KITCHENER-WATERLOO SECTION

July 2003

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GOLD (Graduates of Last Decade)
    vacant

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Upcoming Events

Network Operation & Management Symposium 2004

"Managing Next Generation Convergence Networks and Services" Seoul Korea, 19-23, April 2004 .See http://www.noms2004.org/ for latest information

CCECE 2004 - Technology Driving Innovation.

Tony Kormos
The next Canadian Conference of Electrical and Computer Engineering will be held in Niagara Falls in May 2004. This conference, organized by local IEEE sections, provides a forum for Canada's best emerging Engineering talent and industrial leaders to present, participate, sponsor and network between partners in Canada's high technology frontier. For more information, see attached and see: http://www.ieee.ca/ccece04 . For the complete sponsorship info package, contact Tony Kormos at a.kormos@ieee.org.

Toronto Chapter Centennial

John Mowbray
The Toronto IEEE chapter, the first outside of the US, will celebrate 100 years this September. For more information see: http://ewh.ieee.org/r7/toronto/centennial.htm

Life Members to Form Chapter

Tom East
It is proposed to form a joint chapter of Life Members in the Hamilton, London and Kitchener-Waterloo sections.

Any Member, Senior Member, Fellow or Associate, whose years of membership + age equals or exceeds 100 is automatically a Life Member, Life Senior Member etc. (call them LM for short). However, to become a member of the Chapter, the LM would have to sign on, and the chapter would have to have three LMs who had signed on.

Among activities suggested for such a chapter, could be talks on technical history; assisting at technical conferences and services such as encouraging student interest in math and science and judging at science fairs; and persuading companies to support the IEEE.

Congratulations

Students honoured for high-tech work

UW Daily Bulletin, Selected by C.Hulls

UW and Communications and Information Technology Ontario presented cheques and awards to students who have received scholarships or internships awards from CITO within the last year.

Among those being honoured is UW student Anil Kumar, who received a scholarship for his work in the area of foldable displays. This is the inaugural year for CITO's Student Research Excellence Scholarships.

CITO internships were awarded to four UW students: Zheng Qin, Rafal Jaroszkiewicz and Wayne Olive for their work in the area of advanced shader programming and applications; and Bill Todorovic for his research into the entrepreneurial orientation of university departments and the incidence of commercial activity in Canadian universities.

David Boswell

David is the 2003 recipient of the J.W. Graham Medal in Computing and Innovation. David spent his earlier years in Waterloo and obtained his B. Math and M.Math from the University of Waterloo. He began his career with the Computer Systems Group at the University of Waterloo and has been instrumental in the success of several Waterloo software companies including WATCOM (now iAnywhere Solutions) and LivePage (now part of Siebel Corporation).

Mike Lazaridi faces his first convocation

16Jun, Daily Bulletin
The business executive and philanthropist took on a new role, as he was installed as UW's chancellor at the first session of the Eighty-Sixth Convocation. "Technology transfer is the buzz word of the day, especially in the circles that fund us," said the new chancellor, Mike Lazaridis, who as founder and president of Research In Motion (RIM) has made hundreds of millions from technology transfer.

But, he said in his convocation address, "I think this view of technology is short-sighted and wrong." Rather, he said, the most important means of innovation is for universities to rear students with new ideas and energy, who will then have their impact in business.

Trio triumphs in Disney contest

Daily Bulletin
Disney announced that a team of three UW students had placed first in Walt Disney Imagineering's Imagi-Nations competition with their "Monsters, Inc. Training Facility Ride."   The three women -- Munira Jessa, Analene Go and Kimberly Tuck -- collaborated for nine months to develop their concept for a new theme park ride based on the movie "Monsters, Inc."

Kevin Ma receives IEEE Scholarship

This scholarship recognizes a student who has demonstrated a previous commitment to the IEEE McNaughton Learning Resource Centre and related IEEE activities, and who indicates a desire to continue this activity.

DSPFactory

Dspfactory has won the 2003 Swiss Economic Award, the top national prize for emerging entrepreneurs and companies in Switzerland.

