



IEEE prohibits discrimination, harassment and bullying. More info: <http://www.ieee.org/web/aboutus/whatis/policies/p9-26.html>

- **Message from the chair**
- **IEEE Canada forms committee on commercialization of wireless technology**
- **DTV monitoring: monitoring and troubleshooting digital television & ATSC mobile television**
- **IEEE Vancouver section executive 2011 nominations**
- **Feedforward control: theory and applications**
- **Experimental security analysis of a modern auto**
- **IEEE mini-symposium on antennas, propagation and electromagnetic compatibility**
- **Non-conventional lightning protection systems update**
- **Performance is dead, long live performance!**
- **Software and business method patents in Canada**
- **IEEE Mini-symposium on commercialization of applied physics research at TRIUMF**
- **Our local wireless industry: opportunities and challenges**
- **IEEE milestone ceremony - CBC transmitter site on Mt. Seymour**
- **IEEE Vancouver's technical chapters organization**
- **An engineer's journey part II**
- **XBOX360 & Kinect - an insider look**
- **IEEE Vancouver section annual social event**
- **Bluetooth 4.0 -low energy**
- **Fluidics in energy applications: past, present and future**
- **Cross-layer optimization for spectrum and energy-efficient wireless networks**

Message from the chair

Within IEEE, 38 technical societies support a wide range of technical interests by: 1) publishing magazines and journals, 2) organizing conferences, 3) hosting technical and standards committees, 4) providing community networking opportunities, and 5) supporting activities at the local level, including sponsorship of Distinguished Lecturers. Details can be found at http://www.ieee.org/societies_communities/.

Although members of Vancouver Section have been well represented amongst all of the IEEE technical societies for many years, only 21 of the Societies were represented within the Section's technical chapter organization as recently as a year ago. This meant that members of the 17 IEEE societies that weren't represented in the Section were deprived of the opportunity to participate in Society-supported activities at the local level. At the same time, 18 Societies were deprived of the opportunity to directly engage our 2200 members.

In response, we launched a major effort to address this issue and to incorporate the remaining 17 Societies into our Technical Chapters organization. I'm pleased to report that this has now been accomplished. It was a group effort that involved preparation of proposals, recruitment of volunteer leaders, and submission of petitions. We are now only the third IEEE Section in the world to have accomplished this feat. Please be certain to take advantage of the enhanced opportunities that this will offer!

We've just submitted the petition required to form our new Joint

Oceans, Geoscience and Remote Sensing Chapter that will represent the IEEE Oceanic Engineering Society and the IEEE Geoscience and Remote Sensing Society in Vancouver. Thank you to Tristan Crees from International Submarine Engineering and Gordon Staples from MacDonald Dettwiler and Associates for agreeing to serve as co-chairs of the new chapter. Thank you also to James MacFarlane, President of International Submarine Engineering and Dr. Harold Zwick and Richard Juren of MacDonald Dettwiler and Associates, for lending their respective organization's strong support to the new chapter. Planning for the new chapter's first event (to be held early in Spring 2011) are already well in hand.



Two of our new chapters are sponsoring major afternoon events later this month: The Joint Aerospace and Electromagnetics Chapter is hosting an IEEE Mini-Symposium on Antennas, Propagation and Electromagnetic Compatibility at UBC on the afternoon of Monday, 22 November 2010 at UBC. The Joint Applied Physics Chapter is hosting an IEEE Mini-Symposium on Applied Physics Research at TRIUMF on the afternoon of Friday, 26 November 2010 at the TRIUMF Laboratory on the UBC campus. See the details elsewhere in this issue of Contact.

As always, feel free to contact me should you have any suggestions or concerns.
Dave Michelson dmichelson@ieee.org

IEEE Canada forms committee on commercialization of wireless technology

The IEEE Canada Board of Directors has just voted to form an ad hoc committee to work with the Vancouver-based Wavefront Wireless Commercialization Centre and other regional groups with an interest in wireless commercialization (e.g., Edmonton-based TRILabs, Waterloo-based Communtech, the Ottawa Centre for Research and Innovation and Prompt-Quebec) to:

- Promote and facilitate cooperation between academia, government and the wireless industry with a particular focus on commercialization of wireless technologies.
- Establish the feasibility of assisting start ups and small and medium

enterprises by working with universities and colleges to develop a database of research equipment and facilities that are available to assist in the commercialization of wireless technologies.

- Encourage the wireless industry and government officials to share their knowledge and insights concerning commercialization of wireless technology with IEEE members through IEEE Canada publications and technical activities.

The committee will be chaired by Prof. Dave Michelson of the University of British Columbia and Chair of IEEE Vancouver Section.



Richard Chernock
Triveni Digital

Distinguished Lecturer

A DOUBLE HEADER

Tuesday 09 November

3:00 - 4:15 pm *Sharp!*

Sheraton Wall Centre 1088
Burrard St, Vancouver

Registration required
anewton.ieee@gmail.com
Name tags issued on location before event

Wednesday 10 November

1:00 - 3:30 pm

Room 2020/2030, Kaiser
Building, 2332 Main Mall, UBC

Information

Joint Communications Chair
Alon Newton
anewton@ieee.org

DTV monitoring: monitoring and troubleshooting digital television & ATSC mobile television

DTV Monitoring: Monitoring and Troubleshooting Digital Television (broadcast, cable, DTH and IPTV): Digital television is considerably more complex than the analog broadcasts that it replaces. The use of a television to monitor the quality of the broadcast output is no longer a suitable approach. This presentation explains what needs to be monitored in a DTV system in order to ensure a quality signal, a standardized approach to filtering errors by severity and some strategies for practical DTV monitoring.

ATSC Mobile Television: ATSC Standard A/153 provides the technology to support mobile broadcast DTV reception. This standard is built upon and coexists with the 8-VSB transmission used for fixed DTV broadcast. This presentation explains how the mobile DTV broadcast works and some considerations for adding mobile DTV to an existing DTV broadcast station.

Speaker: Richard Chernock Chief Technology Officer, Triveni Digital, Inc. Princeton Junction, New Jersey. Dr. Chernock is currently

Chief Technology Officer at Triveni Digital – an LG Electronics Company. In that position, he is developing strategic directions for monitoring, content distribution and metadata management for emerging digital television systems and infrastructures. Previously, he was a Research Staff Member at IBM Research, investigating digital broadcast technologies.

