IEEE National Capital Area **scanner**

A Joint Publication of the Washington and Northern Virginia Sections
www.ieee.org/escanner

Volume 23, No. 4
July–August 2008

Eta Kappa Nu, IEEE to Merge

By Pete Sypher
***Scanner* Editor-in-Chief**

A merger of Eta Kappa Nu and IEEE will probably be finalized late this year. Talks between the two organizations began in 2006, and in late 2007 the Board of Governors of HKN (we use the English letter H for Eta; using E would stand for Epsilon) and the IEEE Board of Directors signed a memorandum of understanding. The merger will be complete after definitive agreements are prepared and approved by the boards of IEEE and HKN, and certain governmental approvals are obtained.

HKN is an electrical and computer engineering honor society started in 1904 emphasizing technical excellence, character and leadership potential. To be invited to join, students must be in the upper fourth of their junior class and the upper third of their senior class. In recent years, HKN expenses have exceeded income and its endowment income has been gradually decreasing. The declining number of graduates in electrical and computer engineering has resulted in lower income from initiation fees. A quote from HKN President J. David Irwin: "As an old Southern boy, our current financial situation reminds me of the saying: 'When your outgo exceeds your income, your upkeep will be your downfall.'"A major benefit to HKN from the merger will be the Web-hosting, e-mail alias, and database support from IEEE.

The major benefit to IEEE will be the requirement that HKN inductees be IEEE student members. This requirement is the principal reason for the IEEE's interest in the merger. This requirement is a concession of HKN, because HKN and IEEE have tended to be competitors for a student's dues, time, and efforts. Most of us will agree that engineering students have very little spare time from their studies.

Gerry Christman, an HKN member and chair of the Washington Section, says: "In my personal view, this is a win-win situation. IEEE gets to mainstream the best and the brightest in electrical and computer engineering right into IEEE as student members and then full professional members upon graduation."

Post-merger, HKN will become an organizational unit of IEEE. The president of IEEE-HKN will sit on the IEEE Educational Activities Board as a voting member of that board and on the board of the IEEE Foundation.

Making a Difference as a Mentor—*At the IEEE National Capital Area Annual Awards Banquet on April 12, Janet Rhodes Latham (right) was recognized for her contributions as a high school IEEE Club Liaison. She is also a FIRST Robotics team mentor. She told banquet guests about how she uses robotics projects and competitions to get students excited about engineering and science. Kiki Ikossi, banquet co-chair, presented Latham with an award from the Washington Section. See p. 4 for a story about the banquet, more photos and a list of awards.*

Preparing for a Virtual Challenge—*Participants in a two-day workshop held at NIST in October were introduced to simulation software and test scenarios for automated guided vehicles. Each college team was provided with a desktop computer running Linux, monitor, keyboard, joystick, Unreal game engine, and NIST-developed high-fidelity simulation and control systems to prepare for an April competition focusing on accurate path following and docking.*

Virtual Automation Competition Features Open Source Code

By Raj Madhavan
Chair, Robotics and Automation Society Chapter

Using a $10,000 grant from the New Initiatives Competition program offered by the IEEE Robotics and Automation Society (RAS), my colleagues and I created a regional virtual manufacturing automation competition (VMAC) for college teams during the 2007-08 academic year. Students used simulation systems and open source software to control an automated guided vehicle (AGV) through real-world settings in a virtual factory. Hood College prevailed in an April contest between the participating teams.

AGVs represent an integral component of today's manufacturing processes. Major corporations use them on factory floors for jobs as diverse as intra-factory transport of goods between conveyors and assembly sections, parts and frame movements, and truck trailer loading and unloading. Automating these systems to operate in unstructured environments presents an exciting area of current research in robotics and automation.

Unfortunately, the traditional entry barrier into this research area is quite high. Researchers need an extensive physical environment, robotic hardware, and knowledge in research areas ranging from mobility and mapping to behavior generation. One way to lower this entry barrier is through the use of simulation systems and open source software.

The competition organizers, Dr. Stephen Balakirsky, Mr. Chris Scrapper and myself, all work in the Intelligent Systems Division within the Manufacturing Engineering Laboratory at the National Institute of Standards and Technology (NIST). To design the competition, we relied on our experience in managing the de facto standard open source systems for virtual urban search and rescue development (see ***www.sourceforge.net/projects/usarsim***), and the RoboCup virtual league simulation robot competitions.

We recruited eight teams from regional universities consisting of faculty mentors and both undergraduate and graduate students. The groups that completed the contest were two teams from Hood College in Frederick, Md., one team from George Mason University in Fairfax, Va., and two teams from the University of Maryland Eastern Shore. Three teams dropped out of the competition due to lack of interest and schedule conflicts.

One of the main motivations for the VMAC was to lower the entry barrier for teams to participate in the competition. They were provided with all hardware and software necessary to participate, including the Unified System for Automation and Robot Simulation (USARSim) system, the MOAST (Mobility Open Architecture Simulation and Tools) robotic control framework, and the hardware to run the controller (a Linux PC).

In addition to the hardware and software, two workshop tutorials were held and a user's support group was established. The first workshop was a two-day event in October at NIST in Gaithersburg, Md. During this workshop, students and faculty were acquainted with the software base and participated in the design of the competition events. A follow-up workshop was held at Hood College in February to track progress and provide hands-on assistance with any outstanding issues.

As discussed at the workshop tutorials, the competition was based on real-world scenarios. The scenario chosen was a factory setting that had significant clutter, maze-like passageways of various widths, and dynamic obstacles. The original objective was to have several Ackerman-steered AGVs pick-up packages at a central loading station and deliver them to one of several unloading stations. The package destinations were encoded in RFID tags on each package. This objective included the sub-problems of traffic management, route planning, path following, and docking.

While the baseline code provided to the teams was capable of performing the objectives, it was far from optimal.

See **COMPETITION,** *p. 8*

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eScanner Calendar of Events

The calendar is available at ***www.ieee.org/escanner***. Check here for events submitted too late for print publication.

