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— Chicago Section —

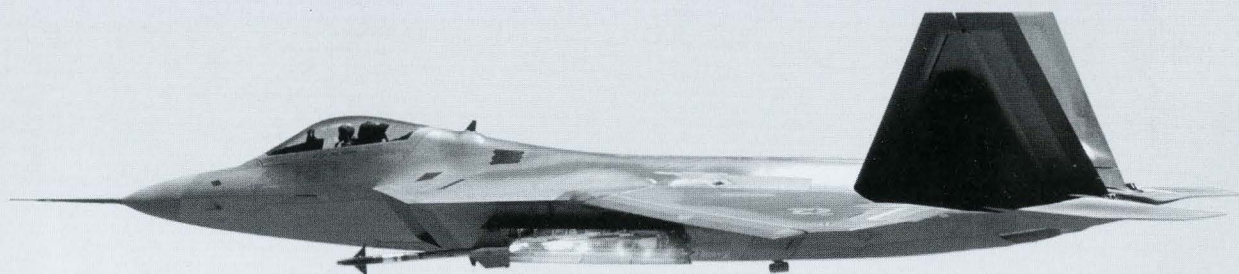


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CHICAGO SECTION EXECUTIVE COMMITTEE MEETING

Tuesday, February 11, 7:00 p.m.
DeVry DuPage, Room TBA, 1221 N. Swift Rd., Addison, IL
No Registration Needed

ATTENTION

NEW BUSINESS OFFICE LOCATION:

The Institute of Electrical and Electronics Engineers Business Office has moved.
The new address and phone number are as follows:

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INDUSTRIAL APPLICATIONS

Mechatronics at Work in Everything from Cars to Factories to Space

by Paul Zukowski

While the word "mechatronics" is not in most dictionaries yet, with the increase in servocontrolled devices in all walks of life, the discipline of mechatronics should become more familiar to all of us in the future.

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), the term "mechatronics" was coined by a senior engineer of the Japanese company Yaskawa in 1969 as a combination of the "mecha" of mechanisms and the "tronics" of electronics. Yaskawa got trademark rights on the word in 1971, but due to broad acceptance of the term in industry, Yaskawa abandoned its rights in 1982 to allow its free use. Yaskawa Electric America Inc. (YEA) opened its first U.S. office in Oakbrook in 1967. Yaskawa is one of the leading suppliers of AC servos, AC inverters, CNC controller systems, robotics, and systems integration.

Mechatronics is now widely used to describe a philosophy in engineering technology more than the technology itself. For this wider concept of mechatronics, a number of definitions have been proposed in the literature that emphasize different characteristics. The most commonly used one emphasizes synergy: Mechatronics is the synergistic integration of mechanical engineering with electronics and intelligent computer control in the design and manufacture of products and processes.

The international journal *Mechatronics*, which uses the subtitle, "The Science of Intelligent Machines," agrees with the synergistic definition, and adds that it relates to the design of systems, devices and products aimed at achieving an optimal

balance between basic mechanical structure and its overall control. The publication covers a wide range of application areas including consumer product design, instrumentation, manufacturing methods, computer integration and process and device control. Embedded microprocessor control is a major way machines, devices and systems are given a degree of computer-based intelligence.

As part of its mission to promote international intellectual cooperation, UNESCO funded a chair on mechatronics at Bogazici University in Istanbul, Turkey, in 1993. The Bogazici Mechatronics Laboratory is part of the Electrical and Electronic Engineering

Department. At many American universities, courses in mechatronics can also be found within the engineering schools while integrating other disciplines. At Virginia Tech, for instance, they define mechatronics as, "fusing mechanics and electronics to design intelligent machines." At the University of Wisconsin-Madison campus, mechatronics courses are taught by an interdisciplinary team from Mechanical and Electrical and Computer Engineering as a three-credit lecture series. They address different elements of a mechatronics system such as signal conditioning, sensors, actuators, microcontrollers, and software.

In a January 2001 article in *Mechanical Engineering*, the person who teaches Stanford University's graduate course in mechatronics emphasized the importance of "not getting locked into an M.E. point of view or and E.E. point of view." A mechatronics designer has to look at things and optimize, sometimes stressing mechanical aspects, other times electrical or computer aspects of control and feedback. One key is to get mechanical engineers who may have only had one "volts for dolts" course to look beyond the seeming mysticism of electronics. The Stanford course seeks to break down the mystery through hand-on work making robots and other devices.

In automotive electronics, Delphi Automotive Systems Corp. referred to mechatronic switches when it acquired the vehicle switch and electronics division of Eaton Corp. in 2001. Automotive mechatronic switches typically include an injection-molded housing for a metal and wire unit that acts as conduits for power windows, seats, and other electronically controlled moving parts. Delphi became the world's third-largest maker of automotive switches, a \$3.9 billion market.

