

KITCHENER-WATERLOO SECTION

March 2003

IEEE Executives	3
Section Officers	3
Student Activities Chairs	3
Awards	3
Nominations	3
Chapter Chairs	3
Section News	4
Annual General Meeting.....	4
Membership Response Request.....	4
Publications Chair Change.....	5
Call for Papers.....	5
Graduate Student Research Conference.....	5
NSERC Seeks Nano Innovation	5
Upcoming Events.....	6
2003 Canadian Workshop on Information Theory	6
Perimeter Institute Lectures	6
Panel discussion on science and the media - March 5, 2003	6
"The Mathematics of Chance" - April 2, 2003	6
"Superstring Theory: Past, Present, and Future" - May 7, 2003	6
"Why does science work?" - June 3, 2003.....	7
Waterloo Aerial Robotics Group (WARG)	7
Xilinx Professor Workshop.....	7
Student Design Contest.....	7
RIM/IEEE BlackBerry Programming Contest.....	8
IEEE Seminar by Dr. Michael Reed - March 3, 2003	8
IEEE Distinguished Lecture Series by Vijay K Arora - March 6, 2003	8
IEEE Seminar by Dr. Russell Thompson - March 7, 2003.....	9
Business Risk Analysis: Link between Information Security Theory and the Practice .	9
"Surpass Yourself" - People, Productivity and the Return on Investment	10
Alternative Energy Seminars	10
Congratulations	11
Engineers triumph in competition.....	11
Golden Jubilee Medal Recipients	11
Order of Canada.....	12
Recent Seminars.....	12
Space and Time Close Up.....	12
Engineers Without Borders Conference	13

Canadian Undergraduate Technology Conference	13
Fourth Year Design Project Symposium	14
Biomedical Image Analysis	14
News From Academia.....	14
Wireless Revolutions, Perspective and Challenges	14
Conestoga College Earns Institute of Tech. and Advanced Learning Designation	15
Conestoga College Graduate Survey	16
Speed of Gravity	16
New Prime Algorithm.....	16
News From Industry	16
Research in Motion	16
City of Cambridge.....	16
ATS Automation Tooling Systems	16
Research and Technology Park.....	17
International Internet Usage.....	17
e-Solutions Data Centre	17
Alternative Energy	17
Zenn electric car.....	17
Windpower in Toronto.....	17
Nuclear Fusion	17
Engineering Humor.....	18
Truth in Meeting Minutes	18
The Mobile Cake.....	18

IEEE Executives

Section Officers

Chair: Mauro Rossi
519 747-3969x110
mrossi@handshakeinteractive.com

Vice Chair: Tony Kormos
519 725-4706x226
a.kormos@ieee.org

Secretary: Faycal Saffih
519 888-4567x5167
fsaffih@venus.uwaterloo.ca

Treasurer: Joseph Shu
519 747-3969x103
jshu@handshakeinteractive.com

Membership Development:
Tony Kormos 725-4706x226
a.kormos@ieee.org

Professional Activities:
Gilbert Lai 888-4567x3819
gmylai@Kingcong.uwaterloo.ca

Educational Activities:
Magdy Salama 888-4567x3757
msalama@hivolt1.uwaterloo.ca

Newsletter Editor:
Mike Hulls 519 747-5222 x208
mike.hulls@ieee.org

Student Activities Chairs

Conestoga College:
Valdis Cers 519 748-5220
cersval@mcmaster.ca

University of Guelph:
Shawki Areibi 519 824-4120
sareiba@uoguelph.ca

University of Waterloo:
Siva Sivoththaman
519 888-4567
sivoth@ece.uwaterloo.ca
Stream B: Winter 2003 Nicholas Kim

Awards

Wai-Cheung Tang
519 622-2300
WaiCheung.Tang@comdev.ca

Nominations

John Mowbray 519 884-1710
john.mowbray@ieee.org

Chapter Chairs

Antennas and Propagation (Raafat Mansour)
888-4567x5780
Microwave Theory and Technique:
Raafat.mansour@ece.uwaterloo.ca

Circuits & Systems: Faycal Saffih
519 888-4567x5167
fsaffih@venus.uwaterloo.ca

Communications: Raouf Boutaba
519 888-4820
rboutaba@bbcr.uwaterloo.ca

Vehicular Technology: Youssef Iraqi
519 888-567x4716
iraqi@bbcr.uwaterloo.ca

Control Systems: Fakri Karray
karray@watfor.uwaterloo.ca

Electron Devices: Arokia Nathan
519 888-4803

Signal Processing Computers:
Mohamed Kamel / Guy Cote
519 888-4567x5761
mkamel@pami.uwaterloo.ca

