



**Joint Communications**

**Engineering in Medicine and Biology**

**Mobile Robotic Research at UBC  
-Thunderbird Robotics -  
the future is autonomous**

John A. Meech  
Keevil Institute of Mining Engineering  
Monday 01 February 700 - 900pm  
BCIT Burnaby campus SW3 - 1750

**Lessons from the trenches –  
case studies  
in medical device development**

Scott Phillips  
Starfish Medical  
Tuesday 12 January 400 - 500pm  
Rm 101Chem & Biological Eng'g Bldg UBC

Research into autonomous ground vehicles has been on-going at the University of British Columbia by an undergraduate student group called Thunderbird Robotics since 2004. The work began with development of an entry into the 2005 DARPA Grand Challenge in which a 1991 Jeep Cherokee was converted into a telerobotic system by creating a removable robotic driver. Later this vehicle was adapted to be driven fully-autonomously to enter the 2007 DARPA Urban Challenge. Since then, the group has been involved in five independent, yet interlinked projects:

1. 1/10 Scale Autonomous Robot Racing
2. Robotic Soccer Team
3. The NASA Regolith Excavator Centennial Challenge
4. The Zero-Emissions Race Around the World
5. Development of a Fully-Autonomous Mine-Haulage Truck System

The approach taken in these projects involved three main sub-systems - hardware, software, and instrumentation conducted in a collaborative fashion by about 400 students over the years.

The presentation will describe these projects - how each was conceived, coordinated, and completed. The various successes and failures will be discussed and projected into what the future may hold for robots in society.

**Speaker:** John Meech is Professor in the Norman B. Keevil Institute of Mining Engineering at the University of British Columbia. He is Director of CERM3 (Centre for Environmental Research in Minerals, Metals, and Materials), a multidisciplinary team of over 30 researchers who conduct studies on Mining and the Environment.

He teaches Industrial Automation and Robot-

Developing and commercializing new technology and devices is not for the faint of heart. So many things must go well including product definition, technology, IP, engineering, testing, industrial design, manufacturing, quality, sales, service.

Scott will present a series of case studies of medical products which were developed over the past decade with various outcomes. In the process he will highlight pitfalls and success strategies which anybody who hopes to commercialize a new technology or device can learn from. He will also outline the successful development methodology which is being used at StarFish Medical.

**Lessons.. continued**

ics, Introduction to Mineral Processing, and Artificial Intelligence in the Mining Industry. His research activities include Safety Issues at Mine Reclamation Sites, Fracture Mechanics at High-Impact Velocities, Autonomous Open Pit Haulage Vehicles, Geothermal Activities in British Columbia (both low- and high-temperature applications, and Mercury Use in Gold Mining.

In 2004 he founded a student-run group called IBC Thunderbird Robotics that conduct applications of mobile robotics in a variety of competitive environments that included the BARPA Grand and Urban Challenges, the NASA Regolith Excavator Challenge, the University of Waterloo Robot Racing Competition, Robo-Cup Robotic Soccer, and the Zero-Emissions Electric Car Race. More than 400 students from across the Faculty of Applied Science have participated in this club over the past 5 years.

**Info:** Email Joint Communications Chair Alon Newton, anewton@ieee.org

**Women In Engineering**

**Mobile UI Design – User Centered Design and UI Best Practices**

Selma Zafar  
OpenRoad Communications

Monday 11 January 700 - 9pm  
BCIT SW3-1750

Want to understand how to make a mobile application easier to use? Want to ensure your mobile site meets the needs of your target audience? This 1.5 hour session is aimed at introducing you to the world of user centered design and its importance in helping you design a better mobile product. User centered design puts your customers at the heart of your product design and development process.

OpenRoad will provide an overview on best practices for mobile user interface design and introduce established mobile design standards. The session will include a basic introduction to human factors principles that helped to formulate these guidelines and best practices.

**Speaker:** Selma Zafar has over 10 years experience in designing innovative and usable software and hardware. She ensures that the needs of the end-user remain at the heart of the research, design and development process. Selma has lead the usability and overall user experience for products and websites for Nokia, Microsoft, Telus, Tourism British Columbia and Ronald McDonald House Charities.