Dr. Chernock is active in many of the ATSC and SCTE standards committees, particularly in the areas of mobile DTV, monitoring, metadata, and data broadcast. He is vice-chair of the Technology Standards Group (TSG) and chairing the Non-Real-Time Services and Mobile/Handheld management layer activities within ATSC. He is a major participant in the SCTE HMS video monitoring activity. He is also the Distinguished Lecturer Chair for IEEE BTS.

In another life, he used transmission electron microscopy to study materials characteristics for advanced ceramics packaging and semiconductor technology at IBM. His ScD was from MIT in the field of nuclear materials engineering.



Joe Decuir
IEEE Region 6 Chair

BCIT Burnaby campus
SW3-1750

Monday 22 November
7:00pm - 9:00pm

Information

Joint Communications Chair
Alon Newton
anewton@ieee.org

Bluetooth 4.0 – low energy

Bluetooth has been re-invented.

Bluetooth Low Energy is optimized for two things: simple applications; run on coin cells for years. The layers from the antenna up to the applications support middleware are all published in the 2010 Bluetooth 4.0 specification. The first wave of those applications are in development; dozens will be specified in the next year.

Soon there will be support in mobile phones, PCs and other internet gateways. This talk will address a few questions: what is Bluetooth Low Energy? how does it work? how does it compare to classic Bluetooth and to Zigbee (IEEE 802.15.4)? what is it good for? where do we learn more?

Speaker: Joe Decuir - IEEE Region 6 Northwest area Chair. Joe Decuir has been working in networking and communications for 3 decades. As a standards architect for Cambridge Silicon Radio, he contributed to the Bluetooth 4.0 specification, and he is currently working on applications that use it.

He has been giving presentations on computer and communications topics to IEEE chapters around the US and Canada. He also serves as the Northwest Area chair for IEEE Region 6, supporting Sections in Alaska, Oregon and Washington



IEEE mini-symposium on antennas, propagation and electromagnetic compatibility

Monday 22 November - 13:30 – 16:00
Electrical & Computer Engineering
Room 418, 2356 Main Mall, UBC

Sponsored by:
Western Economic
Diversification Canada

Organized by: IEEE Joint
Aerospace & Applied Electromagnetics
Dave Michelson, co-chair

Pre-registration is strongly recommended. Please send a message to IEEE.JAEC@gmail.com.

13:00-13:10 **Welcome and introduction - Dave Michelson**, Chair, IEEE Vancouver Section

13:10-14:00 **Reconfigurable antenna technology for multi-radio platforms - Helen K. Pan**, Intel Labs (Hillsboro, OR)

Future implementations of SDR and MIMO systems in mobile devices will require new approaches to antenna system design if they are to deliver the promised reliability, flexibility, and increase in capacity. Future mixed network platforms are expected to have 8 to 10 radios but space, location, packaging, EMC/EMI, RF interference and cost are major constraints that preclude providing a single antenna for each radio. Innovative antenna designs, such as reconfigurable antennas, are needed to solve this difficult problem. In this approach the electrical length of the antenna is changed with out changing the physical size of the antenna. Antennas can be reconfigured to change the operating frequency, radiation patterns and polarization. In designing a frequency reconfigurable antenna, one antenna operating at one frequency can be changed to operate at another frequency by changing the electrical length. Recent development in MIMO can also benefit from this research. Exploring spatial diversity to build fully orthogonal multi-spatial channels in MIMO is a good way to achieve higher throughput. Radiation pattern reconfigurable antenna brings flexibility to achieve better spatial channel forming and increase throughput.

Helen K. Pan received the B.S. degree in Computer Science from Beijing Polytechnic University and the M.S. degree in Electrical Engineering from the University of Illinois at Urbana-Champaign, in 1996 and 2000 respectively. From 2001 to 2002, she was with Agilent Technologies, Santa Rosa, CA, where she developed high-performance spectrum analyzers. From 2003 to 2004, she was with Maxim Integrated Products, Hillsboro, OR, where she developed and tested high-speed digital-to-analog converter chips. Since 2004, she has been with Intel Labs investigating various multi-radio wireless platforms. She has 3 patents pending and has published 33 papers on antenna design in IEEE journals and international conferences. She received the IEEE Antennas and Propagation Society H. A. Wheeler Prize Paper Award. She is an IEEE Senior Member and has served as a member of various Technical Program Committees and served as a session chair at various IEEE conferences and reviewer for IEEE transaction on Antenna Propagation. Her research interests include RF/microwave circuits, systems, 60GHz technology and reconfigurable antenna designs.

14:00-14:30 **Phased-array feeds for future radio telescopes - Bruce Veidt**, Dominion Radio Astrophysical Observatory (Penticton, BC)

Before the end of this decade, construction will begin on a new international radio telescope called the Square Kilometre Array. This telescope will survey much of the visible sky with unprecedented sensitivity, enabling exploration of the early universe. To cover large areas of the sky requires new technologies to expand the field of view of telescopes. This presentation will discuss development of low-noise phased arrays placed at the focal planes of reflector antennas as a means of obtaining wide fields-of-view.

Bruce Veidt received the Bachelor of Science degree in Electrical Engineering from the University of Alberta in 1981. For his Master's degree thesis he developed a second observing band for the Synthesis Telescope at the Dominion Radio Astrophysical Observatory in Penticton, Canada. After graduation he joined the technical staff of the Caltech Submillimeter Observatory in Pasadena, California. After returning to Canada he worked in the field of biomedical research for several years before returning to the University of Alberta for Ph.D. studies involving millimetre-wavelength receivers based on superconducting tunnel junctions. Since 1996 he has worked at the National Research Council of Canada on the development of future radio telescopes, in particular the Square Kilometre Array.