GOLD (Graduates of Last Decade):
Currently Vacant

The Kitchener-Waterloo Section of the Institute of Electrical and Electronics Engineers serves all members whose mailing address is in Bruce, Grey, Perth, Waterloo or Wellington counties. Address: IEEE K-W Section
c/o Elect. & Comp. Eng. (DC 2597)
University of Waterloo
Waterloo, Ont. N2L 3G1
www.ece.uwaterloo.ca/~ieee_kw

Section News

Annual General Meeting

Source: Tom East

There was a good turnout for the Kitchener-Waterloo Section Annual General Meeting on January 16th. Since the executive is serving for two years (2002-2003), there was no election. Chair Mauro Rossi introduced the executive, which is listed on page 3 of this newsletter: those who were present reported on their activities for the past year.

This was followed by a presentation by Prof. David Wang on “Starting a University of Waterloo Spin-off Company”. His company is called “Handshake Interactive”. He and a number of his students have been working on robotic and “haptic” systems, whose input devices convey a sense of touch to the user. A possible huge market is the automobile industry: weight reduction is an approach to more efficient cars, and one method is to use electrical linkages between, for example, the brake pedal and the brake. The brake pedal would become just a sensor, but would have to give the driver’s foot the feel of a real pedal.

Among the technical hurdles that the team has overcome is the time delay in remote operation, for instance internet computer games and telemedicine.

To exploit these ideas profitably, the team has to handle its intellectual property (IP) very carefully. The University of Waterloo is the only university where IP belongs to staff and students. To handle it, it is important to document which students worked on a project, and to respect their contributions, maintaining good relations with them. Of course, it is necessary to hold back on publication, till patent rights are established.

The management team should have all the necessary abilities, with complementary skills. There is a shortage of suitably qualified accountants and lawyers in the region. Communitech has been very helpful. This is a very bad time to go looking for money, though support for putting an invention into production can be obtained from the federal government.

Handshake Interactive has one firm customer and is developing relationships in the auto industry.

Membership Response Request.

Source: Section Executives

The KW IEEE section has a growing pool of funds allocated to the section for activities. This account has been accumulating and the section executive would like to receive feedback suggestions on activities or events that you would be interested in. Please take a few minutes and reply to the Member Development, Professional Activities, Educational Activities, Student Activities, Awards or Nominations committee chairperson through email, or call them directly to provide your feedback. (see IEEE executives ([page 3](#)) for contact information)

Ideas proposed so far include:

- Theoretical Presentations, Short Courses, Workshops, Field Trips, Plant Tours, Socials,
- Local IEEE Website directory linkage to Academic Institutions / Industry
- Contact listings for School: Career Fairs, Science Fairs, Career Guidance Councilors, ...

Another item that has been raised a couple of times is, job postings on our website. We are searching for any IEEE policies regarding this topic but we would like some feedback from you as well. (Note that the Ottawa section has a page on their web site that posts job openings in local companies, but the page does not seem active). We propose that there would be a fee structure associated with this service due to the administration involved. If a majority of our membership is interested in this service, then we will pursue establishing or adopting an appropriate policy to suit.

Publications Chair Change

Tom East, long standing contributor to the local IEEE section has handed the editing of this newsletter and other duties of the Publications Chair to Mike Hulls. Mike, a UW CS/EEE grad (BMath 1987) currently works at Campana Systems developing software for CAA/AAA automobile clubs and the healthcare industry. The Software Development process will be one area of interest for Mike. Mike can be contacted thru kw.newsletter@ieee.org or mike.hulls@ieee.org. Tom East continues to be active in the section and newsletter, as well as continuing to be Life Members Chair.

Call for Papers

Graduate Student Research Conference

Source: UW Daily bulletin, selected by C.Hulls

The deadline for submissions to the Graduate Student Research Conference is April 2-4.

See: <http://www.grad.uwaterloo.ca/conference> for more information.

NSERC Seeks Nano Innovation

Source: Canadian Association of Physicists, selected by Tom East

A nanometer is one billionth of a metre. Tracks on some chips are a hundred or so nanometres wide. How small could features get?

The NSERC Nano Innovation Platform wants to accomplish three things in 2003:

1. Develop a strategic vision for nano in Canada in collaboration with all stakeholders.
2. Innovation Platform Awards.
3. Organize Canada wide local workshops.

