

SCANFAX

November 2004

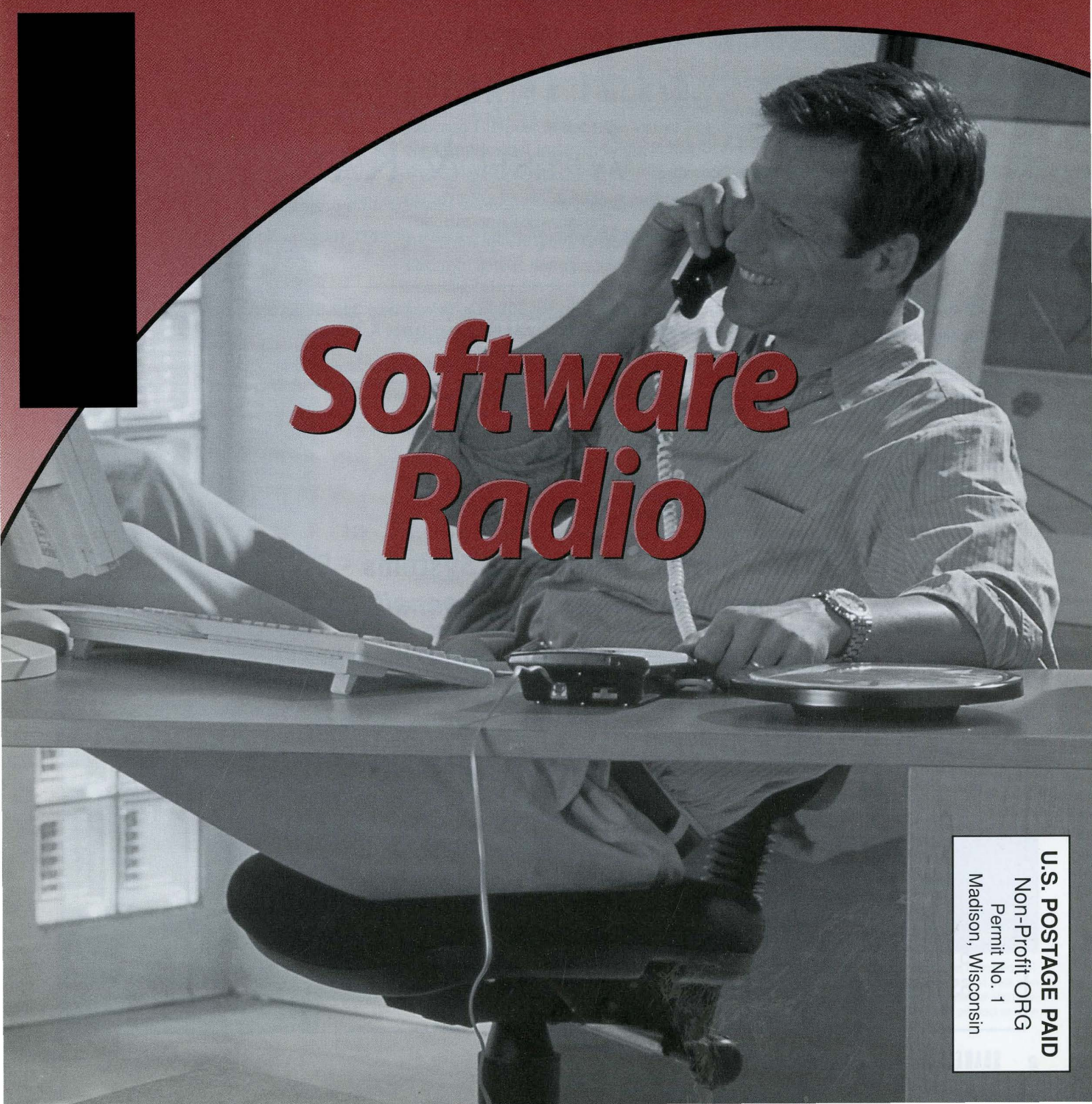
Volume 56, Issue 8



IEEE

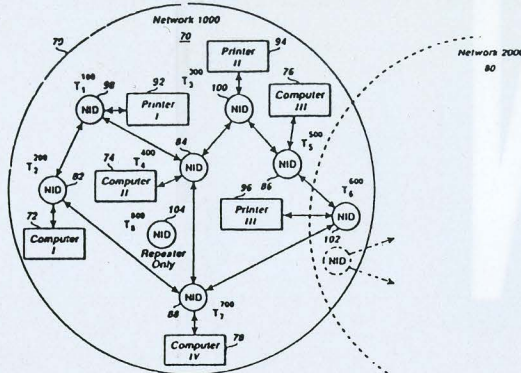
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ewh.ieee.org/r4/chicago

