



FIRST Robotics: A True March Madness for Future Engineers

By RICHARD HILL

COMPUTATIONAL INTELLIGENCE SOCIETY CHAIR

The FIRST Robotics Washington Regional Competition (<http://www.usfirst.org/roboticsprograms/frc>) took place March 29th through 31st. "The Varsity Sport for the Mind" hosted 63 high schools who competed while simultaneously collaborating on advanced robotic projects. FIRST calls this concept "coopertition" and "gracious professionalism". The event this year was titled "Rebound Rumble" and was related to basketball, but with a few enhancements. If you have never seen robots play basketball, check out the video at <http://www.youtube.com/watch?v=nOXsdhZZSdM>.

Each year, FIRST unveils its challenge to all teams simultaneously during an opening ceremony on a Saturday in January. This heralds the beginning of the "build season," a six-week period of frenzied activity, with many teams building nearly every day, before and after school and on weekends. The result is a five-foot-tall 120-pound machine that is built, wired, and programmed to perform that year's challenge assignment. At the end of the build season, FIRST rules require that the robots be crated and not opened again until competition time. At competition, each team has an assigned area in the "pit" and access to practice areas and a spare parts counter for robot first aid.

The Rebound Rumble challenge is played in 135-second matches on a 27 x 54 foot field. Each match begins with a 15-second hybrid period in which robots operate autonomously, with one robot on each side controlled by a Microsoft Kinect. Baskets scored during the hybrid period are worth extra points. For the remainder of the match, the robots are human-controlled. The objective is to score as many baskets as possible, with more points awarded for goals in higher hoops. Both robots and human players (from outside the field) are allowed to score. A second objective is for the robots to balance on tilt bridges in the middle of the field at the end of the match. Game theory comes into play here because one of the tilt bridges on the field is designated for competing robots to balance in cooperation, for the award of points toward their respective qualification seeds and "Coopertition Award."

In "coopertition," each contest is staged between three-team alliances rather than individual teams. Thus, teams can design their strategy around a particular expertise to strengthen their alliance. Alliances are formed at the competition, so the three teams that will

compete together likely have never met nor seen one another's robots prior to the competition. Alliance building is advantageous for less experienced teams that have not had multiple seasons to practice and train and would not have the opportunity to develop a complete and mature solution to the challenge within a single robot.

One amazing aspect of the regional competition was the cooperative spirit displayed by the teams. If a team is facing some difficulty with its robot in the pit, other teams will share their expertise and lend a hand to alliance-members and competitors alike to overcome the problem.

In addition to local teams,



The Queue: the Robopanthers and their alliance partners await their match at the FIRST Robotics Washington, DC Regional Competition. (Photo by Richard Hill)



Monica Mallini and Barry Tilton at last year's National Capital Awards Banquet. This year's banquet will be held on May 19 at the Marriott Fairfax at Fair Oaks.

Register Now: 2012 IEEE NCA Awards Banquet

By HARRY SAUBERMAN, P.E.

2012 NCA AWARDS BANQUET CHAIR

The IEEE Washington and Northern Virginia Sections are pleased to announce the 2012 IEEE National Capital Area Awards Banquet. This year's event is hosted by the IEEE Washington Section and will be held on Saturday, May 19, 2012 at the Marriott Fair Oaks Hotel, 11787 Lee Jackson Memorial Highway, Fairfax, VA 22033. The evening will be highlighted by guest speaker, Nobel Laureate, Dr. John C. Mather. In the keynote address, "The History of the Universe from the Beginning to the End," Dr. Mather will present his views on the origins of the universe and the potential for detecting planetary systems capable of supporting life.

See NCA Awards Banquet, p. 5

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*Washington, Northern Virginia, and Baltimore Sections

ON THE WEB**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.ieee.comunities.org/nc.

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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. Please 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 content 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 content editor. The deadline for the upcoming issue is June 15, 2012.

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calendar of events

For the latest calendar information, go to www.ieee.org/escanner.

Tuesday, May 1, 2012

New Approaches for Electronics for Advanced Sensors

Sponsor: IEEE Washington/NoVa Sensors Council Chapter
Cosponsors: IEEE Nanotechnology Council
Speaker: Prof Michael Dickey of North Carolina State University
Time: 6:30 p.m. to 8:30 p.m.
Place: Jeong H. Kim Engineering Building, Room Number: 1107, Kay Board Room, University of Maryland, College Park, MD, 27607
Contact: Randy Avent; (919)-614-0363; randy.avent@gmail.com

Tuesday, May 1, 2012

Washington Section Administrative Committee Meeting

Sponsor: IEEE Washington Section
Time: 6:30 p.m.
Place: American Association for the Advancement of Science (AAAS), 2nd Floor Conference Room, 1200 New York Avenue NW, Washington, DC.
Directions: Use the 12th Street entrance. The AAAS building is one block from Metro Center.
More Info: All IEEE members are welcome.
Contact: Contact Wally Lee at w.h.lee@ieee.org.

Wednesday, May 16, 2012

NoVA Section Administrative Committee Meeting

Sponsor: IEEE Northern Virginia Section
Time: 6 p.m. to 8 p.m.
Place: Olive Garden, 8133 Leesburg Pike, Vienna, VA 22182
Directions: From I-495, take Route 7 West (Exit 47A) toward Tysons Corner. Turn left at Gallows Road. Parking garage is behind the restaurant.
More Info: All interested IEEE members are invited to attend.
Contact: Susanne Dreier at nova.secretary@yahoo.com, 703-297-7242.

