

The



IEEE Newsletter

PUBLICATION OF THE NORTH JERSEY SECTION OF THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

North Jersey SMC Society:

Innovative Hybrid Model of Risk Analysis in Supply Chains

On Tuesday, May 17, 2005, the NJ Systems, Man and Cybernetics (SMC) Chapter will host a talk on "Innovative Hybrid Model of Risk Analysis in Supply Chains." The speaker will be Dr. Azzam ul Asar.

About the Talk

Risk analysis in supply chains is the process of identifying threats and system vulnerabilities to analyze consequences and estimate the expected loss. Supply chains need to be modeled at various degrees of abstraction in order to arrive at strategic, tactical, or operational level decisions. Therefore, a complete structure and an inference engine are required to determine the most probable path and the relative probabilities of occurrence for any chain of events. The proposed approach introduces a multi-paradigm system based on a discrete event formalism for simulating a supply chain as a complex adaptive system. It utilizes a Petri net approach to model the discrete event behavior of supply chain, fuzzy logic to incorporate subjective probabilities of contributor events/ conditions, and Bayesian approach for structuring the probabilistic relationships among events involving conditional probabilities that quantify the strength of dependencies. The proposed approach generates its model based on matrices and performs fuzzy reasoning automatically. The proposed model uses subjective probabilities based on MIL standards and produces compatible results under a much adaptable and flexible environment. The results are being applied to several military supply chain scenarios.

About the Speaker

Dr. Azzam ul Asar received his PhD and MSc degrees from the University of Strathclyde, Glasgow, U.K. He did his BSc Engineering in Electrical from the NWFP University of Engineering & Technology, Peshawar, Pakistan. He is currently a visiting Professor in the

Electrical and Computer Engineering Department of the New Jersey Institute of Technology, New Jersey. His areas of research are intelligent systems, neural networks, and artificial intelligence, with applications to industrial systems. He has published over 20 technical papers in international journals and conference proceedings. He is currently conducting research on adaptive Petri nets and has been active in modeling risk analysis of supply chain networks by integrating Petri nets, Bayesian networks, and fuzzy logic into an innovative methodology.

All Welcome!

You need not be a member of IEEE to attend, and there is no charge for admission. Light refreshments will be served starting at 6:45 PM.

Time: 7:00 PM (light refreshments at 6:45 PM), Tuesday, May 17, 2005.

Place: New Jersey Institute of Technology (NJIT), Room 202, ECE Center, Newark, NJ. Directions are available at <http://www.njit.edu>.

Information/RSVP: Dr. Mike Liechenstein, (973) 471-0721, m.liechenstein@ieee.org, or Dr. Mengchu Zhou, mengchu.zhou@njit.edu. Please also check electronic newsletter for any possible changes in room, etc.

North Jersey Section Seeks Committee Chairs and Volunteers

The NNJ IEEE Section ExCom is seeking new volunteers to help conduct business at the section level for the benefit of its membership in the North Jersey section and surrounding areas. There are a variety of volunteer positions open and available. They range from

long-term to short-term, technical to non-technical, leadership or just participatory. All activities have varying levels of time commitment. For Chapter Chairs, you must be a member of the corresponding IEEE Society.

If you would like to become involved with volunteering in some of these efforts or positions or just become more informed about what is happening at the NNJ IEEE Section, please contact the persons listed below for additional information and questions. You can even attend the section business meeting held the first Wednesday of every month to find out more and other volunteer activities that require some help.

Some of the positions currently open and available are:

- *LEOS Chapter Chair.* Contact Har Dayal (har "DOT" dayal "AT" baesystems "DOT" com)
- *Controls Chapter Chair.* Contact Howard Leach (Hhleach "AT" aol "DOT" com)
- *GOLD Affinity Group Chair.* Contact Dick Tax (rtax "AT" bellatlantic "DOT" net)
- Historian Committee seeks help collecting IEEE historical information and specifically IEEE North Jersey Section History. Contact Al Stolpen (a "DOT" stolpen "AT" ieee "DOT" org)
- Student Activities Committee seeks new volunteers for North Jersey. Contact Amit Patel (a "DOT" j "DOT" patel "AT" ieee "DOT" org)

Additionally, if interested volunteers would like to get more general information about other activities in our section, visit the North Jersey Section website for newsletter information <http://web.njit.edu/~ieeenj/> or contact Har Dayal, har "DOT" dayal "AT" baesystems "DOT" com.

May 2005

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IEEE NJ SECTION HOME PAGE

<http://web.njit.edu/~ieeenj/>

IEEE NJ SECTION NEWSLETTER HOME PAGE

<http://web.njit.edu/~ieeenj/NEWSLETTER.html>

REPORT ADDRESS CHANGES TO:

IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, (732) 981-0060. It is not necessary to inform the North Jersey Section when you change your mailing address. "The IEEE Newsletter" and other section mailings use a list provided by IEEE's national headquarters.

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The North Jersey Section Executive Committee usually meets the first Wednesday (except holidays and December) of each month at 7:00 PM. Meetings are open to all members. For information on meeting agenda contact Secretary Russell Pepe at (201) 960-6796, rpepe@att.net.

NJ Section PACE & GOLD:

Engineers Meet:

Region 1 Director Elect About Afghanistan – The Latest

On Wednesday, May 11, 2005, the North Jersey Section GOLD and PACE committees will host a meeting with Barry L. Shoop, Region 1 Director-Elect.

He will discuss military - educational efforts in Afghanistan. He will also address your concerns for Region 1 IEEE activities.