Electronics Professor Wins Conestoga's Top Teaching Honour
CC web site
Nancy Nelson, a professor in the Electronics and Computer Engineering Technology programs at Conestoga College, has been chosen winner of the Aubrey Hagar Distinguished Teaching Award, the College's top honour for a faculty member.
http://www.conestogac.on.ca/jsp/news/2003/20030609.jsp

Recent Events

Highlights from the Essential Guide to the Software Business
This seminar, on June 13, is part of the infraNET Smart Community Seminar Series. David Boswell discussed the essential aspects of a software business, looked at the special issues in startup businesses, as well as shared interesting vignettes from the different worlds of enterprise software sales, business acquisitions, and startup finance.

David Boswell has enjoyed a broad range of action-packed experience in the software industry, on the management teams of software enterprises ranging from startups to large multinationals.

Collaboration Technology Vision – Open Text Corp.
Daily Bulletin
Links between UW and Open Text Corporation -- the company behind Livelink, "the leading collaboration and knowledge management software for the global enterprise" were celebrated June 17. Open Text grew out of UW-based research into text analysis and the _New Oxford English Dictionary_ in the 1980s. It now employs more than 1,000 people, many of them at its world headquarters beside UW.
Says Coolman: "This event is to celebrate a relationship, since OpenText is a UW start-up company. We have a historical relationship and current relationship with research and co-op. We are hosting the event to celebrate these relationships. We hope to have future relationships in the areas already mentioned as well as other possibilities."

Why Does Science Work
Tom East
The Perimeter Institute lecture on June 3rd was sold out at least 12 days ahead, but again, your reporter was lucky enough to get in. Dr. Smolin is a researcher at the Institute, but rather than describe his specialty, he gave us his thoughts on science as a whole. From the Aristotelian view of the earth being at the centre of the universe, with the stars on spheres, (which served as an adequate model for a millennium), it took a 140 year revolution starting with Copernicus and ending with Newton to the next stable view. The next revolution started with Einstein and quantum theory and is still going on - the Perimeter Institute is taking part in it. In the present world view, the universe is infinite and is not centred at the sun, nor at the observer. Mathematics and logic are becoming more relational.

Science is carried on by a community of people who are ethical (mostly) and communicate with each other. Their theories must be not only verifiable but falsifiable.

Their community is similar to that of artists. Dr. Smolin feels that it is not a coincidence that science and democracy tend to flourish together. Universities tend to be rigidly hierarchical, but science must be broad-ranging and willing to take risks.

Are there any general principles? Dr. Smolin says:
Scientists belong to an ethical community (a network),, work in good faith, share results and honestly report results. (Since scientists tend to fool themselves, there have to be tools to find errors.)
They have to be convincing, which requires learning the craft.
They have to believe they can do better than others.
A first rate piece of science is accepted by contemporaries, and will be in textbooks in 50 years' time.
Post-modernism is a mistake.

Polaris, a thing of the past
by Bruce Campbell of engineering computing, Daily Bulletin

On May 1, 2003, with no fanfare, the Waterloo Polaris system was retired from service. In its heyday, Waterloo Polaris connected approximately 1,500 PCs across UW, running the Windows 95 operating system. The Windows 2000 based replacement system, Waterloo Nexus, has taken over and already grown to 2,000 PCs in all six faculties.

Lecture by the Father of Fuzzy Logic
M. Hulls
Lotfi Zadeh, gave an interesting talk on June 13 to approximately 150 people. Zadeh originated much of the theory behind removing the sharp edge of most numerical applications by allowing a degree of impreciseness. He discussed the difficulty in building and supporting ideas that are not mainstream (and that have funny names).

Zadeh gave a quick review of his seminal papers on fuzzy numbers and fuzzy logic as a lead-in to his current research on describing real world problems. There are many problems that cannot be described well using classical logic. Zadeh gave the example of selecting plane flights through different connection points. The trip time may be less through one point but the connection may be difficult to make leading to 2 possible results, the quickest trip time and the slowest depending on whether the connection was made or not.