IEEE National Capital Area Virtual Community

Exchange ideas and participate in discussions with local IEEE members at ***www.ieeecommunities.org/nca***.

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EDITORIAL POLICIES AND PROCEDURES

Calendar Announcements

Please submit calendar items in the format used in the Calendar of Events. You can send email to ***ncac-scanner@ieee.org***. Events must have an IEEE or affiliate sponsor.

If possible, include a synopsis of the event and a biographical sketch of the presenter including academic background, current position, notable achievements, and IEEE and other professional affiliations.

Articles

Other contributions, such as reports on chapter events and other member activities, are most welcome. Please submit articles to the managing editor at ***ncac-scanner@ieee.org***.

Advertising

Contact the advertising manager about ad rates and to place advertising orders. Ads must be submitted by the deadline below.

Deadlines

The editor reserves the right to set policies and procedures necessary to provide members with a newsletter that is informative and timely. Deadlines must be strictly observed to keep the publication on schedule. If you are planning an event and have insufficient information by the deadline, please contact the managing editor. The deadline for the upcoming issue will always be published on this page.

September-October issue deadline: August 1, 2008

IEEE National Capital Area Scanner is published bimonthly by The Institute of Electrical and Electronics Engineers, Inc. Corporate Office: 3 Park Avenue, 17th Floor, New York, NY 10016-5997. It is sent automatically at a cost of $1.00 per member per year (included in annual dues) to each member of the Washington and Northern Virginia Sections. Periodicals postage paid at New York, NY, and at additional mailing offices.

Postmaster: Send address changes to *IEEE National Capital Area Scanner,* 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331. (ISSN 0894-0452)

calendar *of* events

Saturday, July 19, 2008

Northern Virginia Section Picnic

Sponsors: Northern Virginia Section, Graduates of the Last Decade (GOLD), Women in Engineering

Place: Lake Fairfax Park, Reston, VA

Time: 12:00 noon to 4:00 pm

Directions: From the Beltway, take exit 47A (Route 7, Leesburg Pike) to Baron Cameron Avenue. Turn left on Baron Cameron Avenue and take the second left onto Lake Fairfax Drive. Follow the signs to the picnic.
See ***www.co.fairfax.va.us/parks/maps/lakefairfaxmap.htm*** or ***www.reston-paths.com/LakeFairfaxPark***.

More Info: All IEEE members and their guests (including children) are invited. Hot dogs, hamburgers, and vegetarian burgers will be grilled, and cold sodas will be provided. Optionally, a food item, such as a dessert or side dish, would be appreciated. Feel free to bring along an outdoor game. Please no alcohol.

Cost: Free for IEEE members and guests.

Contact: In order that we may plan appropriately, please RSVP to Chuck Baldi at ***cbaldi@ieee.org*** no later than Friday, July 11. Let us know how many will be attending, and whether you will be bringing a dessert or side dish to supplement.

Monday, July 21, 2008

The Washington Post Job Fair

Time: 11:00 am to 5:00 pm

Place: Ritz Carlton Tyson's Corner, VA

More Info: Visit the IEEE booth at this engineering, technology, and security clearance career expo. Meet face-to-face with local and national employers.
For details, see ***www.expoexpertsllc.com/072108-dc-eng.html***.

Tuesday, July 22, 2008

How to Avoid Software Inspection Failure and Achieve Ongoing Benefits

Sponsors: IEEE Computer Society; American Society for Quality (ASQ) Section 509 Software SIG; and the Society for Software Quality (SSQ)

Time: 6:30 pm

Speakers: Lew Priven and Roger Stewart, Priven-Stewart Group

Place: Video teleconference with sites in McLean and Silver Spring. Addresses are provided at the registration link below.

More Info: All interested IEEE members and guests are invited to attend. Pizza and soda will be served.

Cost: Free

Contact: Advance registration is required to enter the facilities. Please register online at ***www.asq509.org/ht/d/sp/i/2499/pid/2499***. If your plans change, please email ***ankums@mitre.org*** to cancel your reservation.

Friday, July 25, 2008

♦ Patterned Nanomagnetic Bits and Devices

Sponsor: Magnetics Society

Speaker: Bruce D. Terris, Hitachi Global Storage Technologies

Time: 2:00 pm

Place: National Institute of Standards and Technology (NIST), Lecture Room A, Building 101, Gaithersburg, MD

Directions: See ***www.nist.gov/public_affairs/maps/nistmaps.html***.

More Info: This is an IEEE Magnetics Society Distinguished Lecture. See Diamond story, p. 7.

Contact: Robert McMichael at 301-975-5121 or ***robert.mcmichael@nist.gov***. Advance registration and photo ID are required for anyone without a NIST badge. We must register you with the security system; otherwise you will not be able to get into NIST.

Tuesday, July 29, 2008

Computer Society Executive Committee Meeting

Time: 7:00 pm

Place: Virtual meeting

More Info: The Northern Virginia and Washington Chapter of the Computer Society wants to expand its executive committee to support more events and activities. This meeting is open to any Computer Society or IEEE member who wants to get involved and share the excitement of the industry.

Contact: To attend this virtual meeting, please RSVP to Tom Starai at ***starai@ieee.org*** 48 hours before the meeting. You will receive instructions for the website and a teleconference number by email. Virtual capacity is limited to 20.

Saturday, August 2, 2008

♦ IEEE Expert Now Course: Skills for Success in the Real World

Sponsors: National Capital Area Consultants' Network, Graduates of the Last Decade, Women in Engineering, Life Members

Time: 1:30-3:30 pm

Place: ITT Technical Institute, 14420 Albemarle Point Place, Chantilly, VA

More Info: *Stuff you Don't Learn in Engineering School: Skills for Success in the Real World* is an IEEE Expert Now Course. This session is Module 1, *Basic Skill.* Depending on member interest, it will be followed by modules 2 and 3 in the fall. This is an excellent opportunity to take the interactive course without having to purchase it. Student members are especially encouraged to attend. Refreshments will be provided. See Diamond story, p. 7. For more information about Expert Now courses, see ***www.ieee.org/web/education/Expert_Now_IEEE***.