About the Meeting

Central to nation-building efforts in Afghanistan is the need to create new national military institutions that are founded on principles that support a new constitution and are compatible with the liberal democracies they will ultimately serve. The key to this effort is to create institutions that will foster the inculcation of the concept of service within their nascent officer corps. Rather than expecting to be served by society because of their position, officers in the new Afghan National Army (ANA) must understand and embrace the concept that they are servants of society. This concept of national service contrasts sharply with the history of militias loyal to specific ethnic groups or individuals. To help create these institutions in Afghanistan, coalition and Afghan leaders turned to the U.S. Military Academy at West Point.

COL Barry L. Shoop spent the summer of 2004 in Afghanistan helping to establish the National Military Academy of Afghanistan (NMAA), returning on 22 March 2005 for the Opening Ceremony. COL. Shoop will discuss his experiences in Afghanistan, including his work to help establish the NMAA. His "boots-on-the-ground" perspective is much different than what you get from watching TV news.

As Director-Elect of Region 1, COL Shoop will also provide insight into what IEEE is doing at the Regional, National, and International level.

About the Speaker

Barry L. Shoop is a Colonel in the U.S. Army, Professor of Electrical Engineering, and the Electrical Engineering Program Director at the United States Military Academy at West Point. He earned the BS degree from the Pennsylvania State University in 1980, the MS from the US Naval Postgraduate School in 1986, and PhD from Stanford University in 1992, all in electrical engineering.

He is a Fellow of the OSA and SPIE and a Senior Member of the IEEE. He is currently the IEEE Region 1 Director-Elect and will assume responsibilities of Region 1 Director in January 2006.

All Welcome!

Members and students from all professional societies and engineering disciplines are welcome. We now have attendees from IEEE, ASME, NSPE, ASCE, NSPE, and AEA. For information about these groups see

www.aeworld.org/
www.aea.org/chapters/nj/
www.ieeeusa.org
web.njit.edu/~ieeenj/
www.asme.org/sections/northjersey

Time: 6:30 to 9:00 PM, Wed., May 11, 2005. Refreshments will be served.

Place: Clifton Memorial Library, 292 Piaget Ave, Clifton, NJ, (973) 772-5500.

Information: Paul Ward, (973) 790-1625 (PWard1130@aol.com) or Richard F. Tax, (201) 664-6954 (rtax@bellatlantic.net).

The NJ Section Education Committee Requests Your Feedback

The IEEE North Jersey Section has been helping fellow engineering professionals for the last fifty years. The Education Committee has successfully conducted software and engineering training courses over the last few decades. The Committee is committed to professional development of the members and the instructors for the courses are very qualified and experienced in their respective fields. Classes are arranged on weekday evenings or on Saturdays provided at least fifteen candidates are available. Completion certificates are issued by IEEE Headquarters with CEU credits for the number of training hours.

Due to the slow growth of the economy and several other factors, registration for these courses has diminished over the last few years. I would urge members to send their feedback regarding what courses they would be interested in, the format, location, and day/time, etc., by email to b.chivukula@computer.org.

Regards,
Bhanu Chivukula
Chair, Education Committee
Vice Chair, IEEE North Jersey Section

IEEE North Jersey Section Activities

May 2005

May 1 – “NJ Section Awards Reception” - 3:00 to 6:00 PM at the Birchwood Manor, 111 North Jefferson Rd, Whippany, NJ. Anne Giedlinski (973) 377-3175.

May 4 – “NJ Section Meeting”, 6:30 PM, “Executive Committee Meeting” - 7:00 PM, ITT, 100 Kingsland Rd, Clifton, NJ. Russell Pepe at rpepe@worldnet.att.net.

May 11 – “Engineers Meet: Region 1 Director Elect About Afghanistan – The Latest” - NJ PACE & GOLD, 6:30 – 9:00 PM, Clifton Memorial Library, 292 Piaget Ave, Clifton, NJ. Paul Ward, (973) 790-1625 (PWard1130@aol.com) or Richard F. Tax, (201) 664-6954 (rtax@bellatlantic.net).

May 11 – “Power Systems Operation and Control: Challenges and Future Directions” – NY I&M Chapter, 7:30 PM, Manhattan College, NY. Gordon Silverman (718) 862-7153 (gsilverman@ieee.org).

May 12 – “Spring 2005 Packaging Symposium” – registration 12:00 - 1:00 PM, papers from 1:00 - 5:30 PM, buffet dinner 5:30 - 7:30 PM, Lucent Technologies, Bell Laboratories, 600 Mountain Ave, Murray Hill, NJ. See <http://www.imaps.org/chapters/garden> for details. Michael Salloum (msalloum@rdcircuits.com).

May 17 – “Innovative Hybrid Model of Risk Analysis in Supply Chains” - NJ SMC Society, 7:00 PM (light refreshments at 6:45 PM), NJIT, 202 ECE Center, Newark, NJ. Dr. Mike Liechenstein, (973) 471-0721, m.liechenstein@ieee.org or Dr. Mengchu Zhou, mengchu.zhou@njit.edu.

May 19 – “HIFET-An Innovative Approach for High-Voltage, High-Power, Broadband Amplifiers” – EDS/C&S, & MTT-S/AP-S Chapters, 7:00 PM (buffet at 6:15 PM), NJIT, 202 ECE Center, Newark, NJ. Dr. Richard Snyder (973) 492-1207 (RS Microwave) or Dr. Edip Niver (973) 596-3542 (NJIT).

May 20 – “Day 2 - Motor And Motor Controls Seminar” - NJ IAS/PES Chapters, 9:00 AM – 3:30 PM, PSE&G Training Center, 234 Pierson Avenue, Edison NJ. Ronald Quade, PE, (732) 205-2614 or rwquade@ieee.org.

May 26 – “Marketing Ideas Workshop” - NJ Consultants' Network, 7:30 PM, Aeroflex/KDI-Integrated Products, 60 S. Jefferson Rd, Whippany, NJ. Robert Walker (973) 728-0344 or www.TechnologyOnTap.org.