Zadeh briefly described his ideas of perceptions and how they can be described using different "protoforms". Combined with extensive world knowledge, he hopes to give language and perceptions a structure that allows computation with the intent to convert search engines into question answering systems.

Fuzzy Logic System
IEEE event, June 11
Dr.Rogelio Soto introduced type-2 fuzzy logic system (FLS) which can handle rule uncertainties.

Prof. John Schwarz on Superstring Theory

Tom East

The Perimeter Institute Public Lecture, given at the Waterloo Memorial Recreation Complex on May 7th, was fully booked days ahead, and your reporter was lucky to get a ticket. By an arrangement of TV projectors, the lecturer's overheads were seen on two screens at once

The talk by Professor John Schwarz was called "Superstring Theory - Past, Present and Future". He started by explaining that fundamental particles are represented as motions of strings, which are one-dimensional objects. Strings were conceived to explain the strong nuclear forces. It was discovered that they can have super-symmetry, hence the name superstrings. To describe them completely takes 10 dimensions - 3 space, 1 time and 6 others.

One outcome of this theory was the prediction of massless particles, such as the graviton (the quantum of gravity). By the 1980s, there were five versions of the theory. The fundamental length of a string is about the same as the Planck length, or 10^{-36} metres.

More recently, the idea of 2 or more dimensional creatures called p-branes was introduced. A 1-brane is a string, a 2-brane is a membrane and so on.

As to the future, the theory is closing in on the cosmological constant (the energy density of empty space). Progress depends on hard work by mathematicians as well as theoretical physicists. Dr. Scharz thinks that in 30 years, there will still be problems.

In the question and answer period, someone asked whether there is or will be any experimental verification. Dr. Schwarz replied that because of super symmetry, every particle should have a partner. He says that there is a 50-50 chance that the Large Hadron Collider being built at CERN will confirm this prediction.

Human meets digital in new centre

Daily Bulletin

The new Canadian Centre of Arts and Technology, based in the faculty of arts, will do research on "how people interact with digital technologies".

"CCAT brings together researchers to study the digital creation, storage, processing, and dissemination of modes central to the Arts -- text image, sound, and video -- as well as to use digital technologies to study how people interact with each other, both in face-to-face and in technologically mediated environments."
"CCAT provides a physical and virtual space for bringing together people who share a common interest in the digital design of sound, text, hypertext, images, and video.

Engineers Without Borders

KW Record

Avi Caplan is supporting aid efforts in Uganda using his computer skills. Engineers Without Borders works to increase the ability of people to support themselves through technology. See http://waterloo.ewb.ca/ for more information.

UW fills Photonics Knowledge Gap

KW Record

UW and several local companies have designed a new program specializing in photonics to increase the background available locally. The program is organized so that industry people can become knowledgeable without returning to school full time. More information at: **http://ep3.uwaterloo.ca**

Conestoga Racing Car Rolling Again

CC Web site

The Conestoga College racing car, pride and joy of the Automotive Service Technician apprenticeship program at the College's Guelph campus, is rolling again and performing better than ever.

The car is a customized 1988 Mustang with a 5.8-litre engine. After the car was originally purchased in pieces as scrap, the apprentices and their faculty members restored and rebuilt it over a 14-month period and first took it out on the track in the summer of 2001. The student-faculty team continues to modify, improve and fine-tune the vehicle as an ongoing project.

In May, the car had a successful season launch, competing in the Coca-Cola Challenge at St. Thomas Dragway. It recorded a new best time of 12.64 seconds at 105 mph. The best time in 2001 was 13.70 seconds, which improved last year to 12.72 seconds.

Prof harvesting rain to keep gardens green, reduce water use

UG web site

A University of Guelph professor has teamed up with a local couple to study a new rainwater harvesting and garden irrigation system designed to reduce municipal water use.