Thursday, May 17, 2012

AAAS/SSE STEM Volunteer Program Annual Meeting

Sponsor: American Association for the Advancement of Science
Time: 4:00 - 6:30 p.m.
Place: The AAAS/SSE STEM Volunteer Program annual meeting will convene at AAAS, 1200 New York Ave. NW, DC.
More Info: Learn about the development and implementation of the new K-12 science standards from Dr. Heidi Schweingruber, Dr. Stephen Pruitt, and Anita O'Neill.
Website: <http://www.seniorscientist.org/>

Thursday, May 17, 2012

Verizon Breach Report

Sponsor: IEEE-CS N. VA & DC, ISSA-NOVA
Speaker: Mr. Chris Porter
Time: 5:30 PM: Networking and Pizza(*); 6:15 to 8:00 PM: Program
Place: ICF International, 9300 Lee Hwy., Fairfax, VA 22042
Cost: Free
Website: <http://www.issa-nova.com/meetings.aspx>
Registration: <http://www.issa-nova.com/default2.aspx>
Contact: Zena Jones, VP_Programs@ISSA-NOVA.ORG

Saturday, May 19, 2012

National Capital Area Awards Banquet

Sponsor: IEEE National Capital Area
Speaker: Dr. John Mather, Nobel Laureate from NASA-Goddard
Time: 6 p.m.
Place: Fair Oaks Marriott
More Info: The event will include live entertainment, science fair exhibits, a seated dinner, keynote address, and award presentations.
Cost: IEEE members and guests are eligible for an early registration price of \$25 (time limited offer).
Registration: Register today at https://meetings.vtools.ieee.org/meeting_view/list_meeting/11059.

Tuesday, May 22, 2012

SAMATE/SW Assurance

Sponsor: IEEE-CS N. VA & DC, ASQ 509 SW SIG, SSQ
Speaker: Frederick Boland of NIST
Time: 5:30 PM: Networking and Pizza(*); 5:50 to 6:50 PM: Program
Place: MITRE, room 1N100 7515 Colshire Drive McLean, VA 22102; FDA, Bld 66, room G512 10903 New Hampshire Ave Silver Spring, MD 20993; MITRE, room 1M306 202 Burlington Rd (Rt. 62) Bedford, MA 01730
Website: <http://www.asq509.org/ht/d/EventDetails/i/66131/pid/372>
Registration: <http://www.asq509.org/ht/d/DoSurvey/i/26913>
Contact: Scott Ankrum at 240-731-7581

Monday, May 28, 2012

Novel Features of Short Pulse Electromagnetics

Sponsor: Washington/NoVA IEEE EMC Society
Speaker: Dr. Shahid Ahmed of Jefferson Lab, which is a particle physics research facility new Williamsburg, VA.
Time: 6:30 p.m. (Networking); 7:00 p.m. (Dinner); 7:30 p.m. (Discussion)
Place: Rhein Tech Laboratories, 360 Herndon Parkway, Herndon VA
More Info: Short pulses are inherently ultra-wideband

(UWB) and have been the subject of interest for various applications such as wireless communications, high speed data transfer, fast switches, high speed interconnects, and medical sciences. Understanding the characteristics of UWB signals is best suited in time domain. The beauty of time domain technique for example, finite-difference time-domain (FDTD) method for simulating various EM problems will be discussed.

Cost: \$15 for IEEE Members, \$20 non-members

Wednesday, May 30, 2012

High Maturity Pays Off: "It is Hard to Believe Unless You Do It"

Sponsor: IEEE-CS N. VA & DC, ASQ 509 LSS SIG
Speaker: Girish Seshagiri, CEO AIS
Time: 6:00 PM: Networking and Pizza(*); 6:30 to 8:00 PM: Program
Place: TEQCORNER, Center Conference Room (3rd Floor) 1616 Anderson Road, McLean, VA 22102
Website: <http://www.asq509.org/ht/d/EventDetails/i/68161/pid/372>
Registration: <http://www.asq509.org/ht/d/DoSurvey/i/38891>
Contact: SixSigmaSIG@asq509.org

Tuesday, June 5, 2012

Washington Section Administrative Committee Meeting

Sponsor: IEEE Washington Section
Time: 6:30 p.m.
Place: American Association for the Advancement of Science (AAAS), 2nd Floor Conference Room, 1200 New York Avenue NW, Washington, DC.
Directions: Use the 12th Street entrance. The AAAS building is one block from Metro Center.
More Info: All IEEE members are welcome.
Contact: Contact Wally Lee at w.h.lee@ieee.org.

Wednesday, June 13, 2012

NoVA Section Administrative Committee Meeting

Sponsor: IEEE Northern Virginia Section
Time: 6 p.m. to 8 p.m.
Place: Olive Garden, 8133 Leesburg Pike, Vienna, VA 22182
Directions: From I-495, take Route 7 West (Exit 47A) toward Tysons Corner. Turn left at Gallows Road. Parking garage is behind the restaurant.
More Info: All interested IEEE members are invited to attend.
Contact: Susanne Dreier at nova.secretary@yahoo.com, 703-297-7242.



