SPRING CONFERENCE
Thursday Evening, April 24, 2014

Oakland Center (at Oakland University)
2200 N. Squirrel Road, Rochester, MI, US, 48309
Tel: +1 248 370 2020

Meeting Agenda:

4:00 PM – 5:30 PM   Registration
                    Display Tables / Student Posters / Networking / Entertainment
5:30 PM – 5:40 PM   Oakland University Welcome
5:45 PM – 6:30 PM   Panel Discussion
6:45 PM – 7:30 PM   Technical Sessions
7:30 PM – 8:00 PM   Poster Presentations and Student Competition
8:00 PM – 8:30 PM   Dinner and Entertainment
8:30 PM – 8:40 PM   Remarks by Dean L. Chamra, SECS
8:40 PM – 8:45 PM   Keynote Speaker Introduction
8:45 PM – 9:30 PM   Keynote Presentation
9:30 PM – 9:45 PM   Awards and Recognition

Keynote Presentation:
Microsystems to Nanosystems:
Meeting the Challenges of the 21st Century
Kensall D. Wise

William Gould Dow Distinguished University Professor
Professor Emeritus Electrical Engineering and Computer Science

Progress in the miniaturization of microelectronic functions has far exceeded anything imagined in the early years of integrated circuits and has revolutionized data processing, communications, control, transportation, and access to information. Although its impact on areas such as health care, security, sustainable energy, and the environment has so far been muted, it is now poised to transform these areas as well, merging very low-power integrated circuits with wireless connectivity and sophisticated sensing technologies. Employing nanotechnology, energy scavenging, heterogeneous integration, and wafer-level packaging, these wireless integrated microsystems will be key in solving some of the most challenging problems of the 21st century. Today, microsystems 1mm3 in size and dissipating less than 1nW are being realized, while in the future, nanosystems the size of single cells operating at pW levels may be possible. This talk will highlight several emerging devices, including chromatography-based microsystems capable of rapidly analyzing complex gaseous mixtures with sensitivities in the parts-per-trillion range, chronically-implantable neural microsystems for the treatment of deafness, blindness, epilepsy, Parkinson's disease, and perhaps paralysis, and an intraocular microsystem for continuously monitoring eye pressure to improve the treatment of glaucoma.

This Conference supported by:

Oakland University School of Engineering and
Computer Science

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Panel Discussion

Industry Advancing Technologies for Humanity

(Followed by Technical Presentations, Dinner and Keynote Address)

Moderator: Dr. Hoda S. Abdel-Aty-Zohdy, J. F. Dodge Chair Professor, Oakland University

Panelists:

Dr. Hussein Dourra, Technical Fellow, CHRYSLER.LLC
"Utilizing Virtual Tools; Physics Based Solutions; Achieving Optimum Results"
Dr. Subhendu Guha, Former Chairman , Uni-Solar
"*Solar Energy g– Coming of age"*
Ms. Delia Rodi, CEO, Owner NIAGARA MURANO ARCHITECTURE
"Lightning Technology and how it applies to Humanity."
Dr. Anthony Cooprider, Senior Technology Leader, Ford Motor Company
"Embedded Electronics in Automotives"
Dr. Hoda S. Abdel-Aty-Zohdy, J. F. Dodge Chair Professor, Oakland University
"Bio-Inspired Integrated Systems Applications"

Special thanks to
Ms. Barbara Kooiman for piano entertainment , and to **Dr. Kent Ko** for donating his composed *Piano Concerto No. 1* CDs for distribution to the conference participants.

Technical Presentations (after Panel Discussion)

Parallel Presentations Followed by Dinner and Keynote Address

The Importance of Electromagnetics in the Automotive Industry as a Result of Telematics and Infotainment

Dr. Dan Aloi
Professor, Chair
ECE Department,
Oakland University

Wireless technologies have proliferated onto automotive platforms as part of infotainment, telematics and active safety initiatives. These wireless solutions present engineers design challenges in the area of applied electromagnetics in terms of antenna design, antenna placement, electromagnetic compatibility and wave propagation. The Applied EMAG and Wireless Lab at Oakland University possesses an outdoor vehicle-level antenna range (80 MHz - 6,000 MHz) and full-wave electromagnetic field solvers with high end computers to solve these issues. A background will be provided on the wireless technologies on automotive platforms followed by past industry relevant research in these areas relating to antenna design, antenna measurement and antenna placement.

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Technical Presentations (after Panel Discussion)
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Using Cyber-Physical Systems to Explore Ancient Sites Underneath Lake Huron With Cultural Algorithms

Robert Reynolds
Professor
Computer Science
Wayne State University

Most of the Grand Challenge questions that remain about human evolution can only be addressed by accessing sites that are now under water. In this talk we discuss a Cyber-Physical System developed in conjunction with the University of Michigan-Ann Arbor Museum of Anthropological Archaeology and the Department of Oceanographic and Atmospheric Engineering. The system is used to help identify and explore ancient occupational sites currently found in over 100 feet of water underneath Modern Lake Huron. The contribution of Virtual World modeling and Machine Learning using Cultural Algorithms will be highlighted. The potential for applying such techniques to explore other ancient sites will be explored.

