshop
Xavier Fernando
Ryerson University

Publication
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IEEE

Canadian Conference on Electrical and Computer Engineering

General Information

Congrès Canadien en Génie Électrique et Informarique

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General Information

Registration

Registration will be located in the Oakes Foyer on the Mezzanine Level of the Marriott Gateway.

Sunday	May 8	15:00 - 21:00
Monday	May 9	07:00 - 16:00
Tuesday	May 10	07:00 - 16:00
Wednesday	May 11	07:00 - 12:00

Meals

Each registration fee, except for Partners, includes the following meals:

Sunday	May 8	Welcome Receptions
Monday	May 9	Breakfast, Lunch, Banquet
Tuesday	May 10	Breakfast, Lunch
Wednesday	May 11	Breakfast, Lunch

Additional tickets for the lunches and the banquet can be purchased at the Registration Desk during the Conference.

All meals will be held in the Oakes Ballroom, located on the second floor of the of the Marriott Gateway hotel.

Dietary Needs

Any Conference delegate or partner with special dietary needs etc. is invited to indicate these needs to the organizing committee - please forward your requirements to admin@ieee.ca or inform the Registration Desk.

Sunday Night Reception

This year's Sunday Night Reception highlights the international flare of the CCECE. You won't want to miss this opportunity to meet friends and colleagues in this relaxed and entertaining setting. The Social will be held from 19:00 to 21:00, in the Oakes North of the Marriott Gateway Hotel.

Authors' Breakfasts

Each morning of the conference, a complimentary breakfast will be held for all authors presenting that day from 08:15 to 09:15 in the Oakes North/Ballroom of the Marriott Gateway Hotel. A table will be reserved for each session scheduled for that day. It is mandatory for all authors to attend on the day that they are presenting in order to meet their session chair and to review the technical session logistics.

Additional Equipment

Authors are reminded that each session room will be equipped with a LCD projector, screen, pointer device and microphone. Laptop and or desktop computers **will not** be provided. You are required to bring your own computer with your own software presentation package preinstalled. Please let the Conference organizers know (admin@ieee.ca) if you require an overhead projector. Please include your paper # in all correspondence,

Conference Proceedings

Conference Registration fee includes a copy of the Conference Proceedings. Additional copies are available. Please enquire at the Registration Desk.

After the Conference, additional copies of the Conference Proceedings, on printed formats, will be available from IEEE Publications.

Exhibits

The Conference Organizing Committee has arranged for a number of exhibitors to be present during the Conference. They will be set up on the second floor of the Marriott Gateway Hotel, in the Oakes Foyer. The exhibits will be open from 09:00 to 16:00 on Tuesday May 10th.

Conference Secretariat:

Cathie Lowell
CCECE 2011 Secretariat
IEEE Canada
PO Box 63005, University Plaza Postal Outlet
Shoppers Drug Mart #742, 102 Plaza Drive
Dundas, ON, L9H 4H0, CANADA
Tel/Fax: (905) 628-9554
Email: c.lowell@ieee.org
Conference website: www.ieee.ca/ccece11

Wireless Internet Access:
Will be provided for the convenience of all delegates in the Oakes Foyer on Monday, Tuesday and Wednesday.
Note that you must have your own computer and that internet access will not be provided in the presentation rooms.

Sponsors

Premium Sponsor: London Hydro

Sponsors: GE Energy Services
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CCECE 2011 is organized by:

IEEE Canada Central Canada Area Sections: Hamilton, Kingston, Kitchener/Waterloo, London, Peterborough, Toronto.

RECEPTIONS AND BANQUETS:

Conference Welcome Reception

Sunday, May 8, 19:00-21:00, **Oakes North** (with cash bar)**.**

All delegates are welcomed to Niagara Falls and CCECE 2011 by IEEE Canada and the Conference Organizing Committee. This is your opportunity to network with colleagues, renew old friendships, and forge new ones over light refreshments and cocktails.

IEEE Canada Awards Reception and Banquet

MONDAY, May 9, 18:30-22:00, **Oakes North**

OPEN TO ALL DELEGATES TICKET REQUIRED
(included with full registration)

Additional tickets may be purchased at the Registration booth. The Conference Awards Banquet will honor recipients of IEEE Canada awards.