Nano Innovation Platform Awards will support excellent, high risk, high gain projects in nanoscience and nanotechnology that will help put Canada on the 'nano' world map.

NSERC will put up \$100K per year for 2 years or more to successful applicants. Proposals will be in NSERC format, sent as a PDF file by 30 April. But don't send them to NSERC! To find out what to do, see

www.physics.mcgill.ca/NSERCnanoIP/

Upcoming Events

2003 Canadian Workshop on Information Theory

This Workshop will be held at the University of Waterloo May 18-21, and is sponsored by the Canadian Society for Information Theory, the Information Theory Chapter of the KW IEEE Section, the KW IEEE Section and others.

For further information see <http://multicom.uwaterloo.ca/cwit2003/>

Perimeter Institute Lectures

Source: www.perimeterinstitute.ca and Tom East

The following public events, which are specifically geared to the general public and are an integral part of Perimeter Institute's community outreach program. The Winter/Spring series of lectures began on January 8, 2003 at 7:00 pm and thereafter will be held the first Wednesday of the month (except June which will be held Tuesday, June 3rd).

All lectures will be held at the Waterloo Recreation Complex, 101 Father David Bauer Drive, Waterloo. Attendance is free, but tickets are required and can be reserved via phone: (519) 886-2375, (519) 886-1177, e-mail: tickets@city.waterloo.on.ca or can be picked up directly at the Waterloo Recreation Complex, ticket reservations desk.

Panel discussion on science and the media - March 5, 2003

Panelists include: Peter Calamai, Science Writer, Toronto Star; Lynn Haddrall, Editor-in-Chief, Grand River Valley Newspapers; Jim Handman, Senior Producer, Quirks and Quarks; Rob Myers, Researcher, Perimeter Institute; Ivan Semeniuk, Producer, Discovery Channel, Simon Singh, author of The Code Book, Journalist and TV Producer

"The Mathematics of Chance" - April 2, 2003

Simon Singh looks at how chance, risk and uncertainty influence our world, from the courtroom to the doctor's surgery, from the paranormal to the casino. Indeed, our lives are dominated by the laws of chance ...an oxymoron if ever there was one. But how can mathematics help us exploit risk? Simon shows how probability theory leads to truths that confound our intuition and he explains how it can help us to live, thrive and survive. For more information on Simon Singh see <http://www.simonsingh.net/>

"Superstring Theory: Past, Present, and Future" - May 7, 2003

Professor Schwartz is an eminent string theorist and one of the founders of this important and highly influential research area. For more biographical information see <http://superstringtheory.com/people/johns.html>

"Why does science work?" - June 3, 2003

Lee Smolin, author of Three Roads to Quantum Gravity, Researcher, Perimeter Institute Professor Smolin is a world leader in quantum gravity research and co-developer of "loop quantum gravity", an important approach to unifying quantum theory and Einstein's theory of space, time and gravity.

For more biographical information see

<http://perimeterinstitute.ca/people/researchers/longterm.cfm>

Waterloo Aerial Robotics Group (WARG)

Source: Gilbert Lai

The WARG group is a student team at the University of Waterloo. Their main objective is to build a team of unmanned autonomous vehicles (UAVs) to compete in the annual International Aerial Robotics Competition (IARC) organized by the Association for Unmanned Vehicle Systems (AUVS). With their involvements, the students are given the opportunity to gain practical experience in solving real-world problems and the chance to work with leading-edge technologies in the area such as flight control and navigation systems, vision systems, and artificial intelligences.

During last year's competition in Calgary, AB, Discovery Science Canada interviewed some of the WARG's members and has produced a show on the IARC competition. The show is part of the weekly Aerospace series. The series was first aired on Saturday, February 1, 2003 and will continue until the end of March. The segment on the UAV competition is scheduled to appear on March 29, 2003 (at 8:00pm EST).

For more information on WARG, <http://www.ece.uwaterloo.ca/~warg>

For more information about the IARC competition,

<http://avdil.gtri.gatech.edu/AUVS/IARCLaunchPoint.html>

Discovery Channel web site, <http://www.discovery.ca>

Xilinx Professor Workshop

Source: Gilbert Lai

Xilinx is a programmable logic device/system provider. As part of their Xilinx University Program (XUP), they are offering hands-on workshops for professors at universities to introduce the latest programmable logic technologies available. Xilinx will donate a full development system (Value \$3,000 USD) to each workshop attendee. The workshops are free of charge.