Maurice Nelischer, School of Environmental Design and Rural Development, is using the home of Richard and Norah Chaloner as a test site. He hopes to refine a relatively low-tech system of rain barrels and drip irrigation to allow homeowners to keep their gardens green without straining municipal waterworks.

The trial will provide a first-ever look at the feasibility of a rainwater collection and distribution system for Guelph-area gardens. "There are no data on rainwater harvesting in this climate," said Nelischer, who recently returned from a two-year teaching stint in California, where homeowners are required by law to use only drip irrigation.

http://www.uoguelph.ca/mediarel/archives/002783.html

U of G to participate in world's largest prototype race

UG web site

For the first time ever, University of Guelph engineering students have custom-built a race car to enter in the Formula Society of Automotive Engineers (SAE) competition in Pontiac, Michigan, May 14 to 18. Formula SAE is the largest prototype race in the world, with entries from 140 universities. Fourth-year engineering systems and computing student Jeremy Goertz said Guelph has probably never entered the competition before because it doesn't have a mechanical engineering program.

http://www.uoguelph.ca/mediarel/archives/002622.html

Thin Zno Films

Tal David (davidta@post.tau.ac.il) gave a seminar entitled: "Electro-Optical and Structural Properties of Thin ZnO Films, Prepared by Filtered Vacuum Arc Deposition". For more information visit the Electrical Discharge and Plasma Laboratory web page at: http://www.eng.tau.ac.il/eng/Departments/Inter/edp_lab/

From MIMO to SISO and Back: The TAST Framework

The IEEE Information Theory Society organized a seminar by Mohamed Oussama Damen on May 22. The abstract included:

Wireless channels are characterized by complex physical layer effects resulting from multitude of potentially mobile users communicating simultaneously in a multi-path fading environment. In such environments, reliable communication is made possible only through the use of diversity techniques in which the receiver is afforded multiple replicas of the transmitted signal under varying channel conditions. Antenna diversity techniques have received considerable attention recently due to the significant gains promised by information theoretic studies. While the use of multiple receive antennas is a well-explored problem, the design of space-time signals that exploit the available capacity in multi transmit antenna systems still faces many challenges.   A general framework for constructing multi-input multi-output (MIMO) space-time signals using single-input single-output (SISO) components was discussed in this talk. The new approach is based on the threaded space-time architecture and the Diophantine approximation theory. For further information contact
khandani@cst.uwaterloo.ca   or mohammad@cst.uwaterloo.ca

Prefetching in Expiration-based Hierarchical Caching Systems

Jianping Pan of Fujitsu Laboratories of America gave a seminar on May 20.

Caching is favorable for many distributed applications. As a consequence of caching, consistency control for object validity becomes a necessity in these systems. We evaluate the performance of two threshold-based prefetching schemes. With a location-independent freshness threshold, an end user can request an object that has a higher remaining TTL; with a location-dependent retrieval threshold, a cache server can specified a minimum TTL of the object retrieved from upstream cache servers. Our analysis and numerical results show that with an appropriate set of control parameters, the quality of service received by end users, e.g., object TTL and response time, can be considerably improved, without much trade-off in systems performance. This work offers new opportunities to understand underlying behaviors and improve overall performance in expiration-based hierarchical caching systems.

Scheduling Algorithms for High Throughput Packet

Data Access in Cellular Radio Systems

Professor Witold A. Krzymien of University of Alberta gave a talk on May 30 that discussed his work on scheduling algorithms designed to achieve very high spectral efficiency of packet data service in cellular networks employing single-carrier transmission, and both SISO (single-input single-output) and MIMO antenna systems.

Seminar on Power Electronics

The seminar, on June 6 by Dr. Michael Andersen gave us an overview of research at the DTU. This includes switchmode power amplifiers that show great promise in all fields from Magnetic Resonance Imaging (MRI) to high-power servo control and audio amplifiers. In audio, amplifiers must have very linear characteristics and high bandwidth, and recent research has shown how these two characteristics can be obtained. In most applications, filters are necessary to reject the switching carrier. It is the aim at DTU to design transducers that will allow direct connection to the power switches. The technology will also be useful in fields outside of audio.

