



IEEE NEWSLETTER KITCHENER - WATERLOO SECTION



January 1994

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Contents

Meetings

January 25	Mowbray and Vyas on Safety and EMC for Europe	page 2
February 22	Davison on Control of Third Generation Spacecraft: An Overview	page 2
March 8	Student Papers Night	page 2
March 29	Rafaat Mansour on High Temperature Superconductors for Satellite Payloads	page 2 & 3

Feature Articles

Merger With CSECE	page 3
Conferences in Canada - 1994	page 3
CANARIE is Alive and Well	page 3
Draft Metric Policy for IEEE	page 3 & 4
UW Team Wins Battle of Waterloo	page 4
Deadlines for Award Applications	page 4
Government Software Standards	page 4
Copy-Shop Charged Over Course Material	page 4
Watcom and Maple in the News	page 4 & 5
Proceedings of the IEEE	page 4 & 5
One Billion Dollar Software Contract	page 5
MEDRISK - Data Base on Medical Devices	page 5
Weather Maps on Your PC	page 5
Software - A Mixed Blessing	page 5
High Voltage Powerline Health Risk Again?	page 5

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.

MOWBRAY AND VYAS ON SAFETY AND EMC FOR EUROPE

Time: 7:00 p.m. Tuesday, Jan. 25th, 1994

Place: University of Waterloo Davis Center, Rm. DC 1304

Speakers: John Mowbray and Arvind Vyas, NCR

Subject: Safety and Electromagnetic Compatibility Requirements for Europe

Dinner: Meet the speakers for dinner at 5:30 p.m. Phone Professor Jayaram @ 885-1211 ext. 5337 for reservation by January 18.

Speakers: John Mowbray is a Professional Engineer and a Senior Member of the IEEE who graduated from the University of Waterloo with a BSc (1972) and MSc (1978). He has experience in most phases of product design, and has for the past 5 years worked directly in the field of EMC Compliance at NCR.

Arvind Vyas is a Professional Engineer and a member of the IEEE who received his BSEE from Gujarat University in India and his MSEE from the Florida Institute of Technology. He has experience in most phases of product design, and for the last 9 years has been the Product Safety Engineer for NCR.

Subject: This presentation attempts to summarize the requirements for marketing electrical products in the European Community. It begins with an overview of the present European Community, and progresses into a discussion of the various compliance requirements. It continues with the various routes that are available to a manufacturer for achieving the required compliance and the right to attach the required "CE" Marking. The discussion will also include a reference to the potential losses related to non-compliance.

DAVISON ON CONTROL OF THIRD GENERATION SPACECRAFT: An Overview

Time: 5:30 p.m., Tuesday, February 22nd, 1994

Place: University of Waterloo Davis Center, Rm. DC 1304

Speaker: E.J. Davison

Subject: Control of Third Generation Spacecraft: An Overview

Dinner: Meet the speaker for dinner after the presentation. Phone Professor Jayaram @ 885-1211 ext. 5337 for reservation by February 15.

Speaker: Edward J. Davison received the Ph.D. and Sc.D. degrees from Cambridge University, Cambridge, England in 1964 and 1977, respectively. At present he is a Professor of Electrical and Computer Engineering at the University of Toronto in the Systems Control Group.

Dr. Davison has received several awards including the E.W.R. Steacie Memorial Fellowship, The Canada Council Killam Research Fellowship, several IEEE Transaction on Automatic Control Outstanding Paper Awards, and a Current Contents Classic Paper Citation Award. He is a fellow of the IEEE, the Royal Society of Canada, and an Honorary Professor of Beijing Institute of Aeronautics and Astronautics. He has served in

numerous positions in the IEEE Control Systems Society, including President in 1983 and Consulting Editor of the IEEE Trans. on Automatic Control in 1985. He has served as Chairman of the IFAC Theory Committee, Vice-Chairman of the IFAC Technical Board and presently is a member of the IFAC Council. He is a designated Consulting Engineer in the province of Ontario since 1979. Recently he has received the Quazza Medal from the IFAC.

Subject: The control of third generation spacecraft as modelled by the MSAT configuration is considered in this talk. Third generation spacecraft have the properties of being:

- a) highly flexible
- b) highly unsymmetric
- c) non-collocated sensors/actuators

and so the problem of effective control is quite challenging. In particular, it is desired to find a controller, based on a relatively crude model of MSAT, which solves the following problems, when applied to an unspecified evaluation model of MSAT:

- # Attitude control
- # Shape control
- # Stabilization
- # Station Keeping
- # Decentralized control constraint

The talk gives an overview of results obtained when designing controllers to solve the above problem.