Awards Banquet - sponsored by IEEE Canada

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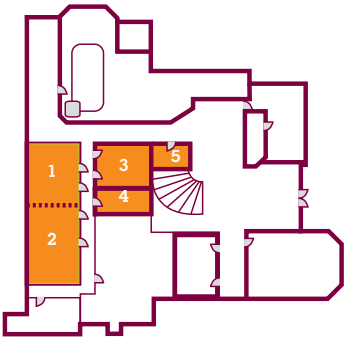
Session & Meeting Room Locations

Congrès Canadien en Génie Électrique et Informarique

IEEE

Marriott
NIAGARA FALLS
GATEWAY ON THE FALLS

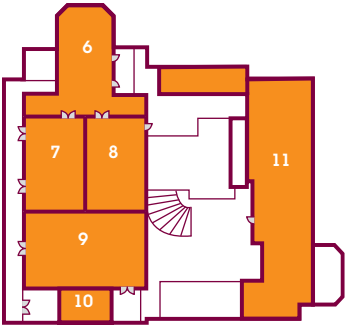
FLOOR PLANS



Lobby Level

Key

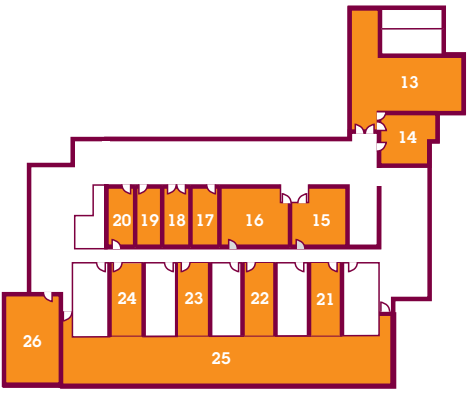
Room 1:	Hennepin North
Room 2:	Hennepin South
Room 3:	Auditorium
Room 4:	Chippawa
Room 5:	Business Centre/ Registration Desk



Mezzanine Level

Key

Room 6:	Oakes Foyer
Room 7:	Oakes North West
Room 8:	Oakes North East
Room 9:	Oakes South
Room 10:	Stage
Room 11:	Milestones Grill + Bar
Room 12:	Private Dining RoomRoom



Third Floor Level

Key

Room 13:	Salon A
Room 14:	Salon B
Room 15:	Ontario
Room 16:	Niagara
Room 17:	Canadiana
Room 18:	Executive Boardroom
Room 19:	Oneida
Room 20:	Maple
Room 21:	Fallsview Parlour
Room 22:	Fallsview Parlour
Room 23:	Fallsview Parlour
Room 24:	Fallsview Parlour
Room 25:	Fallsview Terrace
Room 26:	Mount Carmel

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Tutorials and Workshops

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Tutorials

Detailed information at:
www.ieee.ca/ccece11/tutorials.php

Sunday May 8, 2011 - 9 a.m. - 12 p.m.

Tutorial A: Routing in Opportunistic Networks
Location: Hennepin North
Presenter: Prof. Isaac Woungang

Tutorial B: Bit Interleaved Coded Modulation
Location: Niagara
Presenters: Prof. Leszek Szczecinski and Alex Alvarado

Sunday May 8, 2011 - 1 p.m. - 4 p.m.

Tutorial C: Saving Miners and Energy: Innovations in Underground Communication Systems
Location: Hennepin North
Presenters: Wisam Farjow and Prof. Xavier Fernando

Tutorial D: Getting Your Point Across
Location: Ontario
Presenter: Celia Desmond

Tutorial F: Solar Electric Systems and Humanitarian Projects
Location: Niagara
Presenter: Pritpal Singh and Alfredo Herrera

Sunday May 8, 2011 - 9 a.m. - 4 p.m.

Tutorial E: Everything You Wanted to Ask about Power System Fault Studies but were Afraid to Ask
Location: Hennepin South
Presenter: Charlie Henville

Workshops

Detailed information at:
www.ieee.ca/ccece11/workshops.php

Sunday, May 8 and Monday, May 9, 2011.

