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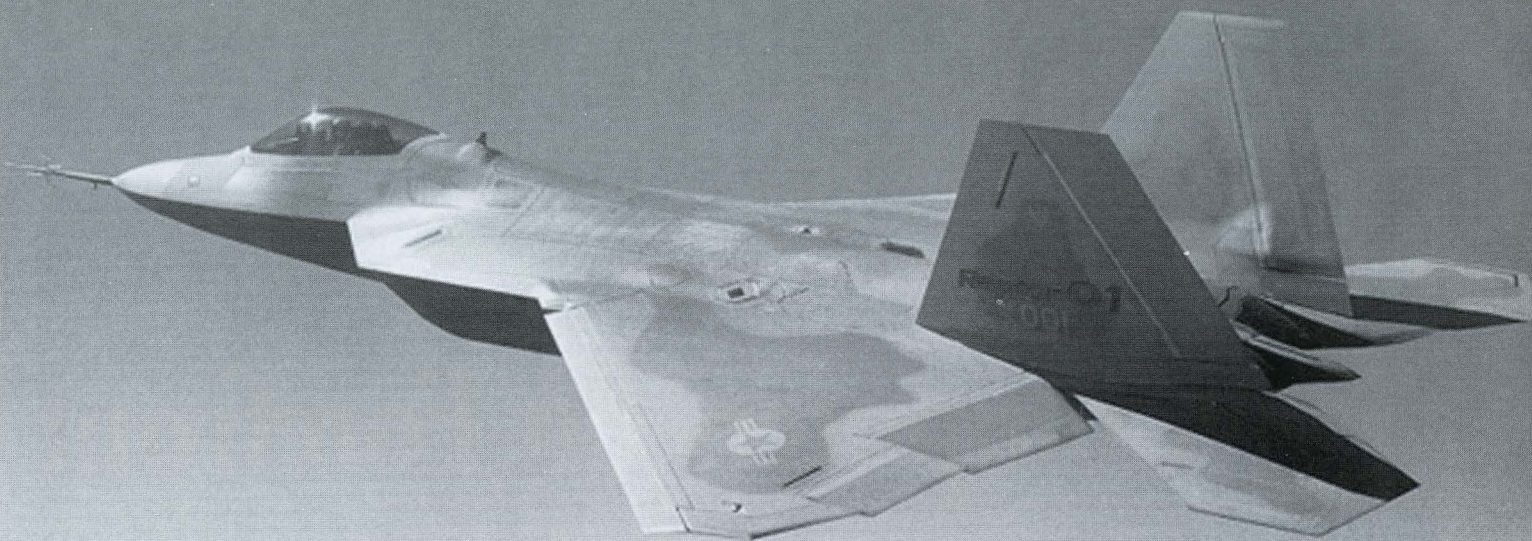
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Institute of Electrical & Electronics Engineers
— Chicago Section —

Computers on Forefront of Biotech Advances

>> *DNA May Be Next Chip*

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CHICAGO SECTION EXECUTIVE COMMITTEE MEETING

Tuesday, October 8, 6:30 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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Computers on Forefront of Biotech Advances



In addition to handling the data from biological investigations, biology itself is leading to novel ways to compute. One fascinating avenue being investigated is the ability of DNA molecules to be used as types of computing devices.

As Nancy Forbes points out in a recent article in *Computing in Science & Engineering* magazine, "Biologically Inspired Computing," it is thought that the number of transistors that can be put on a silicon chip will soon stop doubling and reach a physical barrier in the nanometer range. Forbes quotes Tom Theis, Director of Physical Sciences at IBM Research, who estimates that, "When silicon microelectronics reaches ultimate physical limits to further miniaturization, the smallest silicon transistor will still contain over a million atoms. Yet, there is no fundamental reason why switches that process information cannot be made far smaller than that."

The article goes on to say that when compared to conventional computers,

certain operations in DNA computing (for example, the bonding of two DNA strands to form the double helix) are over a billion times more energy efficient. Also, DNA stores information at a density of about one bit per cubic nanometer — about a trillion times as efficiently as videotape. Computing systems inspired by biological systems (biocomputation) are one possible alternative currently being investigated.

With DNA molecules as software and the enzymes that work on them as hardware, you could have one trillion primitive computers, all working in parallel in a single drop of water working at a billion operations per second.

Modern high-speed digital computers have become part of nearly every field today, letting us collect staggering amounts of data and create complex algorithms to solve problems in milliseconds.

One field where computing power has become crucial is biology, increasingly a data-driven science. The use of high-throughput data acquisition technologies has been an important factor in the progress being made in investigating biological phenomena.