STUDENT PAPERS NIGHT - MARCH 8th

Presented by: K-W Section: Student Branch A, University of Waterloo and Student Branch, Conestoga College.

Time: 7:00 p.m., Tuesday, March 8, 1994

Place: University of Waterloo Davis Center, Rm. 1302

You are cordially invited to the annual Student Papers Night.

Students from Conestoga College and/or the University of Waterloo will deliver oral presentations of their technical papers. The best paper from the College is awarded the Ken McKenzie Award and the best paper from the University receives the George Dufault Award: the awards include cash prizes.

Refreshments will be provided.

RAFAAT MANSOUR ON HIGH TEMPERATURE SUPERCONDUCTORS FOR SATELLITE PAYLOADS

Time: 5:30 p.m., Tuesday, March 29th, 1994.

Place: University of Waterloo Davis Center, Rm. 1304

Speaker: Dr. R.R. Mansour, COM DEV Ltd.

Subject: High Temperature Superconductors for Satellite Payloads

Dinner: Meet the speaker after the presentation. Phone Professor Jayaram @885-1211 ext. 5337 for reservation by March 22.

Speaker: Dr. Rafaat Mansour received the BSc (EE) in 1977 and MSc in 1981 from Ain Shams University, Cairo and PhD in 1986 from the University of Waterloo. Since then, he has been with COM DEV Ltd., Cambridge where he is a Senior Member of technical staff. His present research interests are in analysis and design of microwave and millimeter-wave integrated circuits.

Dr. Mansour received the 1987 UW Engineering Award for outstanding achievement, and NSERC Fellowship in 1987. He is on the Editorial Board of the IEEE Transactions on Microwave Theory and Techniques.

Subject: The Nobel-prize winning discovery of high temperature superconductors allows the use of much smaller and less expensive cooling systems. The HTS technology offers potential major breakthroughs in performance of microwave and millimetre-wave components and sub-systems of light weight and small volume for space-based systems.

The Naval Research Lab in the USA has an ongoing program known as high temperature superconductivity space experiment (HTSSE) to demonstrate the viability of HTS devices and systems in space. The initial experiment (HTSSE-1) is scheduled for launch in an experimental satellite in 1994. The second experiment (HTSSE-2) is scheduled for launch in 1996. COM DEV is currently developing a superconducting four channel C-band input multiplexer, which replicates the requirements of a typical commercial satellite program, for integration into the HTSSE-2 experimental satellite.

The presentation will cover:

1. Applications and history of HTS.
2. Overview of the HTSSE program.
3. Advances to date in the development of superconductive microwave devices.

MERGER WITH CSECE

In the Fall 1993 issue of IEEE Canadian Review (pages 5-7), you were invited to vote by postal ballot on a proposed merger between Region 7 of IEEE (which covers the whole of Canada) and the Canadian Society for Electrical and Computer Engineering. The deadline for this referendum is being extended (it was November 15), so there is a good chance that if you send your ballot in now, your vote will be counted (but not if you are a student member).

It's easy - find IEEE Canadian Review no. 17, tear out or copy page 7, fill in your membership number, sign it and mail it.

The CSECE held a vote on the merger at a Special General Meeting on November 6 and the result was strongly in favour.

CONFERENCES IN CANADA 1994

April 13-14: AFCEA Canada 94 (Armed Forces Communications and Electronics Association)
Ottawa 613-594-8788.

May 16-24: CAST 94 Fourth International Workshop on Computer Aided Systems Technology.
Ottawa, T.I. Oren 613-564-5068.

June 26-29: IEEE/SP 7th Workshop on Statistical Signal and Array Processing. Quebec, D. Gingras 418-657-7006.

August 7-10: 4th IEEE Workshop on Computers in Power Electronics. Trois-Rivieres, Quebec. A. Skorek 819-376-5071 ext. 3929.

September 25-28 Canadian Conference on Electrical and Computer Engineering. Halifax N.S., E.S. Strachan 506-632-6900 (Call for papers deadline - March 30 - C.R. Baird 902-420-7717).

