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Bulletin

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Included in this issue:

Editor: Philip Cox, p.e.cox@ieee.org; Contributors: Jim Beck, Gabriela Hug, Gene Kern, Steve Mozelewski, Kal Sen, Mey Sen, Matt Valenti and Dave Vaglia

All announcements for publication in a particular month's bulletin are due to the Editor by the 20th of the previous month. The accuracy of the published material is not guaranteed. If there is any error, please bring it to the Editor's attention. The Section's web site, https://webinabox.vtools.ieee.org/wibp_home/index/r20037, has recent issues of the bulletin and lots of other useful information

• Beck's Bytes

Things got off to a quick start in January, with some exciting technical seminars by our Power & Energy Society and Industrial Application Society (PES/IAS), as well as the Communications Society. I hope you had a chance to attend one of these talks, or get involved with one of the 11 active technical chapters here in our Pittsburgh section. There are many more technical seminars in the works, so be sure to keep an eye out for announcements in the bulletin or on the website.

At last month's excomm meeting we discussed a wide range of topics pertaining to activities being planned in 2014 and I'll have much more to share with you about this in the months ahead. For one thing, we became a sponsor of FIRST Robotics. You may have noticed a call for volunteers in our January bulletin to support the FIRST Regional Competition at Cal-U on March 27-29. If you have time available, I highly encourage you to help out with this worthwhile event. We think FIRST is a great way to get students interested in math and science and we're proud to be a sponsor in 2014. You can get more info about FIRST at www.usfirst.org or www.firstpittsburgh.org

I also learned that the IEEE Energy Conversion Congress & Expo (ECCE) is going to be held in Pittsburgh this year, September 14-18, at the David L. Lawrence Convention Center. Check out their website for more details (http://2014.ecceconferences.org). We're excited to have this conference in Pittsburgh, and we'll have more details to share as the date approaches.

You may be interested to learn there's a new IEEE Technical Community on the Internet of Things (IOT). You can learn more at their website (http://iot.ieee.org). We're excited about this since there seems to be overlap with our area, and the local companies and universities doing research on IOT. Russel Dudek is spearheading an effort to explore ways we can get involved locally. If you have ideas or would like to help out please contact Russel at russell.dudek.us@ieee.org

We still have an opening for the chair of our life member affinity group. If you're an IEEE life member and would like to volunteer please contact me.

Thanks, and have a great month!

Jim Beck, Section Chair, 2014

Section

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Treasurer – Jim Lagree, JamesLLagree@Eaton.com

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UpperMon Subsection

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Electromagnetic Compatibility Society Chair: Michael J. Oliver emi@majr.com (814) 763-3211

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Society on Social Implications of Technology Chair: Joe Kalasky, P.E., j.kalasky@ieee.org 724-244-1609

Affinity Groups

GOLD – Chair: Mike Hollis, mike.hollis@ieee.org

Life Member – Chair: Rich Haverlack, r.haverlack@comcast.net

Women In Engineering – Chair: Dr. Gabriela Hug ghug@ece.cmu.edu

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- ## *Utilizing Global Views for both Desktop and Mobile Malware Detection*

Speaker: Yanfang "Fanny" Ye, Ph.D.
Date: Monday, February 3, 2013
Time: 4:00-5:00 PM
Place: G102 Engineering Sciences Building (ESB)
West Virginia University, Morgantown, WV
RSVP: Matthew Valenti, Valenti@ieee.org
Organizer: Upper Mon Subsection

Abstract: Due to its damage to computer security, malware (e.g., virus, worms, trojans, spyware, backdoors, and rootkits) has caught the attention of computer security researchers for decades. One outcome of such research is malware analysis that helps with both detection and recovery. However, to gain profits, malware writers quickly developed automated malware development toolkits, such as Zeus, to write and change malicious codes that can evade Anti-Virus (AV) detection. Due to wide availability of these easy-to-use automatic malware creation toolkits, today's malware samples are created at a high speed (thousands per day). In order to remain effective, many Anti-Malware venders have turned their classic signature-based method to cloud (server) based detection. Accordingly, many research efforts have been conducted on developing intelligent malware detection systems applying data mining techniques. Such techniques have successes in classifying and/or clustering particular sets of malware samples, but they have limitations that leave a large room for improvement and rare of them have been applied in real applications.