From left to right, IEEE Communications Society Chapter Chair Dr. Kafi Hassan, Dr. Charikleia Zouridaki, GMU graduate students Thao Nguyen, Neshat Etemadi Rad and Yuanao Sun, the speaker, GMU Prof. Brian Mark, Dr. Alexe Leu and the Communications Society Chapter Vice-Chair Abdul Kareem (Photo by Jeff Poston).

Learning about Opportunistic Spectrum Access over Lunch

By JEFF POSTON

CHAIR, IEEE NORTHERN VIRGINIA SECTION

Prof. Mark Davis of George Mason University (GMU) surveyed the state of the art in cognitive radio applications and introduced his recent research in the seminar "Opportunistic Spectrum Access in Wireless Networks" held on March 27th. Sprint graciously offered use of their Executive Conference Center as a venue for this noon event. He began his talk by reviewing the three key paradigms of spectrum access: underlay, overlay and interweave, the last also known as dynamic spectrum access (DSA). The intent of these three strategies is to permit the coexistence of conventional, licensed spectrum services--known as the primary users in radio spectrum parlance--with cognitive radio applications operating on otherwise idle spectrum. These cognitive radio users are known as the secondary users to denote that they must not cause harmful interference to the primary users and must accept and adapt to any interference received from the primary users.

For the first paradigm, underlay, techniques such as ultra-wideband or smart antenna-based shaping of transmit patterns can avoid harming the primary user by creating very low power spectral density at the primary user's receiver. For the overlay approach, the strategy is to understand enough about the primary user's transmitted signal structure to create signals of negligible correlation to the primary user's messages, even if the secondary user's signal has power spectral density on par with that of the primary user. Finally, the interweave technique seeks to find vacant "spectrum holes" in frequency, time or space that the primary user has left vacant. It is this last, opportunistic approach that Prof. Mark emphasized in his research. For reliable sensing, his studies and simulations illustrated the importance of spatial sampling the spectrum due to the nature of radio propagation and the value of estimating the primary user's location. In addition, by incorporating a time domain Markov model of the primary user's activity, the cognitive radio's sensing could further improve estimation completeness and operating agility in spectrum access.

Prof. Mark reviewed existing applications of opportunistic spectrum access in the DARPA XG program and for the TV band "white spaces" by the IEEE 802.22 standard. He also commented on the emerging application of "Cognitive OFDMA" (Orthogonal Frequency Division Multiple Access) that could offer an evolution of the Wi-Max and LTE wireless technologies. The seminar was equally well attended both by attendees at the seminar site and by those participating on-line. The IEEE Communications Society of Northern Virginia welcomes new speakers to the technical program; if you are interested in presenting to this chapter please contact the chair, Dr. Kafi Hassan (kafi@ieee.org), or Jeff Poston (poston@ieee.org).

News from IEEE-USA

Economist Freeman to Speak at Sci-Tech Measurement Event

Registration is now open for the second STEM enterprise measurement workshop in Washington, D.C., on Wednesday 6 June. Harvard professor and leading labor economist Dr. Richard Freeman will deliver the keynote address. The workshop, "STEM Enterprise: Measures for Innovation and Competitiveness," is designed to measure the impact and effectiveness of all federal, state, private and academic money spent on research and development in the STEM (science, technology, engineering and math) area. Sessions will focus on four main areas: funding, workforce, output measures and indicators, and policy implications. The American Association for the Advancement of Science (AAAS) is hosting the event at its Washington headquarters. The program will run from 9 a.m. to 5:30 p.m. A reception open to the public will follow from 6 to 8 p.m. For more information and to register, see <http://www.ieee-usa.org/calendar/conferences/stem/default.asp>. Workshop chair and former IEEE-USA Congressional Fellow Marty Sokoloski said the workshop is designed as a forum for STEM thought leaders to better measure the outcome and impact of R&D investment on society and quality of life.

"Work in this area serves as the driving force for economic and social advancement in the United States and worldwide," Sokoloski said. "The economic health of the STEM enterprise is important to everyone, and policies should be derived from basic incorruptible data and measures. This will help us to better plan for a healthy and productive enterprise, future economic growth and rapid innovation."

The workshop is organized by IEEE-USA, AICHE, AIME, ASCE and ASME and supported by a grant from the United Engineering Foundation. Cosponsors include AAAS, ASTRA, SME, Thompson Reuters and Northrop Grumman. IEEE-USA advances the public good and promotes the careers and public policy interests of 210,000 engineering, computing and technology professionals who are U.S. members of IEEE. For information on the benefits of IEEE membership, see <http://www.ieee.org/join>.

calendar of events

Thursday, June 21, 2012

Protecting Data While Allowing Social Media in the Enterprise

Sponsor: IEEE-CS N. VA & DC, ISSA-NOVA
Speaker: Dr. Terry Gudiatius
Time: 5:30 PM: Networking and Pizza(*); 6:15 to 8:00 PM: Program
Place: Avaya Government Solutions, 12730 Fair Lakes Circle, Fairfax, VA 22033
Website: <http://www.issa-nova.com/meetings.aspx>
Registration: <http://www.issa-nova.com/default2.aspx>
Contact: Zena Jones, VP_Programs@ISSA-NOVA.ORG