The next round of workshops are scheduled in April and May 2003 at McGill University, University of Waterloo and Royal Military College. For more details, please visit

<http://ece.uwaterloo.ca/~praetzel/Xilinx-Course.html>

Student Design Contest

The University of Waterloo Student Chapter has been invited by the IEEE Student Chapter at the Rochester Institute of Technology to participate in their Student Design

Contest. The deadline to enroll in the contest is April 4, 2003. The contest will be held on May 10, 2003. Information has been past to Kevin Ma, Student Chapter. For more information on the contest itself, please visit

<http://www.rit.edu/ieee>

RIM/IEEE BlackBerry Programming Contest

Source: Kevin Ma

This contest was launched on Jan 27th, 2003 concurrently at IEEE Student Branch in University of Waterloo, University of Guelph, and Conestoga College. The registration period ended on Friday, Feb. 7th, 2003.

University of Waterloo got registrations from 23 teams with total of 39 students. The participants range from years 1B to 1st year master level and a variety of facilities and programs. The nice mixture of programs and years will bring a truly amazing result in final submissions as some participants are already claiming their programs will win the top prize, quoting their email: "your contest won't know what hit it". We even received emails from Queen's University's IEEE student members wanting to participate!

Unfortunately, at the time of registration deadline, University of Guelph's chair, Radu, says they are only able to get 3 entrants. We'll follow up on the details and try to understand why their participation level is extremely low despite the size of the university.

The Conestoga secretary Jason assures, they will have at least 10 working final submissions target with a possible number of 12.

Despite the small turnout at UofG and Conestoga, we are still confident that the contest will result in several quality applications submitted.

IEEE Seminar by Dr. Michael Reed - March 3, 2003

Organized by Dr. Arokia Nathan. This is scheduled on March 3, 2003 (Monday) at 11:30am. The title and location for the seminar is to be determined (watch out for announcements).

IEEE Distinguished Lecture Series by Vijay K Arora - March 6, 2003

Invited by Dr. Arokia Nathan. The title of the Lecture is "Hot Electrons: A Myth or Reality?". To be held on March 6, 2003 (Thursday) at 3:00pm in DC-1304 at the University of Waterloo.

Abstract: A review of steady-state electronic transport in a high electric field is given. In particular, expressions for mobility and diffusion-coefficient degradation are obtained in the framework of asymmetric distribution function. The concept of a hot electron and its temperature in a given context is discussed and simple analytical expressions extracted. These contextual definitions include: energy temperature, mobility temperature, Einstein-relation temperature both under ac and dc conditions, quantum temperature, and two-

band intrinsic temperature. The dependence on the electric field is given in each case and the role of electric-field-induced quantum emission is delineated.

IEEE Seminar by Dr. Russell Thompson - March 7, 2003

Organized by Dr. Arokia Nathan. This is scheduled on March 7, 2003 (Friday) at 3:00pm. Title and location of the seminar is to be determined (watch out for announcements).

Business Risk Analysis: Link between Information Security Theory and the Practice

Source: UW ICR selected by C.Hulls

Presenter: Miroslav Kis, Ph.D., CISSP (miroslav.kis@bmo.com) BMO Financial

Date: February 24, 2003 Time: 3:30 p.m. Place: MC 5136

Abstract

Conventional software engineering methodologies barely mention the information security aspect: usually citing it as one of quality attributes of the application. System security specification methodologies, on the other hand, from the practitioner's point of view, are hard to understand and too general to be applied. By following these methodologies and failing to understand the security consequences, we often end up with inadequate application security. The end result is that in theory we have wide range of strong protection mechanisms while in practice we don't know where and how to effectively use them. When should we use encryption, secure hashing, authentication and how strong should the algorithms be? How do we tie information security with the software development process? These are the questions that this presentation will address. An approach based on business risk analysis combined with an architecture-centric, spiral software development cycle is explained.

Prerequisites: Basic understanding of the information security concepts and software development process is assumed. Elementary knowledge of probability and statistical decision theory would be helpful.

Biography

Miroslav Kis is a Certified Information Systems Security Professional and a member of IEEE Computer Society. Dr. Kis is a senior advisor for BMO Financial group and manager of the Strategy and Technology within the Information Security department.

Dr. Kis is coauthor of BSDP, a speech recognition algorithm, and the architect of a speech recognition device developed based on that algorithm. His current research interests include system and software security methodologies, security aspects of software development processes, and biometrics authentication systems' theory and applications.