Shibaru Mechatronics, a subsidiary of Toshiba Corp., has launched the Rolbot system to enable engineers to construct complex systems out of a relatively small number of basic components. These components use precision-ground ball screws and linear guides with AC servomotors to control liner motion in what are called Cartesian handling applications. Inputs from solenoid valves and pneumatic cylinders used in motion con-

trol hardware can be plugged into the main Rolbot controller. Software eliminates the need for external programmable logic controllers or sequence controls, and has macros for basic pick-and-place routines to speed programming.

It seems clear that in the future, mechatronics and other multiagent systems hold promise for improving our understanding about how complex interactions can be understood and harnessed to help meet technological and social needs. ■

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Thursday February 20

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Saturday February 22

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EVENING MEETING

IEEE EMC Society Chicago Chapter Site Requirements for Emissions Testing Above One GHz Tuesday, February 11, 2003

Mike Windler, Underwriters Laboratories Inc.

About the Topic:

This is a summary of recent efforts conducted under the auspices of the American National Standards Institute (ANSI) Accredited Standards Committee C63, Sub-Committee 1, working group 1-13.2. The main purpose of this group is to assess the applicability of low-frequency site qualification methodologies, prescribed in current domestic and international standards (e.g. CISPR, ANSI) to frequencies above 1 GHz. A new measurement procedure, which uses presently available equipment and should fully evaluate all types of facilities, has been derived. Conceptually, this procedure is a rotational pattern comparison of an antenna in a reference site to the same antenna in a test site.

About the Speaker:

Michael J. Windler is an Associate Manager responsible for the operation of the EMC

laboratory of Underwriters Laboratories Inc. in Northbrook, where he has worked since 1985. Mike has a BSEE from the University of Wisconsin in 1985, an MBA from Northwestern University in 1995, and is a licensed Professional Engineer.

Mike is a member of the ANSI Committee C63, and Vice Chair of Sub-committee 1 on measurement techniques and methods. Mike is the chairman of working group 1-13.2 on requirements for sites operating above 1 GHz and has been one of the principle researchers in this area.

Location:

Underwriters Laboratories, Inc.
333 Pfingsten Rd.
Northbrook, IL

Time:

6:30 PM Social Hour
7:00 PM Meeting Start

Reservations:

R.S.V.P.
Steve Laya (Elite Electronic Engineering)
Phone: 630-495-9770

For Additional Information:

www.ewh.ieee.org/soc/emcs/chicago/

LUNCH MEETING

Chicago Chapter of the IEEE Power Engineering Society Reactive Power Control: Methods and Applications Wednesday, February 12, 2003

Dave Mertz, Burns & McDonnell Engineers

About the Topic:

As power transmission and distribution facilities are placed under increasing load, controlling the reactive power (or power factor) becomes more critical to maintaining electrical system efficiency and reliability. This presentation will describe the sources of reactive power, ways to minimize reactive power needs during design, and means for correcting excessive reactive power requirements in existing systems. Several examples will be described, and questions will be addressed after the presentation.

About the Speaker:

Dave Mertz is a senior electrical engineer with Burns & McDonnell Engineers. He is a graduate of Valparaiso University, a senior member of IEEE, and a licensed professional engineer in

Illinois and several other states. He has 16 years of experience in electrical power distribution, industrial control, and facility distribution, communication, and lighting systems. He is chair of the Chicago Chapters of the Power Engineering and Industry Applications Societies of the IEEE, a board member of the Consulting Electrical Engineers division of the Chicago Electric Association, and a member of ISA, IESNA, and the NFPA. He teaches the Design of Electrical Systems for Buildings course for the Electric Association.

Location:

Chicago Bar Association
321 South Plymouth Court
(Near Jackson & Dearborn)
Chicago, IL

Time:

11:30 AM Social
12:00 PM Lunch (optional)
12:15 PM Presentation
1:00 PM Adjourn

Reservations

Lunch tickets can be purchased in the lobby bookstore (\$11.00). Please call the IEEE Business Office at (312) 253-4333 to make your reservation.

For More Information:

Please visit the Chicago Chapter IEEE PES website: <http://peschicago.org>

EVENING MEETING

IEEE Fox Valley Subsection and IIT-Rice Campus Applications of Active Noise Control Wednesday, February 19, 2003

Sen M. Kuo, Northern Illinois University

About the Topic:

Acoustic noise problems become more and more evident as increased numbers of large industrial equipment are in use. Active noise control (ANC) is achieved by introducing a canceling "antinoise" wave through an appropriate array of secondary sources. ANC is an effective way to attenuate noise that is very difficult and expensive to control using passive means. It has application to a wide variety of problems in manufacturing, industrial applications, and consumer products. This talk will briefly introduce the principle of ANC, and focus on many real-world applications to automotive, appliances, transportation, communications, entertainment, and a new snore control.