Tuesday, June 26, 2012

Cloud Computing Security Standards

Sponsor: IEEE-CS N. VA & DC, ASQ 509 SW SIG, SSQ
Speaker: Ms. Dawn Leaf
Time: 5:30 PM: Networking and Pizza(*); 5:50 to 6:50 PM: Program
Place: MITRE, room 1N100 7515 Colshire Drive McLean, VA 22102; FDA, Bld 66, room G512 10903 New Hampshire Ave Silver Spring, MD 20993; MITRE, room 1M306 202 Burlington Rd (Rt. 62) Bedford, MA 01730
More Info: <http://www.asq509.org/ht/d/EventDetails/i/66131/pid/372>
Registration: <http://www.asq509.org/ht/d/DoSurvey/i/26913>
Contact: Scott Ankrum at 240-731-7581

Wednesday, June 27, 2012

The Key to Establishing a Lean Six Sigma Culture

Sponsor: IEEE-CS N. VA & DC, ASQ 509 LSS SIG
Speaker: Mr. Joe F. Pauley, President
Time: 6:00 PM: Networking and Pizza(*); 6:30 to 8:00 PM: Program
Place: TEQCORNER, Center Conference Room (3rd Floor) 1616 Anderson Road, McLean, VA 22102
Website: <http://www.asq509.org/ht/d/EventDetails/i/68161/pid/372>
Registration: <http://www.asq509.org/ht/d/DoSurvey/i/38891>
Contact: SixSigmaSIG@asq509.org

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<http://ieee-nova.org>
 For Washington Section info, visit
<http://www.ieee.org/washsec>

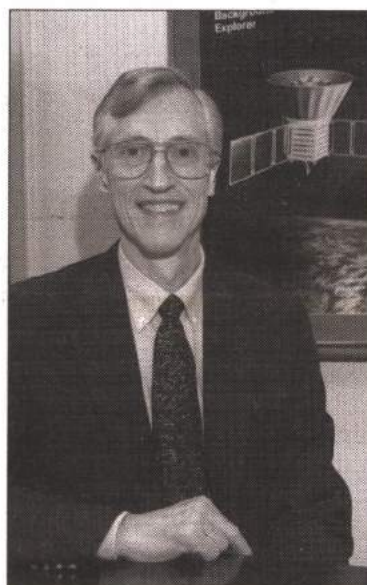


Region 2 Meeting, Standing left to right are: Andrew Thompson, SAC Representative, Javvad Qasimi, Membership Development Chair, Anna Romaniuk, Awards and Recognition Chair, Kate McDevitt, WIE Coordinator, Ralph Ford, Region 2 Director, Holly Cyrus, Region 2 Employment Coordinator (shown with her special award), Moshe Kam, IEEE Past President, Joe Burns, PreCollege and SPAC Coordinator, and Murty Polavarapu, Professional Activities Coordinator. (Photo by Mithun Banerjee)

Pre-Registration Underway for 2012 NCA Awards Banquet

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Dr. Mather is a Senior Astrophysicist at NASA's Goddard Space Flight Center (GSFC) in Greenbelt, MD, where he specializes in infrared astronomy and cosmology. As an NRC postdoctoral fellow, he led the proposal efforts for the Cosmic Background Explorer (COBE) project. Dr. Mather came to GSFC in 1976 to work on the Far IR Absolute Spectrophotometer (FIRAS) for the COBE Explorer. The COBE team discovered the cosmic anisotropy (hot and cold spots in background radiation), now believed to be the primordial seeds that led to the structure of the universe we know today. These findings led to Dr. Mather's sharing the Nobel Prize in Physics in 2006. His bachelor's degree is from Swarthmore, and his Ph.D. is from the University of California, Berkeley—both in physics.



Dr. Mather (Photo Courtesy of NASA)

This year's banquet event will feature the music of the Les Carl New Dominion Band. Les is a retired Navy captain, and his five piece band has received high acclaim in gigs performed throughout the area. The band will highlight its playlist throughout the evening.

The banquet will kick off at 6 p.m. with student science exhibits, hors d'oeuvres and a cash bar. Dinner, with a choice of entrées (selected at pre-registration) will follow at 7 p.m. The keynote address, with an introduction of Dr. Mather by IEEE Fellow Dr. Saj Durrani, is scheduled for 8 p.m. Parking for the event is free, and there is ample parking space available.

The event will conclude with a special awards ceremony that will honor the work and achievements of our student science winners, our members, and our outstanding volunteers. Their contributions lead directly to IEEE's ability to recruit and retain its membership and to its overall success.

Pre-registration is currently underway, with tickets at a special discounted member price of \$25 per person. (IMPORTANT: You must include your valid 8-digit IEEE number on each registration to receive the discounted price for member and guest. The same IEEE number may be used for member and guest.) You may register online or by mailing a check (prior to May 5) to: Richard Hill, Treasurer, 712 Mapleton Road, Rockville, MD 20850. If you send a check, please indicate the name of your guest and the food entrees that you prefer: beef, fish or vegan. After May 5, checks should not be mailed, but there are several registration options at the banquet website. We will accept checks at the door, but only advance registrations will receive the \$25 member price. Nonmember and on-site registration price is \$50 per person. Please check the IEEE NCA Banquet webpage at: <http://ewh.ieee.org/r2/washsec/banquet.html> for registration details.

