



KITCHENER-WATERLOO SECTION

October 2011

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The Kitchener-Waterloo Section of the Institute of Electrical and Electronics Engineers serves members whose mailing address is in Bruce, Grey, Perth, Waterloo or Wellington counties. It collects news relevant to local engineers and is published monthly.

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<http://kw.ieee.ca>

IEEE KW Section, c/o Electrical & Computer Engineering (EIT 3028)

University of Waterloo

Waterloo, ON, N2L 3G1

KW Section Executives

<http://www.ieeekw.com/executive.php>

Officers :

Chair

Vice-chair

Secretary

Treasurer

Committee Chairs :

Membership Development

Professional & Publicity Activities

Student Activities (Conestoga College)

Student Activities (University of Guelph)

Student Activities (University of Waterloo)

Educational Activities

Newsletter Editor

Nominations

Awards

Chapter Chairs :

Aerospace and Electronic Systems (AES10)

Antennas and Propagation (AP03)

/Microwave Theory (MTT17)

Circuits and Systems (CAS04)

Communications (COM19)

Computational Intelligence Society (CIS11)

Computer (C16)

Control Systems (CS23)

Electron Devices (ED15)

Engineering in Medicine & Biology (EMB18)

Information Theory (IT12)

Photonics (PHO36)

Power and Energy (PE31)

Signal Processing (SP01)

Solid State Circuits (SSC37)

Systems, Man, & Cybernetics (SMC28)

Vehicular Technology (VT06)

Affinity Group Chair :

GOLD (Graduates of the Last Decade)

WIE (Women In Engineering)

Consultants Network

LM (Life Members)

Student Branches :

Conestoga College Student Branch

University of Guelph Student Branch

University of Waterloo Student Branch - Stream A

University of Waterloo Student Branch - Stream B

Dr. Shahab Ardalan

Dr. Amin Mobasher

Mr. Jameson Hyde

Dr. Amir Khatibzadeh

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Dr. Mohamed Kamel

Dr. Weihua Zhuang

Mr. Steve Henry

Dr. Ladan Tahvildari

Dr. Shahab Ardalan

Vacant

Mr. Brian Censner

Vacant

Mr. Haosen Cai

Ms. Joanna Ma

Upcoming Events

Updated information can be found at <http://www.ieeekw.com/activities.php>.

Recent Advance in Application-level Protocol Design for RFID Systems

IEEE KW Section Vehicular Technology Chapter

October 5, 2011, 3:00 PM
University of Waterloo
Waterloo, ON

Speaker:

Professor Shigang Chen
Department of Computer and Information Science and Engineering
University of Florida

RFID technologies are expected to revolutionize warehouse management and exert a profound impact on our daily lives. Comparing with barcodes that have to be read from a very close range by a laser scanner, RFID tags have great advantages: they can be read wirelessly over a distance, and can perform simple computations. RFID technologies have many important applications in automatic toll payment, access control to parking garages, object tracking and theft prevention. In this talk, we will discuss recent advance in application-level protocols design for RFID systems. We will cover an array of interesting problems, including missing-tag detection, dynamic information collection, tag number estimation, and reading throughput improvement. In particular, we will focus on sensor-augmented RFID systems. After RFID tags are deployed to make the attached objects wirelessly identifiable, a natural next step is to invent new ways to benefit from this "infrastructure". For example, sensors may be added to these tags to gather real-time information about the state of the objects or about the environment where these objects reside. This leads to the problem of designing efficient protocols to collect such information from tags. It is a new problem that existing work cannot solve well. A series of newly developed protocols are able to collect information from sensor-augmented tags with nearly optimal performance in terms of protocol execution time and energy expenditure. The latter is particularly important for battery-powered active tags.

<http://www.ieeekw.com/events/90.pdf>

Toronto Aerospace Museum Lecture and Tour

IEEE Toronto Section

October 13, 2011, 6:00 PM
Toronto Aerospace Museum
Toronto, ON

Speaker:

Hassan Kojori
More Electric Aircraft

On this tour:

- Hear a historic overview of the site.