Sunday May 8, 2011 - 9 a.m. - 12 p.m.

Workshop A: Sensor Networks for Intelligence Gathering and Monitoring
Room: Ontario
Chairs: Janet Light and Stefano Abbate

Monday May 9, 2011 - 9 a.m. - 12 p.m.

Workshop B: Commercialization of Wireless Technology
Room: Salon B
Chair: Dave Michelson

Monday May 9, 2011 - 9 a.m. - 4 p.m.

Workshop C: Connecting Engineering Applications and Disaster Management
Room: Niagara
Chair: Americo Cunha

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Conference at a Glance

Congrès Canadien en Génie Électrique et Informarique

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CCECE 2011 Conference Schedule at a Glance

Sunday and Monday

Time	Sunday May 8, 2011
9:00 - 12:00	**Tutorial A & B, Workshop A**
9:00 - 16:00	**Tutorial E**
13:00 - 16:00	**Tutorials C, D & F**
19:00 - 21:00	**Welcome Reception**
	Monday May 9, 2011
7:00 - 16:00	**Registration**
9:00 - 16:00	**Exhibits**
8:15 - 9:15	Breakfast **Plenary Talk "Automotive Research in Canada"**
9:00 – 12:00	**Workshop B**
9:00 – 16:00	**Workshop C**
9:15 - 9:45	Break
9:45 - 11:30	**Morning Oral Session**
11:45 - 13:30	Lunch
13:30 - 15:15	**Afternoon Oral Session**
15:15 - 15:30	Break
3:30 - 5:15	**Evening Oral Session**
6:30 - 10:00	**IEEE Canada Awards Ceremony and Banquet**

CCECE 2011 Conference Schedule at a Glance

Tuesday and Wednesday

	Tuesday May 10, 2011
7:00 - 16:00	Registration
9:00 - 16:00	Exhibits
8:15 - 9:15	Breakfast and **Plenary Talk "PEEC The Power Engineering Education Consortium"**
9:15 - 9:45	Break
9:45 - 11:30	**Morning Oral Session**
11:45 - 13:30	Lunch **McNaughton Lecture**
13:30 - 15:15	**Afternoon Oral Session**
15:15 - 15:30	Break
15:30 - 17:15	**Poster Session**
	Wednesday May 11, 2011
7:00 - 16:00	Registration
9:00 - 16:00	Career Fair and Exhibits
8:15 - 9:15	Breakfast and **Plenary Talk "Why don't we have more high-tech entrepreneurs in Canada?"**
9:15 - 9:45	Break
9:45 - 11:30	**Morning Oral Session**
11:45 - 13:30	Lunch and **Best Paper Awards**
13:30 - 15:15	**Afternoon Oral Session**
15:15 -15:30	Break
15:30 -17:15	**Evening Oral Session**