September 28-30 IPCC 94 IEEE International Professional Communication Conference. Banff, Alberta. P.R. Kostur 306-777-2894. (Call for papers deadline - January 31 - D.K. Farkas 206-685-8659).

Oct. 30 - Nov. 2: INTELEC 94 IEEE International Telecommunications Energy Conference. Vancouver. E. Parker 514-639-3030.

CANARIE IS ALIVE AND WELL

The Canadian Network for the Advancement of Research, Industry and Education is a planned data network using fibre optics and satellites to carry video, sound, images and data across Canada. A new head was appointed in October - Andrew Bjerring of the University of Western Ontario.

CANARIE is intended to be another in a succession of historic projects to bind Canada together following the Canadian Pacific Railway, the Trans-Canada Highway, the microwave relay network and the Anik series of satellites.

DRAFT METRIC POLICY FOR IEEE

The IEEE Committee on Metric Policy has issued a Draft Statement as follows:

"The IEEE will:

1. Actively support the use of the SI metric system in electrical and electronics engineering.
2. Use SI units exclusively to express measured and calculated values of quantity in all IEEE publications, including standards. With respect to existing standards, this policy shall take effect with the next revision; with respect to other publications, no later than January 1, 1995
3. Use the current issue of IEEE Standard 268.
4. Promote the use of SI in education at all levels.

* It is recognized that certain exceptions to this policy will be necessary (e.g. where a conflicting world industry practice exists). These exceptions must be evaluated and approved by the appropriate Institute Board on an individual basis, and for a specific period of time, and reported to the Board of Directors."

Apparently established trade sizes such as American Wire Gage will not be translated into metric.

The name SI comes from the French, "Systeme Internationale". This system is based on the metre, kilogram and second. Other units include newton, watt, joule, volt, ampere and weber. Multiples such as giga, mega, kilo, milli, micro, nano, pico and femto are used.

Useful tables of metric units and conversion factors are contained in section 3 of SAMS Reference Data for Engineers: Radio, Electronics, Computer and Communications.

The IEEE is a "trans-national" organization but is still largely based in the USA. According to IEEE Computer magazine, the USA, Myanmar (Burma) and Liberia are the only countries in the world which have not yet adopted the metric system.

UW TEAM WINS BATTLE OF WATERLOO

A University of Waterloo team consisting of students Seiji Ando, Ka Ping Yee and Ian Goldberg beat 74 other teams from the eastern parts of Canada and the US, in a computer programming competition held at UW. The event was a regional competition of the International Collegiate Programming Contest of the Association of Computing Machinery.

The winning team, and a team from Michigan University who came in second, will compete next year in the final competition in Arizona.

DEADLINES FOR AWARD APPLICATIONS

In the near future are deadlines for the following awards:

- January 8: Stentor Telecom Award - \$5,000 - University/Industry Collaborative Research in Canada.
- January 15: IEEE Fortescue Fellowship - \$24,000 - Outstanding Student Entering Graduate Studies
- February 15: IEEE Canada Student McNaughton Scholarship - Final year tuition fees - Involvement in McNaughton Center
- February 28: IEEE Outstanding Student Branch Counsellor - Certificate & \$500 - Nominated by students.
- March 1: Power Engineering Society Outstanding Power Engineering Educator Award - PES member who is tenure track or tenured faculty.
- March 31: IEEE RAB Wilson Award - Plaque & 3 years IEEE membership - Extraordinary accomplishment in student activity.

For more details, contact Professor S. Jayaram, Department of Electrical and Computer Engineering, University of Waterloo, 200 University Ave. W., Waterloo, Ontario, N2L 3G1, or phone 885-1211 ext. 5337.

GOVERNMENT SOFTWARE STANDARDS

Anyone selling certain kinds of software to the Canadian Government will have to meet International Standards Organization standards. ISO 9001 and ISO 9001-3 apply to commercial, real-time and safety-critical software. ISO 9126, concerned with software quality measurement, may also apply.

Just because a company does not sell directly to the government does not mean that they are not impacted: if their software is to be embedded in someone else's product which is sold to the government, the same standards will apply. Software exported overseas may run up against the same situation.

COPY-SHOP CHARGED OVER COURSE MATERIAL

A photocopying service in Ottawa which printed course materials for professors at the University of Ottawa was charged by the RCMP under the Copyright Act. The penalty could be 6 months in jail and/or a \$25,000 fine.