Model Based Control Application to Powertrain Applications

Dr. Gouming (George) Zhu
Professor, Mechanical Engineering and Electrical and Computer Engineering Michigan State University

With the growing concern of global warming and energy crisis, many new technologies are used in modern powertrain and engine systems. Variable valve-train, electronic throttle, exhaust-gas-recirculation, variable geometry turbo and waste gate, super charger, new after-treatment systems, and hybrid powertrain system add additional degrees of freedom to powertrain and engine control systems. The conventional single-input-single-output control technique cannot provide precise powertrain and engine control under either steady state or transient operations and model-based multi-input-multi-output control becomes a necessity. This talk presents some model-based control applications to powertrain and engine system at the Energy and Automotive Research Lab of the Michigan State University, which includes crank-resolved engine model for hardware-in-the-loop (HIL) simulations, hybrid powertrain HIL simulation and control, model-based combustion mode transition control, gain-scheduling control for the bio-fuel after-treatment system, linear parameter varying (LPV) control of engine throttle and cam phasing system, and so on.

Cloud based Mobile Application Testing

Rajkumar Bhojan
Test Architect
Wipro Technologies

As mobile applications are becoming increasingly sophisticated, they significantly increase the requirement for functional and non-functional tests. Academicians and testing experts have to come up with effective verification techniques to ensure reliability of these mobile applications. One of the ways to test mobile applications is Cloud based mobile application testing which helps to develop and execute automation scripts on real devices. This seminar focuses on mobile testing, multiple/cross device execution and parallel execution.

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Technical Presentations
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Getting arms around Big Data with Systems Thinking

Whether we like it or not, we are all deluged with data. Furthermore, we are obligated to respond to concerns and hopes that accompany data deluge. This talk will describe a systems thinking based framework to get arms around Big Data. This framework serves as a guidance system to make the most out of Big Data efforts regardless of Big Data maturity level or role or whether the context is that of an individual or an organization.

Satyendra Rana
Visiting Professor
College of Engineering
Wayne State University

Electric Vehicle Charging

This presentation will identify the requirements and progress on Plug-in Electric Vehicle (PEV) charging. It will provide an overview of the current Utility Grid and on how this will evolve as the population of PEVs continue to expand. Existing tools employed by utilities and proposed new tools being evaluated for effectiveness are presented. Combining these will provide a seamless approach for additional loads while maintaining existing Grid distribution and transformer loading
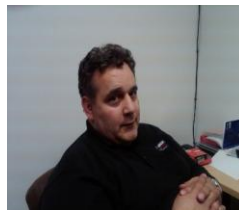
Rich Scholer
Chair, SAE/JAE Task Force

IEEE Power & Energy Society Scholarship Plus Program

Power and energy engineers work with some of today's most exciting technologies, developing solutions to problems that affect our lives and lifestyles. The PES Scholarship Plus Initiative provides scholarships and real world experience to undergraduates interested in power and energy engineering careers.

Kevin Taylor
Chair, SEM IEEE PE/IA

Performance Analysis of Adders over Fp for Cryptographic Applications

Cryptographic applications require fast finite field arithmetic operations. FIPS 186-2 and NIST recommend ten fields for elliptic curve cryptography, five are prime Fp where the number of bits m needed to represent the prime span the range m = 192, 224, 256, 384, and 521. The prime moduli p are chosen of a special type of numbers called generalized Mersenne numbers. This report provides a comprehensive study of several performance requirements such as area, delay, static and dynamic energy consumption.

Dr. Fayez Gebali
Professor and Chair,
ECE Department
University of Victoria

Reverse Power Flow (RPF) in the SG environment with applications

There is an increasing interest with smart grid (SG) preservation within the US and Globally. There are a number of problems associated with future power loading without the use of observing the grid in a SG mentality. It is important that electric supply to customers is optimize and maintain a low cost of operation. One of the problems with SG is the development of Plug in Electric Vehicles (PEV).

Albert Ancona
Vice President
Operations and Owner.
Ancona Controls Inc.

The Electric Vehicle Supply Equipment (EVSE) is a concept that will help supplement in the protection of the power infrastructure and shield the network thru smart grid technologies. The grid is a power disbursement network; once it is produced it is consumed immediately. There is no way at this time to hold it economically for a later moment when the demand increases. With the smart grid, we are able to manage it and maintain a level absent from overloading. The demand for power is only going to increase with the push for (PEV). The Government is pushing this as part of the Green initiative, so demand for more power is not going away, it is already here. This is why the EVSE can be an asset that shows promise in giving back.

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Call for Posters

All research faculty, professionals and students are invited to participate.

- Conference highlights the cutting edge research activities being pursued in Southeastern Michigan
- Showcase your research and network with people from Industry/Academia.
- Best poster awards for top posters presented as judged by the review committee.
- Poster topics related to any of the chapters/societies represented in the IEEE Southeastern Michigan Section (chapters tab at www.ieee-sem.org) are encouraged.
- Authors wishing to participate in the poster session must submit a poster title and abstract (less than 150 words) to Chaitanya Setti (sck@computer.org) by no later than April 20, 2014.
  - Suggested poster size should be less than 4 feet by 3 feet.
  - Authors will present their posters during the poster session from 4:00 PM to 5:30 PM and the Poster Presentation and Student Competition from 7:30 PM to 8:00 PM

Registration

Register at the conference web site www.ieee-sem.org/spring

Conference Attendee Fees (Early Registration/Late Registration):
Students/Retired/Unemployed (Members)…………………………… $25/$35
IEEE Members ……………………………………………….…… $45/$60
Non Members ……………………………………………………… $50/$70
Student Dinner Table Sponsor (10 Students) ………………………..$250
Corporate Table Sponsor (8 Guests)……………… ……………... ..$250

Registration closes midnight April 20, 2014 (early registration ends April 17, 2014)

Questions?

Conference Committee Contacts

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