May 31 – “Desktop Linux – the Time Has Come!” - NJ Computer Chapter, 7:00 PM (pre-meeting buffet at 6:00 PM), Public Meeting Room, Morris County Library, 30 E. Hanover Ave, Whippany, NJ. Seth Jakel (973) 731-1902, (sgjakel@comcast.net) or Vivek Shaiva (908) 229-6125 (vshaiva@computer.org).

Upcoming Meetings

June 1 – “NJ Section Meeting”, 6:30 PM, “Executive Committee Meeting” - 7:00 PM, ITT, 100 Kingsland Rd, Clifton, NJ. Russell Pepe at rpepe@worldnet.att.net.

June 30 – “Promotional Materials Workshop” - NJ Consultants' Network, 7:30 PM, Aeroflex/KDI-Integrated Products, 60 S. Jefferson Rd, Whippany, NJ. Robert Walker (973) 728-0344 or www.TechnologyOnTap.org.

Sept. ? – “Field Programmable Gate Array Seminar” - NJ Section, Time, Date and Location TBA. See <http://web.njit.edu/~ieeenj/> and upcoming Newsletters for updates.

Sept. ? – “Oracle Database Concepts Including SQL for Programmers” - NJ Section, Time, Date and Location TBA. See <http://web.njit.edu/~ieeenj/> and upcoming Newsletters for updates.

Members and Non-Members Welcome

PLEASE POST

Reminder: The June Newsletter will be electronic only. If you have a valid email address on record, you will receive a Newsletter web-update notice via email. To update your email address, go to

<http://www.ieee.org/update>

As always, that latest meeting updates can be found on the North Jersey webpage

<http://web.njit.edu/~ieeenj>

HIFET-An Innovative Approach for High-Voltage, High-Power, Broadband Amplifiers

On May 19, 2005, the IEEE NJ Section Electron Devices, Circuits and Systems Chapters together with MTT/S/AP-S and the New Jersey Institute of Technology will host a talk on "HIFET-An Innovative Approach for High-Voltage, High-Power, Broadband Amplifiers." The speaker will be Dr. Amin Ezzeddine.

About the Talk

HIFET* (High Voltage FET) is an innovative power combination technique to achieve high-voltage, high-power and broadband amplification. It stacks up the individual FETs both DC and RF in series. The source of the top FET becomes the drain of the bottom FET. Therefore, both the DC bias voltage and RF impedance of the FETs are added to a high value. By proper choice of the device configuration, it is possible to achieve near 50-ohm RF impedance for very broadband amplification. The challenge of designing the HIFET is to ensure that: a) Each FET in series sees the optimal load impedance to achieve optimal output power and efficiency, b) The RF output voltages of each FET are in phase to achieve efficient power combination, and c) To achieve high degree of stability.

AMCOM has developed discrete HIFETs for 14V and 28V DC voltage with output power up to 8W, and HIFET MMICs with 3W output power from 25MHz to 2,500MHz with 20V DC bias voltage, and 5W output power at 1.5-1.7GHz GPS band.

The HIFET is a methodology, which is not limited only to FET. It also applies to PHEMT, GaN, LDMOS, ...etc.

This talk will cover the principle of HIFET and AMCOM HIFET products.

About the Speaker

Dr. Amin Ezzeddine received his Bachelor of Science from Ain-Shams University, Cairo, in 1976, his Master and ScD degrees from MIT in 1979 and 1983 respectively.

Dr. Ezzeddine is the Executive Vice-President, Chief Engineer and co-founder of AMCOM Communications. Prior to founding Amcom Communications he worked with Comsat Corporation for 10 years where he held several management and research positions at COMSAT Laboratories and Comsat RSI.

Dr. Ezzeddine has over 20 years experience in designing MMIC & MIC components, over 20 published technical papers and several microwave and millimeter-wave circuit patents.

All Welcome!

You do not have to be a member of the IEEE to attend.

Time: 7:00 PM, Thursday, May 19, 2005. Free buffet will be starting at 6:15 PM.

Place: New Jersey Institute of Technology (NJIT), Room 202, ECE Center, Newark, NJ. Directions are available at <http://www.njit.edu>.

Information: Dr. Richard Snyder (973) 492-1207 (RS Microwave), Dr. Edip Niver (973) 596-3542 (NJIT), Har Dayal (973) 633-4618 (har.dayal@baesystems.com), or Kirit Dixit (201) 669-7599 (kdixit@ieee.org).

NY I&M Chapter:

Power Systems

Operation and Control: Challenges and Future Directions

On Wednesday, May 11, 2005 the NY Section Instrumentation and Measurement Chapter will host a presentation entitled "Power Systems Operation and Control: Challenges and Future Directions" by Dr. Behruz (Bruce) Fardanesh.

About the Talk

The future state of power systems operations and control based on a number of assumptions and an analysis of the direction that this area might take over the next 25 years. The main premise will be minimization of operating margins or maximum utilization of existing transmission assets with heavy reliance on traditional as well as new control equipment with increased system security and reliability. Issues related to development of techniques and requirements for fully coordinated, high-bandwidth, and robust controls for power systems will be discussed and some methodologies will be suggested. Proceeding toward this ultimate goal, System-wide Automatic Voltage Control (SAVC) and System-wide Automatic Power Control (SAPC) and the integrated System-wide Automatic Control (SAC) concepts will be introduced for coordination of injection (shunt) and routing (series) controllers for both real and reactive power. The application of Flexible AC Transmission Systems (FACTS) controllers as well as GPS-synchronized instrumentation and measurement techniques to enable more advanced control capabilities will be presented.

