

IEEE NORTHERN CANADA SECTION
NEWSLETTER
2008 SEP
Next Section Meeting Oct 9



IAS/PES EMBS CCSSC GOLD WIE

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...For Those Who Desire To Continue Advancing

IEEE knows where industry is flourishing.

2008 IEEE Industry Applications Society
Annual Meeting

October 5-9, 2008

Edmonton, Alberta, Canada

UPCOMING EVENTS

Technical Program

There will be 61 technical sessions on Monday-Thursday, October 6-9.

A schedule for the technical program can be viewed by clicking on the link below.

<http://www.ewh.ieee.org/soc/ias/2008/>

Tutorials will be held on Sunday, October 5

Tutorial #1 - Full Day - Sunday

More than Arc Flash - Designing and Implementing a State of the Art Electrical Safety Program

Organizer: H. Landis Floyd II, PE, Principal Consultant, Electrical Safety and Technology, Du Pont

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Abstract: This tutorial will use ANSI Z10-2005, Occupational Safety & Health Managing Systems as the framework for benchmarking existing programs and for designing and implementing a state of the art electrical safety program. It will incorporate the requirements of NFPA70E-2004, Standard for Workplace Electrical Safety and other recognized industry standards to achieve a comprehensive program based on proven safety management principles. The attendee will be provided the knowledge and tools to assess existing programs, identify improvement opportunities, and develop implementation plans.

Tutorial #2 - Full Day - Sunday

Large (>500HP) VFD applications

Organizer: Frank DeWinter, Business Manager, Large Drives and Mechanical Drives, Siemens Canada Limited

Abstract: TBD

Tutorial #3 - Half Day - Sunday A.M.

Global Stability Methodology for Switching Power Converters

Organizer: Dr. Sudip K. Mazumder, Associate Professor, Department of Electrical and Computer Engineering, University of Illinois

Abstract: Optimal compromise between stability margin and performance of switching power converters (SPCs) is an ongoing challenge. It has now attained newer heights due to traditional applications such as VRMs/POL converters that are of-late demanding significant performance improvements and due to newer DPS/network applications (ranging from Microgrids and FutureGens based on Alternative Energy Sources, More-Electric-Aircrafts (MEA) for aerospace applications, to Advanced Naval Electric Power Systems (AEPS) for electric ships), which demand performance and stability, not only for individual converters but for the network as a whole.

The obvious question is why are traditional approaches based primarily on averaged models alone not enough? This is because linear/nonlinear averaged model cannot account for the "global dynamics" of a SPC/SPC network and is limited to averaged dynamics under "periodic switching conditions". Hence, the associated stability tools and control techniques are limited in their capabilities as well. Thus, there is need for a *generalized approach* that is powerful enough to account for the global dynamics of standalone/integrated/networked SPCs under saturated, quasi-saturated and unsaturated (periodic switching) operating conditions.

Based on the *research advancements made in the last decade, including recent breakthroughs by the author* (outlined under Section C.2), the author will delineate (using fundamental concepts and several practical applications) this generalized global stability approach, how it can integrate existing averaged model concepts as well as methodologies based on nonlinear maps, and how it can lead to advanced hybrid and distributed controllers. Specifically, the focus of the tutorial will be on two key areas:

Reaching condition analyzes: The first part of the tutorial focuses on concepts and methodologies to investigate the dynamics of the SPCs (ranging from basic to integrated as well as complex homogeneous and heterogeneous networked converters) in the saturated and quasi-saturated conditions. The resultant analytically simple but extremely powerful conditions predict transient stability of the system and its orbital existence (i.e., convergence of error/state trajectories from arbitrary initial conditions to equilibrium).

Equilibrium Stability: The second part of the tutorial focuses on the steady-state stability (asymptotic as well as bounded) of a SPC once its state trajectories have reached equilibrium/near-equilibrium operating condition. Using advanced bifurcation analysis methods based on nonlinear maps, first of all, simple analytical criterion will be developed for equilibrium stability. Subsequently, an assessment will be made regarding the predictions of these new nonlinear techniques as compared to those predicted by nonlinear averaged models as well as more traditional small-signal analyzes methodologies based on linearized averaged models.

Tutorial #4 - Half Day - Sunday P.M.

Application-Driven Design and Control of Brushless Permanent Magnet Motors

Organizer: Dr. M. Abolhassani, Staff Research Engineer, TECO-Westinghouse Motor Company


Abstract: The increase rate of depletion of fossil energy resources on one hand and growing energy cost and demand on the other hand has initiated considerable research activities worldwide to explore means for tapping into high efficiency motor/drive technologies. Replacing DC machines and induction machines with permanent magnet (PM) machines has recently gained great interest in appliance, automotive, medical, aerospace and military industries.