Please contact Mark Baurer at mbauer@math.uwaterloo.ca for more information.

"Surpass Yourself" - People, Productivity and the Return on Investment

Full Day Conference April 22, 2003

See <http://www.communitech.org/events> for more information.

Alternative Energy Seminars

Source: Claudio Canizares, selected by C. Hulls

Attached is the schedule for a series of seminars starting Wednesday next week in the areas of alternative energy and distributed generation that I think might be of interest to some of you. All are welcome to attend.

Date	Seminar title	Presenter	Session Chairman	Time	Location
Wednesday March 5th, 2003	Renewable Energy Sources Basics and Economic Prospects for the Waterloo Region	K. A. Nigim Department, ECE	Claudio Canizares Department, ECE	3:00 to 4:00	DC 1302
Wednesday Mar. 26th, 2003	Canada Policy Related to Renewable Energy Sources (federal: Kyoto, provincial: electricity).	P. Parker Director, Local Economic Development Program Professor, Department of Geography Faculty of Environmental Studies	Michael Collins Department of Mechanical Engineering	3:00 to 4:00	CPH 3386 *
Wednesday Apr. 30th, 2003	Development of distributed generation in Europe: recent advances and technical challenges	Valery Knyazkin Ph.D. student in the Department of Electric Power Engineering, Division of Electric Power Systems at Royal Institute of Technology. Sweden. Currently visiting Prof. Canizares	P. Parker Department of Geography Faculty of Environmental Studies	3:00 to 4:00	CPH 3388 *
Thursday May. 29, 2003	??/	E. Saadany Department, ECE	M. J. Patterson Faculty of Environmental Studies	3:00 to 4:00	TBA
Thursday Jun. 26,	??/	K. Ponnabalam	M. Kezarani Department,		

2003			ECE		
Thursday Jul. 24, 2003	??/	M. Kezarani Department, ECE	E. Saadany Department, ECE	3:00 to 4:00	TBA
Thursday Aug. 28, 2003	??/	Ian Rowlands Director, Environment and Business Program Faculty of Environmental Studies	K. Ponnbalam		

Congratulations

Engineers triumph in competition

Source: UW Daily Bulletin, selected by C. Hulls

Waterloo students stood out at the 2003 Ontario Engineering Competition (OEC), held February 1,2 at the University of Western Ontario. The undergraduate-level competition has six events, and UW scored in four of them this year.

Systems Design Engineering student Jay Detsky won first place in Explanatory Communications with an exposition of the engineering of real-time magnetic-resonance imaging.

The team of Laura Naismith, Amy LaFrance and Heidi Collins, also of systems design, placed second in Entrepreneurial Design with their "Stimulation and Data Acquisition Interface for Neuromuscular Research". (This was Laura Naismith's third consecutive successful OEC: she placed second in Editorial Communications in 2001, and finished first in that category in 2002, going on to a second-place result at the Canadian Engineering Competition.)

Second-year computer engineering student Sonya Konzak, took third place in Editorial Communications for her views on oil extraction in northern Alberta.

The Parliamentary Debates concerned, among others, resolutions that "science has done more good than bad" and that "engineers should be held responsible for the weapons that they build." Two teams of Waterloo debaters made the semi-finals: Lawrence Lam and Bobby Naini, of second-year computer engineering, tied for third place with James Gannon and Geoff Rawle of systems design.

For more info see: <http://www.engga.uwo.ca/oec/>

Golden Jubilee Medal Recipients

Source: Uw Daily Bulletin

Several people associated with UW are among 46,000 across Canada to receive the Golden Jubilee Medal in the year that's just ended. The medal was issued to celebrate 50 years on the throne for Queen Elizabeth II and to honour "Canadians who have made a significant contribution to their fellow citizens, their community or to Canada".

Medal recipients were suggested by people across Canada and nominated by organizations that ranged from the Red Cross to the Association of Universities and Colleges of Canada, as well as Members of Parliament and provincial governments.

Among the UW people who made the lists:

Bob Harding, Brascan executive and current chair of the board of governors, nominated by the AUCC.

Mike Lazaridis, RIM executive and soon to be the new chancellor of UW, nominated by Telegdi.

Val O'Donovan, industrialist and UW chancellor, nominated by Janko Peric, the MP for Cambridge, where he lives.