During her time with Nokia, Selma worked on both Series 60 and Series 90 mobile products as well as the design concepting for the new Nokia online music offering, Ovi. At OpenRoad, Selma contributes to the user centered design practice as Senior User Experience Designer, bringing her breadth of experience and knowledge to OpenRoad's clients. As of Fall 2008, Selma was the latest instructor with the Langara College Communication and Ideation Design Program teaching courses in Human Factors and Information Design

**Cosponsor:** Joint Communications  
**Info:** Women in Engineering Chair Zahra Ahmadian at wie.vancouver@ieee.org



**Message from the Chair**

**2009 was an exciting year for Vancouver Section**

We:

- established Okanagan Subsection (Prof. Julian Cheng, Chair)
- established Northern British Columbia Subsection (Prof. Liang Chen, Chair)
- established UBC-Okanagan Student Branch (Prof. Jonathan Holzman, Counsellor; Jackie Nichols, Chair)
- received approval to nominate three sites as IEEE Historical Milestones - CBC Vancouver, TRIUMF and DRAO Penticton
- established a Women in Engineering Affinity Group (Zahra Ahmadian, Chair)
- established a Joint Aerospace and Electromagnetics Chapter (Steven McClain and Prof. Dave Michelson, Co-Chairs)
- established a Section Industry Advisory Council (Prof. Dave Michelson, Section Chair)
- established a LinkedIn group (Kyle Sivertsen, Manager)
- reactivated the Conferences Committee (Eugen Trandafir, Chair)
- reactivated the Continuing Education Committee (Dr. Nikola Stanchev, Chair)
- joined the IEEE Concentration Banking system (Kouros Goodarzi, Section Treasurer)
- sponsored IEEE ICUWB 2009 (Prof. Lutz Lampe, General Chair; Prof. Dave Michelson, Treasurer)
- held our first Section Cultural Event (Mazana Armstrong, Section Vice Chair)
- saw our Joint Communications Chapter (Alon Newton, Chair) hold a record number of events
- saw our Power and Energy Society Chapter (Glen Tang, Chair) recognized as the 2008 PES High Performance Chapter
- saw our Power and Energy Society Chapter (Glen Tang, Chair) win the 2008 PES Membership Contest

Let's make 2010 even better! If you: (1) have an idea for an IEEE activity that can help you, your company and our Section make a difference, (2) would like to volunteer to give a presentation or host a tour of your company, (3) know of someone who would be a good speaker and would like to recommend them to the Section, please let me know! My email address is <dmichelson@ieee.org>.

**IEEE Northern British Columbia Subsection**

IEEE Vancouver Section has approved a request by 21 members in Northern British Columbia to form an IEEE Northern British Columbia Subsection. Members of the subsection organizing committee include Prof. Dave Michelson (IEEE Vancouver Section), Prof. Liang Chen (University of Northern British Columbia) and Prof. Jernej Polajnar (University of Northern British Columbia). Prof. Chen will serve as the Subsection's founding chair. Final approval by IEEE Canada and IEEE MGA is expected in early February.

**Rationale:** Northern British Columbia is emerging as a major economic force within the province. The University of Northern British Columbia (UNBC) has been ranked as the best primarily undergraduate university in Western Canada for five straight years, consistently places in the top two or three in Canada in this category and has 20 MSc students in its Computer Science Program. A large portion of BC Hydro's electrical generating capacity lies within the proposed subsection as does virtually all of British Columbia's thriving oil and gas industry. TELUS, British Columbia's major telecommunications provider, also has a significant presence in the area. The Northern Development Initiative Trust and B.C. Innovation Council are fostering economic development and job creation in the region.