About the Speaker

Behruz (Bruce) Fardanesh received his

BS in Electrical Engineering from Sharif (formerly Arya-Mehr) University of Technology in Tehran, Iran in 1979. He also received his MS and Doctor of Engineering degrees both in Electrical Engineering from the University of Missouri-Rolla and Cleveland State University in 1981 and 1985, respectively. Since 1985 he has been teaching at Manhattan College where he holds the rank of Associate Professor of Electrical Engineering. He is currently affiliated with the New York Power Authority in his capacity as a Senior Research Engineering consultant where his interests include power systems dynamics, operation, and control.

Time: Pre-meeting reception with refreshments 6:30-7:30 PM; meeting 7:30 PM.

Place: Manhattan College.

Directions:

By Train: Take the Broadway #1 line to 238th Street. Walk West on 238th Street one (short) block to Corlear Ave. Turn right., LEO Engineering is directly ahead.

By Car: Take Major Deegan to Exit 11 (Van Cortlandt Park So.). Proceed due West on Van Cortlandt Park So. Past Broadway to Corlear Ave. (Van Cortlandt Park will be on your right as you proceed west. Do not follow sign to Manhattan College but proceed directly onto the elevated subway line at Broadway). Just past the elevated subway, turn left onto Corlear Ave. LEO Engineering is on your right. Parking lot is just beyond the LEO Building.

Information: Gordon Silverman (718) 862-7153 (gsilverman@ieee.org); parking available.

Conference Rooms Needed!

The North Jersey Section (Education Committee) is looking for conference room facilities to hold their training seminars. The seminars are being held on one weeknight from 6:30 PM to 9:00 PM. In return for providing the conference facility for free, the organization can get free registration up to three members in the course/seminar. Please contact Bhanu Chivukula, Education Committee Chairman, at b.chivukula@computer.org for suggestions or discussions, if interested.

NJ Consultants' Network:

Marketing Ideas

Workshop

On May 26, 2005, the IEEE Consultants' Network of Northern NJ (CNNNJ) will host a Marketing Ideas Workshop. The workshop will be led by Peter Schutz.

About the Workshop

Marketing and sales are some of the things that technical consultants find the hardest to do. One of the primary functions of CNNNJ is to make the services provided by CNNNJ members visible and attractive to potential customers, for example, by the existing periodic mailing and through the web site. What other marketing efforts could CNNNJ make?

We'll discuss our plans to visit companies in the area, special challenges we are confronted by, and associated ideas. If time permits, we will also hold a discussion on basic sales and marketing practices that we, as individuals, have found to be helpful.

Join our workshop and give us your ideas so that CNNNJ can provide you the best value for your membership dollars! This meeting was originally planned for February 2005 but was canceled due to inclement weather.

About the Panelist

The workshop will be led by Peter Schutz, Vice Chairperson of the CNNNJ Executive Committee. Peter is a mechanical engineer who has been working as an independent consultant for the last 20 years. He specializes in the development of new products, especially in the areas of medical and laboratory equipment, instrumentation, prototypes, and special machinery. Some of his areas of technical expertise include: electronics packaging, fluid systems, and thermal analysis. Peter has a BSME from Lehigh University and a MSME from NJIT. He survived his first year of consulting by eating rice. He has been a member of CNNNJ for the last 6 years.

All CNNNJ members and visitors are welcome to participate and help make this a successful program!

All Welcome!

Everyone welcome. No registration needed. Free admission.

About the Consultants' Network

Founded in 1992, the IEEE Consultants Network of Northern NJ encourages and promotes the use of independent technical consultants by business and industry.

Time: 7:30 PM, Thursday, May 26, 2005.

Place: Aeroflex/KDI-Integrated Products, 60 S. Jefferson Rd, Whippany, NJ. (Entrance at rear of building)

Information: For directions and up-to-date meeting status, call Robert Walker (973) 728-0344 or visit our website at www.TechnologyOnTap.org. To download a map to KDI, go to: <http://www.mcekdi-integrated.com/directions.htm>.

IEEE USA:

CARE - Congressional Advocacy Recruitment Effort

Calling All IEEE Members!

In 2004 over 2,000 American IEEE members contacted their elected officials on behalf of their profession. In 2005, IEEE-USA needs you to join them.

CARE is a voluntary network of IEEE members who are interested in public policy. Each year Congress and state legislatures debate hundreds of bills that could, if passed, directly impact technology engineers. From promoting broadband to regulating our electrical grid; from funding basic research to providing scholarships to engineering students, the legislative decisions impact engineers' careers in an unlimited number of ways.

CARE gives you an opportunity to influence your legislator's decisions before bills become law. By joining CARE you are giving IEEE-USA permission to contact you when legislation affecting you is being considered. When necessary, IEEE-USA will send you Legislative Action Alerts containing information on what's being discussed, how it will affect technology engineers, and what you can do about it. We then give you an opportunity to quickly make your views known through an e-mail system that automatically links you to your state and federal legislators.

CARE members are not obligated to respond to Action Alerts sent by IEEE-USA. The Alerts just tell you what is happening. Doing something about it is your decision.

Joining CARE is easy. Just go to our Legislative Action Center and sign in using your IEEE web accounts log-in. All you have to do is respond to one of our active Action Alerts, and you will automatically be listed as a CARE member. As new Alerts are posted, you will be notified by e-mail and given a easy way to respond.

Contact:
Russ Harrison
IEEE-USA
(202) 785-0017
r.t.harrison@ieee.org

NJ Consultants' Network:

Promotional Materials

Workshop

On June 30, 2005, the IEEE Consultants' Network of Northern NJ (CNNNJ) will host a workshop on Promotional Materials. The speaker will be Deborah Mesibov.

About the Workshop

Design of corporate materials, brochures, direct mail, and advertising requires a careful understanding of how to influence prospects so that the materials can generate leads and draw them to your business. Bring your current materials to this workshop and we will select items from these materials for instructional and constructive criticism.

- Learn how copy, color, and appropriate graphics catch the eye and create inquiry.
- See a demonstration of layout organized by emphasis.
- Understand the reasoning behind common yet important visual signals.