- Visit the historic "home" - an original de Havilland Aircraft of Canada manufacturing plant, where 1500 Tiger Moths were built and the famous Chipmunk and Beaver aircraft were born.
- Stand on the spot where Canada's first satellite, Alouette I, was made
- View historic aircraft displays, engines, and in-progress restorations.
- Explore the role of the Defence and Civil Institute for Environmental Medicine in helping pilots, divers, and astronauts survive in their unfriendly environments.
- See the restoration of Lancaster FM 104 in progress as we tour.
- See the full-size, all metal replica of the Avro Arrow.

Registration is required.

<http://ewh.ieee.org/r7/toronto/events/oct1311.htm>

Climate Change, Conservation and What You Can Do

Centre for Urban Energy Seminar Series
IEEE Toronto Section

October 13, 2011, 7:30 AM
George Vari Engineering and Computing Centre
Toronto, ON

Speaker:
Peter Love
Distinguished Research Fellow
Hydro One

Peter Love will speak about climate change as the most important environmental issue to face mankind. He will highlight the critical role conservation plays, the benefits of conservation and its challenges. He will refer specifically to what you can do at home, at work and in school. There will be lots of time for questions so use this as a chance to ask those questions about energy that have been nagging you for years.

Continental Breakfast will be served. Registration is required.

<http://ewh.ieee.org/r7/toronto/events/LoveOct13CUEBreakfastSeminar.pdf>

Quantitative Functional MRI: Outstanding Issues and Future Directions

IEEE London Section
Co-sponsored by Biomedical Imaging Research Centre at the University of Western Ontario

October 19, 2011, 5:30 PM
London, ON

Speakers:
Dr. G. Bruce Pike
Killam Professor of Neurology & Neurosurgery

James McGill Professor of Biomedical Engineering
Montreal Neurological Institute, McGill University

While BOLD fMRI has revolutionized systems neuroscience during the past 20 years it has largely been used as a qualitative technique to localize brain activity and its clinical impact has been limited. The complex dependence of the BOLD signal on various physiological parameters can be considered a limitation; however, when combined with other MRI methods, it enables quantitative investigations of the brain's hemodynamic and metabolic responses. In this talk I will review the basic concepts of quantitative fMRI, present experimental results addressing a number of outstanding issues in fMRI brain physiology, and discuss future directions and potential clinical applications.

http://meetings.vtools.ieee.org/meeting_view/list_meeting/8513

EPTECH High-Tech Electronics Show

October 20, 2011
Mississauga, ON

EPTECH regional professional electronics shows are produced in major high-technology centers across Canada.

EPTECH is the only series of coast-to-coast national electronics shows in Canada. The series is sponsored by EP&T, Canada's largest professional electronics trade publication, and is produced by Business Information Group, a leading technology and information provider.

Annual EPTECH events are held in Calgary, Edmonton, Montreal, Toronto/Markham, Vancouver and Quebec City. EPTECH shows in Halifax, Ottawa, London, Winnipeg, Moncton and Saskatoon are held at a frequency of less than every year.

Employing a highly time-efficient table-top display format, EPTECH shows target electronics designers, engineers, technicians, technologists, purchasers, technical managers and researchers.

EPTECH exhibitors cover a very broad spectrum within the electronics industry, displaying such products as semiconductors and ICs; passive and electromechanical components; test equipment and electronic instrumentation; connectors; design, test and technical software; technical computer systems and products; design, testing and contract manufacturing services; electronic chemicals and materials production equipment; and industrial electronics products.

<http://www.ept.ca/eptech/>

An Overview of Regenerative Medicine Commercialization in Canada

IEEE Toronto Section

October 25, 2011, 6:30 PM
Toronto, ON

Speaker:
Dr. Rahul Sarugaser
Manager, Commercialization
Centre for Commercialization of Regenerative Medicine

CCRM (ccrm.ca) is a public-private partnership between industry, academia and the Canadian Centres of Excellence for Commercialization of Research. Its mission is to create a global nexus for regenerative medicine commercialization by unifying dynamic business leadership with high value stem cell technologies. This overview talk will present the regenerative medicine commercialization in Canada.

Registration is required.

