

Bulletin

IEEE Pittsburgh Section

September 2005 Volume 54, No. 13



Included in this issue:

- From the Chair- Section Elections
- Picnic at Settlers Cabin Park - Sept 10
- Signal Processing Meeting - Sept 13
- Consultants Network - Sept 27
- Nuclear Power Plant Control Room Simulators - Sept 28
- Magnetics Society Meeting - Sept 29
- Radio History - Oct 20
- Safety in Industry - Oct 25
- Connect to job openings via our web site

Editor of this issue: Jace Cochrane, P.E. jacejc@pghmail.com (412) 390-0718

Contributors: Michelle Antantis, Phil Cox, Bob Grimes, Ganping Ju, Joe Kalasky, Heung-No Lee, Kal Sen, Chuck Urso and Dave Vaglia.

All announcements for publication in a particular monthly bulletin are due to the Editor by the 20th of the previous month. Monthly issues of the bulletin are posted on the web site www.ewh.ieee.org/r2/pittsburgh. The accuracy of the published material is not guaranteed. If there is any error, please bring it to the Editor's attention.

• From the Chair

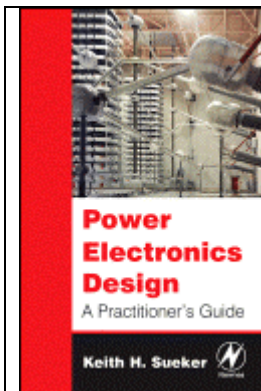
Dear Members of IEEE Pittsburgh Section,

I am delighted to report that the Industrial Applications Society (IAS) of the Pittsburgh Section has been selected the winner of the 2005 Outstanding Large Chapter Award for its activity during 2004. The award will be presented next month at the IAS Annual Meeting in Hong Kong. The Power Engineering Society (PES) of the Pittsburgh Section was presented the Outstanding Large Chapter Award in June at the PES General Meeting in San Francisco. It is remarkable for our Section to receive both awards in the same year. It proves that with our collective effort we can put together the best quality programs consisting of technical and public affairs meetings, plant tours, and tutorials so that our members can stay in touch with the latest technology.

I urge members to come forward and take part in shaping the future of IEEE Pittsburgh Section. The Section desperately needs new volunteers with fresh ideas. The first step is to participate in the upcoming election. The Section Executive Committee has approved a list of candidates for this election; Chairman: **Ralph Sprang** and **David Vaglia**; Vice Chairman: **John Twigg**; Secretary: **Charles Urso**; and Treasurer: **Harold Hagerty**. For the Chairman position there are two candidates and the other positions are unopposed at this time. Additional candidates can be nominated by petition. For more information, please write to me at senkk@ieee.org or call me at (724) 696-1611.

Kal Sen

• Newest Book on Power Electronics



Keith Sueker, PE, a longtime active member of IEEE Pittsburgh Section authored the newest book titled *Power Electronics Design*. The details of the book can be found at the publisher's web site at

<http://books.elsevier.com/bookscat/links/details.asp?isbn=0750679271>.

Section

Chair – Dr. Kalyan Sen (Kal)
senkk@ieee.org (724) 696-1611

Vice Chair – Ralph Sprang
rsprang@ieee.org (412) 635-2663

Treasurer & Awards Co-Chair – David J. Vaglia, P.E.
davevaglia@ieee.org (412) 491-6944

Webmaster – Andrew Novotny
andrewnovotny@ieee.org (412) 351-4954

Chapter Chairs

Communication
Dr. Prashant Krishnamurthy
prashant@tele.pitt.edu (412) 624-5144

Computer Chair and Section Secretary
John Twigg
jtigg@ascent-systems.com (724) 387-2772

Engg. In Medicine & Biology
Robert Brooks
bbrooks@medrad.com (412) 767-2400 x5543