Instead of focusing on the development of a single classification algorithm that only works for a narrow range of file sample sets, in this seminar, we will investigate how to utilize global views for malware detection. We will introduce a unified classification ensemble framework, effectively combining results from heterogeneous base-level classifiers derived by different learning methods with different feature representations on dynamic training sets. Furthermore, the popularity of the mobile devices around the world (6.8 billion mobile connections by the end of 2013) has also attracted attackers. Therefore, mobile malware is becoming yet another major security threat on the mobile Internet. In this seminar, we will extend malware analysis and detection framework to mobile malware as well.

Speaker Bio: **Dr. Yanfang "Fanny" Ye** is an Assistant Professor in the Lane Department of Computer Science and Electrical Engineering at WVU. She was the Principal Scientist in Comodo Security Solutions, Inc. (2010.9~2013.6), which is one of the largest companies specializing in R&D on Internet security. She was formerly the Deputy Director at Kingsoft Internet Security Corporation (2008.12~2010.9) responsible for cloud security R&D. Her research areas are in cyber security, data mining, machine learning, malware detection, phishing website detection and smart device. She has proposed and developed cloud-based solutions for mining big data in the area of Internet security, especially for malware detection and phishing website detection. Her research results have been published in several top conferences such as ACM SIGKDD (2007, 2009, 210, 2011), as well as top journals in the area of cyber security, such as Journal in Computer Virology (2008, 2009), IEEE TSMC (2010, 2012), and Journal of Intelligent Information System (2010). Her algorithms and systems have

been incorporated into popular commercial products, including Comodo Internet Security with over 35 million users in the U.S., and Kingsoft Antivirus with over 150 million users in China. In addition, she has been awarded 3 Chinese patents in the area of malware detection and categorization. As a co-applicant, she has successfully applied 5 national grants with $2 million USD from Chinese National Science Foundation (NSFC) as well as other funding agencies in recent five years.

- ## *Combination Arc Fault Circuit Interrupters (AFCIs): What they will and will not do*

Speaker: Joseph C. Engel, PhD
Date: February 6, 2014
Time: Social 6:30 PM, Program 7:00 PM
Place: Westinghouse Energy Center
4350 Northern Pike, Monroeville, PA 15146
RSVP: **Required** to Mey Sen (senml@ieee.org) by February 3, 2014 with each attendee's Name, Affiliation, email, and phone number. If you would like to receive PDH, please bring a copy of this announcement for verification of your attendance. A non-Member who would like to receive PDH is required to pay $10 to IEEE Pittsburgh Section. A Member who would like to receive PDH is required to show membership ID.
Organizers: Power & Energy Society/Industrial Applications Society

Abstract: The branch circuits of most new home are required by the National Electric Code to be electronically protected, either by a Ground Fault Circuit Interrupters (GFCIs) or an Arc Fault Circuit Interrupters (AFCIs). Kitchen, bathroom, garage, etc. must be protected by GFCIs, while living areas must be protected by AFCIs. The AFCI is the fourth generation in residential branch circuit protection after fuses, circuit breakers, and GFCIs. National Electrical Code in 2002 first added AFCI protection, for bedrooms outlets. In 2008, coverage was expanded to all living areas, also adding that only "Combination AFCIs" are allowed.

Manufacturers and UL claim that arcing across a break in a cord's conductor is hazardous, and that a Combination AFCI will respond to prevent a fire. The author believes the claim is unproven, and will explain why the now disallowed Branch/feeder AFCI provides more protection at less cost.

Speaker: Joseph C. Engel received his BSEE and MSEE degrees (1960 and 1962) from University of Cincinnati and Ph.D. EE (1969) University of Pittsburgh, respectively. His work experience includes SemaConnect 2011-present, Eaton (Cutler-Hammer) from 1993-2009, Westinghouse Electric Corporation (1963-1993), Baldwin Piano Company (1960-1963) and Allis-Chalmers (1956-1963). His awards include more than 100 Issued US Patents, Finalist for the Design News Magazine "Year 2001 Engineer of the Year Award" (2001), Member of Eaton Society of Inventors (1994), Westinghouse Order of Merit (1993), George Westinghouse Signature Award of Excellence (1990), George Westinghouse Innovation Award (1989), and Inventor of the Year (1988, as recognized by the Patent Law Association of Pittsburgh). He has many technical publications.