[some names deleted as being less relevant to IEEE members]

Medal nominations came from so many sources that I'd be surprised if there aren't other UW-related recipients whose names haven't come to my attention yet.

http://www.gg.ca/honours/golden-jubilee_e.asp

Order of Canada

Congratulations to **Val O'Donovan**, co-founder of Com Dev International for being appointed to the Order of Canada.

Recent Seminars

Space and Time Close Up

Source: Tom East

It was standing room only at the Hauser Haus in the Waterloo Memorial Recreation Complex, when Dr. Fotini Markopoulou Kalamara of the Perimeter Institute gave a public lecture on her work on the universe.

She starts by assuming that there is nothing outside the Universe, that the general theory of relativity applies throughout, and therefore nothing can travel faster than light in a vacuum. The future of any item at an instant therefore lies inside a cone in space-time whose semiangle is the speed of light. Quantum mechanics also applies.

Among the fascinating ideas the speaker put forward was that space-time is not absolutely continuous, but consists of “atoms” whose size is 10^{-35} m and duration 10^{-46} s.

Quantum gravity is a hypothesis waiting for experimental proof. Unfortunately, a laboratory experiment would require an accelerator half the diameter of the earth’s orbit, so physicists have to look outwards for proof. Energy of certain frequencies could be deflected by the “atomic” structure of space-time. The Gamma Ray Space Telescope, due to be operational about 2006, could observe this phenomenon. The speaker suggests that, in the mean time, theoretical physicists should predict the results to be observed.

The Perimeter Institute plans to present a public lecture once a month. For details, see page 6.

Engineers Without Borders Conference

Source: UW Daily Bulletin

More than 300 members of [8]Engineers Without Borders from across Canada, the United States and the United Kingdom arrived at UW Wednesday, January 29 for discussions of the role of technology in international development.

EWB is "a facilitator of student innovation", according to conference co-chairs John Cuddihy and Scott Griffiths, both systems design engineering students at UW. The conference will display 25 research projects and initiatives in the field of international development, specifically focusing on appropriate technology.

There were three days of "provocative speakers, dynamic panel discussions and interactive workshops" on topics that include the environment, gender roles, peace and conflict, education, health, economics, technology, society and culture.

Engineers Without Borders was founded by two Waterloo engineers, and in less than three years has grown to include 20 chapters across Canada, harnessing the creativity and generosity of more than 2,500 engineers. The organization has already sent more than 40 interns to work overseas with developing communities and NGO (Non-Governmental Organization) partners, and begun projects with overseas partners in Cameroon (health and sanitation), the Philippines (IT learning centres), Uganda (education and IT), and more.

Canadian Undergraduate Technology Conference

Source: UW Daily Bulletin Thurs Jan 16, selected by C. Hulls

Exploring the direction of technology was the theme of the 2003 Canadian Undergraduate Technology Conference held at Toronto's Regal Constellation Hotel January 16.

<http://www.cutc.ca> for more details, <http://www.bulletin.uwaterloo.ca/2003/jan16th.html> for summary.

Fourth Year Design Project Symposium

Source: ECE department web page, selected by C.Hulls

The fourth year design projects are a requirement in many engineering programs. Student groups develop projects in a variety of areas. This year includes: Cool Pool, a billiards recording and playback system, and an autonomous robot that searches for and extinguishes fires.

2003 Fourth Year Design Project Open House, Jan 22

<http://www.ece.uwaterloo.ca/fydps.html>

2003 Fourth Year Design Project Symposium

<http://www.ece.uwaterloo.ca/4SymPgm.html>

Biomedical Image Analysis

Source: Dr. Mohamed Kamel

KW-IEEE Joint Chapter of Signal Processing/Neural Networks/ Computer Societies and the Department of Systems Design Engineering Presented:

Prof. Aurélio Campilho January 27, 2003

Biomedical images give information of pathological status, function and shape of tissues and organs of human body, being one of the most important mean for a medical doctor establish a diagnosis.

Image processing techniques offer new capabilities for diagnosis, including: quantitative measurements, of several image parameters; change detection among images acquired in different instants; data fusion, among different imaging modalities; image comparisons useful for studying a particular pathology or for indexing an image database; movement characterization of human organs and articulations; data visualization of volumes and dynamic scenes.

In this talk some biomedical image analysis methodologies will be presented, namely for image segmentation, registration, characterization and motion analysis. Applications in Biology, Oncology, Ophthalmology and Radiology was illustrated.

News From Academia

Wireless Revolutions, Perspective and Challenges

More than 80 people attended this talk, given on January 31.