14:30-15:00 Refreshment break and UBC EMC/Antenna lab tour

15:00-15:30 **Implications of wireless propagation for smart grid deployments - Eugene Crozier**, Consultant to BC Hydro

The recent allocation by Industry Canada of exclusive spectrum at 1.8 GHz to the power utilities for the management of the electric supply represents a unique opportunity for power utilities to deploy a private network to support a number of "Smart Grid" applications. Some of the applications require a quality of service, high reliability and low latency that WiMAX technology can provide. BC Hydro have been using the facilities at UBC RSL to evaluate the advanced RF features of WiMAX such as MIMO and the inherent advantages of OFDMA. This has included verifying the transmitter and receiver performance with a channel emulator to simulate a number of environments and deployment guidelines against industry standard channel models. The initial phase of this work has been the bench testing of sample equipment, based on using this work as a baseline, field tests will be used to derive deployment guidelines for power utility environments.

Eugene Crozier is senior member of IEEE. He is currently working as a wireless consultant for BC Hydro evaluating the use of WiMAX for power utility application. Prior to this he worked SR Telecom as a wireless architect on their WiMAX products. Since 2004 he has been involved in the WiMAX Forum technical groups and has chaired a number of the sub working groups on the PHY and RF parameters. He has held a number of technical and management roles in both established and start-up digital wireless companies in frequency bands from 1.4 to 38 GHz.

15:30-16:00 **Opportunities for industry involvement in the new antenna and EMC lab at UBC - Rob Stirling**, Protocol EMC

With equipment donations from Nokia, VTech Canada and Sierra Wireless, major support from NSERC, Western Economic Diversification Canada and the Department of Electrical and Computer Engineering, and involvement of the local EMC community, the UBC Radio Science Laboratory has established a new Antennas and EMC Laboratory that will support teaching in EECE 483 – Antennas and Propagation, EECE 571A – Antennas and Propagation II and EECE 585 – Electromagnetic Compatibility and sponsored research involving antennas and electromagnetic compatibility. In this presentation, Rob Stirling will describe UBC's new facility and share the opportunities for industry to be involved in the new facility.

Robert E. Stirling, B.A.Sc., P.Eng., MBA., has specialized in regulatory compliance in various capacities since 1987. After holding engineering and engineering management positions in the Far East and at Garaventa Canada Limited and 3M/Dynapro, he founded Protocol Datasystems Inc., and Veritas Engineering Limited. His companies have served Canada's manufacturing sector in regulatory project management and testing for safety, electromagnetic compatibility, and product validation for 15 years. Having served over 100 leading manufacturers, with several hundred products certified and tested, he has a broad understanding of the global regulatory landscape, and a respect for the challenges and pitfalls that manufacturers face with globalization. He currently serves as Chair of the UBC Radio Science Laboratory's Industry Advisory Council.

IEEE mini-symposium on commercialization of applied physics research at TRIUMF

Friday 26 November - 13:00 – 16:45
TRIUMF Auditorium
4004 Wesbrook Mall, UBC

*Pre-registration is strongly recommended.
Please send a message to IEEE.JAPC@gmail.com
with your name and contact information*

**Organized by
IEEE Joint Applied Physics
Ewart Blackmore, co-chair**

13:00-13:05 **Welcome and introduction**

Dave Michelson, Chair, IEEE Vancouver Section, and Nigel Lockyer, Director, TRIUMF

13:05-13:45 **Routes to success in technology commercialization - Jack Scott**, President and CEO, Advanced Applied Physics Solutions Inc. Advanced Applied Physics Solutions (AAPS) is a nationally designated Centre of Excellence for Commercialization and Research, established at TRIUMF – Canada's national laboratory for research into particle and nuclear physics. Commercial success for applications of technology can take many forms and paths to market. Identifying user value in potential opportunities, securing resources for navigating the stages of commercialization and understanding the terminology and expectations of key stakeholders are critical to this success. AAPS is developing the foundation of resources and approaches for commercialization that will enable success in bringing applications of Canada's physics-related technologies to markets in need, worldwide.

Jack Scott is continuing a career in creating and growing international business opportunities and teams around innovative technologies, building upon prior positions at NaiKun Wind Energy Group Inc., Atomic Energy of Canada Limited, ADCOM Inc., AGRA Inc. (now part of AMEC plc) and Bell Canada. He has experience worldwide in sectors such as renewable and nuclear energy, public-private infrastructure, specialty materials, and telecommunications with particular skills in project finance, strategic planning, international market development and corporate partnering, mergers and acquisitions. Jack is a Registered Professional Engineer, a member of the IEEE and a past member of the Conference Board of Canada Strategy Development Council. He has a B.Sc. in Chemical Engineering from Queen's University and an MBA from the University of Western Ontario.

13:45-14:25 **The production of radioactive isotopes for biomedical applications - Paul Schmor**, AAPS Inc.

Nuclear Reactors and accelerators are used to produce the radioactive isotopes used in biomedical applications. Cyclotrons are the primary accelerator-based tool for producing the shorter-lived proton-rich radioactive isotopes. TRIUMF has taken a pivotal role in developing cyclotrons specifically designed for the production of these isotopes. AAPS is currently promoting cyclotron and other accelerator technology to address the reliability, security and waste issues faced by the Nuclear Reactor approach in the production of isotopes.

Paul Schmor received a BSc (Hons) in Physics from McMaster University, a Ph.D. in experimental physics from the University of British Columbia and was an accelerator physicist at TRIUMF for more than 35 years. Until his retirement in June 2008, he was head of the Accelerator Systems Division which included the 500 MeV cyclotron facility, the Isotope Separator and Accelerator facility (ISAC), as well as the TR13 medical cyclotron. He is currently at TRIUMF as an emeritus accelerator physicist. In September '08 he joined AAPS (Advanced Applied Physics Solutions, Inc.) as their science advisor

14:25-14:45 Refreshment break

14:45-15:25 **Applications of particle physics technology - Doug Bryman**, UBC

Particle physics, the cutting edge of basic science, seeks to reveal the fundamental constituents of matter and the underlying forces of nature. Since the requirements of advanced particle physics experiments generally exceed the capabilities of existing detectors and techniques, these efforts have spurred the development of new instrumentation and systems which have often found uses in other fields; notable examples include the World Wide Web developed at CERN and radiation-based medical imaging such as PET and SPECT. I will discuss some current examples of developing spin-off technologies from particle physics including medical, border security, and geophysics applications.