News from Industry

Waterloo Firms top in research

KW Record

Four local companies, RIM, Dalsa, Decartes and Open Text, were included in a list of the top 100 R&D spenders for 2002.

Online Medical Records

KW Record

Medicalis, a Kitchener spinoff from Mitra is providing a Web-based service that allows doctors to connect to hospitals and exchange information about patient tests. Test order forms and results are managed and stored securely. The test requests are also analyzed to verify that the test is appropriate for the patient and alternatives may be offered.

Another startup, Micohealth, is involved in making the tracking of diabetic sugar levels easier, more accurate and timely. www.micohealth.com

Dalsa Cameras on way to Mars

KW Record

Cameras, using circuits produced by Dalsa in their Quebec foundry, form a key part of two Martian exploration rover missions expected to land on Mars in January 2004.

Alternative Energy

The Whey to Go

KW Record

Researchers at U of Wisconsin found a mix of nickel, tin and aluminum that acts as a catalyst to produce hydrogen from glucose. This would allow waste from processing plants to become a source of hydrogen fuel.

Engineering Humor

Squirrel Tales

UW Daily Bulletin, Selected by C.Hulls

An interruption to computer network service last Thursday has been traced to its source, as the information systems and technology department detected _hostile action by a squirrel_ on a fibre feed to the Chemistry II building.

The Dog ate my Homework

Tom East

At a recent meeting at Luther Village of the Residents Advisory Board, the Chair started the proceedings by announcing "You will all have to speak up: The dog swallowed my hearing aids."

CCECE Publicity and Sponsorship attachment

CCECE 2004 - Technology Driving Innovation
Canadian Conference on Electrical and Computer Engineering
May 2-5, 2004 Sheraton Fallsview Hotel
Niagara Falls, Ontario, Canada

Sponsorship & Participation Benefits:

Is your organization looking for a means of being the most effective leader recognized and respected in your field of expertise, or seeking to expand? How can the 17th annual IEEE Canadian Conference on Electrical and Computer Engineering (CCECE) help make this happen?

There are many opportunities offered to assist you in this endeavor. We invite you to be apart of this Canada wide, and globally recognized event.

CCECE provides a forum for Canada's best emerging engineering talent and industrial leaders to present, participate, sponsor and network between partners in Canada's high technology frontier. Technology Driving Innovation, a dynamic winning combination - the foundation of success nationwide and beyond.

CCECE 2003 drew over 400 registered participants from around the world and corporate sponsors from across Canada, to Montreal, Quebec in May 2003. We are excited to bring this event sponsored by IEEE Canada and its Central Canada Council sections to Niagara Falls, Ontario in May 2004.

Benefits to Company or Organization in participation include:

- **Exhibiting information, products or services** in the exhibits space,
- **Recruiting** and **networking** from Hospitality suites,
- **Offering Technical presentations** from Hospitality suites,
- **Sponsoring** and/or **hosting** events, e.g. Breakfast or Luncheon & Plenary, coffee breaks, …
- **Corporate advertising** through "logoware" promotion on: conference CD-ROM, Publications, Canvass Tote-Bag, handouts or giveaway prizes, ...

Benefits to Student participation include:

- **Student Paper Competition** in the presentation or poster format,
- **Attending Company** or **Organization Technical presentations** from Hospitality suites,
- **Networking** with peers and Companies or Organizations throughout.

Students may be sponsored in ways including:

- **Corporate Sponsors** by way of notice to an IEEE Section Treasurer contact in your Section.
- **IEEE Section funding** by checking www.ieee.ca for your Section Treasurer contact,
- **IEEE Canadian Foundation** by submitting an application at www.ieeecanadianfoundation.org.

Note: Section funding is for attendance expenses, in part, dependent on funding set from within your Section.
IEEE Canadian Foundation funding is for travel expenses, in part, dependent on applications processed.

For most current information, visit our website at www.ieee.ca/ccece04.