Cost: Free for IEEE members. A CEU certificate is available from IEEE for a nominal cost.

Contact: Pre-registration is required by Thursday, July 30. Please provide your IEEE member number to Wally Lee at ***w.h.lee@ieee.org*** or 301-468-2418.

Tuesday, August 5, 2008

Washington Section Administrative Committee Meeting

Time: 6:45 pm

Place: American Association for the Advancement of Science (AAAS), 1200 New York Avenue NW, Washington, DC

Directions: Use the 12th Street entrance. The AAAS building is one block from Metro Center (Red, Orange and Blue lines).
Street parking is free after 6:30 pm (no parking 4:00-6:30 pm). There is a pay parking lot at the intersection of 9th St. and New York Ave., and an underground parking garage at 14th St. and New York Ave. See map at ***www.aaas.org/dcwest.pdf***.

More Info: All interested IEEE members are welcome.

Contact: RSVP to Tim Weil at ***trweil@ieee.org*** or 301-452-3641.

Wednesday, August 6, 2008

Capitol College Graduate School Virtual Open House

Sponsor: Capitol College

Time: 7:00 pm

Place: Online

More Info: Capitol College is an IEEE Education Partner. Learn about its master's degree programs, meet faculty and staff, and experience the online classroom. For information about IEEE tuition discounts, see ***www.capitol-college.edu/academicprograms/partnerships/ieee***.

Contact: RSVP required. Please send your name, email address, phone number and program of interest to Laura Broughton at ***gradadmit@capitol-college.edu***.

Saturday, August 16, 2008

Washington Section Picnic

Sponsors: Washington Section, National Capital Area Consultants' Network

Time: 3:00-6:00 pm

Place: Lake Fairfax Park, Reston, VA

Directions: From the Beltway, take exit 47A (Route 7, Leesburg Pike) to Baron Cameron Avenue. Turn left on Baron Cameron Avenue and take the second left onto

See **CALENDAR**, *p. 7*

Kiki Ikossi, 2007 Washington Section chair, presents the section's Friend of IEEE award to David Colapinto, Stephen Kohn and Michael Kohn, partners in the law firm, Kohn, Kohn and Colapinto, LLP.

On behalf of the entire University of Maryland Solar Decathalon Team, John Cartagirone, Dan Vlacich and Nirmal Mehta accepted the Achievement Award from the IEEE Washington Section, presented by Kiki Ikossi.

Marc Apter accepts the Distinguished Service Award from Kiki Ikossi.

Tim Weil (right), patron chair for IEEE GLOBECOM 2007, presents the framed Presidential proclamation for the conference to Jerry Gibbon for his work as general chair of the conference.

Monica Mallini accepts the Northern Virginia Section's Volunteer of the Year Award from Chuck Sisung, 2007 section chair.

Dressing Up & Heading Downtown: Festive Banquet is Worth the Effort

By Dr. Kiki Ikossi
2008 Banquet Co-Chair

Engineers are notorious for their casual, easy going dress, but the night of Saturday, April 12 was special. It was a rare opportunity for IEEE members in the National Capital Area to dress up and head downtown to the Grand Hyatt Washington for an evening honoring local IEEE volunteers, newly-elected Fellows, student leaders and supporters.

The Washington and Northern Virginia sections of IEEE together serve more than 12,000 members who live or work in the metropolitan area. The two sections share many joint activities and take turns hosting the annual awards banquet. The Washington Section was pleased to be the host this year. More than 180 IEEE members, dignitaries and guests attended the banquet.

Two newly-elected IEEE Fellows, Paul Ebert (left) and Peter Mikhalevsky (far right) are congratulated by IEEE Fellow Frederica Darema (second from left) and 2007 Banquet Co-chair Kiki Ikossi.

Reception & Dinner

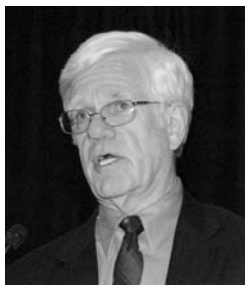
The evening began with a reception that offered an opportunity to meet the next generation of engineers and scientists and ask them about their projects and future plans. Guests enjoyed drinks and hors d'oeuvre while viewing displays by the first place winners of regional science fairs, a FIRST Robotics team, and the University of Maryland Solar Decathlon Team.

A pleasing surprise during the reception was live music by the McLeod-Miller Jazz Quintet featuring students from the St. Stephen's and St. Agnes School Jazz Ensemble. Their music created a relaxing, festive atmosphere. Many guests commented on the quintet's versatile repertoire and outstanding performance. The quintet received a standing ovation for pieces such as *All of Me* and *The House of the Rising Sun.*

The banquet menu included wine, a crab cake appetizer and a choice of four entrees including beef tenderloin and panko crusted rock fish, followed by an individual chocolate souffle cake with caramel peanut praline and a chocolate "straw."

Keynote Address

The keynote speaker was Dr. Linton Wells II of the National Defense University. He serves as the transformation chair and distinguished research professor at the Center for Technology and National Security Policy.



Dr. Wells

In his talk, "Continuity and Discontinuity in National Security Affairs," Dr. Wells discussed trends in six key areas that will affect the nation's security in the future. Advances in science and technology will blur the line between the organic and inorganic and will lead to new micro weapons. Demographic trends include an aging population in the western world, a "youth boom" in sub-Saharan Africa, and a worldwide shift towards urban residency. Economic trends include increased empowerment of individuals competing in the global economy but also the danger of unrest if the price of food and other commodities rises. Environmental limitations cannot be ignored. Cultural changes include the growing importance of non-state actors and the need to understand them.

Finally, the nature of global conflicts is moving away from major wars and towards attacks by non-state groups and even individuals who can build extremely lethal weapons in their basements, Dr. Wells said. Robotics and cyber crime are separating the soldier from the battlefield.