PES and IAS Co-Chairs
Charles Urso, P.E.
cURSO@ieee.org (412) 338-4871
Faruq Ahmed, P.E.
Faruq.Ahmed@burthill.com (724) 477-1253

Magnetics: Dr. Ganping Ju
Ganping.Ju@Seagate.com (412) 918-7046

Robotics Co-Chairs
Dr. Guy Nicoletti
Nicoletti+@pitt.edu (724) 836-9922
Dr. Ron Stone
RStone@ParadigmGenetics.com (412) 488-4858

Signal Processing: Dr. Heung-No Lee
hlee@engr.pitt.edu (412) 624-9677

UpperMon Subsection
Dr. Dimitris Korakakis
Dimitris.Korakakis@mail.wvu.edu
(304) 293 0405 x2512

Life Member Chair: Bob Grimes
r_d_grimes@ieee.org (412) 963-9711
Vice-Chair – Wally Raisanen
wraisanen@reliableinstruments.com (724) 986-4467

Committees

Professional/Career Activities (PACE) Chair:
Joe Kalasky, P.E.
j.kalasky@ieee.org (724) 838-6492

Consultants Network Chair:
Dr. George Crawford, P.E.
gwc2@psu.edu (412) 675-9164

Membership Development Chair:
Elliott Levenson
elliott.levenson@us.army.mil (412) 303-3573

Conference Chair: Dr. Miklos Gyimesi
miklos.gyimesi@ansys.com (724) 514-1787

GOLD Chair: Andrew Rydholm
andrew_rydholm@yahoo.com (412) 261-3200 x281

Student Activities Chair: Ben McMillen
bmcmlen@engr.pitt.edu (412) 445-8638

Awards Co-Chair: Ray Valentine, P.E.
r.d.valentine@ieee.org (724) 733-5083

Publicity Chair: Thomas Dionise, P.E.
ThomasJDionise@eaton.com (724) 779-5864

• IEEE Pittsburgh Section 8th Annual Fall Picnic

Enjoy the outdoors, meet IEEE members and their families, and enjoy the food at our section's 8th annual fall picnic. IEEE will provide the meat and soft drinks. You should bring a salad OR dessert to serve 10-12 people. The Pittsburgh Section Executive Committee will meet from 1-2 PM (members are welcome to attend), and the picnic starts at 2 PM. Michelle Antantis is organizing this event and welcomes your assistance.

Date: Saturday, September 10, 2005

Place: Mohawk Grove, SETTLERS CABIN PARK, Allegheny County

Time: Picnic: 2 PM Executive Committee meeting: 1 PM

RSVP: To Michelle Antantis by Wednesday, September 7. Let her know how many people and what dessert or salad you are bringing. (412) 393-4912 or mantantis@duqlight.com.

Directions: From Downtown take the Parkway West toward the airport. Take the Campbell's Run Road exit. Make a left at the end of the exit ramp onto Campbell's Run Road. Make next left onto Boyce Road. Right onto Ridge Road. Left onto Papoose Drive (wave pool to the right). At T, make left onto Tepee Drive. Mohawk is first grove on the left. Additional parking is available at Tomahawk Grove on the right.

• Signal Processing Society Lecture

Maximum likelihood union bound for MIMO channels

Speaker: Prof. Heung-No Lee, University of Pittsburgh

Place: University of Pittsburgh, Benedum Hall, Room 370, Oakland

Date: Tuesday, September 13, 2005

Time: Social (snacks provided): 6:00PM; Technical Program: 6:15PM

RSVP: Prof. Heung-No Lee (hnlee@engr.pitt.edu)

Directions: See <http://www.umd.pitt.edu:16080/tour/tour-118.html> or try <http://maps.yahoo.com> with zip code 15261. Suggested parking lot is Soldiers and Sailors Memorial Hall.