Dr. Wen Tong, Nortel Networks Wireless Technology Labs presented the view of current and future wireless internet from the technology development perspective. A brief review of the fundamentals and enabling technologies was followed by a focus on the primary drivers that shaped the wireless revolution. The talk also presented Nortel Wireless

Technology Laboratory's development of key technologies for Future Wireless Systems ranging from the air interface through to the network. Indications will be given of performance levels that might realistically be achieved with such designs.

Conestoga College Earns Institute of Tech. and Advanced Learning Designation

Source: Conestoga College News release

Kitchener, ON – February 10, 2003 - Conestoga College has been designated an Institute of Technology and Advanced Learning (ITAL) by the provincial government, as announced today at the Doon campus of the College by the Hon. Dianne Cunningham, Minister of Training, Colleges and Universities. This designation allows Conestoga College to offer new and expanded programs, an important part of the College's strategy to help meet the community's increasing demand for skilled labour.

ITALs can offer up to 15 per cent of the programs as applied degrees in addition to bridging courses that enable diploma and certificate holders to earn degree designations in their areas of study. "Conestoga is a leader in the provincial college system. We have a record of exceptional programming and academic excellence, and a reputation for outstanding service, both to our student body and the local area," says Dr. John Tibbits, Conestoga College president. "The ITAL designation reflects this success and enables us to continue to meet this community's unique education and training needs."

ITAL designations are another government step in differentiating institutions within the College system, in response to evolving post-secondary education needs. In 2002, the provincial government launched an assessment program for applied degrees at Ontario colleges. Conestoga College is one of only three colleges in the province to receive approval for the maximum number of applied degrees per college in each assessment round – two last March and two more in November. "To continue to fuel community prosperity we must be able to increase both the quantity and quality of skilled labour we produce. As an ITAL we will be able to reach these goals through expanded programming and innovative course offerings," says Tibbits.

The Economic and Social Value of Conestoga College, a study recently published by Essential Economics Corporation, revealed that more than 40 per cent of the local labour force has been trained by Conestoga College. Additionally, through Continuing education activities alone, Conestoga College helps upgrade the skills of an estimated 36 per cent of the local labour force. The College also offers more Training and Development opportunities customized for local employers than any other local educational institution. "Conestoga College plays a critical role in our ability to compete globally," says Klaus Woerner, President and CEO of ATS Automation Tooling Systems. "Conestoga students graduate with a combination of skill, competency and commitment. We are pleased to hire many of these graduates every year. In addition, the College provides ongoing skills upgrades to our workforce through seminars and workshops, helping us ensure our skills base remains on the leading edge of technology. The ITAL designation is exciting news not only for the College but also local business, industry and every member of the community."

Conestoga College Graduate Survey

Source: KW Record 18Feb, selected by Tom East

Conestoga College did well in a survey of 24 colleges by the government of Ontario. 46820 graduates were queried, 35033 replied. 8000 employers were queried. 92.4 % of graduates were working after 6 months, 84.1% said they were satisfied with their training. In employer satisfaction, Conestoga came 7th at 93.1% approval.

Speed of Gravity

Source: Tom East

Until now, it has never been clear whether the gravitational influence of a large mass is felt simultaneously throughout the universe, or whether it travels at a finite speed, as does light. Recently, Sergei Kopeikin of the University of Missouri-Columbia has reported the result of an experiment carried out using a combination of four radio telescopes spread out over the earth, to achieve very fine angular resolution. Signals from a distant quasar appeared to change direction as the planet Jupiter moved in its orbit. Calculations with an accuracy of +/- 20%, showed that the gravity "waves" from Jupiter propagated at 1.06 times the speed of light, making the speed of light a possible value. More accurate measurements with more radio telescopes are planned.

New Prime Algorithm

Source: Computer magazine Oct 2002 p 28. selected by Tom East

Prof Manindra Agrawal and students Neeraj Kayal and Nirin Saxena of the Indian Institute of Technology in Kanpur claim to have designed an algorithm that lets computers prove reliably that a number is a prime. Prime numbers are at the heart of encryption keys such as RSA. Other tests for primes are almost but not quite perfect. The new algorithm is claimed to be perfect, but unfortunately may be too slow to be of practical value.

See "Primes is in P". <http://www.cse.iitk.ac.in/news/primality>.

News From Industry

Research in Motion

is supplying the New York City fire department with an unspecified number of BlackBerry email pagers. "it adds an additional option for us in times of catastrophe or even in day to day operations"

City of Cambridge

had a major power outage January 31 possibly caused by a buildup of salt on a transformer station.