These trends are interlinked and will have an aggregate impact on national security, requiring the military to adapt quickly to new types of situations. "Macro-level effects can appear very fast, from micro-level inputs," he said.

Dr. Wells emphasized the importance of anticipating and adapting to complex, revolutionary changes. "Effective and continuous learning is of strategic, national im-

David J. Pelgrim (left), director of global support services for E.K. Fox & Associates, accepts the Sustaining Friend of the IEEE Northern Virginia Section Award for his firm's support of the section's activities over many years. Presented by Chuck Sisung, 2007 section chair.

Murty Polaravapu accepts the Distinguished Leadership Award from Kiki Ikossi.

portance," he said. IEEE can play an important role by nurturing first-rate scientists and engineers, promoting technological literacy, and helping politicians understand technical issues and their impact, he said.

Special Guests

Many Washington and IEEE dignitaries attended the banquet. Representing the Washington Academy of Sciences were President Dr. Al Teich with his wife Dr. Jill Pace, and Executive Director Peg Kay, who chaired the recent Capital Science 2008 conference.

Other guests included Chris McManes, IEEE-USA public relations manager. The President of IEEE-USA, Dr. Russell Lefevre, planned to attend but he was caught in April's international airline delays.

The IEEE Region 2 leadership had a strong representation with John Dentler, director of Region 2; Thomas Tullia, past director; Murty Polavarapu, chair of Region 2 South Area; Marc Apter, bylaws/parliamentarian; Jerry Gibbon, educational activities; Michael Cardinale, membership development; and Amarjeet Basra, pre-college education representative.

The Baltimore Section was represented by Secretary Anna Romaniuk and Treasurer Helen Garrison.

Awards

More than 100 individuals and several organizations were recognized for their volunteer contributions, support of IEEE, and leadership of the sections, chapters and student branches.

Region 2 Director John Dentler helped present two meritorious awards. Special guest Patricia Strother participated in the presentation of the 2008 James F. Strother Meritorious Service Award to Amarjeet Basra for outstanding leadership and dedication to IEEE and the Northern Virginia Section. Her late husband was a dedicated IEEE leader in whose honor the award was established by the Northern Virginia section.

Many of us knew the late John Margosian as a dedicated IEEE member who energetically organized and supported all our local activities and earned the Volunteer of the Year Award year after year. He celebrated his 90th birthday at a Washington Section Administrative Committee Meeting in 2006. The new John Margosian Meritorious Service Award went to Jerry Gibbon in recognition of his outstanding leadership and service as the IEEE GLOBECOM 2007 general chair. Following that presentation, Jerry received a surprise gift—the framed Presidential proclamation for the conference.

Patricia Strother congratulates Amarjeet Basra, receipient of the James F. Strother Meritorious Service Award.

E.K. Fox & Associates received the Sustaining Friend of the IEEE Northern Virginia Section Award for its continued support of the section.

The Washington Section's Friend of IEEE award went to a unique firm, Kohn, Kohn and Colapinto, LLP. Since the 1980s, Michael Kohn, Stephen Kohn and David Colapinto have consistently supported and defended the rights of engineers throughout the Washington area and the nation. They founded the National Whistleblower Center to assist engineers and others in the workplace who assume great risk to speak out and uphold the ethical code of our profession.

The University of Maryland College Park Solar Decathlon Team received an Achievement Award from the Washington Section in recognition of their achievement in the 2007 Solar Decathlon competition sponsored by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy. The team's LEAFHouse took second place overall and won the People's Choice award.

The formation of the first IEEE Student Clubs in high schools occurred in the National Capital Area with the initiative of Amarjeet Basra, who received the Volunteer or the Year Award from the Washington Section for his leadership in establishing the clubs. In addition, this year IEEE Student Club liaisons and leaders from McKinley Technology High School, Theodore Roosevelt Senior High School, and Chantilly Academy attended the banquet and were recognized their contributions.

The complete list of awards follows.

Washington Section Awards

Administrative Award – **Gerard Christman,** Vice Chair for 2007

Administrative Award – **Richard Benjamin,** Treasurer for 2007

Administrative Award – **Tim Weil,** Secretary for 2007

Volunteer of the Year – **Amarjeet Basra** for his leadership in establishing IEEE Clubs in high schools.

Outstanding Chapter of the National Capital Area – **Women in Engineering,** with **Charity Burd** accepting the award.

Distinguished Service to the Engineering Profession Award – **Paul Hazan**

Friend of IEEE Award – **Kohn, Kohn & Colapinto, LLP**

Delegate to Washington Academy of Sciences – **Sajjad Durrani**

Delegate to District of Columbia Council of Engineering and Architectural Societies – **James Christian**

Outstanding Leadership Contributions to Lasers and Electro-Optics Society Chapter – **Mary Tobin**

Outstanding Leadership Contributions to Magnetics Society Chapter – **Zareh Soghomonian**

Communications Society Chapter Chair – **Roger Hardwicke**

Doug Holly accepts the Distinguished Service Award from Kiki Ikossi.

Thank You!

The support of these companies helped make the 2008 banquet a great success.

BAE Systems

Comtech Mobile Datacom Corporation

E.K. Fox & Associates

I-Cube Inc.