A publication of the
Institute of Electrical & Electronics Engineers
— Chicago Section —

A black and white photograph of a man in a light-colored button-down shirt sitting at a desk. He is smiling and holding a corded telephone receiver to his ear. On the desk in front of him is a computer keyboard and a small, dark electronic device, possibly a mobile phone or a small radio. The background is slightly blurred, showing what appears to be an office environment.

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— Chicago Section —

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SCANFAX

November 2004

Volume 56, Issue 8

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Chicago Section Executive Committee Meeting

Tuesday, November 9, 2004, 7:00 p.m.

DeVry DuPage, Room TBA, 1221 N. Swift Rd., Addison, IL

No Registration Needed

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Software helps wireless devices latch onto any communications network available

By Paul Zukowski

I was taking a phone call on a land line at my office, and really wanted to get on the road. In my bag was my cell phone. Too bad there wasn't an easy way to simply transfer the call from the land line to the cell. I envisioned just hitting a button on my cell and having it take over the call.

Or how about this situation: You're working on your Wi-Fi enabled PDA in a coffee shop, but then go to meet friends in another coffee shop nearby. Why can't your PDA link to any Wi-Fi hot spot that's available, jumping cells just like a cell phone?

As a recent article in Business 2.0 magazine said, the world of wireless communications is a tower of Babel. Cell phones, Wi-Fi base stations, military radios, and public safety networks can operate only on the frequency bands burned into the hardware at the factory.

So not only can't my cell phone pick up a call that originated on a land line, American CDMA phones don't work in Europe and many European GSM phones are useless in Japan.

Of course, our personal communication needs pale in comparison to those of emergency workers, such as the inability of New York City's police and firefighters to coordinate evacuation efforts on 9/11 because their radios were incompatible.

Instead of having each device be hard-wired to do one thing over one frequency, many engineers are working on the concept of "software defined radio," a technology to replace fixed radio hardware with flexible software that can be programmed to communicate over a broad range of frequencies, bandwidths, and transmission standards. Software defined radio is abbreviated as SDR.

With SDR, you would be able to drive across the country and maintain an Internet connection by means of whatever was available on any communications network, from analog cellular and 3G to Wi-Fi and WiMax -- Intel's proposed chip based on the IEEE 802.16 wireless broadband standard, WiMAX could provide a high-speed, wireless broadband solution using a cleaned up 700MHz spectrum sometime in 2005.

Reconfigurability is a key property in the development of SDR, and in a paper by that name from the Mitsubishi Electric ITE Telecommunications Laboratory in France, it is pointed out that SWR equipment should be able to change (re-configure) its radio functionality part.

The paper explains that the concept of reconfigurability has been around a while and is in fairly common use in microcontrollers or other programmable components in embedded systems to provide in-system programmability, and in radio applications where reconfiguration capabilities can be seen in digital TV decoders, upgradable modems over wireline, as well as cell phones based on Java that run downloaded Java applets.

What is new with software radio, the paper says, is the application of such capabilities in the domain of radio communications to include the radio (air-interface) functionality as well. In the case of the ideal all-software radio, reconfigurability is already built into the system since microprocessors can be reprogrammed by changing the contents of their program memory.

According to the "Reconfigurability" paper, the term "software radio" was first coined by J. Mitola in a May 1995 article in IEEE Communications magazine. In its ideal realization, wideband signal digitization occurs next to the antenna and the rest of the radio processing is implemented in software running on a very fast general purpose processor.

The Software Defined Radio Forum [<http://sdrforum.org>] is an industry group hammering out standards for the technology in collaboration with more than 100 companies, including Intel, Motorola, and Qualcomm.

According to the SDR Forum, a software defined radio is a collection of hardware and software technologies that enable reconfigurable system architectures for wireless networks and user terminals. The forum's goal is to accelerate the proliferation of software defined technologies.