DIRECTIONS TO WESTINGHOUSE ENERGY CENTER (MONROEVILLE)

From Pittsburgh take Interstate 376 East (Parkway East). Take Exit 84A to Monroeville. Cross Business Rt 22 at the traffic light and proceed on Rt 48 South (Moss Side Blvd) approx ½ mile (two traffic lights). The 2nd traffic light is at a 4-way intersection with a Marathon station on the right. Turn left onto Northern Pike. Proceed approx 0.2 miles and turn right at the 1st traffic light onto Westinghouse Dr. Travel 0.7 miles (past the guard stand) to the 3 flags where the building's main entrance is located. Parking in the evening will be plentiful. Use the main entrance and check with the security guards inside. You will be directed to the proper room for your meeting.

From the PA Turnpike, take Exit 57 (Monroeville). After the toll plaza, get in the left lane to get on Business Rt 22 West. At the first light, turn left onto Rt 48 South (Moss Side Blvd) and follow the above directions.

- ***Trade-offs in Climate Mitigation Strategies: Assessing the Regional Variations in the Health, Environmental, and Climate Benefits of Wind and Solar Generation Across the United States***

Speaker: Inês Azevedo, Department of Engineering and Public Policy, Carnegie Mellon University
Date/Time: Wednesday, February 12, 2014, 6:15pm
Location: Hamerschlag Hall 1107 on CMU Campus

There is a growing interest in reducing emissions from electricity generation in the United States. Renewable energy and energy efficiency and conservation are typically among the suggested solutions. Both supply- and demand-side interventions will displace energy and emissions from conventional generators. However, there is large uncertainty on which generators are being displaced by these interventions. I will present the first systematic calculation of marginal emissions factors (MEFs) for the U.S. electricity system. I will show how marginal emissions factors for CO_2, NO_x, SO_2 and $PM2.5$ can be applied to estimate climate, environmental and health benefits from displaced emissions from wind and solar, highlighting regional differences. Depending on location, combined health, environmental and climate benefits from wind or solar range from about \$10 to \$100 per megawatt-hour. The key conclusion of this work is that the sites with the highest energy output not always yield the greatest social benefits. This work has been co-authored with K. Siler-Evans, M.G. Morgan and J. Apt. Funding comes from Climate and Energy Decision Making (SES-0949710), through a cooperative agreement between the National Science Foundation and Carnegie Mellon University.

Inês Azevedo, PhD, is Assistant Professor in the Department of Engineering and Public Policy at Carnegie Mellon University. She is co-PI and the co-Director for the Climate and Energy Decision Making Center. She has a B.Sc. in Environmental Engineering (2004) and a MSc in Engineering Policy and Management of Technology from IST-Portugal, and a PhD in Engineering and
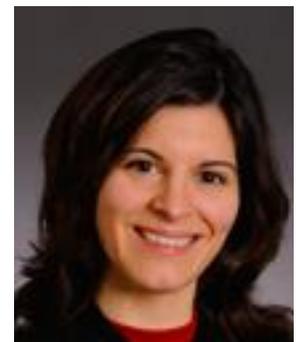
Public Policy from Carnegie Mellon University (2009). Dr. Azevedo's research interests lie at the intersection of environmental, technical and economic issues, such as how to address the challenge of climate change and to move towards a more sustainable energy system. She addresses complex problems in which traditional engineering plays an important role but cannot provide a complete answer.

• *An Introduction to Microwave Engineering*

Speaker: Michael Stennes
Date: Monday, February 24, 2013
Time: 4:00-5:00 PM
Place: G102 Engineering Sciences Building (ESB)
West Virginia University, Morgantown, WV
RSVP: Matthew Valenti, Valenti@ieee.org
Organizer: Upper Mon Subsection

Abstract: An overview of microwave theory and techniques is given, with a brief survey of practical applications. Topics covered include: methods for generating microwave signals, transmission of microwaves from point to point (both free space propagation and waveguiding structures), and detection of microwaves. Examples of current areas of research that are of interest to the microwave engineer are radar remote sensing, passive radiometry for airport security screening, and medical diagnostics/therapy. In addition, the trend toward higher processing speeds in consumer electronics creates an ever increasing need for microwave engineering in their design.

Speaker Bio: Michael Stennes was born in Boston, Massachusetts, in 1961. He received his B.S.E.E. and M.S.E.E. degrees in electrical engineering from the University of Massachusetts, Amherst, MA, in 1987 and 1989 respectively. While an undergraduate at UMass, he was employed by the Laboratory for Millimeter Wave Devices & Application, as a research assistant. In 1987, he joined the Radar Systems Lab, Raytheon Company, Lexington Massachusetts, where he was involved in the design of microwave components and radar subsystems. Since 1994, Mr. Stennes has been with the National Radio Astronomy Observatory in Green Bank, WV, as a designer of low-noise microwave and millimeter wave receivers and components.