About the Speaker

Deborah Mesibov is the founding partner of Special Graphics, an agency known for its work in direct mail, advertising, consumer product packaging, trade show display, and publicity. As an award-winning art director and designer for nearly 30 years, Deb has created numerous promotions, advertising and direct mail campaigns, and package designs which have catapulted businesses into growth spurts by leveraging their own strengths.

Additional information can be found by visiting the agency's website at www.specialgraphics.com.

All Welcome!

Everyone welcome. No registration needed. Free admission.

About the Consultants' Network

Founded in 1992, the IEEE Consultants Network of Northern NJ encourages and promotes the use of independent technical consultants by business and industry.

Time: 7:30 PM, Thursday, June 30, 2005.

Place: Aeroflex/KDI-Integrated Products, 60 S. Jefferson Rd, Whippany, NJ. (Entrance at rear of building)

Information: For directions and up-to-date meeting status, call Robert Walker (973) 728-0344 or visit our website at www.TechnologyOnTap.org. To download a map to KDI, go to: <http://www.mcekdi-integrated.com/directions.htm>.

Spring 2005 Student Presentation Contest Late, But a Success

The North Jersey Section student presentation contest for spring 2005 was held on Tuesday, March 22nd at FDU in Teaneck, NJ, after being delayed by the ice storm on March 8th.

The contest was well attended and had a good number of participants. There were a total of 15 graduate and undergraduate student presenters covering a wide variety of topics. A group of five judges volunteered their time to grade each of the speakers. The purpose of the contest is to help students improve their communication and presentation skills. Each presenter received the judge's comment sheets for constructive feedback.

The contest started with dinner and then moved right into the graduate and undergraduate categories. Many different topics were covered and this year's students showed great expertise in using animated and concise slide presentations. Topics included everything from tutorials on nanotechnology and its applications, wireless credit card systems, to PLC controllers, and 4G mobile communications.

The winners, titles, and short abstracts can be found below. Winners in both categories were awarded 1st/2nd/3rd place prizes. All participants were given a career planning tutorial on CD. The next round of competition will be the regional contest to be held at SUNY Buffalo, NY, on April 9/10. All the details of their program can be found off the SAC website

http://ewh.ieee.org/r1/north_jersey/sac/ieee.html

The North Jersey Section Presentation contest will be again held next spring. Greater participation is hoped and the call for presentations will start early in November. All North Jersey Grad/Undergrads are welcome to participate for prizes. Special thanks goes to our judges, Maurice Baker, Har Dayal, David HESSIG, Stephen Wilkowski, and Mel Lewis for taking their time to support local students. Find below pictures of some participants of the presentation contest, judges, and some winners.



Student Presentation Contest Judges



Student Presentation Contest Contestants



Student Presentation Contest Winners

*Tias Kundu – 1st Place Graduate
New Jersey Institute of Technology
“Hydrogen/Deuterium Implantation for Si/SiO₂ Interface
Passivation”*

The Si-SiO₂ interface has become a focus of study with the trend to even smaller devices with thin gate oxides (<7nm region) in VLSI technology. One of the major defects giving rise to the interface states in the silicon band gap is the dangling bonds. Passivation of these bonds with hydrogen had been found to diminish their effect but leads to degradation of the device due to the effect of hot electron. Deuterium annealing has proved to improve the life time of the MOS devices for one level metal-dielectric structure but this technique is not very effective for a multi-level metal-dielectric structure. The present work investigates and optimizes incorporation of deuterium by ion implantation into the silicon substrate before the growth of thin gate oxides. Different implantation conditions were used for optimization to effectively passivate the silicon dangling bonds. Hydrogen implantation has also been carried out to study the isotope effect. The improvement in electrical and reliability characteristics of deuterium implanted devices were investigated. The deuterium implanted devices showed an enhanced interface passivation. Soft and hard breakdown characteristics of deuterium implanted device yielded better results compared to hydrogen implanted devices further confirming the isotope effect.

*Purushothaman Srinivasan – 2nd Place Graduate
New Jersey Institute of Technology*

*“Modeling and Simulation of SiGe Photodetector for Optical
Communication”*

The objective is to model and simulate the SiGe Photodiode using a Device Simulator (Taurus-Device, a Synopsys based TCAD tool) and understand the steady-state and transient characteristics of the device with i) changes in the doping concentration of the intrinsic layers ii) doping concentration of SiGe layers, iii) thickness of SiGe/Si superlattice structure (SLS) and iv) mole fraction of SiGe. The parameter that is studied to optimize them is the dark current of the photodiode. By dark current characteristics it is possible to estimate the electrical performance by observing the reverse bias breakdown voltage and reverse saturation current. The main application of this photodiode is for optical communications and hence it is essential that the parameters involved needs to be optimized in order to have maximum efficiency. The behavior of the diode is therefore studied for its wavelength and intensity variations as a measure of its optical performance.

*Mubashir Syed – 3rd Place Graduate
Stevens Institute of Technology*

*“Utilizing Beamforming for Random Access - A Cross-Layer
Paradigm”*

Adaptive beamforming has been shown to substantially improve the performance of many a packet radio systems. We present here, a slotted Aloha based random access protocol designed to be employed in conjunction with adaptive beamforming, for use in a sectorized cellular wireless system. The focus is on a cross-layer design approach, in which information about the status of packet transmissions is utilized to dynamically adapt antenna beams among the sectors in a cell. This scheme is especially robust against network inefficiencies due to uneven and time-varying traffic load densities within the sectors of a cell. Simulation results demonstrate the substantial enhancement in throughput and delay performance accorded by the proposed scheme.