SDR is seen as an efficient and comparatively inexpensive way to build multi-mode, multiband, multifunction wireless devices that can be adapted, updated, or enhance by using software upgrades.

The SDR Forum meets five times a year and holds an annual international technical conference and product exposition, and the next one will be held in Phoenix, Arizona on November 15-18.

One of the institutions backing research into SDR is the military. The Joint Tactical Radio System is a U.S. Department of Defense initiative. JTRS is designed to provide a flexible new approach to meet diverse warfighter communications needs through software programmable radio technology. Service requirements are clustered so that similar requirements can be met with a single acquisition effort. The goal is to provide seamless real-time communications among warfighters -- through voice, data, and video -- with and across the U.S. military services, and with coalition forces and allies.

In July, General Dynamics won a \$1 billion order to build software radios that will allow Army soldiers, Navy sailors, and Air Force pilots to exchange information in the heat of battle.

There is still a long way to go before consumers can have SDR in their pockets. Today's software radios require heavy-duty chips, they suck up lots of power, and they're expensive. But industry analysts estimate that in five years, software radios will be a \$31 billion business, and we will have phones and other devices that will work on any mobile network, anywhere. ■

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Revitalizing the Northwest Subsection

By Norm Phoenix • Chicago Section Chairman

Are you a member of Chicago's Northwest Subsection? The subsection has been around since 1970, but many of its members are not even aware they belong. It comprises the entire northwest corner of the Chicago Section. To be specific, it consists of those portions of Cook, Lake, and McHenry Counties in Illinois that are north of Lawrence Avenue and west of the Edins Expressway/Skokie Highway except for the city of Elgin. If you are an IEEE member whose IEEE mailing address is within those boundaries, you are a member of the Northwest Subsection as well as the Chicago Section.

Unlike chapters that concentrate on their society's field of interest, subsections look for any topic that would be of interest to IEEE members. Their meetings thus provide a nice variety. The purpose of the subsection is to hold its activities within its boundaries for the convenience of its members. Chicago's Fox Valley Subsection, for example, has been doing an excellent job providing timely topics at their monthly meetings in the western suburbs. With nearly a third of our Chicago Section members in the Northwest Subsection, I'm sure that more IEEE activities in the northwest suburbs would be appreciated.

If you are a member of the Northwest Subsection and would like to see more meetings held in the northwest suburbs, let us know. Our Chicago Section Member Services Chairman, Jack Sherman, has been looking for new volunteers and possible locations where the subsection meetings could be held. I am pleased to report that he has been successful in both areas. If you would like to join in and help form some subsection meetings, contact Jack (847/885-4189, j.sherman@ieee.org) or me (773/631-4917, normphoenix@yahoo.com). Getting involved is the best way to get more out of your IEEE membership. ■

Evening Meeting

Chicago Chapter of the IEEE Power Engineering Society
New Approaches to Maximizing Reliability
 Wednesday, November 10, 2004

Douglas M. Staszkesy
 S&C Electric Company

About the Topic:

Utilities are frequently faced with the considerable challenge of providing an alternate power source for increasing numbers of sensitive customers. In the past, this meant that an additional feeder, with sufficient capacity to meet the customer's demand, had to be routed to the customer's site - at considerable expense. Or, capacity must be reserved on existing lines - tying up valuable line capacity. The customer is then faced with higher service costs which may lead them to seek an alternate provider - or seek another location which better meets their financial needs - sometimes not in the power provider's territory.

Utilities now have the choice of using advanced but proven automation technology

to overcome this problem by more effectively using all the distribution feeders near a customer to not only meet the needs of the sensitive customer - but generally improve the reliability and service to the neighborhood. By using real-time load monitoring as part of the restoration algorithm, and taking advantage of access to multiple power sources, the utility can now realistically provide enhanced service - without the need to reserve or route the additional capacity needed for any one customer.

A case study will demonstrate how technology solved this particular problem as well as give the audience some ideas about applying technological solutions on their system.

About the Speaker:

Doug Staszkesy is Director-Marketing of S&C Electric Company's Automation Systems Division and is responsible for mar-

keting, customer support and application engineering support for all aspects of S&C's system automation products and services. Doug has held numerous positions at S&C, from field sales, to research and development project manager to business development manager for S&C's services division.