Control Systems Society Chapter Chair – **Haik Biglari**

Education Society Chapter Chair – **Charles Kim**

Robotics and Automation Chapter Chair – **Raj Madhavan**

Signal Processing Society Chapter Chair – **Min Wu**

Southern Maryland Communication, Computer and EMC Chapter Chair – **Fred Heather**

Capitol College Student Branch – **Jeremy Putt,** President; **Charles Conner,** Faculty Advisor; **Jerry Gibbon,** Section Liaison

Catholic University of America Student Branch – **Patrick Boughan,** President; **Scott Mathews,** Faculty Advisor; **Ron Ticker,** Section Liaison

George Washington University Student Branch – **Pavan Luckoor,** President; **Nicholas Kyriakopoulos,** Faculty Advisor; **Steve Weiss,** Section Liaison

Hood College Student Branch – **George Dimitoglou,** Faculty Advisor; **Haik Biglari,** Section Liaison

Howard University Student Branch – **Peter Ramsumair,** President; **Charles Kim,** Faculty Advisor and Section Liaison

University of the District of Columbia Student Branch – **Fatou Mbengue,** President; **Wagdy Mahmoud,** Faculty Advisor; **Doug Holly,** Section Liaison

University of Maryland College Park Student Branch – **Derek Wood,** President; **Patrick O'Shea,** Faculty Advisor; **Harry Sauberman,** Section Liaison

Achievement Award – **University of Maryland College Park Solar Decathlon Team** for their achievement in the 2007 Solar Decathlon competition, with **John Cartagirone, Nirmal Mehta** and **Dan Vlacich** accepting the award.

See **AWARDS,** *p. 6*

Setting the Mood—*The talented young musicians of the McLeod-Miller Jazz Quintet are Peter Labovich on tenor sax, Mike Smith on guitar, Michael Ikossi on the drum set, Wilson Miller on upright bass, and Ian McLeod on the piano.*

AWARDS, *from p. 5*

McKinley Technology High School IEEE Club – **David Pinder,** Principal; **Kenneth Lesley,** Advisor; **KiAura Frazier,** Chair
Theodore Roosevelt Senior High School IEEE Club – **Benjamin Hosch,** Principal; **Lana Cohen,** Advisor; **Kenton Winkfield,** Chair
High School IEEE Club Liaison – **Janet Rhodes Lathan**
Prince George's Area Science Fair – **Julie Walker** for "What A MES: Mars Environment Simulator II."
Montgomery Area Science Fair – **Louis Wasserman** for "A Monotone Characterization of P."
Outstanding Leadership Award – **Kiki Ikossi** for distinguished service and leadership as Chair of the Washington Section for 2007.

Northern Virginia Section Awards

Administrative Award – **Syed Ahmed,** Vice Chair for 2007
Administrative Award – **Monica Mallini,** Treasurer for 2007
Administrative Award – **Kerry Hartman,** Secretary for 2007
Outstanding Chapter Award – **Life Members,** with **Amarjeet Basra** accepting the award.
Volunteer of the Year – **Monica Mallini** for her distinguished service to the Northern Virginia Section.
Sustaining Friend of IEEE Northern Virginia Section – **E.K. Fox & Associates,** with **David Pelgrim** accepting the award.
Communications Society Chapter Chair – **Dennis Moen**
Control Systems Society Chapter Chair – **Seddik Benhamida**
Education Society Chapter Chair – **Jennifer Polack-Wahl**
Signal Processing Society Chapter Chair – **Timothy Settle**
Graduates of the Last Decade Chair – **Chuck Baldi**
DeVry University Student Branch President – **Ryan Niles**
George Mason University Student Branch President – **Andrew Fernandes**
Chantilly Academy IEEE Club – **Joan Ozdogan**, Advisor
First Place, Northern Virginia Regional Science and Engineering Fair – **Timothy Bennett** for "Electrokinetics."
First Place, Prince William–Manassas Regional Science Fair – **Seung Ji Lee** for "The Effect of Temperature on Magnetic Field Strength."
Outstanding Leadership Award – **Charles Sisung** for distinguished service and leadership as the Chair of the IEEE Northern Virginia Section for 2007.

Joint Awards

Distinguished Service Award – **Doug Holly** for dedicated service to the National Capital Area.
Distinguished Leadership Award – **Murty Polavarapu** for outstanding leadership and dedicated service to the National Capital Area.
Distinguished Member Award – **Marc Apter** for outstanding leadership and dedicated service to IEEE and the National Capital Area.
Scanner Team – **Pete Sypher, Elsie Grant, Chuck Baldi, Wally Lee, Rex Klopfenstein** and **David Booth**
Administrative Award – **Debra Meale,** National Capital Area Office Manager for 2007
Aerospace and Electronic Systems Society Chapter Chair – **Roger Oliva**
Antennas and Propagation Society Chapter Chair – **Monica Taysing-Lara**
Computer Society Chapter Co-Chairs – **Tirumale Ramesh** and **Shahid Shah**
Computer Society Chapter Webmaster – **Amir Shah**
Electromagnetic Compatibility Society Chapter Chair – **Greg Snyder**
Electron Devices Society Chapter Chair – **Dimitrios Ioannou**
Engineering in Medicine and Biology Society Chapter Chair – **Fari Schlake**
Engineering Management Society Chapter Chair – **Doug Holly**
Geoscience and Remote Sensing Society Chapter Chair – **James Tilton**
Industry Applications Society Chapter Chair – **Fred Pearson**
Information Theory Society Chapter Chair – **Greg Strutt**
Lasers and Electro-Optics Society Chapter Chair – **Mario Dagenais**
Magnetics Society Chapter Chair – **Can Korman**
Microwave Theory and Techniques Society Chapter Chair – **Bruce Levine**
Nuclear and Plasma Sciences Society Chapter Chair – **Harry Sauberman**
Oceanic Engineering Society Chapter Chair – **Mike Goldberg**
Power Engineering Society Chapter Chair – **Jeff McWhirt**
Reliability Society Chapter Chair – **Dev Raheja**
Society on Social Implications of Technology Chapter Chair – **Tesa Leon**
Vehicular Technology Society Chapter and Land Transportation Committee Chair – **Karl Berger**
Life Members Chair – **Amarjeet Basra**
National Capital Area Consultants' Network Chair – **Monica Mallini**
Women in Engineering Chair – **Charity Burd**

Special Awards

James F. Strother Meritorious Service Award – **Amarjeet Basra** for his leadership and dedication to IEEE, Region 2 and the Northern Virginia Section.
John Margosian Meritorious Service Award – **Jerry Gibbon** for outstanding leadership and service as General Chair of IEEE GLOBECOM 2007.

