KITCHENER-WATERLOO SECTION

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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 bi-monthly.

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Upcoming Events

Check http://kw.ieee.ca/activities.html for updated information.

Entrepreneur Week
UW DC Oct 1-7
The second annual Entrepreneur Week "brings the entrepreneurs of tomorrow together with mentors, professional service firms, investors, government, and business organizations, acknowledging a rich entrepreneurial history, a strong and diverse economic sector. The week celebrates the brightness of the entrepreneurial future in Waterloo Region."

A number of events are planned over the week, check the website for details.
http://www.entrepreneurweek.ca/

A Tale of Two Centuries: Engineering in 1900 and Technology in 2000
UW Engineering presents Rosalind Williams from MIT Oct 3, DC 1302

At the turn of the 21st century, the world is in the midst of a self-proclaimed "information revolution." At the turn of the 20th century, Western societies were in the midst of the so-called "second industrial revolution." How similar--or not--are these two points in the history of technology?
http://web.mit.edu/sts/sites/rwilliams/

Competing Against America Author Visits
UW School of Architecture, Oct 12 7pm
In his new book 'Competing Against America,' Michael Alexander examines the rapidly falling productivity rate and declining standard of living in Canada. Why have Canadians been steadily falling behind the United States in our economic performance since the 1980s – and what needs to be done to reverse the trend? There will be a reading followed by a book signing.
http://www.architecture.uwaterloo.ca/cambridge/directionstocambridge.html

The Man | The Science | The Times | The Legacy
September 30 to October 23 | 2005

Join the Perimeter Institute for a spectacular celebration of the 100th anniversary of Albert Einstein's annus mirabilis – "miracle year" – of 1905 when, at the age of twenty-six, he published several groundbreaking ideas that led physics—and thereby, the world—into the modern era.

EinsteinFest explores our rapidly changing civilization at the turn of the century and sets Einstein's prolific contributions in context with the science, philosophy, politics, art and music of the day. A full spectrum of hands-on exhibits, educational activities, compelling lectures and inspiring performances examines the discoveries, brilliant minds and rich culture of this transformative period in history.
Sign up for updated information or to volunteer.
http://www.perimeterinstitute.ca/activities/community/einsteinfest/

Target Tracking and Data Fusion: How to get the most out of your Sensors
October 24, 2005

IEEE Aerospace & Electronic Systems Society (AESS) chapter presentation. Dr. Bar-Shalom, University of Connecticut will describe the evolution of the technology of tracking objects of interest in a cluttered environment using remote sensors. Approaches for handling target maneuvers (unpredictable motion) and false measurements (clutter) are discussed. Advanced (intelligent) techniques with moderate complexity are described. The emphasis is on algorithms which model the environment and the scenarios of interest in a realistic manner and have the ability to track low observable (LO) targets. The various architectures of information processing for multi-sensor data fusion are discussed. Applications are present from Air Traffic Control (data fusion from 5 FAA radars for 800 targets) and underwater surveillance for a LO target.

Recent Events

Senior Member Upgrades
The following local member has earned the professional recognition of peers for technical and professional excellence.
Reza Dizaji
See http://www.ieee.org/ra/md/smprogram.html for more information on this program.

Raytheon RADAR Presentation and Company Tour
IEEE Event
This presentation was arranged through the new Aerospace and Electronic Systems Society Chapter and the GOLD Chapter. Approximately 50 people attended and saw a variety of Canadian technology being developed and delivered world-wide. Raytheon showed some impressive engineering in their ability to create solutions for over-the-horizon RADAR, rapid deployment and extreme conditions. The microwave system in the far north that provides 3MB of signal on solar power (even though the sun doesn't shine for 5 months) had an impressive story.

The tour introduced visitors to the manufacturing, assembly and testing areas. A number of Lean Manufacturing processes were visibly in use throughout the plant. The testing areas were impressive with temperature controlled, sealed and shielded rooms available for burn-in.

The IEEE thanks Raytheon employees for providing such an enlightening event.