Prior to joining S&C in 1989, Doug worked at PSE&G of New Jersey in line construction, major projects engineering, underground network engineering and led the Customer projects group. In addition, Doug was responsible for operation of the division SCADA system as well as overseeing storm restoration efforts.

Doug earned a Bachelor of Mechanical Engineering degree from the Georgia Institute of Technology in 1981 and has been involved in the electric power industry ever since. He also instructs in the area of distribution automation at the University of Wisconsin.

Location:

ComEd Commercial Center, 1919 Swift Drive, Oak Brook, IL (near the I-290 and I-294 interchange)

Time:

5:30 Social
 6:00 Dinner
 7:00 Presentation
 8:30 Adjourn

Reservations:

Please call the IEEE Business Office by noon on November 8, 2004 at (312) 253-4333 or (800) 898-IEEE to make your reservation. The cost of the optional box-lunch style dinner is \$15.00 for IEEE members, \$20.00 for non-members, payable at the event. Sorry, no credit cards. Checks payable to "IEEE-PES Chicago Chapter" and cash are accepted, and receipts will be provided.

Continuing Education

IEEE technical meetings may be acceptable as continuing education where required for maintenance of professional engineering licensure.

For more information, please visit the Chicago Chapter IEEE PES web site: <http://peschicago.org>

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Evening Meeting

AP/MTT Societies (Antennas and Propagation/Microwave Theories and Techniques)
**Ultrahigh-Speed Wireless Digital Bus Interconnects Using
 Electromagnetic Bandgap (EBG) Technology**

Thursday, November 11, 2004

Jamesina Simpson
 Northwestern University PhD Student

About the Topic:

Since their inception, computers have been constructed using baseband metallic interconnects to transfer data between processors. Much above present clock rates, however, problems with signal integrity, cross-coupling, radiation, and loss may render this type of interconnect impractical. Since clock rates in the microwave frequency range are projected by 2010, attention is being drawn toward alternative technologies that have relatively favorable signal transmission characteristics. We are investigating the alternate possibility of using bandpass wireless interconnects at millimeter-wave frequencies. In this talk, I will discuss our computational and experimental study of a promising waveguiding structure for such interconnects: linear defects in periodic electromagnetic bandgap (EBG) structures. Initially developed by the optics community, EBG structures are a periodic array of scatterers that limit the propagation of a "band" of frequencies in a given direction. Some of the advantages of our EBG waveguiding interconnects are that they can be fabricated with conventional circuit-board technology, allow wave con-

finement within a low-permittivity medium (thereby permitting signal transmission at nearly the speed of light), provide less copper loss over traditional interconnect structures, and have dimensions which scale inversely to the operating frequency. I will highlight our most recent results for both straight and 90° bend EBG waveguides operating at a center frequency of 50 GHz and also show that when further scaled to millimeter-wave center frequencies above 300 GHz, this technology appears feasible of supporting data rates in the hundreds of Gb/sec.

About the Speaker:

Jamesina Simpson was born in Portsmouth, VA on July 20, 1981 to Donald and Kenie Simpson. She is presently pursuing her Ph.D. degree in electrical engineering at Northwestern University, Evanston, IL. Since her freshman undergraduate year, she has been a research assistant in Prof. Taflov's Computational Electromagnetics Laboratory. Her current research interests include FDTD modeling of geophysically induced extremely low-frequency propagation about the entire Earth-ionosphere waveguide, and FDTD modeling of novel ultrahigh-speed bandpass wireless interconnects for next-generation digital cir-

cuits (funded by Intel Corporation). She is the recipient of the Walter P. Murphy Fellowship for her graduate studies.

Acknowledgements:

The authors are pleased to recognize the support of Intel Corporation Signaling Technologies Lab in this work. Supercomputing resources for the FDTD simulations were provided by the Pittsburgh Supercomputing Center under grant number ECS020006P.

Location:

Devry DuPage - Addison, Illinois. 1221 N. Swift Road - Room TBA. Park in the visitors parking area. Enter at the Main entrance, sign the visitor's log.