Douglas Bryman is the J. B. Warren Chair Professor in the Department of Physics and Astronomy at UBC. His research has focused on particle physics through the study of rare decays of muons, pions, and kaons at TRIUMF and Brookhaven National Laboratory. He has also been involved in detector instrumentation development for high energy physics and applied physics, for which he has received several patents. His current research involves measurements of rare pion decays, positron emission tomography, and cosmic ray muon geo-tomography. Bryman is a Fellow of the American Physical Society.

15:25-16:05 **Radiation testing of electronics for space and terrestrial applications - Ewart Blackmore**, TRIUMF.

As electronics devices become more complex and technologies move to higher densities, radiation effects such as single event effects or total ionizing dose may limit the performance in space where high energy protons dominate or in avionics and ground level where high energy neutrons are present. TRIUMF provides commercial designers and manufacturers with proton or neutron beams to test and qualify devices and systems for these applications. About 30 Canadian and international companies, laboratories or universities test at TRIUMF each year.

Ewart Blackmore received a PhD in nuclear physics from the University of British Columbia in 1967 and was part of the original team that built the TRIUMF cyclotron. From 1995-2005 he coordinated Canada's \$40M accelerator contribution to the Large Hadron Collider at CERN and since 1995 has developed the proton cancer therapy and proton and neutron radiation test facilities at TRIUMF. In 2009 he stepped down as head of the TRIUMF Engineering Division to pursue technology transfer activities. He has been a member of IEEE since 1998.

16:05-16:45 **TRIUMF tour** (optional) – please indicate your interest when you pre-register.



Feedforward control: theory and applications

Precision, output-tracking controllers are needed in high-performance applications such as positioning of large flexible structures, aircraft guidance, robotics, manufacturing systems, and scanning probe microscopes (SPMs). In such applications, the addition of feedforward control to traditional feedback control can improve the output-tracking performance (when compared to the use of feedback alone).

He is currently a Professor at the Mechanical Engineering Department at the University of Washington, Seattle where he has taught since 2000. From 1994 to 2000, he taught in the Mechanical Engineering Department at the University of Utah, Salt Lake City. He has served as an Associate Editor for the ASME Journal of Dynamic Systems, Measurement and Control and the IEEE Transactions on Control Systems Technology.

Santosh Devasia
University of Washington

Friday 05 November
2:00pm-3:00pm

Room 2020/2030
Kaiser Building, UBC

Information

Control Systems chair
Ryozo Nagamune
nagamune@mech.ubc.ca

This talk will review theoretical issues in inversion-based feedforward control. Connections will be shown between inversion-based feedforward and other existing methods such as zero-phase-error-tracking (ZPET) feedforward and robust feedforward. Additionally, the talk will present the use of feedforward in emerging applications such as image-based control for subnanometer-scale studies with scanning tunneling microscopes (STMs), and the imaging of large soft biosamples with atomic force microscopes (AFMs).

Speaker: Santosh Devasia received the B.Tech. (Hons) from the Indian Institute of Technology, Kharagpur, India, in 1988, and the M.S. and Ph.D. degrees in Mechanical Engineering from the University of California at Santa Barbara in 1990 and 1993 respectively.

His current research interests include inversion-based control theory and applications such as high-precision positioning systems for Atomic Force Microscopes and Scanning Tunneling Microscopes used in nanotechnology, biomedical applications such as the imaging of human cells to investigate cell locomotion, and control of distributed systems such as Air Traffic Management.

Details of teaching and Research Interests can be found at: <http://faculty.washington.edu/devasia/>



Experimental security analysis of a modern automobile

Modern automobiles are no longer mere mechanical devices; they are pervasively monitored and controlled by dozens of digital computers coordinated via internal vehicular networks. While this transformation has driven major advancements in efficiency and safety, it has also introduced a range of new potential risks. In this talk I will survey the current structure of automotive systems and describe recent work exposing their fragility to adversarial attacks.

This talk describes joint work between the groups at University of California, San Diego and the University of Washington.

Speaker: Stefan Savage is a professor of Computer Science and Engineering at the University of California, San Diego. He received his Ph.D. in Computer Science and Engineering from the University of Washington and a B.S. in Applied History from Carnegie-Mellon University.

In particular, I will present a range of experimental results in which a contemporary automobile's safety can be compromised through attacks on its software - including disabling the brakes, selectively stopping individual wheels on demand, shutting down the engine and so forth. Finally, I will describe some of the unique challenges to fixing these kinds of problems within the automotive ecosystem and discuss some directions forwards.

Savage's research interests lie at the intersection of operating systems, networking and computer security and he currently serves as director of the Cooperative Center for Internet Epidemiology and Defenses (CCIED), a joint effort between UCSD and the International Computer Science Institute.

Savage is a fairly down-to-earth guy and only writes about himself in the third person when asked.

Stefan Savage
UCal San Diego

UBC Computer Science
Distinguished Lecturer

Thursday 04 November
3:30 - 4:50 pm

Hugh Dempster Pavilion
(DMP) Rm 110 6
245 Agronomy Rd
UBC, Pt. Grey Campus

Our local wireless industry: opportunities and challenges



Brad Lowe
Wavefront

Friday 19 November
6:00 - 7:30pm
SW3-1710 - BCIT
Burnaby

Please register with
Technology Mgmt chair
Kouros Goodarzi
604 726-1387
krs@ieee.org

The wireless industry has been one of the fastest growing segments in history and that growth isn't over yet. There are new opportunities opening up in wireless that will allow small and medium companies to prosper. However, there are also obstacles to success. In this presentation, we will look at the opportunities, hurdles, and how Wavefront is helping to get over them.

Speaker: Brad Lowe is the Community Engagement Manager at Wavefront, the accelerator for wireless businesses in Canada. He has been active in the Vancouver technology community for 20 years, working in management positions at Nokia, Redback Networks, Abatis, and MacDonald Dettwiler.

Previously, Brad was Director of Research and Development and Head of Nokia's Program Centre in Vancouver, BC. He also served as the chair of Nokia's Canadian Management team. At the Vancouver R&D facility, Brad led Nokia's efforts in building Nokia's new business portfolio including devices like the Nokia N96 and N91, as well as services like Nokia's music and gaming solutions. While at Nokia, Brad

drove the integration of Nokia into the greater Canadian wireless community, working with academia and industry associations to build up the industry ecosystem of developers and researchers. Brad developed the Nokia University Relations program which provided research topics, equipment, course material, funding and an opportunity for collaboration between Canadian universities and the wireless industry.