Abstract: Maximum likelihood union-bound techniques have been used throughout the history of communications and coding theory. They provide design insights as well as performance benchmarks. Recently, there has been extensive renewed interest in finding union bounds for turbo- or turbo-like coded modulation systems and many new results have been generated in the last few years for basic channels such as binary symmetric channels, binary erasure channels, as well as the additive white Gaussian noise channels. The reason for the interest has been that the operating region of the turbo-coded system is beyond the cut-off rate region in which a traditional ubiquitous union bound is loose. The tight bounding techniques originally studied by Fano and Gallager in the 1960s have been revised and applied to obtain these newer bounds. In this talk, we are interested in discussing one of our novel maximum-likelihood union-bounds recently developed for multiple transmit and receive antenna systems (MIMO systems). The proposed transceiver system uses the turbo or low-density parity check codes as the outer codes. As an inner code, conventional space-time block codes can be used. Typically, the turbo-iterative decoding and detection scheme is used at the receiver. The robust performance of the proposed transceiver scheme has been verified in simulations, as shown in many recent publications. There have been, however, a limited number of theoretical measures to assess the performance of such systems. In our recent development, we have been able to solve a number of combinatorial techniques arose from the MIMO system and obtained tight union bounds for a variety

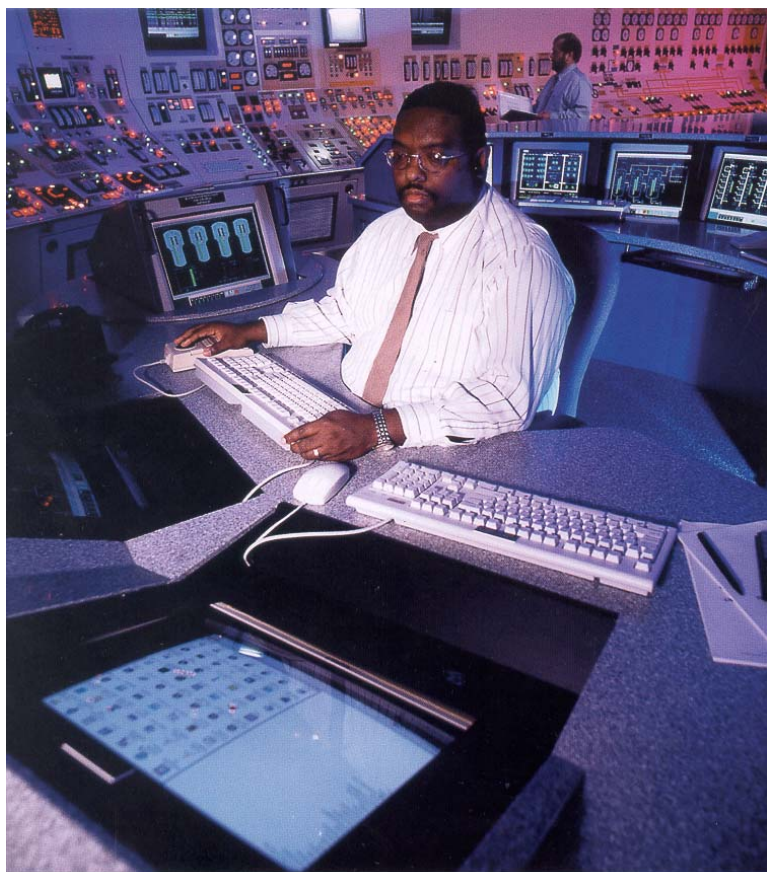
of different channel conditions and modulation schemes. This is an important advance since the tight union bound can be very useful and lead us to new system design rules and insights.

Speaker: Dr. Lee obtained his B.S., M.S., and Ph.D. degrees from the Electrical Engineering department at the University of California, Los Angeles in 1993, 1994, and 1999 respectively. He was with the HRL Laboratories (formerly Hughes Research Lab) in Malibu, California from 1999 to 2002. In 2002, he joined the Electrical and Computer Engineering department at the University of Pittsburgh as assistant professor.