Please contact us for information on sponsorship opportunities, or if you have any questions regarding the banquet. Inquiries may be directed to our banquet coordinator, Valerie Davis, at ncabanquet@ieee.org.

diamond stories

Tuesday, May 1, 2012

New Approaches for Soft, Stretchable and Biomimetic Electronics for Advanced Sensors

Abstract:

This talk will describe efforts from our research group to control the shape and thus function of soft materials (liquid metal, polymer and hydrogels) for applications that include sensors, soft/stretchable electronics, and self-folding polymer sheets. The research harnesses interfacial phenomena, microfabrication, and the unique properties of a moldable liquid metal. Conventional electronics are typically fabricated from rigid materials (e.g., silicon for transistors, copper for antennas). New materials are being explored as candidates for flexible/stretchable/soft electronics because of the novel applications that emerge from their mechanical properties. Examples include flexible displays, implantable devices, electronic textiles, and soft robots. This talk will discuss the underlying fundamental science motivating active areas of research in our group and will include work on ultra-stretchable wires, sensors, antennas, and microelectrodes created by injecting a gallium-based metal alloy into elastomeric microchannels. Soft, biomimetic memory ("memristor-like") and diode devices composed of hydrogels and moldable metal will also be discussed as well as self-folding polymers sheets that change shape in response to light.

Biography:

Prof. Michael Dickey received a BS in Chemical Engineering from Georgia Institute of Technology (1999) and a PhD in Chemical Engineering from the University of Texas at Austin (2006) under the guidance of Professor Grant Willson. From 2006-2008 he was a post-doctoral fellow in the lab of Professor George Whitesides at Harvard University. Michael has several years of industrial work experience as a co-op for Kimberly Clark working on non-wovens and as a Chemical Engineer for Merck working on scaling up pharmaceutical processes. Prior to arriving at NC State Michael received several honors, including the Georgia Tech Presidents Scholarship, a NSF Graduate Fellowship, and a NIH Post-doctoral Fellowship. In August 2008, he joined the Department of Chemical & Biomolecular Engineering at NC State University where he is currently an Assistant Professor. He received the NSF CAREER award in 2010, the Sigma Xi Young Faculty Award in 2011, and the Outstanding Teacher Award in 2012. Michael's research interests include the study of soft materials, thin films and interfaces, and unconventional nanofabrication techniques. The goal of the research is to introduce new functionality into devices (e.g., stretchable circuits, soft electronics, self-folding sheets) in a simple, inexpensive, and scalable manner.



The Project Management Tools & Techniques Workshop was held on March 24th, 2012, the first ever joint event between IEEE Northern Virginia Section & PMI Baltimore Chapter. The event was sponsored by IEEE (WIE, GOLD(NoVA), Consultants Network) & co-sponsored by PMI Baltimore Chapter. (Photo by Mithun Banerjee)

See D.C. United vs. Columbus Crew on Aug 4

Make sure to mark your calendars to join the IEEE Women in Engineering, Consultants' Network and Graduates of the Last Decade on Saturday, August 4 for a D.C. United Soccer Game at RFK Stadium in Washington, DC at 7:30 p.m. All are welcome to attend! The cost is \$16 for IEEE members; \$24 for non-members (tickets regularly \$32). Advance payment required. If interested, please contact Katie Schaffold at katie.schaffold@ieee.org. The registration deadline is July 9. Payments must be received by July 21.



Basketball-playing robots on the competition field. (Photo by Monica Mallini)



In the pit area, teams prepared for competition and entertained visitors with colorful displays, while volunteers circulated to remind everyone to wear safety glasses. (Photo by Monica Mallini)

For Inspiration and Recognition of Science and Technology

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the competition hosted teams from as far away as South Carolina, Massachusetts, and Michigan. In the end, the teams were awarded rankings #1 to #63 based primarily on the QS, with other scoring statistics used to separate ties. Twenty-nine awards were made to teams and individuals. For instance, the "Coopertition Award" went to Boys & Girls Club - FBR Branch in Washington. Xerox sponsored a "Creativity Award," won by James Madison High School in Vienna. The "Gracious Professionalism Award" sponsored by Johnson & Johnson was awarded to George Mason High School in Falls Church. Rockwell Automation sponsored the "Innovation in Control Award," and it went to Montgomery Blair High School in Silver Spring. The team "Precision Guesswork" from Lafayette, Indiana High School was acknowledged for the best website, which features an animation of the Rebound Rumble game. You can view the award-winning website at <http://www.precisionguesswork.org/>.

As you might imagine, it takes more than a dozen high school students to design and build a 120-pound robot in six weeks. Each team has sponsors and mentors to contribute financial, in-kind, technical and moral support. The extensive list of team sponsors typically includes the high school, local universities, technology vendors, manufacturers, recyclers, automotive suppliers, hardware stores, restaurants, retailers, NASA, and, of course, IEEE.

IEEE Washington Section, led by the Computational Intelligence Society, mentors KIPP College Preparatory High School, located in Washington, DC. This activity supports IEEE-USA's Engineering in Primary and Secondary Education position statement by "investing in after-school engineering education programs" and providing on-campus leadership in STEM education with an emphasis on the "E" for engineering.

In the first year of robotics on KIPP's campus, the Robopanthers finished as playoff alternates and achieved a ranking as high as 13 out of 63 teams. The team finished at 24th, but their drive for learning did not end at the competition. This is quite an amazing feat for a first-year team of only six students "coopertitioning" with more established teams of 15+. The Robopanthers will display their robot and concepts learned at the IEEE National Capital Area banquet on May 19th.