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Technical Program Summary

Congrès Canadien en Génie Électrique et Informarique

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Monday Program at a glance

IEEE CCECE'11 Technical Program Schedule

Monday, May 9, 2011

Session Identifier	Symposium Name	Session Names (ORAL sessions)	Paper Numbers (last 6 digits of EDAS 1569xxxxxx paper number)						Rooms
Morning Sessions: 9:45 a.m. - 11:30 a.m.									
MM01	Power Electronics and Systems	Renewable Energy I	397909	398173	399047	~			Hennepin South
MM02	Power Electronics and Systems	Distributed Generation (DG) Systems				397889	397943	400947	Hennepin South
MM03	Biomedical Engineering and Health Informatics	Biomedical Applications	394871	398503	399021	401899	402793	403111	Salon A
MM04	Communications and Networking	Cooperative Communications I	399101	399397	401051	402809	402781	399145	Oakes NE
MM05	Signal and Multimedia Processing - 1	Image Processing I	393211	396745	397915	~			Oakes NW
MM06	Signal and Multimedia Processing - 2	Radar & Array Processing				376759	398639		Oakes NW
MM07	Controls and Robotics	Adaptive Control	398147	398921	399399	402821	403267		Ontario
MM08	Circuits, Devices and Systems	Analog Circuits II	385553	398301	398429	400651	401259	397985	Hennepin North
Afternoon Sessions: 1:30 p.m. - 3:15 p.m.									
MA01	Power Electronics and Systems	Power Systems I	398165	400777	400799	400965	385159	397229	Hennepin South
MA02	Biomedical Engineering and Health Informatics	Biomedical Instrumentation	398355	399165	400653	402075	402179	403099	Salon A
MA03	Communications and Networking	Resource Allocation and Scheduling in Wired & Wireless Networks	398661	400919	403197	403295	398367	402953	Oakes NE
MA04	Signal and Multimedia Processing	Image & Video Processing I	392847	401943	402379	~			Oakes NW
MA05	Signal and Multimedia Processing	Speech & Audio Processing I				398241	398347	399307	Oakes NW
MA06	Controls and Robotics	Robotic Applications	399245	402655	402875	403025	403201	403645	Ontario
MA07	Circuits, Devices and Systems	Analog Integrated Circuits	403057	401089	401093	403237	399257	403697	Hennepin North
Evening Sessions: 3:30 p.m. - 5:15 p.m.									
ME01	Power Electronics and Systems	Power Converters and Drives I	374157	397417	398141	398163	401253		Hennepin South
ME02	Communications and Networking	System Design and Implementation	403593	390067	393467	403221	403187	373463	Salon A
ME03	Signal and Multimedia Processing	Signal Processing I	396999	401347	399873	403155	397957	399219	Oakes NE
ME04	Signal and Multimedia Processing	Speech & Audio Processing II	399407	401761	401827	401987	393531	397005	Oakes NW
ME05	Controls and Robotics	Optimal and Optimization-based Control	398533	400011	402797	402879	398525	402131	Ontario
ME06	Circuits, Devices and Systems	Micro-systems	399075	399347	398949	402081	400661		Hennepin North

Tuesday Program at a Glance

IEEE CCECE'11 Technical Program Schedule

Tuesday, May 10, 2011

Session Identifier	Symposium Name	Session Names (ORAL sessions)	Paper Numbers (last 6 digits from EDAS 15690xxxxx paper number)						Rooms
Morning Sessions: 9:45 a.m. - 11:30 a.m.									
TM01	Power Electronics and Systems	Renewable Energy II	402573	402855	402921				Hennepin South
TM02	Power Electronics and Systems	Power Converters and Drives II				398541	402137	399415	Hennepin South
TM03	Communications and Networking	Multi-carrier/OFDM & CDMA-based Wireless Access	398775	398987	401469	401853	403043	402665	Salon A
TM04	Communications and Networking	MIMO/Cognitive Systems	403173	399117	401953	390849	403143		Oakes NE
TM05	Computer Systems and Applications	Computer Systems	398035	397567	399211	403283	403017	381637	Oakes NW
TM06	Computer Systems and Applications	Computer Applications	399309	401273	403033	402703	398841	403159	Ontario
TM07	Controls and Robotics	Control Applications	402985	399355	401381	401777	403309	400139	Hennepin North
Afternoon Sessions: 1:30 p.m. - 3:15 p.m.									
TA01	Power Electronics and Systems	Power Converters and Drives III	399067	403577	401521	402133			Hennepin South
TA02	Communications and Networking	Channel/Source Coding and Modulation	398417	398771	399375	401999	399349		Salon A
TA03	Communications and Networking	WiFi and Wireless Mesh Networks	402899	399123	401341	403255	402003	401765	Oakes NE
TA04	Computer Systems and Applications	NoC/SoC and Embedded Systems	397861	403259	401715	401261	403219	402865	Oakes NW
TA05	Signal and Multimedia Processing	Image & Video Processing II	400569	401699	402093				Ontario
TA06	Signal and Multimedia Processing	Signal Processing Algorithms & Architectures I				399079	401343	400681	Ontario
TA07	Circuits, Devices and Systems	Digital Integrated Circuits	397979	403073	403141	398529			Hennepin North
Evening Sessions: 3:30 p.m. - 5:15 p.m.									
TE01	Power Electronics and Systems	Poster Session	364493	390613	391679	394041	398581	398969	Oakes South
TE02	Power Electronics and Systems	Poster Session	399033	400335	400641	400941	402735	402975	Oakes South
TE03	Power Electronics and Systems	Poster Session	403105	403151	403157	403303	403713	403729	Oakes South
TE04	Biomedical Engineering and Health Informatics	Poster Session	398423	399005	403299				Oakes South
TE05	Communications and Networking	Poster Session	397611	397817	398963	401319	401479		Oakes South
TE06	Communications and Networking	Poster Session	402767	402775	403041	403621			Oakes South
TE07	Computer Systems and Applications	Poster Session	399335	400059	401847	402711	403241		Oakes South
TE08	Signal and Multimedia Processing	Poster Session	401169	401487					Oakes South
TE09	Circuits, Devices and Systems	Poster Session	399239	399957	402329	402973			Oakes South
TE10	Controls and Robotics	Poster Session	359477	402783	402943	403039			Oakes South
TE11	Engineered & Natural Complex Systems: Modeling, Simulation & Analysis	Poster Session	398415	400447	401229				Oakes South