*Brenda Kasigwa – 1st Place Undergrad
Fairleigh Dickinson University
“Voice Over Internet Protocol”*

Voice Over Internet Protocol (VoIP) is one form of Internet telephony which encompasses voice, video, and data. VoIP has gained popularity for the obvious reason of being cost effective especially through the intranets. Other reasons include the need to integrate voice and data networks, and the demand for multimedia communication. Some of the issues inhibiting popularity of VoIP include absence of standards, resulting in incompatibility of some systems, problems in voice quality, lack of security, and problems with integration with the public switched telephone networks. For the future, the most promising areas for VoIP are within corporate intranets and commercial extranets that control who can use the network. With the need for multimedia conferencing, ways will be found to ensure that VoIP is the trend of the future.

*Edgar Argueta – 2nd Place Undergrad
Fairleigh Dickinson University*

“Energy Conservation Using Compact Fluorescent Bulbs”

Fluorescent lights have been around for a while. They are used in most buildings and they consist of a ballast and a gas filled tube. The ballast, usually magnetic or electronic, “sparks” the gas making the tube glow with ultraviolet light exciting a white phosphor coating on the inside of the tube giving visible light. Compact Fluorescent lamps (CFL’s) are a smaller version of the standard fluorescent lamps with the difference that they can directly replace standard incandescent bulbs. The CFL’s have the same brightness and color retention as that of the incandescent with the difference that it uses less energy to give the same amount of light output and lasts 10 times longer. CFL’s are very energy friendly and replacing an incandescent bulb with a CFL of equal light output lessens energy consumption, reducing energy costs. If every household were to replace its incandescent bulbs with CFL’s, the reduction of pollution would be equivalent to removing 1 million automobiles.

*Todd DeLuck – 3rd Place – Undergrad
Fairleigh Dickinson University*

“Using Power Line Structures for Distributed AM Broadcasting”

Current AM radio broadcast schemes use multi-tower arrays commonly located in wetlands. These plant locations have become less desirable with recent concerns for environmental impact. Power line structures, which are in nearly all communities, can offer an alternate method of broadcast that would alleviate many environmental concerns and provide better coverage and reliability for broadcasters. Using the natural loop or slot created by lines passing from tower to tower small antennas can be created. By careful selection of antenna location, power and phasing a distribution network can be installed. These antennas can be fed with low power digital transmitters controlled by computer from a studio location. With computer modeling software, current coverage patterns can be duplicated or improved, faults in the system can be compensated for and environmental impact can be virtually eliminated. On the down side this proposed system would require a large upfront investment and a change in regulation by the FCC to begin implementation.

NJ Computer Chapter:

Desktop Linux – the Time Has Come!

On Tuesday, May 31, 2005, the IEEE North Jersey Section Computer Chapter will host a presentation entitled “Desktop Linux – the Time Has Come!” by Frank Middleton.

About the Talk

For years, the main complaint about Unix/Linux on the desktop has been the supposed lack of applications. This isn’t true any more. For example, this write-up and the presentation were developed and will be given entirely using Unix/Linux and Unix/Linux based tools.

In the presentation we will briefly go over the history of Unix and GNU/Linux (as it is properly called) and the Open Source Software (OSS) movement, look at the pros and cons of various major GNU/Linux distributions, and the many and varied OSS licenses and what they mean. As time permits, we will demonstrate some of the important desktop applications that make Linux a compelling option today not just on the desktop, but also as the home entertainment center, and for use in SOHO businesses for server based applications, such as email.

About the Speaker

Frank Middleton is the President and Founder of Apogee Communications Technologies, Inc., an established IT consulting services provider based in New Jersey that specializes in reducing costs and improving productivity and security in small to midsize companies by leveraging best of breed technologies, including Linux, and process management through Model Driven Architecture. For more information, visit <http://www.apogee.com> and also subscribe to his newsletter by sending an email with subject “subscribe” to news-request@apogee.com. Frank has many years of experience in IT at various companies including Deloitte, Citibank and others, and holds a Masters in Computer Science from the Courant Institute of Mathematics, NYU, and has been a member of IEEE, IEEE/CS and the ACM for longer than he wants to remember.

All Welcome!

You do not have to be a member of the IEEE to attend. Bring your friends and network during the free pre-meeting buffet starting at 6:00 PM.

Time: 7:00 PM, Tuesday, May 31, 2005 (pre-meeting buffet starting at 6:00 PM).

Place: Public Meeting Room, Morris County Library, 30 E. Hanover Ave, Whippany, NJ, (973) 285-6930.

Information: Seth Jakel, sgjakel@comcast.net, home - (973) 731 1902, cell - (973) 820-1865, office - (908) 243-8715, or Vivek Shaiva, (908) 229-6125, vshaiva@computer.org.

Dr. Durga Misra Selected as EDS Distinguished Lecturer!

Congratulations to Dr. Durgamadhav Misra on being selected as Electron Devices Society (EDS) Distinguished Lecturer. Dr. Misra has been very active in the North Jersey Section and currently sits as Junior Past Chair, Vice-Chair of the North Jersey Section EDS Chapter, and former Treasurer and Member-At-Large amongst numerous other IEEE activities. Dr. Misra was recently selected as a recipient for a 2004 IEEE Regional Activities Board Leadership Award. He is currently a professor at the New Jersey Institute of Technology.

IEEE-USA:

U.S. Government Agency's Approval of Unauthorized Visas Cuts U.S. Jobs

WASHINGTON (18 March 2005) - IEEE-USA "is extremely discouraged to learn that the United States Citizenship and Immigration Services (USCIS) in the U.S. Department of Homeland Security has accepted and approved more than 75,000 H-1B visa petitions for Fiscal Year 2005 even though they were capped at 65,000," said IEEE-USA Career Activities Vice President Ron Hira, an assistant professor of public policy at the Rochester, NY, Institute of Technology.