Brad also served on the board of the Canadian Wireless Telecommunications Association and WinBC. He has lectured at BC universities and has also spoken at numerous industry and academic conferences.

After the presentation, feel free to network or ask questions. Light refreshment is planned.



IEEE milestone ceremony - CBC transmitter site on Mt. Seymour

The IEEE Board of Directors has approved the IEEE History Committee's recommendation that the CBC's establishment of the first television transmitter in Western Canada be recognized as an IEEE Milestone in Electrical Engineering and Computing with the following citation:

First television broadcast in Western Canada, 1953 On 16 December 1953, the first television broadcast in Western Canada was transmitted from this site by the Canadian Broadcasting Corporation's CBUT Channel 2. The engineering experience gained here was instrumental in the subsequent establishment of the more than one thousand public and private television broadcasting sites that serve Western Canada today.

At a dedication ceremony to be held at the site on
Mount Seymour at
10:30 am on
Wednesday, 10 November 2010,

Prof. David G. Michelson, Chair of IEEE Vancouver Section, and David Newbury, Senior Manager - West, CBC Transmission will unveil a pair of bronze plaques that give the citation in both official languages.

After the ceremony, Dave Newbury will conduct a 45-minute tour of the facility which includes transmitters for CBUT, CBUT-HD and CBC-FM. If you are planning to attend the ceremony or participate in the tour, please contact Dave Michelson, davem@ece.ubc.ca, so that we can plan accordingly.

Members of IEEE Vancouver Section are cordially invited to attend both the ceremony and a special technical seminar and reception to be hosted by CBC and UBC Department of Electrical and Computer Engineering
2332 Main Mall
in Kaiser 2020/230 from
1:30 - 3:30 pm on
Wednesday, 10 November 2010.

Please check the IEEE Vancouver Section website, <http://vancouver.ieee.ca/>, and the Online edition of Contact for updates concerning the event as the date approaches.

IEEE Vancouver section executive 2011 nominations

The Nominations Committee proposes the following nominations for the Section Executive for the Activities Year 01 January to 31 December 2011. Balloting for that year will be completed by 05 November in order to complete the process for the change of officers as of 01 January, 2011. See December 2010 Contact for election results. Any last minute changes will be posted on the section website.

CONTACT INFORMATION

Deadline for appointed positions or voted-on positions is 5rd November, 2010. Final list of 2011 elected or appointed positions will be published in December Contact. Please contact Rasvan Mihai by telephone at 604-946-9981 or by email at rasvanm@analyticssystem.com. Nominating Committee for 2011: Rasvan Mihai, Paul Bowler, Eugen Trandafir

CALL FOR VOLUNTEERS

The IEEE Vancouver Section is seeking volunteers to take on a leadership role in helping to deliver the historical levels of high quality technical programs to our members. The main requirements of IEEE volunteer leaders are willingness to help the technical development of their peers, and membership in the IEEE technical society that they volunteer for.

Chair Mazana Armstrong
Vice-Chair Kouros Goodarzi
Treasurer Alon Newton
Secretary Steven McClain
Northern BC (Subsection chair) Jernej Polajnar
Okanagan (Subsection chair) Julian Cheng

Technical chapters

Society **Chair(s)**
*Joint Aerospace & Electromagnetics
..... Dave Michelson, Steven McClain
Joint Applied Physics Ewart Blackmore, Michael Hughes
Circuits and Systems Ljiljana Trajkovic
Joint Communications Alon Newton
Joint Computing Sathish Gopalakrishnan
Joint Controls and Automation Ryozo Nagamune
Electron Devices Bonnie Gray
Engineering in Medicine and Biology Rob Rohling
Joint Industry Applications & Electronics Jahangir Khan
Joint Management Kouros Goodarzi
Joint Oceans, Geoscience & Remote Sensing
..... Tristan Crees, Gordon Staples
Joint Power and Energy Glen Tang
Power Electronics Rasvan Mihai
Signal Processing Jane Wang, Mehrdad Fatourehchi
Solid State Circuits & Technologies Shahriar Mirabbasi

***The Societies comprising a 'joint' chapter are shown in the following technical chapters organization.**

IEEE Vancouver section - technical chapters organization

New Societies or Chapter Chairs (since 2009) are indicated by '*'

Joint Aerospace and Electromagnetics Chapter (new!)

• IEEE Aerospace and Electronic Systems Society • IEEE Antennas and Propagation Society • IEEE Electromagnetic Compatibility Society* • IEEE Microwave Theory and Techniques Society* • IEEE Product Safety Engineering Society • IEEE Reliability Society
Co-chairs: Dave Michelson <davem@ece.ubc.ca>* Steven McClain <StevenMcClain@ieee.org>

Joint Applied Physics Chapter (new!)

• IEEE Instrumentation and Measurement Society* • IEEE Magnetics Society* • IEEE Nuclear and Plasma Sciences Society* • IEEE Ultrasonics, Ferroelectrics and Frequency Control Society*
Co-chairs: Ewart Blackmore <ewb@triumf.ca> Michael Hughes <michael.hughes@honeywell.com>

IEEE Circuits and Systems Society

Chair: Ljiljana Trajkovic <ljilja@cs.sfu.ca>

Joint Communications Chapter (expanded!)

• IEEE Broadcast Technologies Society* • IEEE Communications Society • IEEE Information Theory Society* • IEEE Intelligent Transportation Society* • IEEE Photonics Society* • IEEE Vehicular Technology Society
Chair: Alon Newton <anewton@ieee.org>

Joint Computing Chapter (expanded!)

• IEEE Computer Society • IEEE Computational Intelligence Society*
Chair: Sathish Gopalakrishnan <sathish@ece.ubc.ca>

Joint Controls and Automation Chapter (expanded!)