ATS Automation Tooling Systems

New subsidiary Spheral Solar Power expects to move into its new building this summer and start production in the fall. Spheral's solar cells consist of tiny silicon spheres glued between thin aluminum layers making them flexible enough to be applied to almost any surface.

Research and Technology Park

University of Waterloo's Research and Technology Park (<http://www.rtpark.uwaterloo.ca>) is in progress with Sysbase subsidiary iAnywhere expecting to be in place for spring 2004.

International Internet Usage

Source: The Economist 4 Jan 2003 p 45, selected by Tom and Isabel East

Country	Percentages of population	
	with Internet access	Use e-government services
USA	62	36
Canada	56	45
Britain	49	10
Japan	41	17
Germany	40	18
Italy	32	29
France	27	18

e-Solutions Data Centre

Source: Tom East

This Waterloo company keeps sensitive computer data for clients in a secure facility, with its own power generator, batteries and fire suppression system. It is a division of Conestoga Rovers and is in partnership with FibreTech Telecommunications Inc., the network set up by local hydro companies.

Alternative Energy

Zenn electric car

The Zero-Emission, No Noise car produced by Feel Good Cars (www.feelgoodcars.com) may be approved for use in Quebec as early as 2004.

Windpower in Toronto

The new wind powered turbine is in place and providing power to the electrical grid. For more information see (www.trec.on.ca/windshare)

Nuclear Fusion

Source: Tom East

One alternative to hydro, fossil fuels and nuclear fission (as in conventional reactors) is nuclear fusion. There are two approaches to obtaining energy by combining isotopes of hydrogen to make helium. One is "inertial confinement", applying extreme pressure by an array of high power lasers: this was the preferred method in the USA for a number of years, but seems to have been abandoned. The other uses a plasma confined in a "magnetic bottle", typically a doughnut shape known as a Tokamak Hydro Quebec had a

small Tokamak at Varennes which would run for a fraction of a second, but has decommissioned it.

The February 1992 issue of this newsletter contained a description of the state of development at the time. A large Tokamak in Britain had run for several seconds. An agreement had been reached to form a consortium to build the International Thermonuclear Experimental Reactor (ITER). This would be so large an equipment that the members of the consortium would be the United States, the Soviet Union, Europe and Japan. The reactor would exceed the break-even point where it produced more energy than it consumed, but even at this size, it would not reach the economical break-even point. It would be used to get data to design the next size up which would become profitable. Canada would be part of the European team.

It was originally agreed that the ITER would not be built in the US nor in the Soviet Union: it was hoped that cities elsewhere would bid for it like they do for the Olympics. Factors would be: available cooling water and land, a strong transmission line and a city attractive to high tech workers. The Bruce nuclear facility had been proposed.

Our October 1997 issue contained an update: since the collapse of the Soviet Union, Russia had dropped out, and the US had scaled back its involvement. However in his State of the Union address in January this year, President Bush said he will propose to the Congress more funding for ITER.

Another proposal by President Bush was \$1.2B in new money for development of hydrogen fuel infrastructure and fuel cells for transportation (apparently leapfrogging over hybrid gas-electric cars). Honda and Toyota have leased fuel cell cars, but it will be many years before they will be in local showrooms.

Engineering Humor

Truth in Meeting Minutes

Source: Tom East

The discussion at the meeting was so disorganized that the secretary gave up in disgust and put in the minutes: “Half the board are idiots”

At the next meeting, the board took exception and insisted the minutes be changed. The secretary issued revised minutes, which said: “Half the board are not idiots”.

The Mobile Cake

Source: Tom East

The Master of Ceremonies of a forklift truck manufacturers’ conference was checking preparations for the banquet when he found the chef assembling the giant cake in the middle of the dining room. “No – no!” he said, “make the cake in the kitchen. We want to bring it in to the dining room on a forklift truck”. The chef protested that the cake would collapse when picked up. The MC suggested he bake a hard crust on the bottom. “My cake is not forkliftable!” said the chef. The MC chased around and got a wooden pallet, and the chef assembled the cake on it in the kitchen.

At the end of the dinner, a forklift truck picked up the cake on the pallet and brought it in for the guests, who applauded. After they had departed, the chef asked the MC “How was the cake?” “That was a great show” replied the MC. “Yes, but how did it taste?” asked the chef. The MC replied “It was palatable”.