Because the communities of Northern British Columbia are far from Vancouver, it is difficult for IEEE members in northern BC to participate in the majority of activities that are organized by Vancouver Section. The proposed Subsection will bring together the 40+ IEEE regular, affiliate and student members in Northern BC to: (1) host IEEE technical presentations, (2) organize IEEE social events, (3) recruit new IEEE members, (4) provide local support to the proposed IEEE Computer Society Student Chapter at UNBC and (5) support initiatives such as the Northern Development Initiative Trust that aim to foster economic development in the region. As one member of the proposed subsection put it, "I think it is time we did this."

For more information, please contact Dave Michelson, <dmichelson@ieee.org>, Liang Chen <l.chen@ieee.org> or Jernej Polajnar <jernej.polajnar@gmail.com>.

**UBC Okanagan Student Branch**

IEEE Vancouver Section has approved a request by 17 student and graduate student members at UBC Okanagan to form an IEEE Student Branch. Members of the student branch organizing committee include Prof. Dave Michelson (IEEE Vancouver Section), Meliha Selak (IEEE Vancouver Section), Prof. Jonathan Holzman (UBC Okanagan), and Prof. Julian Cheng (UBC Okanagan). Final approval by IEEE Canada and IEEE MGA is expected in a few weeks.

**Rationale:** The School of Engineering at UBC Okanagan has made impressive strides since it was formed a few short years ago. It graduated its first Master's students in Spring 2008, will graduate its first cohort of undergraduate students in Spring 2010, and will soon have completed the CEAB accreditation process. It is earning a stellar reputation for the quality of its faculty, students, teaching and research.



The proposed Student Branch will provide UBC-O students with further opportunities to develop leadership, communication and organization skills and opportunities to participate in IEEE student activities in BC, across Canada and around the world. Prof. Jonathan Holzman will serve as the founding counsellor. For more information, please contact Dave Michelson, <dmichelson@ieee.org>, Meliha Selak <melihase@ieee.org>, Jonathan Holzman <jonathan.holzman@ubc.ca> or Julian Cheng <julian.cheng@ubc.ca>.

**Vancouver Section is LinkedIn**

If you use the LinkedIn professional networking service, please be sure to join the new IEEE Vancouver Section group. Display an IEEE Vancouver icon on your public profile, get late breaking news concerning Section activities and connect to other members of the Section. To join the group, please visit <http://www.linkedin.com/groups?gid=2377330> or click the link..



For more information, please contact Dave Michelson, <dmichelson@ieee.org> or Kyle Sivertsen <k.sivertsen@ieee.org>.

**Bioelectronics**

Rahul Sarpeshkar  
MIT

Thursday 21 January 330-450pm  
Room 310 Hugh Dempster Pavilion, UBC

Nature is a great analog and digital circuit designer. She has innovated circuits in the biochemical, biomechanical, and bioelectronic domains that operate very robustly with highly imprecise parts and with incredibly low levels of power. I will discuss how analog and bio-inspired circuits and architectures have led to and are leading to novel architectures in sensing and computing, e.g., in ear-inspired radios, architectures for improving operation in noise, ultra-low-power signal-to-symbol conversion, and hybrid analog-digital architectures that model computations within cells.

Such techniques can yield more than order-of-magnitude power reductions while maintaining high levels of robustness to several sources of noise. I will provide examples from systems built in my lab for bionic ear processors for the deaf, brain-machine interfaces for the blind and paralyzed, and body sensor networks for patient monitoring.

**YOUR SECTION NEEDS YOU !!**

Do you have audio / video editing skills? Perhaps you have access to video/audio recording equipment, or audio / video editing software? Please consider getting involved as a volunteer with the Vancouver Section!

The Vancouver Section is forming a team to record and process presentations, in various formats. With the right team of volunteers, we will record, edit and make available these presentations in various electronic forms. This will allow us to better serve our members who cannot attend presentations in person.



NOTE: The Section is *also* looking for volunteers to serve in other positions, we have several openings! Please get involved and help us provide outstanding service to our members.

If you are interested, please contact the Vancouver Section's Communications Officer, Pieter Botman p.botman@ieee.org.