Some Perspectives on Future of Wireless Networks
IEEE co-sponsored, Al Javed formerly of Nortel
Wireless Networks are evolving and becoming pervasive rapidly. They are now allowing every device including our home appliances to be connected to the network. In this talk, Al will share his views on how these Wireless Networks will evolve in the near to long term and what services they will be capable of. He will focus on market drivers, technology evolution, network architectures, system performance and its impacts on delivering new services.

UW's aerial robot second in Georgia
UW Daily Bulletin

A flying machine produced and operated by the Waterloo Aerial Robotics Group took second place overall in the 2005 International Aerial Robotics Competition held in late July, and WARG also received an Honourable Mention in the technical paper competition.

WARG entered the competition, held in Fort Benning, Georgia, with the support of namesake sponsors Research In Motion and QNX Software Systems Limited. WARG has a record as one of the leading teams in the IARC, having won first place in 2004. This year's competition included 20 teams from Canada and the United States.

Brent Tweddle, president and technical leader of WARG, reports: "Although, as planned, we did not fly on the day of the competition, we conducted tests and research that will be extremely valuable and will definitely give us an edge in completing our strategy. In 45 minutes of in-depth analysis of our technical presentation, the judges were unable to identify any major flaws, and noted that if WARG accomplishes its goals, especially with respect to our autonomous parachute, WARG will redefine the state-of-the-art in aerial robotics technology."

WARG's long-term strategy is to use a large fixed-wing airplane (which will be unveiled on September 10, Tweddle says) to travel the three kilometres, search the city with onboard cameras, and drop a guided parachute through the open window that will then release a small ground vehicle to search the building for the required visual information.

WARG is working on this system with a team of more than 100 undergraduate and graduate students from a variety of disciplines in engineering and math.
http://www.ece.uwaterloo.ca/~warg/

Award for UW network pioneer

UW Daily Bulletin

Roger Watt of UW's information systems and technology department was honoured in mid-June during a conference sponsored by the Ontario Research and Innovation Optical Network -- the agency that operates 4,100 kilometres of fibre optic network linking Ontario universities and other institutions.

Watt was one of eight people presented with ORION Awards for their role in pioneering computer networks in the province. "We can draw a straight line from the work these people did, some more than 20 years ago before the Internet was born, to what we have in place today," said ORION CEO Phil Baker.

Watt was among the original directors of ONet Networking, ORION's predecessor, and its chair from 1994 to 1996. A founding member of the CA Domain Registration Committee that oversaw the assignment of ".ca" Internet domain names until 2000, he participated in the technical and review committees that made recommendations on the evolution of CA*net, and was part of the committees that created the ONet and NetNorth networks, as well as serving on many other projects and task forces over the decades.

The first link in NetNorth connected UW and the University of Guelph in September 1983, and the first link in ONet was completed between Waterloo and the University of Western Ontario in August 1988.
http://www.orion.on.ca/newsjune05/3orionaward.html

New Alternative Energy business in Vienna competition

UW Daily Bulletin

An alternative energy business hatched in the newly formed Master of Business, Entrepreneurship and Technology program has been selected to represent Canada this fall at the Junior Chamber International Best Business Plan Competition.

The final round will be held during the JCI World Congress, which is scheduled to take place October 26-30 in Vienna, Austria. UW's entry is EnerGen Innovations (EGI), founded by UW graduate Ramin Hayratiyan -- who calls himself a "serial entrepreneur."

After deregulation of electricity in Ontario and a dramatic increase in hydro bills in his businesses, Hayratiyan decided to put commercial power generation into the consumer's hand. He designed an innovative low-cost, low-maintenance small wind turbine that can be installed on commercial and residential buildings.

After 11 years away from campus, Hayratiyan returned to Waterloo and the MBET program "to gain the tools and knowledge to commercialize his idea." While working on his MBET, he met the rest of his team. They have a working prototype for the wind turbine (which can generate 30 to 50 kilowatts of electricity) and are currently looking for financing to commercialize their idea.