2008 IEEE Fellows

The honor of IEEE Fellow is bestowed on the recipient who has had an extraordinary record of accomplishments in any of the IEEE fields of interest. The total number selected in any one year does not exceed one-tenth percent of the total voting Institute membership. The following newly named 2008 IEEE Fellows are from the National Capital Area.

Alexander Barg – for contributions to coding theory.

Paul M. Ebert – for contributions to the standard international aircraft collision avoidance system.

Michael C. Fu – for contributions to stochastic gradient estimation and simulation optimization.

Peter N. Mikhalevsky – for contributions to ocean acoustics and tomography.

Ananthram Swami – for contributions to statistical signal processing in communication systems and networks.

Reduced Rank Adaptive Processing—*A seminar by Dr. J. Scott Goldstein (center), a vice president and group chief scientist at SAIC, drew 49 attendees in April. He is pictured with (left to right) Dan Schwed, Tim Settle, Greg Schoenig and Jeff Poston. (Photo by Dan Schwed)*

IEEE Fellow Dr. Goldstein Gives Seminar on Reduced Rank Adaptive Processing

By Jeff Poston

The Northern Virginia chapter of the IEEE Signal Processing Society hosted a technical seminar entitled "Reduced Rank Adaptive Processing" by Dr. J. Scott Goldstein on April 3 at the Mitre Corp. in McLean, Va.

Dr. Goldstein began the talk by noting that signal processing applications in fields such as radar, sonar and wireless communications were often confronted by two opposing design objectives: to increase the system's dimensionality or degrees of freedom for performance reasons and to reduce the complexity of detection and estimation algorithms. He started the technical portion of the seminar with a review of classical approaches to adaptive signal processing such as the Wiener filter and pointed out their reliance on idealized operating environments, a weakness he commented upon several times in his talk. To highlight the shortcomings of conventional, covariance estimation-based techniques he examined the issues for Space-Time Adaptive Processing (STAP) algorithms frequently encountered in radar. While it was desirable to have many degrees of freedom (e.g., many array elements, many range gates, etc.) to resolve, for example, ground clutter from actual targets, the "curse of dimensionality" imposed an infeasible computational burden with arbitrarily large dimensionality.

This issue set the stage for a review of rank reduction in signal processing as a means to reduce complexity. Historically, the Principal Components Analysis (PCA) technique has been an important avenue to rank reduction. Dr. Goldstein cautioned the audience that low rank signal representation, alone, was not the only objective. In radar STAP applications other considerations included the probability of false alarm and the probability of missing the target.

At this point in the talk Dr. Goldstein introduced an important contribution of his to the field: the Cross Spectral Metric (CSM). The CSM provided the theoretical explanation for why PCA can be inappropriate for rank reduction in STAP and other applications. Furthermore, he noted that CSM-based approaches had a graceful reduction in performance as the rank was reduced whereas PCA suffered a sudden, "cliff" effect degradation.

He also shared experimental results from radar system performance to underscore the differences between CSM and PCA performance. Turning to implementation aspects, he explained how to sidestep the burden of covariance estimation, and he introduced the Multistage Wiener Filter MWF) as a computationally attractive processing block for this class of applications. He also explained the extension to the Reduced Order Correlation Kernel Estimation Technique (ROCKET) for spectral estimation problems. He closed his presentation by proposing generalizations of his techniques to image formation applications.

In summary, Dr. Goldstein gave the audience a valuable introduction to signal-dependent, reduced rank techniques for processing weak signals in real-world noise environments. There were 49 attendees at the seminar thanks to a vibrant signal processing community in the area and cosponsorship by the Antennas and Propagation Society.

Check the Signal Processing Society's chapter website at ***http://ewh.ieee.org/r2/no_virginia/sps/*** for details on upcoming seminars.

Senior Members

Congratulations to the following new Senior Members in the Northern Virginia (NV) and Washington (W) Sections:

Philippe Burlina (W)
Gerald Friedman (NV)
Constance Heitmeyer (W)
Nilotpol Kundagrami (W)
Josh Pfefer (W)

If you are interested in becoming a Senior Member, please check ***www.ieee.org/seniormember*** for qualification requirements. For help with references, contact Monica Mallini at ***m.a.mallini@ieee.org*** for Northern Virginia Section members, or Kiki Ikossi at ***ikossi@ieee.org*** for Washington Section members.

CALENDAR, *from p. 3*

Lake Fairfax Drive. Follow the signs to the picnic. See ***www.co.fairfax.va.us/parks/maps/lakefairfaxmap.htm***.

More Info: IEEE will furnish drinks, ice, hot dogs, chips, charcoal, plates, napkins, and other stuff that is important for picnics. You should bring secret barbeque recipes, side dishes, desserts, games, spouses, kids, and significant others. Please leave alcohol and pets at home. Volunteers are sought for the setup, entertainment, and strike committees.

Cost: Free for IEEE members, student members, and guests.

Contact: RSVP to Wally Lee at ***w.h.lee@ieee.org*** with the subject line "IEEE Picnic RSVP."

Tuesday-Thursday, August 19-21, 2008

Performance Metrics for Intelligent Systems (PerMIS'08) Workshop

Sponsors: National Institute of Standards and Technology, Robotics and Automation Society, Association for Computing Machinery Special Interest Group on Artificial Intelligence

Place: Courtyard by Marriott Washingtonian Center, Gaithersburg, MD

More Info: PerMIS'08 is the eighth in a series that started in 2000, targeted at defining measures and methodologies of evaluating performance of intelligent systems. It will consist of five plenary addresses, four special sessions, and two panel discussions. For more information, see ***www.isd.mel.nist.gov/PerMIS_2008***. Registration details will be available soon.

Contact: Dr. Raj Madhavan, Program Chair, at ***raj.madhavan@ieee.org*** or 301-975-2865.