**2009 EDS EDUCATION AWARD WINNER**

**DAVID L. PULFREY**

"For contributions to the teaching of semiconductor devices at both the undergraduate and graduate levels"



David Pulfrey obtained the B.Sc. and Ph.D. degrees in electrical engineering from the University of Manchester, England, in 1965 and 1968, respectively. He attended university on a scholarship from the regional electric power authority, which meant that he concentrated on courses and research far from the field of electron devices.

He is essentially self-taught in solid-state electronics, and he believes that learning about devices in this way has attuned him particularly well to the nature of the difficulties that many students face in trying to master this profound subject.

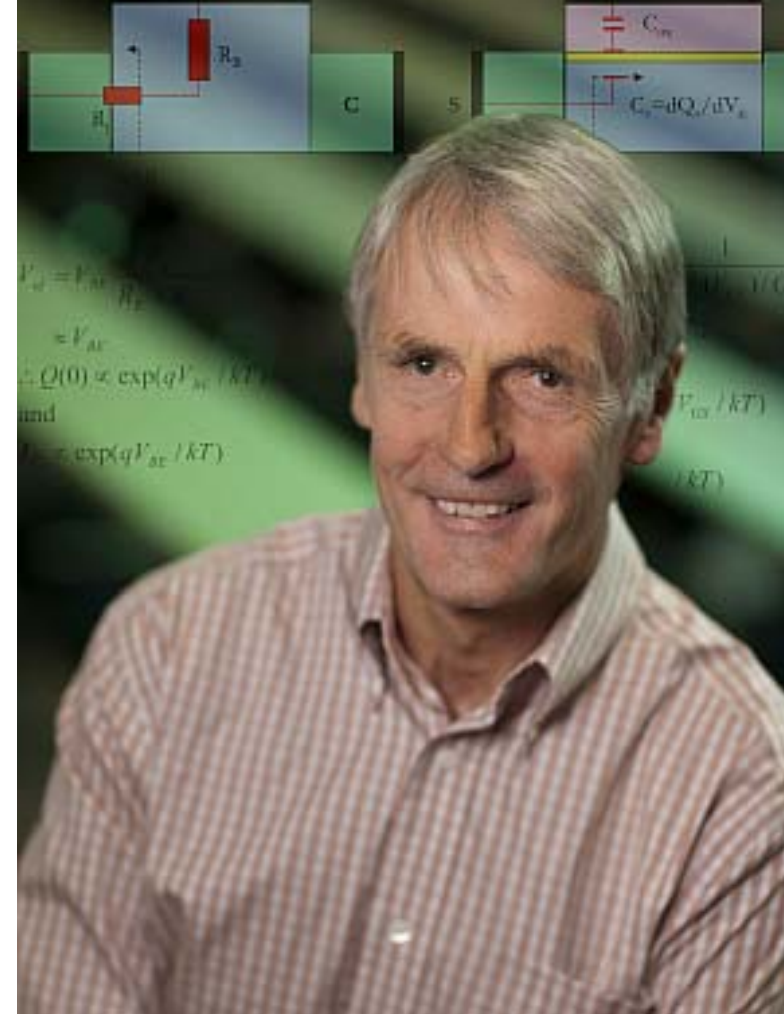
His success in helping students avoid or overcome these difficulties has led to recognition at the local, provincial, and international levels: inaugural winner in 1990 of the University of British Columbia's Teaching Prize in Applied Science; 2009 winner of the Teaching Award for Excellence in Engineering and Geoscience Education from the Association of Professional Engineers and Geoscientists of British Columbia; and now the EDS Education Award. Professor Pulfrey believes that attention to the fundamental details is the best way to give students the ability to appreciate the workings of today's devices, and to participate in the development of tomorrow's devices.

This philosophy illumines his latest book "Understanding Modern Transistors and Diodes", which is to appear in January 2010, and is also evident in his other books: "Photovoltaic Power Generation", 1979; "Introduction to

Semiconductor Devices" (with N.G. Tarr), 1989; and in book chapters on HBTs for Wiley's Encyclopedia of Electrical and Electronic Engineering, 1999, and for Roblin and Rohdin's book "High-speed heterostructure devices", 2002.