68 FIRST Regional competitions were held in March and early April. The FIRST Robotics World Championship is scheduled for April 26-28 in St. Louis. FIRST = "For Inspiration and Recognition of Science and Technology."

FIRST: An Unforgettable Experience

BY DAVID ANDRITSIS, NHAT DOAN AND CLINT HUMMER
NVCC ENGINEERING STUDENTS

Washington, DC is a very busy and beautiful place to visit. My engineering professor decided for the class to visit the FIRST Robotics Competition at the Washington Convention Center. The one person most excited about going on the trip was me. I wasn't excited because I knew a lot about robots. In fact, I know nothing about robots; however, I was determined to learn something. We were supposed to leave campus on Friday, March 30th at 8:00 AM. The night before the trip, before going to bed, I set my alarm on my iPhone and labeled it, "Let's go to Washington."

I arrived on campus at 7:30 AM. The bus to Washington was supposed to leave at 8:00 AM, so I was 30 minutes early. The professor arrived at about 7:50 AM and told me she had to go and get the bus. Before leaving for the bus, she gave me the list of the names and phone numbers of all the students for me to call them. While she was gone to get the bus, I was calling every student. Some of the students said they were in their cars coming; some said they were in traffic; some said they were close by; some said they had to go to work, and one student just yawned and said he wasn't coming. However, most of the students arrived for the trip.

In about 10 minutes, the professor pulled the bus in front of the bus station. We did a safety check, checked the tire pressure, the mirrors, and lights. Once everything was set, we were on board the bus to Washington. There was traffic, but hey, driving to Washington DC at 8:30 in the morning, you can understand why.

We arrived at the Washington Convention Center at about 9:20am. There were a lot of people--high school students, college students, teachers, professors, dancers in funny costumes, which I thought was cool, and of course, robots. It is a robotics show, so therefore, one should expect to see robots. However, I didn't expect to see robots playing basketball and shooting and actually scoring! I was amazed. In fact, I was hyped. I had never seen anything so cool.

There were many different types of solutions to the basketball toss objective. Some people used spinning wheels to shoot, some used springs, and there was also a catapult design. It was interesting to see the different ways the teams tackled the problems they encountered during their design and build process.

What was mind-boggling was that high school students made the robots. I never thought high school students were that smart. I was wondering how they programmed the robots. It definitely took hard work, dedication, prayers and faith, and a good team. Our class was also trying to build a robot, and we were inspired by what we witnessed at the robotics competition.

Nate Boniface and I talked to team ROBOHAWK, one of two teams that had Mecanum wheels, which offer multi-directional movement. They stated that it gave them better movement into different situations to line up for a good shot. We also asked them how long their machine can run on one battery charge. They told us at least 3 rounds, so about 7 minutes of full run time. Most of the parts such as motors, pulleys, and gears were off-the-shelf parts, but everything else was constructed from steel and shaped metal pieces custom-made to complete the task.

Apart from robots shooting basketballs at the basket, there was also music and dance. There were dancers dancing in funny costumes. Some were dressed in robot-like costumes. These dancers were dancing in rhythm. It was amazing, people. I had never seen anything like it.

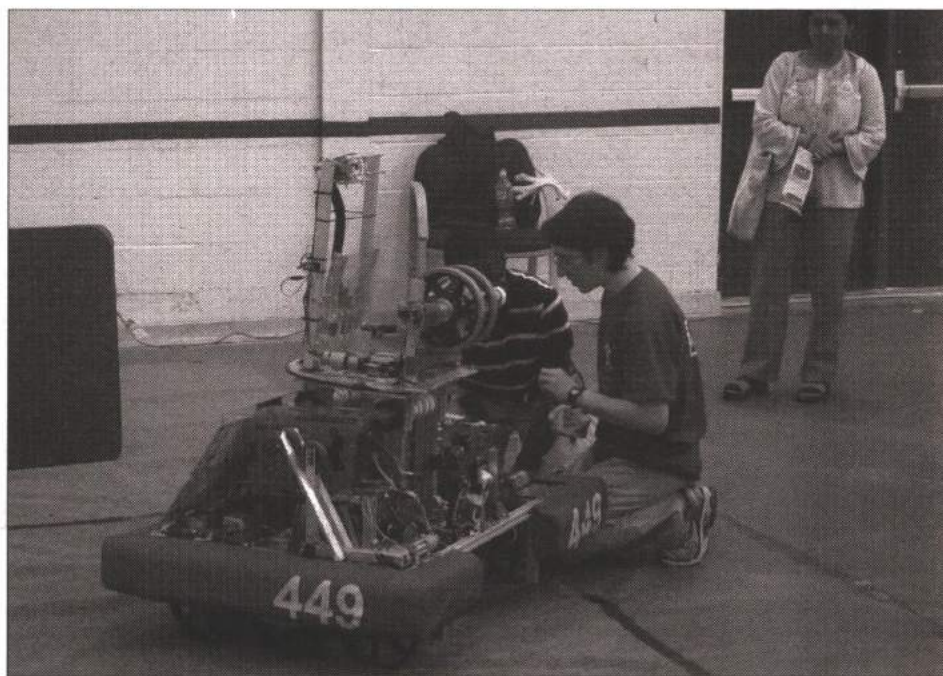
The trip was an unforgettable experience. From the dancing kids as soon as we arrived to the problem solving situations in the pit area, this was a very interesting convention. In my country, I had a chance to attend another Robotic Competition for university students. At that time, I couldn't stop wondering how they could make a machine that runs on itself. Now, attending engineering classes, I have a better idea how a robot is made. After all, it's not that complicated like I thought. I was shocked when they used those robots to play basketball; that's really impressive. In the future, we really can't imagine what an engineer can do!