<http://ewh.ieee.org/r7/toronto/events/oct2511.htm>

Getting More from your Smart Grid Investment

IEEE London Section
Co-sponsored by EnerNex, Bluewater Sustainability Initiative, Lambton College

November 14, 2011
London, ON

This discussion will cover the following topics:

- 1) Benefits of smart grids to the three customer segments (residential, commercial and industrial)
- 2) Measuring the costs and benefits of smart grid
- 3) Applications of smart grid technology
- 4) The need for analytics and the foundation knowledge required for analytics

http://meetings.vtools.ieee.org/meeting_view/list_meeting/8459

A Signal-Processing Approach to Modeling Vision, and Applications

IEEE Toronto Section

November 18, 2011, 2:00 PM
Location TBD

Speaker:
Sheila S. Hemami
School of Electrical & Computer Engineering
Cornell University

Current state-of-the-art algorithms that process visual information for end use by humans treat images and video as traditional signals and employ sophisticated signal processing strategies to achieve their excellent performance. These algorithms also incorporate characteristics of the human visual system (HVS), but typically in a relatively simplistic manner, and achievable performance is reaching an asymptote. However, large gains are still realizable with current techniques by aggressively incorporating HVS characteristics to a much greater extent than is presently done,

combined with a good dose of clever signal processing. Achieving these gains requires HVS characterizations which better model natural image perception ranging from sub-threshold perception (where distortions are not visible) to suprathreshold perception (where distortions are clearly visible). In this talk, I will review results from our lab characterizing the responses of the HVS to natural images, and contrast these results with 'classical' psychophysical results. I will also present several examples of signal processing algorithms which have been designed to fully exploit these results.

<http://ewh.ieee.org/r7/toronto/events/nov1811.htm>

IEEE Student Branch Activities

University of Waterloo and Conestoga College Student Branches will be very active in the upcoming weeks and months hosting a variety of seminars, workshops and competitions.

For more information, contacts are available at
<http://www.ieeekw.com/executive.php>

IEEE International Conference on Communications

June 10 – 15, 2012
Ottawa, ON

Since 1965 the IEEE International Conference on Communications has been one of the flagship conferences of the IEEE Communications Society. IEEE ICC brings together the world's leaders, scientists, policy makers from industry and academia. The IEEE Ottawa Section is proud to host IEEE ICC 2012 Conference and Exhibition from 10-15 June 2012 where recent advances in the field of communications will be presented.

The theme of the conference is "CONNECT COMMUNICATE COLLABORATE". For participants it promises to stimulate the scientific exchange of ideas, the identification of future trends in communications, and the illumination of business opportunities. The conference program will feature 12 technical symposia, 16 industrial forums, keynote presentations, several workshops, and tutorials.

<http://www.ieee-icc.org/2012>

Recent Events

SmartGridComm Video Contest Nominee at Waterloo

September 28, 2011

University of Waterloo Bulletin

A University of Waterloo first-year science student, Austin Montgomery has made the only successful Canadian entry in an international contest on “How to Make the Smart Grid Smarter”. Montgomery’s submission was chosen by IEEE SmartGridComm experts as one of the top 13 videos, from among entries received this summer, and those 13 were available for public vote. Montgomery reports that he wrote up his idea, scripted it, collected props and approvals, and had a friend shoot the creative 3-minute video clip. His video describes a proposal to use new energy monitoring technology to expose details of building energy consumption and enable occupants to conserve energy. Additionally, Montgomery suggests “fun social competition” to encourage people to reduce their carbon footprint.

<http://www.ieee-smartgridcomm.org/video.html>

Engineers and the World

Four Spinoff Firms Flying on Their Own

September 20, 2011

Waterloo Accelerator Centre News Release

The Waterloo Accelerator Centre, an award-winning and world-renowned centre for the cultivation of technology entrepreneurship, celebrates its fifth anniversary this month with the graduation of four more technology start-ups from its award-winning Accelerator Program. The Program, which serves start-ups located at the Accelerator Centre and the Communitech Hub, supports entrepreneurs and early-stage technology companies in their growth, development and success and has directly contributed to Waterloo Region becoming Ontario's fastest-growing tech ecosystem.

"Since opening our doors to early-stage companies in 2006, the Accelerator Program has operated with a simple goal: to accelerate the success of technology companies within Waterloo Region. And we are proud to say we have more than achieved on our objective," says Accelerator Centre CEO Tim Jackson. "Today we mark a major milestone in the Centre's history by graduating the largest number of companies on one day to date."

The Accelerator Program offers one-stop shopping for early-stage companies and entrepreneurs looking to take their company to the next level. Serving clients located at the Accelerator Centre in the David Johnston Research + Technology Park and the Communitech Hub in Kitchener's historic Tannery District, the program offers a complete menu of services, including office facilities, coaching and mentoring, education, connections to capital, networking, R&D support and outreach, talent recruitment, technology transfer assistance and commercialization expertise.