• Consultants Network Meeting

Plans for a meeting on **Tuesday, September 27** are being finalized and will be emailed to all CN members. If you are a consultant offering engineering services, the Consultants Network is for you. Network with other consultants and be included in CN's on-line listing of consultants, which is used by companies in need of consultants. For more information, contact George Crawford at (412) 675-9164 or gwc2@psu.edu.

• Nuclear Power Plant Control Room Simulators



Place: Westinghouse Electric Co.
1740 Golden Mile Highway
(Route 286) Monroeville
[About 1.5 miles past the
junction of Rtes 22 and 286]

Date: Wednesday, September 28, 2005

Time: 6:30 PM - social with light food
and pop

7:00PM – program

RSVP: Dave Vaglia at (724) 733-6513
or davevaglia@ieee.org

The facility we will tour engineers I&C systems and control rooms for nuclear power plants around the world. Our tour will focus on the control room simulators for nuclear power plants. We are fortunate to be able to schedule this tour at a time when there is an actual hybrid control room simulator being assembled and tested on the floor. This upgraded control room simulator will be contrasted with the compact control room simulator that is used as the test bed for the design of new nuclear plant control rooms being built in other countries.

Tour sponsored by PES and IAS.

- **Magnetics Society Distinguished Lecture Series III**
Dynamics in magnetic micro- and nanostructures

Speaker: Prof. Dr. Burkard Hillebrands
of Fachbereich Physik, Technische Universität Kaiserslautern
Place: Seagate Research Center Auditorium, Pittsburgh
Date: Thursday, September 29, 2005
Time: 11:30 AM - Social (with Lunch served), 12:15 PM - Technical Program

For applications in sensors and in data storage, the dynamic properties of micro- and nanostructures gain increasing attention. The fundamental excitations in these objects are confined spin waves, and it is useful in particular to understand their properties in view of the noise spectrum in sensor and MRAM applications.

The lecture addresses the dynamics in homogeneously and inhomogeneously magnetized objects starting with an introduction to spin waves and the effects of finite dimensions. In inhomogeneous systems, the excitation spectrum is complex, and new phenomena like localization and tunneling of modes are discussed. The key points are illustrated by results obtained by space- and time-resolved Brillouin-light-scattering technique, which allows one to follow experimentally the propagation of spin wave packets and to present the results in an animated format. To conclude the lecture, the analysis of ultra-high-frequency dynamic properties of small magnetic elements such as squares and rings with spatial resolution in the 300 nanometer range and the potential application to new logic devices based on spin waves are presented.

Please **RSVP** to Charlotte.Wlodkowski@Seagate.com by Monday, Sep 26 to help us prepare the lunch.

Directions to Seagate Research Center:

Seagate Research Center is located at 1251 Waterfront Place, Pittsburgh, in the Strip District, across from the Heinz History Center and next to the Convention Center.



Burkard Hillebrands received his diploma in physics from the University of Cologne in 1982 and his PhD in physics from the same university in 1986. After a postdoctoral stay at the Optical Sciences Center in Tucson, Arizona he received his habilitation from the RWTH Aachen in 1993. He was employed as an associate professor at the University of Karlsruhe in 1994. Since 1995 he is a full professor at the University of Kaiserslautern. He is the coordinator of the German priority program “Ultrafast Magnetization Processes”, the vice coordinator of the German research unit “New materials with high spin polarization”, and he coordinates a European network on “Ultrafast Magnetization Processes in Advanced Devices”. He is currently the head of the Material Research Center for Micro- and Nanostructures (MINAS) at the University of Kaiserslautern. He is a member of the granting board for collaborative research centers (SFB) of the senate of the Deutsche Forschungsgemeinschaft and a member of the Editorial Board of the Journal of Physics D – Applied Physics.