The advent of high quality, high coercivity, high energy product (40MGO), and high temperature grade (180 C) NdFeB permanent magnet material is the driving force behind the wide-spread use of PM motors in one industrial sector after another. Permanent magnet excitation is current-free and lossless, enabling PM motors to rank as the motor with highest efficiency and power density (kW/kg) as compared to other electric motors.

Despite crystal advantages, some large industries, while being rather conservative and inclined to cling to technologies that seem to have worked in the past, have had rather slow gain in wide acceptance of PM motors. One of the major contributing factors is the fact that adopting PM motors in industrial driven applications that demand their own unique requirements, needs its special design rules and control methods that are far less well developed and limited in their availability compared to those for DC and induction motors.

Recognizing this situation, this tutorial has been organized to address the state-of-the-art of application-oriented practical key issues in the areas of design, analysis, and drive control methods of PM machines. In this tutorial, design requirements and analysis approaches of combined motor and drive system in a wide variety of applications in home appliances, automotive, aerospace, and industry use have been carefully developed and practical and manufacturing issues are discussed. Also, practical implementation of digital control method of sensored and sensorless variable speed PM motor drives are offered. It is believed that this represents a special

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opportunity for engineers in industry and academia to receive a comprehensive review of the application oriented design rules and control methods of this intriguing PM brushless motors and drives systems
Conference registration fees (U.S. Dollars)

Full Conference Registration	After August 31, 2008
Members, IAS or IEEJ/AIE – Registered at conference hotel	\$ 695
Members, IEEE – Registered at conference hotel	\$ 745
Non-IEEE members – Registered at conference hotel	\$ 995
Members, IAS or IEEJ/AIE – Not registered at conference hotel	\$ 1000
Members, IEEE – Not registered at conference hotel	\$ 1050
Non-IEEE members – Not registered at conference hotel	\$ 1300
Life Member	\$ 370
Students	\$ 375
One Day Conference Registration	After August 31 2008
Members, IAS or IEEJ/AIE	\$ 475
Members, IEEE	\$ 525
Non-IEEE members	\$ 600

IAS Electrical Safety, Technical and Mega Projects Conference

On November 19-21, 2008, the third annual Electrical Safety, Technical and Mega Projects conference will take place in Edmonton, Alberta at the Mayfield Inn. IEEE Canada is a sponsor of this conference and it is an excellent service to our members particularly those working in the industry. Detailed information can be found by visiting the websites accessible from: <http://www.ieee.org/estmp>



Edmonton, Nov. 19-21, 2008

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The 2nd annual WISEST, Women in Scholarship Engineering Science and Technology, Golf Tournament to raise money for their Summer Research Program took place on July 24th, 2008. It featured the first annual silent auction which was organized by the IEEE NCS WIE. Many thanks go out to all who helped out and donated items. The auction raised over \$3500 to help fund grade 11 students to do research with professors at the University of Alberta. The program gives students an opportunity to do research in a field where they are underrepresented.

The IEEE was also featured and promoted at one of the holes on the course, where participants were challenged to a test off WiTS --- a quiz about Women in Technology and Science. Many were surprised to learn that, in 2007, only 22% of Bachelors degrees from the Faculty of Engineering at the University of Alberta were awarded to women. A figure only slightly higher than the North American average of 18%.



THE KEY STAFF



THE VOLUNTEERS



MOONEY SHERMANN ACTING!!!



AUCTION ITEMS DONATED BY LOCAL INDUSTRIES AND GENEROUS DONNERS

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WOMEN IN DRIVERS' SEAT-

WISEST OFFICE FOR THE DAY



Congratulations to Shauna Rae from all IEEE members. She & her Baby Vela are doing well and enjoying the time. IEEE members balance life and work very well.

STUDENT CHAPTER

University of Alberta - IEEE Student Branch Networking SuperSession will bring students and industry together at the University of Alberta Friday, November 21st, 2008. Business casual networking will be accompanied by an orchestra of flavours assembled by professionals. Reserve your spot and sponsorship today and help us bring knowledge From Theory to Practice.