Tuesday, August 26, 2008

♦ Using the Freedom of Information Act and Privacy Act

Sponsors: National Capital Area Consultants' Network, Professional Communication Society (PCS)

Speaker: Dan Heily

Time: 6:00 pm

Place: The Front Page restaurant at Ballston Metro Station, 4201 Wilson Blvd., Arlington, VA

Directions: Meet in the 'atrium' or NSF lobby by entering through the restaurant or the NSF building.

More Info: See Diamond story below.

Cost: Approx. $35 cash for dinner. PCS members will get a $10 subsidy from the chapter. If you are not a PCS member, this is an excellent time to join at the half-year rate.

Contact: Please make reservations with Monica Mallini at ***m.a.mallini@ieee.org*** or 202-375-1706.

Tuesday, August 26, 2008

Computer Society Meeting

Sponsors: IEEE Computer Society; American Society for Quality (ASQ) Section 509 Software SIG; and the Society for Software Quality (SSQ)

Time: 6:30 pm

Speaker: Kathy Land, President of the IEEE Computer Society

Place: Video teleconference with sites in McLean and Silver Spring. Addresses are provided at the registration link below.

More Info: All interested IEEE members and guests are invited to attend. Pizza and soda will be served.

Cost: Free

Contact: Advance registration is required to enter the facilities. Please register online at ***www.asq509.org/ht/d/sp/i/2499/pid/2499***. If your plans change, please email ***ankums@mitre.org*** to cancel your reservation.

diamond♦stories

Friday, July 25, 2008

♦ Patterned Nanomagnetic Bits and Devices

As conventional magnetic recording technology extends to ever higher areal density, it is possible the often predicted, and constantly increasing, density limit will be reached. This limit will likely be in the range of 750 to 1000 Gb/in^2. The use of nanofabrication to create patterned magnetic elements, or patterned media, is one of the proposed approaches with the promise of delaying the onset of superparamagnetism and thus enabling higher areal density. This lecture will cover many of the challenges that must be overcome for patterned media to be successful, including fundamental physics and material science issues, new fabrication technologies, nm-scale manufacturing tolerances, and low cost budgets.

One of these challenges is to controllably reverse one magnetic element, or bit, without affecting the neighboring elements. A narrow anisotropy distribution will be required, yet data suggest that as the element size shrinks, the distribution widens. This distribution arises from a number of sources, including shape and size distributions, edge effects, variations in the full film anisotropy and magnetostatic fields from neighboring elements. As will be discussed, understanding and controlling the switching properties of magnetic nanostructures is critical not only for patterned media, but for device applications such as MRAM cells and spintronic devices, and for current induced as well as field induced reversal.

Saturday, August 2, 2008

♦ IEEE Expert Now Course: Skills for Success in the Real World

Stuff you Don't Learn in Engineering School: Skills for Success in the Real World is an interactive online IEEE Expert Now Course. This is Module 1, *Basic Skill.*

The course is authored by business planning consultant Carl Selinger and is based on the nontechnical soft skills covered in Selinger's book, *Stuff you Don't Learn in Engineering School: Skills for Success in the Real World* (Wiley-IEEE Press, 2004). Perhaps the best overview of the content is a quote from Tom O'Neill, CEO of Parsons Brinckerhoff, on his giving the book to Dartmouth's 150 engineering graduates in 2005: "It is a good, useful publication about something that I believe very strongly. I was happy to see that someone has written a book about something that should be a fundamental precept for success in the world of engineering, and I was happy to share it with some young people who will shape the world for the next 40 years."

The course materials are designed to help younger engineers and emerging project managers—indeed, engineers in all disciplines and all professionals—learn the soft skills that are important to be more effective and happier in the real world. After completing this course, you should be able to develop an understanding of basic skills needed for success, including decision-making, setting priorities and managing time, and getting feedback.

The Washington and Northern Virginia sections are very pleased to participate in the IEEE Expert Now course program, which offers a selection of the best courses and tutorials from IEEE conferences and workshops around the world and makes them available to IEEE sections, chapters, and members.

Tuesday, August 26, 2008

♦ Using the Freedom of Information Act and Privacy Act

This presentation is a practical guide to the Freedom of Information Act and the Privacy Act. Learn how the FOIA works and how agencies respond.

Dan Heily has extensive experience in use of the FOIA at both the state and federal level, including litigation. He spent 39 years in the intelligence community developing intelligence systems based on computer, communications and database technologies. While employed at the CIA, Heily was assigned to the program office that developed the nation's first digital imagery satellite system. He assisted the Defense Mapping Agency in their conversion to the digital age. He has supported the development, testing and operations of several communications systems and command and control systems. He retired from the National Geospatial-Intelligence Agency after working in the areas of airborne imagery and data interoperability and standards. He earned a mathematics degree from Oregon State in 1967 and has done graduate work in command control and computers at George Mason University.

AAAS Volunteer Program Targets Science Education

Three years ago, the Senior Scientists and Engineers, an affiliate of the American Association for the Advancement of Science, initiated a program to assist in K-12 science education. Their approach was to capitalize on a pool of experienced scientists and engineers by recruiting members to provide assistance to science teachers.

The initial thrust was to improve the science literacy of all students, and consisted of a project with the Montgomery County Public Schools (MCPS) to place seniors in middle schools for a day a week. The scope has since been broadened to include elementary schools, with 27 volunteers signed up for the current year. In 2007 an additional project for middle schools was started as a pilot with the Fairfax County Public Schools.

A MCPS Science Volunteer Directory, aimed at seniors who want to assist in K-12 science education, but are unwilling to commit to a day a week, is being added for the 2008-09 school year. IEEE members who are interested in learning more about the program, should contact Sarah Ingraffea at 202-326-6670 or ***singraff@aaas.org***.

Assistive Technologies for Elderly, Disabled Examined at Spring Symposium

By Jeff Poston, Debi Siering & Tom Starai

On a cool spring Saturday morning, Washington and Northern Virginia section members, guests and speakers convened on the University of Maryland College Park campus in the Jeong Kim Engineering Building lecture hall to hear how robotics and sensors will provide services in the 21st century. Speakers at the May 10 "Technology for the Golden Years" Spring Symposium came from the greater Washington area as well as Georgia and Pennsylvania.