• IEEE Control System Society • IEEE Robotics and Automation Society* • IEEE Systems, Man and Cybernetics Society
Chair: Ryozo Nagamune <nagamune@interchange.ubc.ca>

IEEE Electron Devices Society

Chair: Bonnie Gray <bgray@sfu.ca>

IEEE Engineering in Medicine and Biology Society

Chair: Rob Rohling <rohrling@ece.ubc.ca>*

Joint Industry Applications and Electronics Chapter*

• IEEE Industry Applications Society • IEEE Industrial Electronics Society
Chair: Jahangir Khan <jahangir.khan@powertechlabs.com>

Joint Management Chapter (expanded!)

• IEEE Technology Management Council • IEEE Education Society* • IEEE Professional Communication Society • IEEE Society on Social Implications of Technology*
Chair: Kouros Goodarzi <krs@ieee.org>

Joint Oceans, Geoscience & Remote Sensing Chapter (new!)

• IEEE Oceanic Engineering Society* • IEEE Geoscience and Remote Sensing Society
Co-chairs: Tristan Crees <tcrees@ise.bc.ca>* Gordon Staples <gstaples@mdacorporation.com>*

Joint Power and Energy Chapter

• IEEE Power and Energy Society • IEEE Dielectric and Insulation Society
Chair: Glen Tang <Glen.Tang@powerex.com>

IEEE Power Electronics Society

Chair: Rasvan Mihai <Rasvan_Mihai@plugpower.com>

IEEE Signal Processing Society

Co-chairs: Jane Wang <zjanew@ece.ubc.ca> Dr. Mehrdad Fatourehchi <mehrdadf@ece.ubc.ca>*

Joint Solid State Circuits & Technologies Chapter (expanded!)

• IEEE Solid State Circuits Society • IEEE Components, Packaging and Manufacturing Technology Society* • IEEE Consumer Electronics Society*
Chair: Prof. Shahriar Mirabbasi <shahriar@ece.ubc.ca>

An engineer's journey - part II



Tyseer Aboulnasr
UBC

Monday 15 November
6:30 - 8:00pm

Room 1500
Simon Fraser University
at Harbour Centre
515 West Hastings St
Vancouver

Information

Women In Engineering
Affinity Chair
Zahra Ahmadian
zahraa@ece.ubc.ca

The IEEE Women in Engineering is proud to present the second talk on the series of "An Engineer's Journey". Our special guest for the evening will be Prof. Tyseer Aboulnasr dean of the faculty of applied science and professor of electrical engineering at the University of British Columbia. Join us for an evening of networking and to hear Prof. Aboulnasr's story on her journey in pathway to success.

Speaker: Tyseer Aboulnasr is currently Dean of The Faculty of Applied Science and Professor of Electrical Engineering at the University of British Columbia. Dr. Aboulnasr received the Bachelor of Engineering degree from Cairo University, Egypt and M.Sc. and Ph.D. degrees from Queen's University all in Electrical Engineering. She was Dean of the Faculty of Engineering at University of Ottawa from 1998–2004 and Associate Dean (Academic) from 1996–1998. She chaired the Council of Ontario Deans of Engineering from 2001–2002.

Dr. Aboulnasr received the Ottawa-Carleton YWCA Women of Distinction Award (Education) in 1999 and was elected Fellow of the Engineering Institute of Canada in 2002 and Fellow of the Canadian Academy of Engineering in 2003. She was named one of the

100 most influential people in Ottawa in 2001. She received her highest honour in 2005 when she was named a 2004 recipient of the Order of Ontario. Dr Aboulnasr's research is in the area of digital signal processing. She has taught a variety of undergraduate courses in English and in French, as well as graduate courses and short courses for industry. She has developed and taught a successful course on professional practice of engineering highlighting all non-technical skills and knowledge needed by engineers as well as their responsibility towards society.

On the personal side, Dr. Aboulnasr has three adult children. She is a first-degree Black Belt in Taekwon Do and a motorcyclist. She is actively involved in community groups aimed at building bridges and fostering understanding amongst Canadians of different background



**(THIS EVENT RESCHEDULED
FROM 22 NOVEMBER)**



Ilan Spillinger
Microsoft

Friday 26 November - 6-8pm

Room 1800
Terasen Cinema
SFU Harbour Centre
515 West Hastings St, Van

Cosponsor

Joint Communications Chair
Alon Newton
anewton@ieee.org

Information

Circuits and Systems Chair
Ljiljana Trajkovic
ljilja@cs.sfu.ca

XBOX360 & Kinect - an insider look

Dr. Ilan Spillinger, Vice President Xbox HW, will provide an inside view into the HW involved in Xbox 360's breakthrough technology, Kinect, as well as a view into the new, sleek Xbox 360 console. He will share how the combination of the HW, SW, and experiences create the 'magic' moments in Kinect. Dr. Spillinger will describe what makes the new Xbox 360 unique.

Speaker: Dr. Ilan Spillinger, VP Xbox Hardware, joined Microsoft in late 2007. He currently leads the Xbox 360 architecture and verification, silicon design, and Kinect HW development. Spillinger manages a team of engineers spanning across global sites, including Redmond, Silicon Valley, and Israel.

During his previous six-year tenure with IBM, Spillinger was Distinguished Engineer and VP, Advanced Processor Design. In that role, he was responsible for development of all Power Architecture-based processors at IBM: server processor; embedded processors; and client-driven solutions (e.g., Xbox 360, Wii). Prior to that, Spillinger was a principal engineer and the manager of the architecture team in Intel Israel, responsible for the definition of X86-based low-cost and low-power microprocessors, specifically the first Intel mobile processor in the Intel Centrino roadmap.

Spillinger holds a D.Sc. and M.Sc. in electrical engineering from the Technion Israel Institute of Technology in Haifa Israel.





David Sinton
University of Victoria

Friday 19 November
2:30pm

SFU
Burnaby campus
Room ASB 9896

Information
Electron Devices Chair
Bonnie Gray
bgray@sfu.ca

Fluidics in energy applications: past, present and future

Microfluidic and nanofluidic transport phenomena are commonly exploited for life sciences research and diagnostic applications. This talk will provide an overview of our past, present and future work in microfluidics for energy applications, from fuel cells to carbon sequestration to photobioreactors.

First, rapid diffusion at small scales is exploited to generate power in microfluidic fuel cells. The flow-through microporous electrode architecture described here enables class-leading power density and fuel utilization, as well as opportunities for scale-up.