IEEE NORTHERN CANADA SECTION

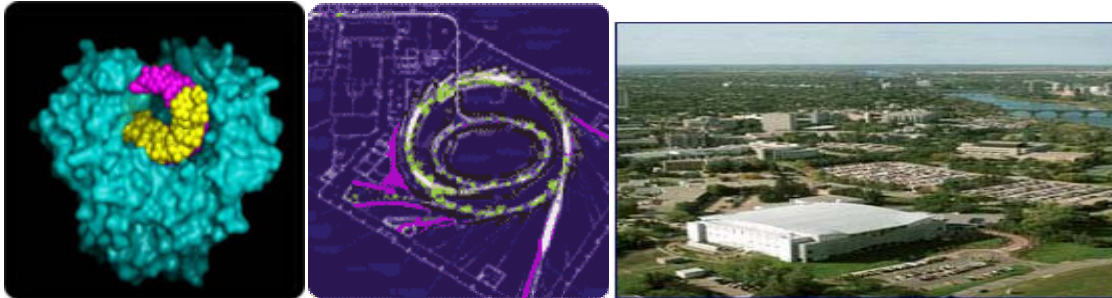
**CHRISTMAS PARTY – DEC 4th 2008, Time: 6 pm,
 Location: German Canadian Cultural Association**



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Synchrotron Visit



IEEE NCS GOLD VISITS SASKATOON SYNCHROTRON

Three members of the Northern Canada Section joined seven members of the North Saskatchewan Section for a tour of the Canadian Light Source (CLS) synchrotron in Saskatoon, Monday September 15, 2008. CLS staff led an extremely informative and interesting tour of the facility. The synchrotron accelerates a beam of electrons to 99.999687% the speed of light and then wiggles the beam precisely so the charged particles throw off extremely intense radiation at very specific frequencies. The radiation ranges from low-infrared light to X-Rays, and is used for an enormous range of scientific investigation, including studies of construction materials, drug interactions, and protein. Visit the CLS website at <http://www.lightsource.ca> for more information.

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2008 Section congress - Quebec ... IEEE is considering lot of new initiatives to serve the members

- Library download access for limited articles for each member
- Financial products for regions 7 to 10.
- Region 7 to shortly get Auto-Home & Financial advantage products
- VTOOLS for section & chapters smooth running and accounting functions
- Membership development
- Canadian Concentration banking program- for sections and chapters
- New Technology connections visit www.ieee.org/go/emergingtech
- Assistance from IEEE Contact Center to clarify items of interest go to www.ieee.org/contactcenter
- Promotional contents for students with big prizes
- Lot of Networking opportunities thru' affinity groups

IEEE SECTION CONGRESS AWARDS

Congratulations to the Canadians among 2008 IEEE Award Winners

2008 IEEE Charles Proteus Steinmetz Award (sponsored by the IEEE Standards Association) awarded to **Roy Billinton**.

2008 IEEE Kiyoo Tomiyasu Award (sponsored by Kiyoo Tomiyasu Fund, IEEE Geoscience & Remote Sensing Society and IEEE Microwave Theory and Techniques Society) awarded to **George V. Eleftheriades**.

Congratulations to the Canadians among IEEE Fellows Class of 2008

Ling Guan of Ryerson University (Toronto, Ontario) for contributions to image and multimedia signal processing.

Vincent Hayward of McGill University (Montreal, Quebec) for contributions to robot manipulator programming and the development of haptic interface technology.

Shesha H. Jayaram, University of Waterloo (Waterloo, Ontario) for contributions to the use of high voltage in process technology.

Jorg Liebeherr, University of Toronto (Toronto, Ontario) for contributions to the design and analysis of computer networks and their protocols.

Yvon Savaria, University of Montreal-Ecole Polytechnique (Montreal, Quebec) for contributions to the development of long interconnect VLSI signal processing architectures.


Ivan Stojmenovic, University of Ottawa (Ottawa, Ontario) for contributions to data communication algorithms and protocols for wireless sensor and ad hoc networks.....

Bin Wu, Ryerson University (Toronto, Ontario), for contributions to high-power converter technology and adjustable speed drives.

En-hui Yang, University of Waterloo (Waterloo, Ontario) for contributions to source coding.

Weihua Zhuang, University of Waterloo (Waterloo, Ontario) for contributions to mobile communications and networks.

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IEEE Canada - Electrical Power and Energy Conference 2008 (EPEC 2008)

October 6-7, 2008
Renaissance Harbourside Hotel
Vancouver, BC


The paper submissions process is now closed after a larger-than-expected number of papers was submitted covering the conference theme (Energy Innovation). The abstracts are now being reviewed and authors will be notified shortly. Several distinguished speakers have been confirmed for the panel sessions. British Columbia Transmission Corporation (BCTC) and BC Hydro are the main conference sponsors. Bob Reid, Chairman of the Board of Directors of BCTC, is the keynote speaker. Events such as the BC Hydro Powersmart Technology Showcase are being organized to complement the conference topic tracks. The conference organizers and the IEEE Vancouver Section are working together to ensure a successful event for all participants. Conference registration is open. Please register early to take advantage of early registration and hotel accommodation fees.