After a continental breakfast, Dr. Henrik Christensen from the Georgia Institute of Technology opened the symposium by discussing the use of robots in everyday life for practical tasks such as cleaning floors and preparing meals. He also described how toys may be designed in the form of animals, such as a seal, in order to quickly gain acceptance in the home. He noted that studies are underway on how family members interact and even bond with robots, as well as how robots impact a family's daily routine.

Robotic Rehabilitation—Dr. Carignan places his arm in the exoskeleton system to demonstrate its operation. *(Photo by Michael Pearse)*

Dr. John Spletzer from Lehigh University presented his research along with a video on the development of his Automated Transport and Retrieval System (ATRS). The system is a wheelchair that docks itself to a vehicle, thus enabling a person in a wheelchair to enter and exit a vehicle without assistance. He discussed the hurdles that his team overcame during preliminary testing of the ATRS. Next, a disabled veteran has volunteered to test the ATRS without manual intervention.

During the lunch break, four students from the University of Maryland's Institute of Systems Research (ISR), Kevin Galloway, Philip Twu, Matteo Mischiati and Ermin Wei, entertained the audience with Cricket, a four-wheel pioneer robot is able to navigate and avoid objects autonomously. The students are investigating using Cricket to assist a disabled or elderly person in everyday tasks.

After lunch, Cindy Crump from AFrame Digital in Virginia presented monitors for a resident safety net. A wristwatch device worn by the individual will sense impact of injury and patient status. Gate stability research included microprocessors and a triaxial accelerometer to identify the point in which someone is about to fall. She noted that the entertainment industry is the market driver for the virtual environment.

Dr. Satyandra Gupta provided insight on the challenges faced by ISR at the University of Maryland. His discussion included how to approach designs to ultimately develop usable platforms for individuals with disability that provide low cost solutions.

Dr. Craig Carignan is a research professor both at Georgetown and the University of Maryland. He briefed the audience on an exoskeleton rehabilitation system that his team is working on and how it could help someone with a shoulder injury rebuild a rotator cuff tear. Dr. Carignan then invited everyone to walk down the hall to a lab where he demonstrated the device.

Afterwards the speakers and volunteers were recognized for their personal contributions and altruism that was exemplified in making an inexpensive local conference such an enjoyable success.

Special thanks go to our volunteers: Pablo Salazar, Khai Lai, Jonathan Hoang, Angel Berrocal, Renato Cabrera, Derek Wood, Professor Uche Abanulo, Ann Sauberman, Harry Sauberman, Elsie Grant and Kerry Hartman.

COMPETITION, *from p. 1*

As time progressed, it became apparent that the set of tasks was overly ambitious for the first year of the competition. A decision was made to break the competition into several discrete best-in-class tasks that would contribute to the scenario, and to leave the end-to-end objective for next year. The tasks of accurate path following and docking were chosen as the VMAC tasks for the 2007-08 competition year.

The final competition was held on April 18 at NIST. For both tasks, the teams were required to accept a standard command message as input. They were free to use as much of the provided infrastructure as they desired. For path following, the input consisted of a set of constant curvature arcs that were to be followed. These arcs were represented as a red centerline with a blue error radius. As the path progressed, the arc complexity was increased and the error radius was reduced. Hood College produced the best-in-class algorithm for path following, with George Mason University in a close second place. The scoring criteria included the distance traveled before the first crossing over the error radius and the average path and speed deviation. The team's score was shown in real-time during the competition.

Docking ability was measured by placing the AGV in a room with a docking station. The AGV was required to successfully dock without a collision, where docking amounts to parallel parking a rear-steered Ackerman vehicle. Upon successful docking, the AGV was placed in a smaller room and the procedure was repeated. Once again, Hood College received top honors in this competition. They successfully docked in every room in which they were placed.

With funding from the robot challenge held for the first time at the IEEE International Conference on Robotics and Automation (ICRA) in Pasadena, Calif. in May, the organizers and the winning team from Hood College were able to demonstrate their code for the first two days of the conference to all attendees.

Follow-on funding from RAS has been approved. The teams from this year's competition will be able to demonstrate and present their research as team-description papers during a special session at the annual Performance Metrics for Intelligent Systems Workshop at NIST in August (see Calendar, p. 7).

The seeds from last year's funds are already bearing fruit. Several of the universities are planning courses based on the material and expertise that they have gained as a result of their participation in this competition. In addition, a public forum has been created at ***http://groups.google.com/group/ras-man-comp*** for participants to share information.

A national competition is being planned for the 2008-09 year, and we are proposing that the VMAC be included as an event in the robot challenge at ICRA'09 to be held in Kobe, Japan. As a lead-in for next year's national competition, all of the Hood code has now been checked-in to the MOAST repository. So, there is no excuse for any team to perform worse than the winning team performed this year!

Competitions are an effective means of stimulating interest and participation among students. Competitions get students excited about the technologies and encourage larger participation in the research community. This effort has already helped to draw more students into IEEE and RAS membership and some of the local conferences and symposiums sponsored by the IEEE Washington and Northern Virginia Sections. Since all code used in these competitions is open source, participants are able to learn from their competitors and self-sustain their research in their particular areas of expertise.

Continuing this joint effort between RAS and NIST will immensely benefit students and researchers, especially those from minority-serving institutes of higher learning. Using a metrics-driven competition model, advancements in the various technologies comprising the AGV control system are quantified, helping the community gauge as well as target progress. It serves as a good education model for future competitions and facilitates interdisciplinary research among other robotics and automation fields.

Competition organizers Stephen Balakirsky, Raj Madhavan and Chris Scrapper gratefully acknowledge the support provided by RAS and NIST during various stages of this effort. The joint effort is administered under the auspices of the Washington and Northern Virginia Chapter of RAS.