Here are a few of the milestones achieved by the Accelerator Program and its start-up clients over the last five years:

- 15 graduate companies from the Accelerator Program
- \$27,000,000 in revenue generated by client companies
- 65 companies served to date with a current 45 client companies in residence across two facilities
- 1,200-plus hours of educational services delivered
- 12,000 hours of mentorship provided by in-house executives and mentors
- \$52 million in external funding flowing to client companies
- 500-plus jobs created by client companies (and growing)

The Accelerator Program also announced the successful graduation of four additional companies. This brings the total number of graduates to 15. Another cohort of companies is expected to graduate in the December timeframe. The latest graduates:

- Bayalink is a leading innovator in smartphone application virtualization and a member of the BlackBerry Alliance Program. The company's product, Bayalink Liberty, is a virtualization solution for BlackBerry smartphones from Research in Motion, providing users with a virtualized presentation of BlackBerry smartphone applications. Bayalink has been a client of the Accelerator Program at the Accelerator Centre since April 2007.

- Client Outlook is building innovative IT solutions that provide healthcare professionals with secure access to information they need at the point of care. The company's initial offering, eUnity, is a Health Canada and US FDA-approved server-based product that allows clinicians to access diagnostic quality medical images through their favourite web browser using eUnity's zero-footprint client. Health professionals access the most up-to-date medical data from any location and with no client software to install or manage. Client Outlook has been an Accelerator Program client at the Accelerator Centre since April 2009.
- Homick Labs joined the Communitech Hub as an Accelerator Program client in 2011, and is the second company to graduate from the facility.
- PerspecSys Inc. provides data privacy, residency and security solutions that enable cloud adoption by the enterprise while controlling and protecting sensitive data. In 2010, PerspecSys was named a "Cool Vendor" in the Cloud Security Category by leading industry analyst firm, Gartner. PerspecSys has been an Accelerator Program client at the Accelerator Centre since January 2010.

"We continue to be amazed at the calibre and quality of the companies flowing through our doors," says Tim Ellis, COO of the Accelerator Centre. "The Accelerator Program has had the privilege of fostering some of Canada's newest technology success stories, and we look forward to watching these companies grow, prosper and contribute to Waterloo Region and to Ontario's economic prosperity."

The Accelerator Centre in Waterloo's Research + Technology Park is a world-renowned, award-winning facility dedicated to developing and commercializing technology start-ups. Through its Accelerator Program, early-stage companies located at the Accelerator Centre and the Communitech Hub receive seamless support services, including access to office facilities, coaching and mentoring, education, connections to capital, networking, R&D support and outreach, talent recruitment, technology transfer assistance, and commercialization expertise, enabling technology start-ups to move to market faster, create jobs and stimulate economic activity.

Retired Engineering Professor to Receive Convocation Honours

September 21st, 2011

University of Waterloo ECE News

David Roulston, an internationally recognized researcher in bipolar semiconductor devices and integrated circuits, who was a faculty member in Waterloo's electrical engineering department from 1967 to 1996, will be recognized with an honorary doctor of engineering degree at fall convocation on October 22. Roulston will also be the central figure of a "celebration" October 20-22 that will include several social events and a Friday afternoon public lecture. The retired electrical engineering professor developed the BIPOLE fast computer program for numerical simulation of semiconductor bipolar devices, which now is used by industry and universities worldwide. He has published more than 100 technical papers and holds six patents.

For Fun...

Never underestimate the bandwidth of a station wagon full of tapes hurling down the highway.

Brain Teaser

Joe McCrea (Logain), The Grey Labyrinth

You have a single six sided die with one integer on each side. The integers are random positive numbers and do not repeat.

When the die is rolled, it is placed against a wall, which means 4 sides are visible, the front, the top and the two sides, and the bottom and back are hidden from view.

The die is rolled 3 times, and the person rolling the die calls out 2 values for each roll, the sum of the front and top numbers, and then the sum of all 4 visible sides.

After the following 3 rolls, what numbers are on the die in what possible arrangement?

Roll #1 = 18, 28

Roll #2 = 7, 18

Roll #3 = 6, 22