Time:

7:00 Social (free sandwiches, snacks and beverages)
 7:30 Presentation

Reservations:

For reservations, please call the IEEE Message Center at (800)898-IEEE or (312)253-4333 by 1:00 PM Tuesday, November 16th or E-Mail apmttchicago@yahoo.com with your name and date of attendance. See the AP/MTT website at <http://ewh.ieee.org/r4/chicago/ap-mtt-chicago/> for more information.

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The ideal candidate will have a minimum of a BSEE and at least 5 years of related experience with regulatory agency approvals especially in wireless and telecom. This position requires a working knowledge of RF communications systems, analog and digital circuitry.

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IEEE EMC Society Chicago Chapter A Special Evening with the Board of Directors

Meet the IEEE EMC Society Board of Directors and Listen to a Topical Presentation in the Field of Electromagnetic Compatibility

Evening Meeting

IEEE EMC Society Chicago Chapter

Electrophobia, or – Why are People Really Scared of Electromagnetic Fields?

Monday, November 15, 2004

Elya B. Joffe

About the Topic:

This presentation attempts to shed light on the issue of "Electrophobia", or "Why are people really scared of electromagnetic fields?" or EMF. It discusses the history of EMF usage, the evolution of EMR standards, from the turn of the 20th century to date, and the evolution of the public response to EMF and its usage. Although it covers only technically acceptable figures, statistics, etc., it addresses this controversial issue from a users' point of view, addressing the sources of fear, the facts and fallacies, and the risk in, risk research.

Areas of review will include:

- "Does science currently know how dangerous the radiation is, will they know more within a year, a decade, a century?"
- "Are the standards for limiting dangerous exposure prepared by biased parties?"
- "Do standards consider thermal effects only, whereas, many a-thermal effects, including cancer, are not considered?"

- Why well known, respectable scientists do not exclude a connection between EMR and cancer "
- "Prudent Avoidance - better to be safe than sorry?"

About the Speaker:

Elya B. Joffe is the VP for Engineering at K.T.M. Project Engineering, Kfar-Sava, Israel, currently holding a position of the V.P. of engineering and works as a Senior EMC engineering specialist and consultant. Elya has over 20 years of experience in government and industry, in EMC/E3, for electronic systems and platforms, in particular aircraft and aerospace. He is actively involved in the EMC design of commercial and defense systems, from circuits to full platforms. His work covers various fields in the discipline of EMC, such as NEMP and Lightning Protection design, as well as numerical modeling for solution of EMC problems. Elya is a Senior Member of the IEEE, Vice President for Conferences and Symposia of the IEEE EMC Society, and of the IEEE Product

Safety Engineering Society, a member of the Board of Directors of the EMC Society, and chairs several committees. He is also a registered Professional Engineer and a NARTE-Certified EMC and ESD Control Engineer. He is also a member of the dB Society.

Location:

D.L.S. Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, IL 60090
Directions can be found at www.dlsemc.com

Time:

7:00 p.m. to 9:00 p.m.

RSVP:

Please call to RSVP before Nov. 11th. Dinner will be provided. Seating is limited.

For More Information:

Contact Maxine Martin at
1-847-537-6400

Evening Meeting

IEEE – IAS/IES Dinner Presentation

Grounding of Sensitive Electronic Equipment

Wednesday, November 17, 2004

Daniel Carnovale, PE, Eaton Corporation (Cutler-Hammer)

About the Topic:

Dan will be speaking on Grounding of Sensitive Electronic Equipment, will review upcoming new changes to the IEEE Emerald Book - Powering and Grounding STD 1100. In addition, he will discuss Data Center Grounding, Effective Surge Protection and Shielding in Isolation Transformers.

About the Speaker:

Dan is the Power Quality Technology Manager for the Eaton Electrical Performance Power Organization. He is responsible for developing strategies and tools for Power Quality across the Eaton Business. Dan has developed and teaches five CEU certified technical seminars on Power Systems and Power Systems Analysis. He has conducted several hundred Power Quality site investigations for commercial, industrial, and utility power systems evaluating PQ issues and applying solutions. Dan worked for Westinghouse Engineering Services and ABB Power T&D. He received his B.S. Degree in Electrical Engineering from Gannon University and his M.S. Degree in Power Systems from Rensselaer Polytechnic University. He is a registered Professional Engineer in the states of Pennsylvania, California and Alaska.