We believe everyone learned a lot on this trip. Since we were trying to build a robot in class, going to see a robotics competition was a brilliant idea. Would I want to go to another robotics competition? Absolutely.

Science is Fun for Everyone at Rockville Science Day on April 15



Science is fun for everyone at Rockville Science Day, held at Montgomery College Rockville Campus on April 15. IEEE Women in Engineering hosted a booth featuring science experiments in electricity and optics. Photos Clockwise from left: An electric bike is shown; basketball-playing robots; Technology exhibits at the Montgomery College gymnasium draw a big crowd; "I Do Science" — IEEE WIE Chapter Chair Dr. Carolyn Carroll shows girls how to make lenses from gelatin squares. (Photos by Monica Mallini)



A Visit to the Government Security Conference and Expo

By PETE SYPHER

MEMBER, IEEE NORTHERN VIRGINIA SECTION

At the same time FOSE was happening in the Convention Center, another conference and exposition, GOVSEC, was held in a nearby hall. FOSE and GOVSEC registrants could visit both expos. Having about the same number of booths as FOSE, GOVSEC had more emphasis on hardware than FOSE, to include armored command vans and personnel carriers. Local schools having booths at GOVSEC included Capitol College and George Washington University. The IT security courses of these and other schools were emphasized.

The display most interesting to me was aviation-related. This was an auto gyro made by AutoGyro GmbH of Hildesheim, Germany. The auto gyro first flew in 1923, and they have been built and flown in very small quantities in the decades since then. The reasons for auto gyros being on the edge of extinction include expensiveness compared to airplanes, the inability to hover, unimpressive cruising speeds, and the need for a runway of some sort, although the runway length required for takeoff is only about 100 yards and only about 50 feet for landing. In other words, gyroplanes don't fly as fast or economically as most airplanes and aren't as good as helicopters for police or rescue work. The offerings of AutoGyro may change this situation. It is offering the Calidus for \$95,000, and one sheriff's department has already bought one and operates it for patrol work. It flies as slowly as 20 mph and landing and taking off from highways might be feasible in some cases. What amazes me is the low price of this machine. For comparison,

the smallest new Piper or Cessna airplanes cost around \$300,000. Helicopters of the type used for police patrols cost at least \$900,000. Although the auto gyro does not have the complexity of a helicopter, it is considerably more complex than four-seater Piper and Cessna airplanes. The AutoGyro has a gearbox and a means of spinning the rotor prior to liftoff, while the propellers of small airplanes are connected directly to the engine crankshaft.

Another item that caught my attention was the electric tricycle offered by Trike Virginia. One model, costing \$1,900, has a maximum speed of 16 mph and a range of 16 miles before its lithium-ion battery, mounted on the steering post, requires a 5-hour recharge. It is offered not as a traveling machine but a pleasant form of exercise. There is no seat; you stand with your feet next to the real wheels and your body flexes and sways during turns.

An armored personnel carrier, smaller than military versions, was impressive. It can run at 50 mph even when its tires are shot out. The tires are not special. The wheels have ridges protruding into the hollow portion of the inflated tires, higher than the rims, that the vehicle runs on when the tires are deflated. The price starts at \$250,000. There is optional equipment available. I asked if they could mount a pair of .50-caliber machine guns, and the sales guy said yes, no problem. I was dressed in a sport coat and tie, and I look like I'm in my sixties, so maybe these guys thought I was a purchasing executive with a serious interest.

Scanner Q&A: Roger Oliva

Wally Lee, Washington Section Scanner Editor, interviews Roger Oliva, long-time IEEE volunteer and Graduate Student Member in the Northern Virginia Section. Roger has been an officer in the local AEISS chapter since 2001, and he also serves on the AEISS International Board of Governors. Recently, he sat down for a chat with Wally for the Scanner.

Wally Lee: Roger, what do you do as an engineer?

Roger Oliva: The focus of my present career objective is product development, refinement, and definition of engineering efficiencies to enable solutions to the most challenging technical and/or geopolitical problems. I arrived here by a circuitous route including systems engineering, research, teaching in inner-city schools, and even some odd jobs.

WL: Please tell us about your family background. Where are you from, and how did you arrive in Northern Virginia?

RO: I am from Ohio but have lived in Northern Virginia since grade school. My life is rooted in strong family values stemming from Italian and Irish ancestry. Grandpa Oliva came to the US as a legal immigrant at 19 years old. Mom's family has been here for 200 years. Growing up, my brother Philip and I had parents and family that demonstrated that we were uppermost in their decisions. We learned the definition of commitment and honor in our participation in various bands, sports teams, and in the witness of our 10 Uncles and Aunts who served our Country in various military, government, and community endeavors.

WL: What is your family doing today?