Second, microfluidic and nanofluidic tools are applied to study multiphase transport in porous media. Examples are presented for the study of water transport in hydrophobic porous media and a new approach to studying transport and reactivity of carbon dioxide in enhanced oil recovery and carbon sequestration operations.

Third, a combination of optics and fluidics are applied in the development of an optofluidic solar photobioreactor toward the sustainable conversion of carbon dioxide to biofuel using photosynthetic bacteria.

Speaker: David Sinton is a Canada Research Chair in the area of microfluidics and nanofluidics and an Associate Professor in the Department of Mechani-

cal Engineering at the University of Victoria. He received a B.A.Sc. from the University of Toronto, M.Eng. from McGill University and Ph.D. from University of Toronto. Dr. Sinton has over 60 journal publications in the area of microfluidics and nanofluidics since 2002. His research has focused on fluidic processes for biomedical lab-on-chip applications, fluidic-integration of nanohole array based plasmonic sensors, microfluidic fuel cells with flow-through electrodes, and the study of transport in porous media for energy applications. He was the recipient of the 2006 Douglas R. Colton Award from CMC Microsystems, the 2006 Canadian Society of Mechanical Engineering I. W. Smith Award, the 2007 Award for Teaching Excellence from the University of Victoria Faculty of Engineering, and the 2008 Early Career Achievement Award from the University of Toronto Faculty of Applied Science and Engineering. Further information regarding his background and research is available at: <http://www.microfluidics.uvic.ca/sinton.html>.



Non-conventional lightning protection systems - an update

Conventional "lightning conductors / air terminals", whether shield wires or Franklin rods/masts, are considered to be passive devices that function by virtue of their location relative to the protected object. Air terminals that are claimed to have special capabilities fall into two categories: a) The so-called lightning elimination devices / Charge Transfer Systems (CTS), and; b) Early Streamer Emission (ESE) lightning rods.

The theory of CTS devices was changed several times over the years in response to criticism of the scientific community. The present claim is that they make the protected object less attractive to lightning, thus causing it to strike elsewhere. ESE devices claim to have a much larger zone of protection than that of Franklin rods. Repeated attempts have been made by the vendors of both CTS and ESE devices to introduce them in national and international standards despite rejection of the underlying theories by the scientific community.

In a recent development, the large zone of protection of ESE devices is being justified by advancing the Collection Volume Method (CVM) for the placement of air terminals. The CVM implies that any air terminal, regardless of its type, has a much larger protective range than implied by the Electrogeometric Model / Rolling Sphere Method which is currently used in standards. Intense lobbying is underway to get the CVM in IEEE Standard 998 which deals with the shielding of substations. The above subject will

be discussed based on a recently published paper presented during September 2010 at the International Conference on Lightning Protection held in Cagliari, Italy.

Speaker: Abdul Mousa was responsible for the electrical design of BC Hydro's transmission lines for 30 years before his retirement in 2008. He is the author of Software Subshield which is used by BC Hydro and many utilities & consultants world wide for designing the lightning protection of substations. Abdul got his B. Sc. and M.Sc. degrees in electrical engineering from Cairo University in 1965 and 1971, respectively, and got his Ph.D. from UBC in 1986.

Lightning protection was the subject of his Ph.D. thesis. His list of publications includes 147 papers and discussions, the first of which was published in 1976. Abdul is co-moderator of the Yahoo Groups forum on Lightning Protection, which has about 3,000 members world wide. He contributed to IEEE standard on lightning protection & lightning performance for both substations & power lines. He has also been a reviewer of the manuscripts submitted to the IEEE-PES and IEEE-EMC for about 22 years and acted as reviewer for IASTED (International Association of Science & Technology for Development) and for the International Conference on Lightning Protection (ICLP).

Abdul was recognized with a PES Chapters Outstanding Engineer Award in 2007.



Abdul M. Mousa
IEEE Fellow

Tuesday 16 November
12:00 to 1:00 pm

BC Hydro Edmonds
Centre Auditorium



Information
Power and Energy Chair
Glen Tang
Glen.Tang@powerex.com



Benjamin G. Zorn
Microsoft Research

Friday 18 November
3:00 p.m.
KAIS 2020/2030
2332 Main Mall, UBC

Information

Computer Society Chair
Sathish Gopalakrishnan
sathish@ece.ubc.ca

Performance is dead, long live performance!

In a world of social networking, security attacks, and hot mobile phones, the importance of application performance appears to have diminished. My own research agenda has shifted from looking at the performance of memory allocation to building runtime systems that are more resilient to data corruption and security attacks. In my talk, I will outline a number of areas where code-generation and runtime techniques can be successfully applied to areas for purposes other than performance, such as fault tolerance, reliability, and security. Along the way, I will consider such questions as “Does it really matter if this corruption was caused by a software or hardware error?” and “Is it okay to let a malicious person allocate arbitrary data on my heap?”.

Despite these other opportunities, the importance of performance in modern applications remains undiminished, and current hardware trends place an increasing burden on software to provide needed performance boosts. In concluding, I will suggest several important trends that I believe will help define the next 10 years of code generation and optimization research.

Speaker: Ben Zorn is a Principal Researcher at Microsoft Research. After receiving a PhD in Computer Science from UC Berkeley in 1989, he served eight years on the Computer Science faculty at the University of Colorado in Boulder, receiving tenure and being promoted to Associate Professor in 1996. He left the University of Colorado in 1998 to join Microsoft Research, where he currently works.

Ben’s research interests include programming language design and implementation and performance measurement and analysis. He has served as an Associate Editor of the ACM journals Transactions on Programming Languages and Systems and Transactions on Architecture and Code Optimization and he currently serves as a Member-at-Large of the SIGPLAN Executive Committee. For more information, visit his web page at <http://research.microsoft.com/~zorn/>.