Many aspects of this merger of biology and computing were explored recently at the

2002 IEEE Computer Society Bioinformatics Conference in Stanford, CA. In an article titled, "The Emerging Landscape of Bioinformatics Software Systems," authors Lenwood S. Heath and Naren Ramakrishnan point out that the recent completion of the human, rice, and flowering plant genome maps would not have been possible without the development of novel algorithms and databases to catalog, organize, harness, and mine the increasing amount of data such research efforts generate. Not only that, but there is now the potential for scientists to infer significant biological knowledge computationally from a desktop rather than in the test tube or lab.

>> DNA May Be Next Chip

That was the premise of research reported in *Nature* last year, when Israeli scientists at the Weizmann Institute of Science and Technion Israel Institute of Technology said they had built such a biological computing machine using bits of DNA as inputs and manipulating them to produce outputs. It is thought that DNA computers might one day have value for highly specialized computing applications, such as being able to program cells to perform tasks such as injecting the proper amount of insulin into a diabetic's bloodstream or detecting the presence of a particular toxin within the body.

Another promising area is using DNA in arrays on surfaces or in capsules to detect proteins. Chinese researcher Cheng Jing says his company's biochips are capable of identifying just about any infectious disease in a few hours. Cheng's company, Capital Biochip, plans to test the new devices at several Chinese hospitals later this year. The biochips can be programmed to detect multiple infectious diseases, ranging from hepatitis to syphilis to HIV. Current methods require tedious laboratory procedures that can take up to three days. Biochips may be able to cut the detection process down to even a few minutes.

By Paul Zukowski

The final impact of these biological research directions on information technology is not clear, but already entirely new directions for information technology applications are being uncovered. At some point the melding of electronics and biological processes may produce a whole new range of computing devices and abilities that will cause a "molecular revolution" in computing. ■

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LUNCH MEETING

Chicago Chapter of the IEEE Power Engineering Society Interrupting Ratings of Overcurrent Protective Devices

Wednesday, October 9, 2002

Robert Simon, Bussmann Division, Cooper Industries

About the Topic:

Bob will discuss interrupting ratings of overcurrent protective devices, how these devices are tested, and the results of improperly applying an overcurrent protective device. The presentation will include video footage of devices being tested simulating proper application and of misapplied devices. Also covered will be current limitation and its effects on arc flash levels as they relate to 110.16 of the 2002 NEC. Video footage of arcing faults and arc flash will be shown.

About the Speaker:

Bob Simon is a District Sales Engineer with Bussmann. Bob has a B.S. degree from Indiana University, and has been employed as a sales representative for electrical product manufacturers for 15 years. Bob is also a member of IEEE and the International Association of Electrical Inspectors.

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 (800) 898-IEEE to make your reservation.

Note:

For more information, please visit the Chicago Chapter IEEE PES web site:

<http://peschicago.org>

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EVENING MEETING

IEEE EMC Society Chicago Chapter PCB Techniques for Good EMC Designs

Tuesday, October 15, 2002

Roger Swanberg, D.L.S. Electronic Systems, Inc.

About the Topic:

With today's higher speed integrated circuits, electronic devices and tougher standards, the need for lower emissions and higher immunity designs are more necessary than ever. The strongest handle available to the designer is the Printed Circuit Board (PCB) level. This is an RF component which you can design.

This talk will discuss methods and means to layout PCBs for low emissions and the subsequent higher immunity needed in today's EMC environment. It is based on the speaker's experiences used when designing products for the consumer electronic market. Practical techniques and useful guides will be presented to help in your next PCB design.

About the Speaker:

Roger Swanberg is a Senior EMC Engineer and NARTE certified EMC engineer working at D.L.S. Electronic Systems, Inc.

A Graduate of the Illinois Institute of Technology in Chicago, Roger has held various positions in the electrical engineering field for over 35 years. These positions included: EMC and electronics design engineer at Motorola Consumer Products and Zenith Radio in color TV design, Nuvatec Design Consulting as electronics designer and Regulatory Compliance Manager, US Robotics as Regulatory Compliance and Engineering Support Manager, Motorola Lighting and Motorola Cellular as EMC and electronics designer.

All these positions included the design of PCBs for the products. Roger is presently vice-chairman for the IEEE EMC Society and a member of the DeVry Industrial Advisory Board.

Location:

DLS Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, IL

Time:

6:30 PM Social
7:00 PM Meeting Start

Reservations:

Maxine Martin (DLS Electronics)
Phone: (847) 537-6400

EVENING MEETING

IEEE—IAS/IES Dinner Presentation Application of Surge Protection Devices

Wednesday, October 16, 2002

Paul Darwin, PE, Danaher Power Solutions

About the Topic:

The need to provide reliable power with a steady voltage has been recognized since the inception of the use of electricity. However, the engineering reality of a power distribution system is that voltage disturbances are unavoidable and can often cause damage to customer's equipment, loss of communication and the corruption of data. These disturbances can be generated external to a customer's facility by lightning strikes, switching, fault clearing and other normal or abnormal events. They can also be generated inside the customer's facility by the normal operations of elevators, HVAC units and lighting contractors or abnormal occurrences such as faults or switching. Paul's presentation will describe and define transients and also detail what can be done to prevent the impact of the transients within the customer's distribution system. He will review ANSI/IEEE C62.41-1991 and IEEE Emerald Book application guidelines, Nema LS-1 and UL testing, and also discuss proposed changes to the National Electric Code as it pertains to surge protection application.