RO: I have two amazing sons, Michael and Alexander, who are both college graduates and contributing to society. The younger, Alex, was just married in June. Growing-up, I was taught that family always comes first and by hard work, anything is possible. This has always been the lesson I have brought home to my sons. I have every intention to continue moving forward and bringing honor to my family by making the "right" decisions by pursuing wholesome goals. For instance, my sons inspired me to start the Washington Volleyball Club. Currently, the Men's and Women's Club has 6 Teams comprised of 43 registered members that have the goal of winning National-level competition in Salt Lake City, UT in the Spring.

WL: How did you get into the engineering profession?

RO: I delivered the Alexandria Gazette, the Evening Star, and the Washington Post from the time I was 11 through to my 2nd year in High School. I worked summer jobs in grounds & landscaping a couple years and then worked a couple of summers in concessions throughout the National Parks in the DC Area. I ended up as driver/deliverer and the assistant storeroom manager for refreshments, souvenirs, and sporting goods supporting the activities throughout the Mall and area National Parks 'til I went to Mason, right out of High School. I completed the Mason 2-year Engineering Program, the only one offered, with the intent to subsequently go to Virginia Tech to compete degree requirements. My career/education were temporarily derailed, after a bout with personal health issues. I continued temporary jobs working odd-jobs as a security guard, in a health food store, and moving furniture, as I tried my hand at more technical endeavors with the Army Night Vision Labs and the Crystal River Nuclear Power Plant. I resumed my studies in the new Mason Electronics and Computer Engineering program with good success.

WL: What was your first engineering job?

RO: I landed my first real job during the year Michael was born. As a research assistant, I worked on Space Systems modeling, simulation, program management, and related software development tasks. Although paid a low wage, I obtained unique and state-of-the-art experience in satellite sensor, ground-based radar, and other communications capabilities. I was in this job when "Star Wars", the Strategic Defense Initiative Organization, was announced by President Reagan. I stayed in "the" job until shortly after Alex was born. During this period as I was working full-time, I continued in school to finish the last 2 years of my undergraduate work, part-time.

WL: You had a lot of experience by the time you graduated!

RO: I worked Special Projects for the Joint Staff, the FAA, and SDIO Program Office until a resurgence of health issues took me off-line for a short period. I also sold electronics for the Tandy Corporation for several months while making my way through the final degree requirements. I took a systems engineering assignment associated with the Commander of the Navy Reserve, did some hotel night work, performed as an industrial safety systems operator, and finished my Bachelors. (Whew!)

WL: Tell us how you made the decision to pursue graduate studies.

RO: I was working on a spectrum and information systems development program in private industry during the onset of hostilities in the first Gulf War. I substitute taught, took coursework in physics and manufacturing engineering, coached, and took various engineering assignments for Navy Sea Systems Command, FAA Advanced Con-



cepts, and the Army Telecommunications System. These endeavors led me into systems engineering at the Pentagon, where Space and Nuclear Force operations and programs were being defined. While in this job, I started my Masters program. I kept this Space job for almost 5 years and had another career-decision to make. Should I vigorously pursue an Aviation Safety position with the FAA or a Special Projects position with basic research for biochemical defense systems? I performed systems analysis and provided export control research activities for the USAF HQ for International Affairs. I got my M.E. degree in Mechanical and Aerospace Systems from UVA in 2004. I have been pursuing my Ph.D. since 2006.

WL: What is your dream job?

RO: I would like to enable a bright future for our country and those that wish to work with the US. That would be to support the implementation of private development or engineering programs. If I do not remain in private industry, then there are several US Government agencies that align with these goals of mine.

WL: What would you do differently if you had to do it over?

RO: Looking back on my career, it seems that I often took difficult routes, but perseverance enabled good results. I sometimes wonder what would have happened if I had taken the FAA job. Could I have contributed in January, 2001, to programs that would have led to cockpit security/safety?! Although our DARPA biochemical solutions were used to deal with the Anthrax business, could I have contributed to a solution that would have disarmed the 19 terrorists of 9-11?! Doubtful, but thinking about it makes me acutely aware of how the failure of cockpit security has been costing our nation so much over the past 10 years.

WL: What is the prognosis for your Ph.D?

RO: I have completed coursework at UVA in nanomedicine, nanophotonics, photonics, and materials science engineering. At the present, my focus is sustainable employment, but I will re-engage with graduate studies when resources are available.

Congratulations!

Congratulations to the following members of Northern Virginia Section who have been elevated to the Senior Member level at the February and March 2012 meetings of the Admissions and Advancements Panel: **John Hiemstra, Hemant Mehta, Patrick Shea, Alice Squires, Neil Steiner, Michael Wolfson, Pinhas Ben-Tzvi, Xiuzhen Cheng, John Daley, Robert Kanyuck, Ergun Simsek and Gerard Stenbakken.**

For more details visit www.ieee.org/seniormember or contact **Murty Polavarapu** (murtyp@ieee.org) for Northern Virginia Section or **Harry Sauberman** (hsauberman@ieee.org) for the Washington Section.

Always Accepting Submissions

Please submit calendar items in the format used in the Calendar of Events. You can send an email to ncac-scanner@ieee.org. Events must have an IEEE or affiliate sponsor. Please 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. Other contributions, such as reports on chapter events and other member activities, are most welcome. Please submit articles to the content editor at ncac-scanner@ieee.org.