Meeting Location:

IIT's Rice Campus, 201 East Loop Road, Wheaton, Illinois. Take Rt.56/Butterfield Rd. to first stoplight east of intersection of Butterfield & Naperville roads. Turn north onto East Loop Road (Philip's 66 Gas Station on the corners); the campus will be on your right about a block north of Butterfield Road. More detailed directions and a map are available at www.rice.iit.edu/directions.html

Dinner Location:

COSTA'S (GREEKTOWN)

Costa's is located in Greektown on the corner of Van Buren and Halsted. See www.iaschicago.com for detailed directions and a map.

Time:

5:30 p.m. Social
6:00 p.m. Dinner
7:00 p.m. Presentation

Reservations:

Please call the IEEE Business Office at (800) 898-IEEE or (312)-253-4333 with your reservation. Please note any special meal requests at the time of the reservation. You can also make your reservation online at www.iaschicago.com.

Cost:

Your cost includes the presentation and a four-course dinner with a choice of the main entry - Roast lamb, Chicken, or Fish. (Vegetarian or special dietary meals available upon request). Cost is \$25 IEEE Member and \$30 non-member. Valet parking is included with your meal.

Continuing Education:

For P.E. licenses that require continuing education for renewal, attendance at IEEE Technical Meetings is acceptable as one Professional Development Hour (PDH) per meeting.

Information:

Visit IEEE Chicago Section IAS/IES website at www.iaschicago.com.

Evening Meeting

IEEE Fox Valley Subsection

Role of Green Power and Distributed Generation in Electricity Restructuring

Wednesday, November 17, 2004

Professor Mohammad Shahidehpour,
Electric Power and Power Electronics Center,
Illinois Institute of Technology

About the Topic:

With further developments in green power technologies and lower manufacturing costs of distributed generation (DG), it is envisioned that DG will account for a higher percentage of electric power generation in the near future. DG technologies include wind, microturbines, fuel cells, photovoltaic, tidal, geothermal, biomass, and storage, while the green power encompasses a subset of these technologies which are pollution free with abundant resources for power generation and minute operating costs. This talk will review the green power phenomenon and its applications to DG for locational pricing, peak load shaving, and transmission congestion management. A software application for managing DG in a utility company will be demonstrated.

About the Speaker:

Mohammad Shahidehpour is a full professor in the Electrical and Computer Engineering Department and Director of the Electric Power and Power Electronics Center at Illinois Institute of Technology (IIT). He is the author of 300 technical papers and four books on electric power systems planning, operation, and control. He is the recipient of the Edison Electric Institute's Outstanding Faculty Award, HKN's Outstanding Young Electrical Engineering Award, Sigma Xi's Outstanding Researcher Award, IIT's Outstanding Faculty Award, and University of Michigan's Outstanding Teaching Award. He is the past president of the National Electrical Engineering Honor Society, and serves as the Editor of the IEEE Transactions on Power Systems. Dr. Shahidehpour has lectured across the globe on electricity restructuring issues and has been a visiting professor at several universities. He is a Fellow of IEEE.

Location:

IIT's Rice Campus, 201 East Loop Road, Wheaton, Illinois. Take Rt.56/Butterfield Rd. to first stoplight east of intersection of Butterfield & Naperville roads. Turn north onto East Loop Road (Philip's 66 Gas Station on the corner); the campus will be on your right about a block north of Butterfield Road. More detailed directions and a map are available at <http://www.rice.iit.edu/directions.html>

Sponsorship:

IEEE Fox Valley Subsection

Time:

6:00 p.m. Networking time
7:00 p.m. Presentation

Reservations:

Not required.

Continuing Education:

Professional Engineers: this meeting qualifies for Professional Development Hours

Information:

The Fox Valley subsection web page is at www.ieee.org/foxvalley/

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Evening Meeting

AP/MTT Societies

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Trends in RF Computer Aided Design

Thursday, November 18, 2004

Dr. Zoltan J. Cendes
Ansoft Corporation

About the Topic:

GHz frequencies, Gb/s data transmission rates and Gsps data sampling rates are typical in today's high-performance electronics design. Time domain metrics such as eye-diagrams, TDR measurements and SSN are now appearing simultaneously on the same spec sheet with frequency domain metrics such as phase noise margins and insertion loss. Large transistor counts, high non-linearities and increased full-wave behavior of on-chip and on-board interconnects have become commonplace. This talk will describe the revolution in RF design tools that is occurring to meet these challenges. It will describe new approaches to circuit simulation that integrate transient simulation with harmonic balance from the same integrated schematic. It will describe procedures that combine electromagnetic field simulation with electrical circuit simulation for modeling on-chip interconnects and other passive structures. And it will describe the seamless integration of 3D electromagnetics with circuit simulation currently used at IC foundries such as UMC and TSMC.