This could have been avoided by obtaining a license from Cancopy. The license fees go to pay royalties to publishers and authors.

WATCOM AND MAPLE IN THE NEWS

Waterloo Maple Software Inc. has announced that it has purchased California based Prescience Corp., a developer of math software.

Powersoft Corp. of Burlington, Mass. has signed a tentative deal to acquire Watcom International of Waterloo, Ontario. It is said that this will allow Watcom to retain its identity, to continue to develop products under its own name and to grow even more rapidly. The two companies had been collaborating on projects earlier. At present, Watcom has about 85 employees, Powersoft about 230.

Waterloo Maple Software Inc. and Watcom Inc. have licensed their software to the Ministry of Education in Ontario for the use of high schools. Math students will be able to use Maple V: this Waterloo developed software is already in use in German schools and in Canadian and U.S. universities. High school students are already using Watcom programs such as Watfile and Infobench.

PROCEEDINGS OF THE IEEE

Members can subscribe to the Proceedings of the IEEE, a prestigious monthly journal, for \$21 U.S. per year. Some months, it takes the form of a Special Issue with all articles devoted to one topic. Other months, there is a group of articles on one topic in a Special Section.

Some of the topics to be covered in 1994 in special issues, special sections and invited papers are:

Real time systems
Antennas and radiotelescopes for deep space
Consumer electronics
The Hartley transform
Data compaction
Power electronics and motion control
Wireless networks for mobile and personal communications
Non-linear phenomena in power systems: theory and practical implications
Optical computing systems

The Proceedings is also introducing a new kind of paper, "a visionary tutorial": subjects to be covered include testing finite state machines and hardware-software codesign of embedded systems.

For information about subscribing, call 800-678-IEEE or 908-981-1393, or write to Proceedings of IEEE, 445 Hoes Lane, P.O. Box 1331, Piscataway, N.J. 08855-1331, USA.

ONE BILLION DOLLAR SOFTWARE CONTRACT

Canada Post Corporation has signed a ten year contract worth \$1B with SHL Systemhouse Inc., an Ottawa company. Among other things, SHL is to take over management of the post office computer network, which records data on mail volumes, bills customers and keeps track of packages: the system, which presently uses two mainframes, will be converted to a more distributed "client-server" system. Delivery trucks will be in touch by satellite.

SHL will also be involved in the growth of Canada Post's electronic mail business.

MEDRISK - DATA BASE ON MEDICAL DEVICES

If you wear contact lenses or have had a heart valve or pacemaker installed, you will be glad to know that all 500,000 brand-name medical devices are controlled by the Bureau of Radiation and Medical Devices, a part of Health Canada.

Before any such device is allowed to be sold, the manufacturer must submit evidence of its safety and efficacy. Then BRMD staff must get up to speed on this particular subject, using information retrieval, and evaluate the evidence.

Price Waterhouse Management Consultants in Toronto, together with BRMD have developed a knowledge based system called MEDRISK to handle all this data. MEDRISK was claimed to be far ahead of efforts in other countries at a conference in 1991. Under a new contract, Price Waterhouse is working with BRMD on an expanded user-friendly program.

WEATHER MAPS ON YOUR PC

The Canadian Atmospheric Environment Service (AES) uses the Anik D satellite to broadcast various kinds of weather forecasts, and several weather maps at regular intervals. They can be received on an Anikon 100 receiver.

Now, with WxBase software from EDM Systems Ltd., you can display these signals on your own personal computer. Phone 613-592-6874 for information.

SOFTWARE - A MIXED BLESSING

It is a small indication of the state of the art that the majority of the articles in this newsletter are about software. It is well to remember that not only our calculations, our correspondence, our business affairs but even our lives can be entrusted to software.

The July 1993 edition of the IEEE Computer Magazine contains a long article about Therac-25, a medical electron accelerator, which allegedly caused massive, fatal overdoses to patients. Mechanical interlocks to prevent incorrect doses in earlier designs had been replaced by software interlocks, which apparently failed.

HIGH VOLTAGE POWERLINE HEALTH RISK AGAIN?

A recent issue of the Lancet, a prestigious medical journal, contains a letter describing conclusions from the combined results of studies in three Scandinavian countries. Indications are that children who live close to power lines and generators have twice the risk of leukemia and may also be risking other diseases.