- ## *from the Pittsburgh Section Robotics and Automation Society*

I have received requests for a presentation on the Raspberry PI setup and use. To be sure I have enough material to talk for 90 minutes, I'm also going to add the Beagle Board and other inexpensive computer boards. The boards I know of will be Arduino, Galileo, LaunchPad, and PIC.

I plan to have the presentation ready for an April meeting. Now I need to find a location.

Thanks to all those who have emailed me about meeting topics. Keep your ideas coming.

Cheers,

Gene Kern,

Pittsburgh Section RAS Chair

Help (Volunteers) Wanted

Want to work with the next generation of engineers? Volunteer with FIRST. FIRST Pittsburgh is looking for volunteers for the FIRST Regional Competition to be held at CalU 27-29 March 2014. Visit www.usfirst.org/ or www.firstpittsburgh.org for additional information. Video of the FRC game is at www.usfirst.org/roboticsprograms/frc/2014-game.   The FTC (FIRST Technology Challenge) game video is at www.usfirst.org/roboticsprograms/ftc/game.

- ## *Open Letter to IEEE Pittsburgh Section's Power Electronics Society Members (PELS)*

Greetings! I have been thinking for some time to ask you if there is enough interest to start a new Chapter of the IEEE Power Electronics Society (PELS) in the Pittsburgh Section. This year PELS is cosponsoring the 2014 ECCE conference to be held in Pittsburgh in September. I am simply seeking your opinion if we should have this Chapter in our Section. We need 12 members' signatures to start a new Chapter. Please respond by emailing to me at senkk@ieee.org.

Respectfully submitted,
Kal Sen
IEEE Pittsburgh Section Chair (2005)
IEEE Pittsburgh PES/IAS Chapters' Chair (2003, 2004)

- ## *Renewal Reminder*

Just a brief reminder that the period to renew IEEE membership for the year has expired. Those members who have not completed renewal by February 22 will have their membership deactivated. If you haven't already done so, please take time to renew your membership. As you know, IEEE membership is important for your career as well as for your own personal growth. Keep up the contact with the societies and affinity groups and stay involved! There is now an automatic renewal option for those of you who just can't seem to remember to renew each year.

- ## *2014 PES Chapter Outstanding Engineer Award*

The IEEE Power & Energy Society Chapter of the Pittsburgh Section is seeking nominations from the local PES members for the 2014 PES Chapter Outstanding Engineer Award. The Outstanding Engineer Award is designed to recognize members of the Pittsburgh PES Chapter who have made outstanding contributions to their profession through their technical abilities and service to IEEE. The nominees will be judged on the basis of their activities during the past two calendar years (2012 and 2013).

Please nominate yourself or someone else by providing the following information:

- Name/IEEE Grade/IEEE Membership Number
- Professional Affiliations
- Description of technical contributions
- Patents/proprietary designs/papers/technical presentations
- Service to IEEE
- Service to the engineering profession outside IEEE
- Recognition through other honors

Nominations should be submitted to the Chapter Award Committee (Past Chair Mey Sen, senml@ieee.org) no later than February 28, 2014. The decision of the Award Committee is final. The winner will be recognized at the Pittsburgh Section's History Dinner, usually held in May.

2014 Calendar – Meetings of IEEE Pittsburgh Section

	Jan	Feb	Mar	Apr	May	June	July	August	Sept	Oct	Nov	Dec
Executive Committee	16 Panera Monroeville	20 Panera Bread Wilkins	20 Panera Bread Wexford	17 Panera Bread Forbes Ave, Oakland	15 Panera Bread Wilkins	19 Spaghetti Warehouse Pittsburgh	17 Panera Miracle Mile	21 Panera Bread Forbes Ave, Oakland	18 Panera Bread Cranberry	16 WVU TBD	20 Panera Bread Wilkins	18 Holiday meeting TBD
Section		15 Robot Car Race										
Communications	21 Interference											
Computer												
EMBS												
EMCS												
PES/IAS	6 Climate Change 23 Arc Furnace	6 AFCIs										
Magnetics												
Robotics												
Sig. Processing												
CPMT/ED												
Social Impl Technology												
Upper Mon		3 Malware Detection 24 Microwaves										
Women in Eng'ing		12 Climate Mitigation										
Life Mem.												
GOLD												
PACE												
Student Act												