About the Speaker:

Zoltan Cendes received the BS degree in Science Engineering from the University of Michigan in 1968 and the MS and PhD degrees in Electrical Engineering from McGill University in 1970 and 1972, respectively. After graduation he joined the General Electric Corporation, first in the Large Steam-Turbine Generator Department and then in the Corporate Research and Development Center. During part of this time, he was also an Adjunct Associate Professor at Union College in Schenectady, NY. Dr. Cendes became Associate Professor of Electrical Engineering at McGill University in 1980. In 1982, he joined the faculty of Electrical and Computer Engineering at Carnegie Mellon University, Pittsburgh, PA, where served as Professor until 1996 and since then as Adjunct Professor. Dr. Cendes is also Founder and Chairman of Ansoft Corporation, Pittsburgh, PA, where he currently serves as Ansoft's Chief Technology Officer and is responsible for directing the company's product and technology research.

Dr. Cendes is a member of the MTT Technical Committee on CAD, is on the editorial board of the International Journal of RF and Microwave Computer-Aided Engineering, has served on the International Steering Committee of the COMPUMAG Conference and is a past chairman of the IEEE Conference on Electromagnetic Field Computation. Dr. Cendes has published over two hundred journal and conference papers.

Location:

Devry DuPage - Addison, Illinois. 1221 N. Swift Road - Room TBA. Park in the visitors parking area. Enter at the Main entrance, sign the visitor's log.

Time:

7:00 Social (free sandwiches, snacks and beverages)
7:30 Presentation

Reservations:

For reservations, please call the IEEE Message Center at (800)898-IEEE or (312)253-4333 by 1:00 PM Tuesday, November 16th or E-Mail apmttchicago@yahoo.com with your name and date of attendance. See the AP/MTT website at <http://ewh.ieee.org/r4/chicago/ap-mtt-chicago/> for more information.

Evening Meeting

IEEE Chicago/Rockford

Consultants' Network

A joint Affinity Group of the IEEE Chicago
and Rock River Valley Sections

High Speed Circuit Stimulation for Signal Integrity

Monday, November 22, 2004

Roy Leventhal

About the Topic:

Network member Roy Leventhal will present a review of semi-conductor models as applied to simulation of high-speed circuits to design for signal integrity and EMI control. The main modeling focus will be on the IBIS (Input/Output Buffer Information Specification) model. In addition to technical descriptions, the discussion will cover some issues of EDA tools, computational electromagnetics methodologies, model accuracy, and design process flow and model availability. The conclusion of the presentation will be a question and answer session where we can share our experiences on these matters. Members and non-members are invited to both the meeting and the optional dinner. (Reservations are NOT required).

About the Speaker:

Roy Leventhal has spent 45 years in electronics design at large OEMs. He holds a BSEE/MSEE from Illinois Institute of Technology, plus additional graduate work at the University of Wisconsin-Milwaukee. He is currently involved in consulting and training in high-speed circuit design and related subjects.

Location:

Palatine Public Library • 700 North Court, Palatine, IL
847-358-1216

Dinner Location:

Bakers Square
270 E. Northwest Highway (at the corner of North Court St.),
just south of the library

Time:

6:15 p.m. Optional Group Dinner at Bakers Square
(Order off the menu - reservations not required)
7:30 p.m. Meeting - Presentation and Open Discussion
9:15 p.m. Adjourn

Information:

Information about the network can be obtained by e-mail to either consultnet@bmillerengineering.com or JAuerConsulting@worldnet.att.net, or visit our web site at www.drblank.com/coaction.htm

Continuing Education:

Attendance at this meeting will earn 1.0 PDH. Meetings are usually held on the last Monday of odd-numbered months.

See you on November 22, 2004, and bring consultants and those who aspire to be consultants for a pleasant and informative evening of networking.

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