Geoffrey Ye Li
Georgia Tech

Distinguished Lecturer

Monday 29 November
10:00am

Room 418
MACLEOD Building
2356 Main Mall
UBC

Information

Joint Communications
Chair Alon Newton
anewton@ieee.org

Cross-layer optimization for spectrum and energy-efficient wireless networks

In this talk, we discuss decentralized cross-layer optimization of multichannel random access by exploiting local channel state and traffic information. In the wireless networks, users are usually within the transmission ranges of some others rather than all; therefore, when a user is transmitting, it may only interfere with some users, which can be exploited to further improve network efficiency. Therefore, we develop decentralized optimization for multichannel random access (DOMRA). DOMRA consists of three steps: neighborhood information collection, transmission control of the medium access control (MAC) layer based on the instantaneous channel state information, and power allocation for each traffic flow on each subchannel. DOMRA can be applied to different types of wireless networks, such as wireless sensor networks and mobile ad hoc networks, to improve quality of service.

As severe co-channel interference in wireless cellular networks significantly affects users at cell edges, we further demonstrate the application of DOMRA to improve performance of users experiencing severe cochannel interference in cellular networks. We propose a cost effective co-channel interference avoidance (CIA) MAC scheme to dynamically control the level of downlink interference. The CIA-MAC scheme requires low signaling overhead and only minor changes to the existing mobile systems. For CIA-MAC, base stations judged as severe interferers transmit randomly and transmission is controlled by wireless channel states to optimize the overall network performance while maintaining proportional fairness amongst users. CIA-MAC significantly outperforms traditional networks through avoidance of severe cochannel interference as well as exploitation of multiuser diversity through cross-layer design.

In this talk, we will also introduce energy efficient design of wireless networks and discuss the trade-off between and spectrum and energy efficiency.

Speaker: Geoffrey Ye Li received his B.S.E. and M.S.E. degrees in 1983 and 1986, respectively, from the Department of Wireless Engineering, Nanjing Institute of Technology, Nanjing, China, and his Ph.D. degree in 1994 from the Department of Electrical Engineering, Auburn University, Alabama.

After finishing his Ph.D. degree, he was with the University of Maryland at College Park, Maryland, as a Post-Doctoral Research Associate from 1994 to 1996 and with AT&T Labs - Research at Red Bank, New Jersey, as a Senior and then a Principal Technical Staff Member from 1996 to 2000. Since 2000, he has been with the School of Electrical and Computer Engineering at Georgia Institute of Technology as an Associate and now a Full Professor. He is also holding a Visiting Chair Professor position, the Cheung Kong Scholar, at the University of Electronic Science and Technology of China (UESTC) since March 2006.

His general research interests include statistical signal processing and telecommunications, with emphasis on OFDM and MIMO techniques, cross-layer optimization, and signal processing issues in cognitive radios. In these areas, he has published about 200 papers in refereed journals or conferences, two books, and filed over 20 patents. He is active in professional societies. He once served or is currently serving as an editor, a member of editorial board, and a guest editor for 10 technical journals. He organized and chaired many international conferences, including technical program vice-chair of the IEEE 2003 International Conference on Communications (ICC’03). He has been an IEEE Fellow since 2006, a Distinguished Lecturer of IEEE Communications Society from 2009 to 2010, and a winner of 2010 IEEE Communications Society S. O. Rice Prize paper award.



Troy McLelan

Law Society of
British Columbia

Friday 24 November
400 pm

Room 418
MacLeod Bldg
2356 Main Mall
UBC

Information

Computer Society Chair
Sathish Gopalakrishnan
sathish@ece.ubc.ca

The status of software and business method patents in Canada

The terms “software patent” and “business method patent” inspire strong emotions in many people in the technology sector, but few have a clear idea of what constitutes a software or business method patent. In Canada, the Federal Court recently ruled that business methods are patentable, in *Amazon.com v. Commissioner of Patents*. The *Amazon.com* decision is the first court ruling on either software or business method patents in Canada in 30 years. Earlier this year, the U.S. Supreme Court and the European Patent Office released key decisions on software and business method patents. The common theme of all three rulings is that software and business method patents are here to stay.

This presentation will focus on the status of software and business method patents in Canada. The *Amazon.com* decision represents a significant shift in Canadian patent law, and will be required reading for anyone working with software or business methods in Canada. However, the ruling itself relies heavily on context that is not explained. This presentation aims to provide the background necessary to understand the *Amazon.com* decision, and software and business method patents more generally.

In particular, the presentation will review the relevant

sections of the Canadian Patent Act, key court decisions, and the overall history of software and business method patents in Canada, as well as English and American influences.

With the legal and historical context established, the strengths and weaknesses of the *Amazon.com* decision will be highlighted. Finally, the *Amazon.com* decision will be compared to the recent U.S. and EPO decisions. If time permits, the speaker will discuss software and business method patents generally, and where the law is likely to go in this area.

Speaker: Troy McLelan is a practicing lawyer in Vancouver, specializing in technology law. Prior to attending law school at UBC, he obtained an electrical engineering degree from McGill, and worked as a software engineer for several years. Troy is active in the local legal community, frequently providing pro bono legal advice and representation. However, he still has a keen interest in the technology industry, and is looking to become more involved in the local engineering and technology communities.



IEEE Vancouver Section Annual Social Event

Tuesday 30 November 2010 07:00—10:00 PM

Vancouver Playhouse Theatre

(Southeast corner of Hamilton and Dunsmuir, Vancouver)



Tickets

Early Bird before November 1st

\$ 25 Student & Life Members

\$ 30 Members

\$ 35 Non-members*

Regular on or after November 1st

\$ 30 Student & Life Members

\$ 35 Members

\$ 40 Non-members*

Join us for an exciting evening of theatrical performance with delicious hors d'oeuvres pre-show reception and good conversation at the Vancouver Playhouse Theatre's Salon followed by Noel Coward's

Brief Encounter

There will be a dessert reception during the intermission.

For more information and to reserve your seats email:
events-vancouver@ieee.org

*** NEW ***

**Electronic registration and credit card payments available on Oct 28th (Visit vancouver.ieee.ca)
Early bird deadline is extended to November 5th !**

Program Details

06:45pm Doors open

07:00pm Pre-show Reception in the Salons

08:00pm Brief Encounter performance

09:00pm Intermission: Dessert Reception in the Salons (15 min)

10:00pm Performance ends

For more information on the Brief Encounter please visit:

<http://www.vancouverplayhouse.com/current-season/2010/noel-coward-brief-encounter.php>

* Limit one non-member per attending member.