About the Speaker:

Sen M. Kuo is currently a Professor and Acting Chair at the Department of Electrical Engineering, Northern Illinois University, DeKalb. He is

a founder and Chief Technical Officer of Creative DSP Solutions, Buffalo Grove. In 1993, he was with Texas Instruments, Houston, Texas. He is the leading author of several books: "Active Noise Control Systems" (Wiley, 1996), "Real-time Digital Signal Processing" (Wiley 2001), "Digital Signal Processors" (Prentice-Hall 2003) and over 140 technical papers. He has been awarded seven U.S. patents. He received the IEEE First-Place Transactions Paper Award in 1993, and a Faculty-of-the-Year Award in 2001. His research focuses on active noise and vibration control, adaptive echo and noise cancellation, digital audio applications, and digital communications.

Location:

IIT's Rice Campus
201 East Loop Road
Wheaton, IL

Take Rt.56/Butterfield Rd. to first stoplight east of intersection of Butterfield & Naperville roads. Turn north onto East Loop Road (Grady's Restaurant and Phillip'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 <http://www.rice.iit.edu/directions.html>

Sponsorship:

IEEE's Fox Valley Subsection, Illinois Institute of Technology's Center for Professional Development (Rice Campus), and the Rice Student Association.

Time:

6:00 PM Networking time
7:00 PM Presentation

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



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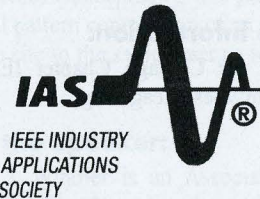
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SPECIAL NOTICE

IEEE - IAS/IES Technical Seminar
Industrial Power System Design
Saturday, February 22, 2003

SPECIAL — ALL DAY TECHNICAL SEMINAR

Topic:	Agenda:
Industrial Power System Design	7:30 AM Registration and Continental Breakfast
	8:00 AM Session I: Introduction, System Planning, System Analysis
Description:	9:45 AM Break
Industry application consultants from various organizations will be presenting on non-vendor specific fundamentals of industrial power system design.	10:00 AM Session II: Switchboards and Switchgear, Transformers
	12:00 PM Lunch
	12:30 PM Session III: Protective Devices, Motor Control
	2:00 PM Break
	2:15 PM Session IV: Conductors, Power Quality
	4:00 PM Conclusion



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Fees:

(A) • IEEE Member Registration \$75.00
(To receive the member rate, provide your IEEE member No. _____)

• IEEE Non-Member Registration \$125.00

(B) Late Registration (after 16 February 2003) \$10.00

(C) Continuing Education Unit (CEU) Registration \$10.00

Total \$ _____

Please make checks payable to "IEEE-IAS Chicago Chapter," and mail with this completed registration form to IEEE-IAS Chicago Chapter Attn: Brian Rener, PE, Grumman Butkus Associates, Evanston, IL 60201. Registrations will not be accepted without payment. Attendance limited to the first 75 registrants.

PRESS RELEASE

Donald L. Sweeney, of D.L.S. Electronic Systems, Inc.,
will be offering two newly updated classes:

*"Introduction to Electromagnetic Compatibility
Design Practices" and
"Design Techniques for Controlling Radiated Emissions"*

May 1-2 & 5-6 and July 24-25 & 28-29
at the Hilton
Northbrook, IL



The latest updates to the curriculum developed by Mr. Sweeney and his associates include power supply design and the application and use of X2Y capacitors. Classes start with fundamentals of electromagnetic compatibility

(EMC/EMI) and then focus on the methodology of how to minimize EMC problems, starting with the design process through final testing and approval. The courses are based on two textbooks and are supplemented with practical information and examples. Originally offered through the University of Wisconsin, these practical application classes are now offered exclusively through D.L.S. Electronic Systems, Inc.

Additionally, attendees will be offered an exclusive, hands-on personal consultation with the instructor or technical staff to apply what has been learned to their specific product. Included will be a guided tour of the largest independent EMC and Product Safety facility in North America.

For advertising information contact:

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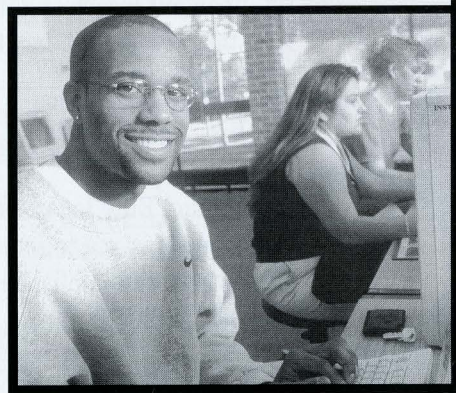
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