IEEE CCECE'11 Technical Program Schedule

Wednesday, May 11, 2011

Session Identifier	Symposium Name	Session Names (ORAL sessions)	Paper Numbers (last 6 digits from EDAS 15690xxxxx paper number)						Rooms
Morning Sessions: 9:45 a.m. - 11:30 a.m.									
WM01	Power Electronics and Systems	Power Systems II	401419	402007					Hennepin South
WM02	Power Electronics and Systems	Power Engineering II - Protection			396979	367953	398117	401409	Hennepin South
WM03	Signal and Multimedia Processing	Image Processing II	402827	403277	397887				Salon A
WM04	Signal and Multimedia Processing	Speech & Audio Processing III				397813	402709	400925	Salon A
WM05	Communications and Networking	Wireless and Wired Networks	403115	403089	402839	401835	402633	388731	Oakes NE
WM06	Computer Systems and Applications	Software - Testing and Debugging	401283	400639	403297	401919	401831	400811	Oakes NW
WM07	Computer Systems and Applications	FPGA	398183	402189	400347	402867	403037	403171	Ontario
WM08	Circuits, Devices and Systems	Nano and Optoelectronic Devices	403131	399161	401547	403001	400855		Hennepin North
Afternoon Sessions: 1:30 p.m. - 3:15 p.m.									
WA01	Power Electronics and Systems	Smart Grids and EV I	402667	399213	402949	403067	403133	403477	Hennepin South
WA02	Power Electronics and Systems	Energy Conversion I	398589	399867	399871	401501	402473	406061	Salon A
WA03	Power Electronics and Systems	Distributed Generation (DG) Systems II	398011	401889	401887				Oakes NE
WA04	Signal and Multimedia Processing	Signal Processing III				397003	398161	403085	Oakes NE
WA05	Communications and Networking	Genetic Algorithms and Neural Network Modelling	401327	402843	399893	402905	403231	403247	Oakes NW
WA06	Signal and Multimedia Processing	Signal and Multimedia Processing and Applications II	400287	402595	403129	398745	403585		Ontario
WA07	Circuits, Devices and Systems	RF and Microwave Components	392965	398191	402825	402835			Hennepin North
Evening Sessions: 3:30 p.m. - 5:15 p.m.									
WE01	Power Electronics and Systems	Renewable Energy III	403251	399051	399057	~			Hennepin South
WE02	Power Electronics and Systems	Other Technologies in Power Engineering I (Transients)				400225	393257	401137	Hennepin South
WE03	Communications and Networking	Optical Communications and Networking	393867	399103	387661	401671	399413	402759	Salon A
WE04	Communications and Networking	Wireless ad hoc / Sensor Networks	402833	399409	398023	401495	403223		Oakes NE
WE05	Signal and Multimedia Processing	Signal Processing Algorithms & Architectures II	402033	402853	403179				Oakes NW
WE06	Circuits, Devices and Systems	Circuit Modelling				397265	400655	401763	Oakes NW
WE07	Circuits, Devices and Systems	Integrated Circuits for Communications	398363	399241	402693	403053	403097		Ontario
WE08	Controls and Robotics	Sensors and MEMS	399069	402995	402903	403199	400915	369811	Hennepin North

Notes