Under the mentorship of Paul Doherty, associate director of the MBET program, and with the help of other faculty and advisory council members, the team won the second place standing in the UW/WLU LaunchPad $50K Venture Creation Competition held earlier this year.

UW's Formula SAE triumph
UW Daily Bulletin

"Those Canadians really know how to build a race car!" said the announcer as UW's Formula SAE race car zoomed around the track at England's Bruntingthorpe Aerodrome and Proving Ground. The car finished 12th in the UK Formula Student Competition, July 7-10. It was the first time the UW student team had gone to Britain to compete.

Waterloo's Intelligent Mechatronic Systems
Waterloo Tech Digest

There have been delays in the testing of IMS' occupant classification system, but the company hopes to have final tests completed by the end of the year. IMS just introduced a product called iPaid that would be installed in a car and let auto insurers know how much a car is being driven, at what time of day, in which areas, and other factors. It would enable them to offer "pay as you drive" usage-based insurance.

Engineers and the World

Einstein For a Day
Tom East

To kick off its "Einsteinfest" which will celebrate 100 years since Albert Einstein published five important papers, including one on the special theory of relativity, the Perimeter Institute in Waterloo (PI) held several media events on Thursday 1st September 2005. I was one of many volunteers who disguised himself as Einstein.

The day started at 6 A.M., when we assembled at the Perimeter Institute, and were driven in two buses to Toronto to appear on CityTV Breakfast TV at 8.30 A.M.. We were given the choice between masks and wigs: I found the mask uncomfortable so wore a large white curly wig and a white mustache. We all wore Einsteinfest T shirts. The 100 (or so) Einsteins and guides stood around in the parking lot on Queen Street for about an hour, surrounded by signs for CityTV, CHUM, Bravo! and CityPulse, and a satellite dish marked MuchMusic. (An interview with PI dignitaries was taking place in the studio). We amused ourselves with a few Physics Tricks, including blowing up a 3 metre long balloon with only one breath (demonstrating Bernoulli's principle). Towards the end of that period, cameramen appeared and we were instructed to wave and jump up and down. Hopefully, it looked all right on the screen.

At 9 o'clock, we all hiked east on Queen Street for 10 minutes till we came to Nathan Phillips Square. There were perhaps half a dozen photographers, taking group pictures and portraits, representing the Toronto Star, Canadian Wire Service and Canadian Press and others. At one point, we were divided into two groups: one group shouted "E" then the other shouted "MC squared".

Throughout the morning, articulated streetcars rumbled by on Queen Street, and their passengers, and pedestrians on the sidewalks, ignored us completely. They must have thought it was just another movie shoot (at any time there are said to be 20 going on at once in the city).

Next we clambered on to the buses again for the drive home. We assembled in the PI building on two galleries for more photos. A lecture was just ending, and as the attendees filed out, they were surprised to see 100 Einsteins waving at them, and even more so when a huge banner was unfurled.

Finally we were given a lunch, thanked heartily, and dismissed for the day. Now I know what it is like to be an extra in a movie – lots of waiting around.

The main part of Einsteinfest takes place from September 30th to October 23rd. A schedule of lectures at PI can be obtained at the Institute.

Engineering Humour

A chemist, an engineer and a mathematician were all asleep in a hotel, when several fires broke out, in their respective rooms.

The chemist woke up, saw the fire, ran over to his desk, pulled out his CRC (chemistry handbook) and began working out all sorts of fluid dynamics equations. After a couple of minutes, he threw down his pencil, got a graduated cylinder out of his suitcase and measured out a precise amount of water. He threw it on the fire, extinguishing it, with not a drop wasted, and went back to sleep.

The engineer woke up, saw the fire, ran into the bathroom, turned on the faucets full-blast, flooding out the entire apartment, which put out the fire, and went back to sleep.

The mathematician woke up, saw the fire, ran over to his desk, began working through theorems, lemmas, hypotheses, you-name-it and after a few minutes, put down his pencil triumphantly and exclaimed, "I have proven that I can put the fire out!" He then went back to sleep.