Professor Pulfrey was the inaugural appointee to PMC-Sierra's in-house university, where he delivered courses on "Deep sub-micron electronics" and, most recently, on "Nanoelectronics". Additionally, he has given guest graduate courses on "Modern semiconductor devices" at the Technical University of Vienna and at the University of Pisa. As a Gladden Distinguished Fellow at the University of Western Australia he has given public lectures on both "Prospects for photovoltaics" and "Nanotransistors". As an EDS Distinguished Lecturer he gave lectures on "Carbon nanotube FETs" to the Mexico City Chapter.

His book on photovoltaics led to an invitation to give a course on "Photovoltaics engineering" at the Institute of Engineering in Kathmandu. This location enabled him to indulge his passion for trekking, and he went above 6000m on Island Peak. He tries to ensure that all his graduate students experience the joys of hiking, and his forays with them into Canada's West Coast Mountains have helped to forge the life-long friendships that he enjoys with many of them. His greatest friends remain his family: his wife Eileen, retired home economist, and his children Simon, Tim and Louisa, all health-care professionals.



**DAVID L. PULFREY**

The EDS Education Award was established in 2006 by the Electron Devices Society of the IEEE. The Award is presented annually and is intended to recognize distinguished contributions to education within the field of interest of the IEEE Electron Devices Society.

**A message to IEEE Vancouver members from your PES Chair**

The Power & Energy Society Chapter would like to thank the members and guests of the IEEE in Vancouver for making 2009 another successful program year. The beginning of 2010 marks the end of a year in which we held six technical presentations on topics including Temporary Overvoltages Caused by Self Excited Machines, Powering the 2010 Olympics, and Cyber Security.

Additionally, PES held a distinguished lecture from a world renowned speaker on Smart Grids, attended by over 110 people and co-sponsored a day course with the Manitoba HVDC Centre on Electromagnetic Transient Programs for Power System Studies. We concluded 2009 by awarding the Chapter Outstanding Engineer Award to Dr. Wenyan Li from the BC Transmission Corporation, which was presented at the IEEE Vancouver Section's Annual Social Event held in November.

Our local chapter is busy preparing for 2010 and will again be offering a number of technical presentations, learning opportunities,

and a facility tour. If you are interested in these offerings, please register for a Power & Energy Society membership when you renew your IEEE membership. Additional details about the membership are available at <http://www.ieee-pes.org/membership/membership-benefits>

If you are interested in the activities of IEEE PES and are not subscribed to a Power & Energy Society membership, please send me an email to be included on our mailing list. Additionally, PES has a number of opportunities for volunteers to becoming involved with our activities. If you are interested in becoming involved, or can suggest a presenter on a topic that you would like to see, please send me an email.

Again, I would like to extend my thanks to the members & guests of IEEE in Vancouver as well as the IEEE Vancouver Section executives for your support. I look forward to seeing and working with you in 2010.

Warmest wishes for the holiday season and the upcoming year.

Glen Tang Chair, IEEE Power & Energy Society Vancouver Chapter glen.tang@ieee.org

**Vancouver celebrates IEEE's 125th**

The 2009 Annual Social Event was held on November 24 at the Playhouse Theatre in Vancouver to acknowledge and celebrate the 125th anniversary of IEEE. The event was a great success with 103 people in attendance: 45 IEEE members, 21 IEEE student members, 3 Fellows and 34 non-members. IEEE Vancouver Section Chair Dave Michelson gave a short talk about current Section initiatives such as the IEEE Milestones Program and formation of new student branches and subsections in the BC interior. The evening continued with a Broadway musical performance "Dirty Rotten Scoundrels". Let us not forget the beautiful and tasty IEEE 125th anniversary cake that was served during the intermission!