Topics of interest to the conference include the following:

Topics	Subtopics
Extending the Limits of Transmission and Distribution	<ul style="list-style-type: none"> • Physical Assets Monitoring • Real-Time Operation • Power Flow Control • Continuity of Supply
Expanding Generation and Alternative Energy	<ul style="list-style-type: none"> • Large Generation Expansion • Distributed Generation • Energy Storage • Impact and Operation of Distributed Generation
Intelligent Grid Technologies	<ul style="list-style-type: none"> • Data Gathering and Information Flow • Wide-Area Operation and Control • Distributed Networks • Cyber Security in the Automated Grid
Conservation and Energy Efficient Technologies	<ul style="list-style-type: none"> • Energy Conservation Measures • Energy Efficient Loads • Power Factor Correction and Power Quality

General Conference Chair is Dr. Ebrahim Vaahedi P.Eng., FIEEE.

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Upcoming IEEE Conferences in Canada

North American Power Symposium (NAPS)
September 28-30, 2008
University of Calgary, Calgary, Alberta
Contact: William Rosehart
Department of Electrical and Computer Engineering, University of Calgary
2500 University Drive NW, Calgary, Alberta T2N 1N4
Tel: 1-403-220-5005
Fax:1-403-282-6855
E-mail: rosehart@ucalgary.ca
Web: http://www.naps2008.net

IEEE Canada - TELUS Innovation Award

Purpose

The purpose of the IEEE Canada TELUS Innovation Award is to offer IEEE student members the opportunity to engage individually or as a team in a significant ICT project, such as their final year undergraduate project in an engineering or technology program, enter this project into the competition to have an opportunity to report, both, verbally and in writing on this project before a panel of industrial, academic and media experts. The project would have a strong design and/or research component with the emphasis on design that embodies the spirit of innovation and has strong application in industry in the foreseeable future.

The project would be carried out at an undergraduate institution (University or College) based in Canada (IEEE Region 7).

Prize

Awards will be divided equally between team members.

The team members of up to 9 selected teams will be hosted for the live competition at a location to be determined annually. Travel will be reimbursed for the selected students/teams of students funded by TELUS and administered by IEEE Canada SAC.


- 1st award prize: CAD10, 000 cash honorarium and certificates for the student/student team
- 2nd award prize: CAD 5,000.00 cash honorarium and certificates for the student/student team
- 2nd award prize: CAD 2,000.00 cash honorarium and certificates for the student/student team
- Up to 6 runner-ups: CAD 500.00 cash honorarium and certificates for the student/student team

Schedule

This competition is a three-tiered event. The first level of competition is within each student branch. Entries are submitted to your Student Branch Counselor. The Student Branch Counselor organizes a branch wide competition. The winning entry from your branch may be entered in the regional competition (R7). There are two rounds of judging at the regional level. In the first round the entries for each area (Eastern Canada Area, Central Canada Area and Western Canada Area) will be ranked based on the written submission. Up to three entries per area are selected for the final competition, where the students will present their projects live to a panel of judges.

Submission Deadline for the Regional Competition	Annually June 1st
Notification of Area Finalists	Annually in July/August

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<p>Final Competition Region 7 Executive Committee Approval of Results Presentation of Awards or Recipient(s) Notification Deadlines for the local competitions vary from school to school</p>	<p>Annually in the Fall/September Annually in the Fall Annually in the Fall</p>
<p>Just for information</p> <p>The IEEE Industry Applications Society has 105 chapters and members in 69 countries worldwide. Their 9 conferences include the International Conference on Power Electronics and Drives Systems, and the International Power Sources Symposium.</p>	
<p>WELL WORTH YOUR TIMEBROWSE..PONDER...SHARE...ENLIGHTEN</p> <p>More useful than a wheatstone bridge http://en.wikipedia.org/wiki/Wheatstone_bridge</p> <p>More linear than a single line diagram http://www.powertapengineering.com/index%20sld.htm</p> <p>More charged than a high capacity capacitor http://www.uoguelph.ca/~antoon/gadgets/caps/caps.html</p> <p>More diverse but connected than a neural network http://en.wikipedia.org/wiki/Neural_network</p> <p>More colorful than a Dense Wave Division Multiplexing Fiber Optic System http://en.wikipedia.org/wiki/Wavelength-division_multiplexing</p> <p>More number intensive than a weather calculation on a CRAY computer http://www.cray.com/Home.aspx</p> <p>More grounded than a Grounding schematic https://www.iapa.ca/pdf/2004_feb_Bonding_Grounding_Illustrations.pdf</p> <p>More powerful than a power calculation http://www.mathconnect.com/power.htm</p>	

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