The IEEE-USA Vice President stressed: "We're not sure just how or why this excess in authorized visas occurred. But this certainly isn't the first time that the Federal agency charged with responsibility for administering the nation's immigrant and non-immigrant admissions programs has failed to enforce a very plain and straightforward law. How hard can it be to count to 65,000 and stop issuing visas?"

Dr. Hira continued: "This excess in approved visas defeats the purpose of one of the most important safeguards for American workers. By increasing the number of visas issued, the USCIS has unilaterally reduced job opportunities for American workers at a critical time, when the job market is still very soft." He also noted: "Several years ago, the USCIS predecessor agency -- the Immigration and Naturalization Service (INS) -- issued 20,000 more H-1B visas than it was supposed to have approved, and added this additional number into the following year's total."

IEEE-USA's Hira also applauded Senator Charles Grassley (R-IA) and others in Congress "for moving quickly to hold the USCIS accountable for its actions." In a 7 March letter to USCIS Director Eduardo Aguirre, Senator Grassley expressed dismay that the agency seems to have ignored Congress' intent with respect to the visa cap. The senator also asked for the numbers of H-1B visa applications that have been approved, and called for an explanation of how the agency intends to ensure that issuance of more visas than authorized does not occur again.

The H-1B temporary work visa program was established by Congress to enable U.S. employers to hire foreign nationals with knowledge and skills deemed to be in short supply in the United States. H-1B visas are valid for up to six years and are currently capped at 65,000 per year.

Educational institutions and related not-for profit research organization are not subject to the 65,000 cap. Late last year, an additional 20,000 H-1B visas were set aside for applicants with Masters and PhD degrees from U.S. colleges and universities.

IEEE-USA is an organizational unit of the IEEE. It was created in 1973 to advance the public good and promote the careers and public policy interests of the more than 220,000 technology professionals who are U.S. members of the IEEE. The IEEE is the world's largest technical professional society. For more information, go to <http://www.ieeeusa.org>.

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IEEE-USA White Paper: U.S. Prosperity at Risk; Gigabit Networks Should be National Priority

WASHINGTON (8 April 2005) - The United States should deploy widespread wired and wireless gigabit networks as a national priority, according to a white paper from the IEEE-USA Committee on Communications and Information Policy (CCIP).

"Providing Ubiquitous Gigabit Networks in the United States," issued 14 March, says that our nation must act promptly to ensure that a new generation of broadband networks of gigabit per second speed is ubiquitous and available to all. Failure to act will "relegate the U.S. telecommunications infrastructure to an inferior competitive position" and undermine the future of the U.S. economy.

"Priority deployment of gigabit networks is essential for the United States to maintain its world leadership in the knowledge economy," IEEE Life Fellow and IEEE-USA CCIP member Dr. John Richardson said. "Information drives our lives and our prosperity. The problem is that current networks aren't fast enough to distribute that information properly."

Digital data rates, or speeds, are

typically expressed as megabits per second (Mb/s) or gigabits per second (Gb/s). A megabit is one million bits; a gigabit is one billion bits. Current broadband networks, such as DSL or cable modems, have an asymmetric speed of about 2 Mb/s. Gigabit networks are capable of digital rates 50 to 5,000 times as fast, with equal upstream and downstream speed. Symmetric speed means information can be downloaded and uploaded at the same rate. With asymmetric systems, upstream speeds lag behind downstream delivery rates.

Omnipresent U.S. gigabit networks, readily achievable by deploying optical fiber and high-speed wireless, would carry numerous benefits. These include providing the U.S. economy with superior ability to compete globally; stimulating economic activity in digital home entertainment; enhancing online education and training; and facilitating health care remote diagnosis and consultation (telemedicine).

Congress, the Executive Branch and private-sector initiatives could secure these benefits for our nation's global competitiveness and quality of life by adopting "principles leading to ubiquitous, symmetric gigabit availability as a national priority," according to the CCIP white paper

(<http://www.ieeeusa.org/volunteers/committees/ccip/docs/Gigabit-WP.pdf>). Such principles include regulatory flexibility and encouragement of user-owned networks.

"The key fact of modern telecommunications is the convergence of voice, data, image and video into digital bit streams," said Richardson, a former chief scientist at the National Telecommunications and Information Administration. "We need faster networks to carry these bit streams to users. Broadband speed and penetration in the United States are pitiful compared to levels in Japan and South Korea. This means that U.S. prosperity is at risk because it depends, in large part, on fast and easy exchange of information."

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E-Mail: c.mcmanes@ieee.org

North Jersey Section
Field Programmable Gate Array Seminar

Seminar overview

FPGA stands for Field Programmable Gate Array. FPGAs are becoming the de facto standard in digital design. They are found in control, DSP and general purpose computing. They offer designers the ability to go to layout before committing to the full design.

This seminar will introduce FPGAs and provide a road map on how to learn and become productive in the use of FPGAs. Development will be used by the instructor to execute labs.

Seminar Design Outline

- **Introduction to FPGA**
- **FPGA architecture**
- **Xilinx Design Flow**
 - ↳ **Architecture Wizard and Pace**
 - ↳ **Reading Reports**
 - ↳ **Global Timing Constraints**
- **Synthesis Techniques**
 - ↳ **XILINX CORE Generator**
 - ↳ **Floorplanner: Effective Layout**
- **FPGA Editor: Viewing and Editing a Routed Design**
 - ↳ **HDL Bencher**
- **FPGA Design Techniques**
- **Synchronous Design Techniques**

About the Speaker

Mr. Chibane Cherif, is a practicing engineer, speaker and lecturer in telecommunications, wireless communication and Voice Over IP technology, business and market issues.

Pre-requisite

Basic Digital design

Time: TBA, September 2005.

Place: TBA – see <http://web.njit.edu/~ieeenj/> and upcoming Newsletters for updates.

Information: see <http://web.njit.edu/~ieeenj/> and upcoming Newsletters for updates.