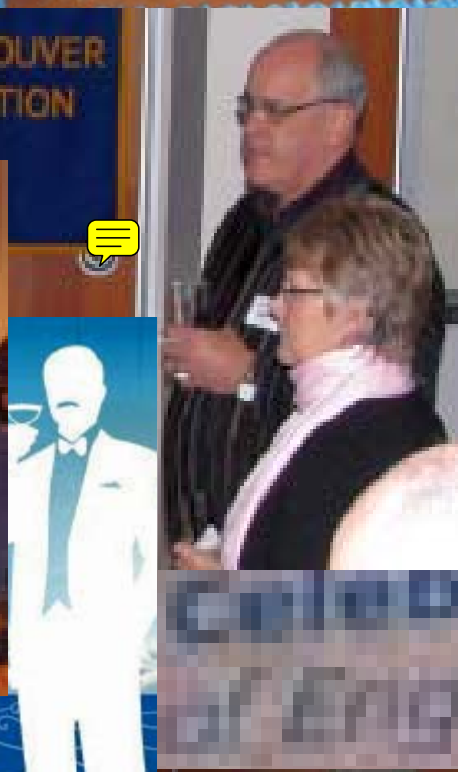
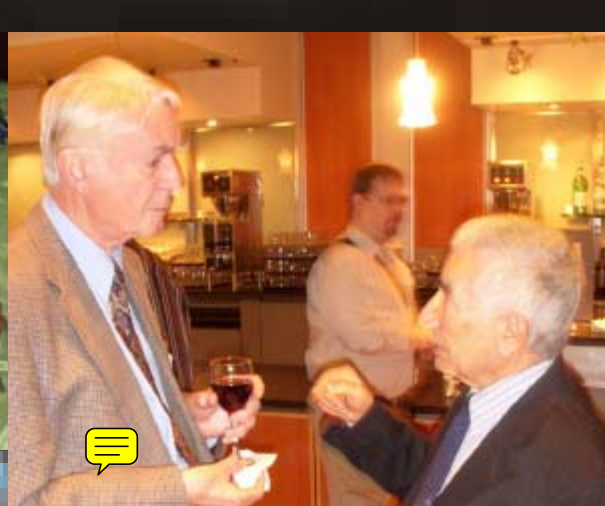
We would like to thank everyone for attending and for taking their time to provide us with a great feedback after the event - we will do our best to repeat this success in 2010. Finally, we would like to take this opportunity to thank Lex Engineering, Powertech and BC Hydro for their generous donations to make this event possible. It was a great way to end this successful year for our Section. We look forward to seeing you all at our events in the New year. We wish you a Merry Christmas, Happy Holidays and a wonderful year to come!



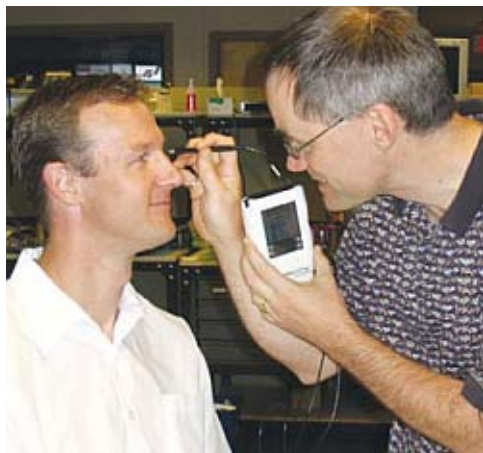
FOR GENERATIONS

Because of the volume we dedicated Page 3 to a selection of the photos taken during this special event. Interactive captions should pop up with mouse moves but if that doesn't work the 'map'(right ) will help identify the photos.