About the Speaker:

Education: BSEE, University of Texas, Austin
MSCE, University of Texas, Arlington

Mr. Darwin is a Registered Professional Engineer in the State of Texas with over 21 years of experience in industrial, commercial and utility surge suppression applications including 18 years in utility transmission, distribution and substation design and also customer services with Texas Electrical Services. He is currently the Manager of Application Engineering for Surge Protection Products with the Current Technology Division of Danaher Power Solutions.

Location:

Costa's (Greektown)
340 S. Halsted St.
Chicago, IL

Costa's is located in Greektown on the corner of Van Buren and Halsted. For detailed directions and a map, go to: www.iaschicago.com

Time:

5:30 PM Social
6:00 PM Dinner
7:00 PM 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 reservations on line 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.

Note:

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.

EVENING MEETING

IEEE Fox Valley Subsection and IIT-Rice Campus Worldwide Safety Approvals Wednesday, October 16, 2002

John Allen, Product Safety Consulting, Inc.

About the Topic:

Federal law requires that products be approved for safety. In the USA this is done by Nationally Recognized Testing Laboratories (NRTLs). Many other countries have similar laws; this talk will cover the current state of approvals in the USA, Canada, Mexico, Europe, and other areas of the world.

About the Speaker:

John Allen is the President of Product Safety Consulting, Inc., a Bensenville, Illinois firm Mr. Allen established in 1988. PSC works with manufacturers, product developers and designers to obtain worldwide product safety approvals from independent certification agencies such as UL, Entela, ETL, CSA, VDE, TUV, etc. Mr. Allen has spent over 15 years working

in product testing and compliance for various companies with a variety of products, including Small Electric's, Industrial Controls, Machinery, Consumer Electronics and more.

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 Phillips 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 and Illinois Institute of Technology's Center for Professional Development (Rice Campus).

Time:

6:00 PM Networking time
7:00 PM Presentation

Reservations:

Reservations are not required.

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

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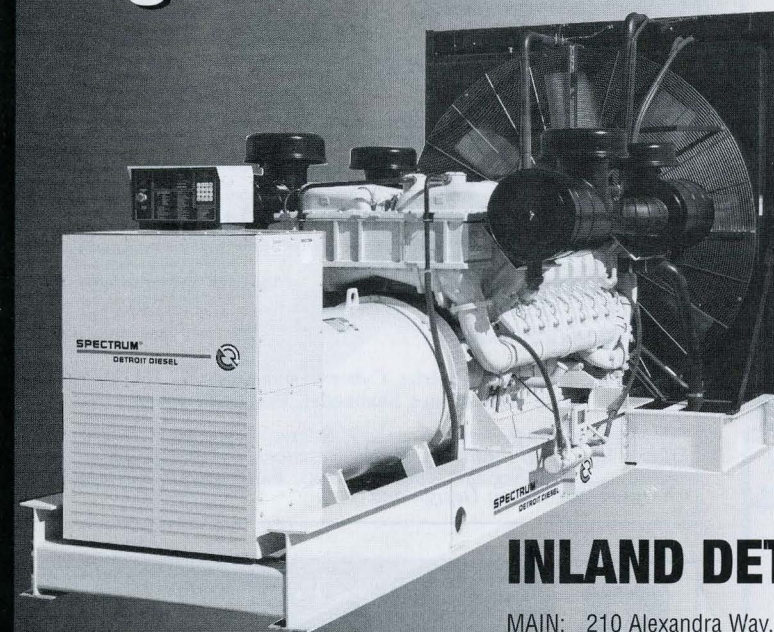
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Step 1: Submit copy via e-mail to: graphics@slackattack.com. Text should be sent in the body of the e-mail not as an attached file. Please include "notice" in the e-mail subject line.

Step 2: Fax a confirming hard copy of the notice to: 608-222-0262.

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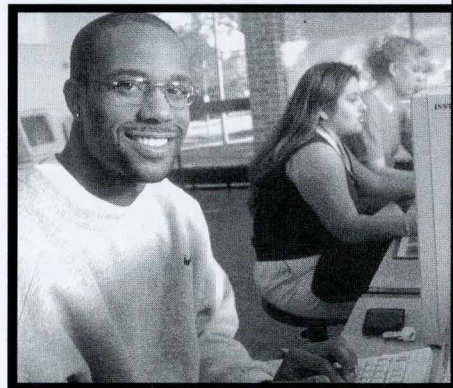
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