North Jersey Section
Oracle SQL Programming 101

Seminar Objective

This 4 hour course will teach you how to work with data within an Oracle Database using SQL and SQL*Plus.

Seminar Design Outline

- Principal features of the Oracle database
- Query and manipulate an Oracle database using Structured Query Language
- Code sophisticated query operations such as join, grouping, case and more
- Update data with insert, update, delete, and merge operations
- Create database tables with the major datatypes such as NUMBER, VARCHAR2
- Create B-Tree indexes to improve the performance of query operations
- Query Oracle data dictionary tables such as USER_TABLES
- Utilize transaction control statements such as Commit, Rollback and Savepoint
- Create database objects such as tables, views, indexes, synonyms and sequences
- Grant and Revoke object privileges
- Utilize SQL*Plus to query, update and create database objects
- Use SQL*Plus scripting and report generation features

About the Speaker

The speaker is scheduled to be Raj Agarwal, DBA.

Time: TBA, September 2005.

Place: TBA – see <http://web.njit.edu/~ieeenj/> and upcoming Newsletters for updates.

Information: see <http://web.njit.edu/~ieeenj/> and upcoming Newsletters for updates.

IEEE AWARDS RECEPTION

*North Jersey Section
May 1, 2005
Birchwood Manor, Whippany NJ*

*A time to relax, unwind and enjoy --
A time to pay tribute to our new Fellows --
A time to honor our Award Winners --
YES it's time for the Annual Section Reception*

The Annual Section IEEE Awards Reception will be held at the Birchwood Manor, 111 North Jefferson Road, Whippany again this year. The affair is scheduled for **Sunday, May 1, 2005** from 3 to 6 PM. Tickets are \$35.00 each. Spouses and guests are welcome. We are limited to 90 attendees, so please make your reservations early.

Reservations are required by April 20, 2005. Complete the reservation form and return it with your payment. If you would like tickets mailed back to you, please enclose a self-addressed **stamped** envelope. Otherwise, your tickets will be held at the door for you. If any additional information is required concerning the reception, contact Anne Giedlinski at (973) 377-3175.

Use this form for Reception reservations. **ENCLOSE A SELF-ADDRESSED STAMPED ENVELOPE to receive tickets in advance. Reservations are required by April 20, 2005.**
Mail reservation request to:

Anne Giedlinski
299 Brooklake Road
Florham Park, NJ 07932

Enclosed is _____ for _____ ticket(s) at \$35.00 each (make check payable to **North Jersey Section IEEE**) for:

NAME: _____

ADDRESS: _____

Yes, please send me directions to the Birchwood Manor

NJ Power Engineering Society/Industry Applications Society

Motor And Motor Controls Seminar

The PES and IAS Chapters will sponsor a two-part seminar covering Motor and Motor Controls. The sessions will be held on two Fridays, April 29 and May 20 at The PSE&G Training Center in Edison, NJ.

The seminar will cover the design and application, protection and control of three-phase motors.

Topics

Day 1

- ✓ Operating conditions, insulation, voltage unbalance
- ✓ Three phase motor theory
- ✓ Protection (fuses, breakers, MCP, overloads)
- ✓ NEMA Premium Efficiency motors

Day 2

- ✓ Solid State Starting
- ✓ Speed control, harmonics, inverter-grade motors
- ✓ Testing, maintenance and repair

About the Instructor

The instructor will be John Hyfantis, President of Energistics LLC. Prior to forming Energistics in 1978, John's responsibilities included engineering and management positions with Electronic Associates, RCA-Astro, Dow Jones & Co., and Johnson & Johnson. John has conducted this course previously for PSE&G, Conectiv, NYSERDA, Northeast Utilities, Hoffmann-La Roche and Schering-Plough.

Mr. Hyfantis is past President and Chairman of the Board of Trustees of the Energy Expo Inc. He is also a charter member and twice past president of the New Jersey Association of Energy Engineers.

His educational credits are a BS degree in Electrical Engineering from Lafayette College, 1960, and a Masters degree in Management from New York University, 1970. He is a Certified Energy Manager, and is a registered Professional Engineer in New Jersey, New York, Connecticut and Pennsylvania.

The registration fee for this two-part seminar prior to April 15th will be \$175 for non-IEEE members, \$125 for IEEE Members, \$100 for GOLD Graduates (last 1-10 years) and \$25 for students with valid ID. The fee will be waived for IEEE Life Member Grades with verification at the seminar. Registrations received after April 15th must include an additional late fee of \$25. The seminar fee includes lunch, refreshments and handouts. Non-members joining IEEE within 30 days of the seminar will be rebated 50% of the IEEE registration charge.

If desired, IEEE Continuing Education Units will be offered for this course - a small fee of \$15 will be required for processing. A total of 1.2 CEUs will be offered. Please indicate if desired below.

Time: 9:00 AM to 3:30 PM with lunch provided at noon, Friday, April 29, 2005 & Friday, May 20, 2005.
Place: PSE&G Training Center, 234 Pierson Avenue, Edison, NJ.
Directions: www.pseg.com/customer/business/small/facility/edison_directions.jsp
Information: Ronald W. Quade, PE, (732) 205-2614 or rwquade@ieee.org.

Registration: Motor Seminar 4/29/2005 & 5/20/2005

Register via US mail to: Ronald W. Quade, PE
Eaton Electrical
379 Thornall St, 8th Floor
Edison, NJ 08837

Name _____

Address _____

Phone _____ Email _____

IEEE # _____ Student @ _____ Non IEEE _____ Life Member _____

Continuing Education Units: _____ Yes \$15 _____ No

If CEUs are chosen, please include a \$15 processing fee

Payment Enclosed \$ _____ Add \$25 late registration after April 15th

Make checks payable to North Jersey Section IEEE