attendees	IEEE 125th Anniversary celebration cake	Life Fellow Prof. Hermann Dommel and Sr Member Mahmood Wasfi. Chapter Chair Steven McClain in the background.	IEEE Life Member Ron Darcus enjoying the company	Vice-Chair Mazana Armstrong welcomes guests
more attendees	IEEE Fellow Charlie Henville accompanied by his lovely wife	IEEE Member Brij Aggarwal of CSA International and companion	good things to eat	Member Ernie Kenward of BCIT and lovely companion.
still more attendees	Life Member Darko Dimitrijevic & lovely wife (left), Member Derek Hutchinson of Lex Engineering, Senior Member Meliha Selak of BC Hydro and Member Paul Fuoco of Lex Engineering (right)	Two generations of IEEE members in their family: member Peter Boetzkes, his daughter IEEE member Joanna Boetzkes and Cheryl Boetzkes	IEEE Member Mark Isaak and his lovely companion enjoying the reception.	
so many attendees	wow - that's a lot of attendees	PES Chair Glen Tang (left), member Jun Sun of BCTC, award winner IEEE Fellow Wenyan Li of BCTC & PES VP Meliha Selak of BChydro	BCIT Past-Chair Patrick Sándi (left), Sr Member Ali Daneshpooy & IAS Chapter Chair Jahangir Khan both of Powertech with his lovely wife Sadia	



**Speaker:** Scott Phillips founder and president of StarFish Medical, a medical device developer and manufacturer based in Victoria. He has been involved in the development and market launch of many products over the past 20 years. He started his career in lithium battery developed, progressed to contract product design in diverse fields as exercise equipment, archery, audio speak



StarFish Medical President Scott Phillips, right, demonstrates a device on Kevin Strange.

ers and spectroscopy instrumentation. Since 1999 StarFish has exclusively focused on developing medical devices and serves a mostly North American clientele. Presently this award winning company is engaged in the development of over 15 different products in fields such as hemodialysis, ophthalmic imaging, intraosseus infusion, intravascular ultrasound and fungal therapy. Scott holds a degree in engineering physics from UBC.

**Info:** Ezra Kwok - ezra@chml.ubc.ca

# CCECE 2010

## 23<sup>rd</sup> Annual Canadian Conference on Electrical and Computer Engineering

May 2 5, 2010, Calgary, Alberta, Canada

<http://www.ccece2010.org>

### “Evolution of Theory: Bringing Theory and Technology into Application”

#### Call for Papers and Proposals

The 2010 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2010) will be held in Calgary, Alberta, Canada from May 2 5.

CCECE 2010 provides a forum for the presentation of electrical and computer engineering research and development from Canada and around the world.

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

- Circuits, Devices and Systems  
Chair: Dr. P. Valizadeh, Dr. G. Cowan
- Control and Robotics  
Chair: Dr Amir Aghdam
- Communications and Networking  
Chair: Dr. Yousef Shayan
- Computers, Software and Applications  
Chair: Vincent Chiew
- Power Electronics and Energy Systems  
Chair: Dr. Amirnaser Yazdani
- Signal and Multimedia Processing  
Chair: Dr. Dongliang Huang

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.

#### Regular Paper Submission

Please submit original full length paper(s) (maximum 6 pages) to the Technical Program Committee using the on line submission process at <http://www.ccece2010.org> by January 8, 2010. Click on “Call For Papers” and follow the instructions provided.

#### Tutorial and Workshop Proposals Submission

Proposals for halfday tutorials and workshops should be submitted before January 8, 2010 to the Tutorials Chair at [rlanderson@ieee.org](mailto:rlanderson@ieee.org).

#### Important Dates

Full length paper must be received by: ..... Friday, January 8, 2010  
 Tutorial or workshop proposals must be received by: ..... Friday, January 8, 2010  
 Notification of acceptance will be sent out by: ..... Friday, February 5, 2010  
 Author’s Registration ends by: ..... Friday, March 5, 2010  
 Advance Registration ends by: ..... Friday, April 2, 2010

#### Industrial Exhibits and Sponsorships

For industrial exhibits please contact the Industrial Exhibits Chair at [rlanderson@ieee.org](mailto:rlanderson@ieee.org).  
For sponsorships please contact the Sponsorship Chair at [rlanderson@ieee.org](mailto:rlanderson@ieee.org).

#### Questions or Comments

For any questions or comments, please contact the Conference Chair: Rob Anderson.  
Ph: 509 9395641 Fax: 509 241 6153 Email: [rlanderson@ieee.org](mailto:rlanderson@ieee.org)