His research field is mostly in magnetoelectronics. His special interests are in

spin dynamics, material properties of thin magnetic films and multilayers, exchange bias, as well as in elastic properties of layered structures. In the field of spin dynamics he is particularly interested in dynamic magnetic excitations in confined magnetic structures, magnetic switching, and nonlinear magnetic phenomena using space- and time resolved Brillouin light scattering spectroscopy and time resolved Kerr effect techniques.

He has published more than 170 articles, has five patents and patent applications, seven book contributions, and he is co-editor of the book series on "Spin Dynamics in Confined Magnetic Structures".

- **Life Member Meeting: Commercial Radio's Birthplace**

Date: Thursday, October 20, 2005 at 1:30pm
Speaker: Rick Harris
Where: George Westinghouse Technical Center. Building 801, Room 2C14
RSVP: It is not necessary to RSVP.

Mr. Harris is chairman of the Frank Conrad Garage Project, an effort to save the birthplace of radio and make it the centerpiece of a proposed National Museum of Broadcasting in Pittsburgh.

Frank Conrad was a Westinghouse engineer who experimented in his garage with his own radio station, 8XK, which was licensed by the U.S. Commerce Department as an "amateur" station. He made the first commercial broadcast in 1920. That same year, at Conrad's urging, Westinghouse built a 100-watt transmitter that Conrad designed and tested. Just in time for the 1920 presidential election results, the U.S. Department of Commerce licensed commercial station KDKA.

The proposed National Museum of Broadcasting would include the garage that once belonged to Conrad. The presentation will cover the history of the garage, the involvement of the Pittsburgh Antique Radio Society and the National Museum of Broadcasting, and plans for the future.

Directions:

The Center is easily accessed right at Exit 10A of the Parkway East in Churchill Borough. The cafeteria in Building 401 is open from 11:30 a.m. to 1:00 p.m. and provides a convenient place to buy lunch before the meeting. The guard at the gate can direct you to the meeting location and parking.

- **Life Safety in Industry**

Date: Tuesday, October 25, 2005
Speaker: Barry Brusso, IEEE Fellow, IEEE Distinguished Lecturer
Place: Westinghouse Energy Center, Monroeville
Time: Social: 6:30PM Program: 7:00PM
RSVP: Chuck Urso at cvurso@ieee.org or (412) 338-4871

Industrial life safety systems are not limited to security and fire protection only, they include hazardous area, environmental and chemical protection, and emergency evacuation systems. This presentation will provide insight into these systems and explain the technologies and human factors fundamentals one needs to know in order to design and apply them in industry to meet life safety objectives. This discussion will be of interest to a wide variety of members and non-members alike.

• **GOLD is Rejuvenated**

The Pittsburgh Section's GOLD (Graduates Of the Last Decade) Committee has a new chair, Andrew Rydholm. Andrew is new to our Section but experienced in IEEE. He recently moved here from Ottawa Canada. He received his BS EE degree from Carleton University. He now works for Ansoft in Pittsburgh as a QA Engineer. He also worked at Ellistar, a start-up specializing in radar based sensor systems for the automotive industry. His real thrills in life include sailing, billiards and various other sports. Andrew has much talent to share and has assisted at several Section functions.

If you are an IEEE Member who received your first professional degree within the last ten years, you are automatically part of IEEE GOLD! Get the most out of your developing career and find your place in the world of technology through IEEE GOLD. Connect with colleagues and share experiences through local GOLD activities.

The Pittsburgh Section's GOLD events are planned for new engineers but are open to all members. Watch future Bulletins. Andrew is planning an October Socializer. If you would like to know more about GOLD and better yet if you want to assist Andrew, call him at (412)261-3200x281 or email him at andrew_rydholm@yahoo.com.

• **Access Job Openings through IEEE Pittsburgh's Web Site**

Sometimes companies looking for electrical engineers notify the Pittsburgh Section of their current openings. We will now put a link to these companies' web sites on the Pittsburgh Section's web site. Our URL can be found on page 1.

• **SciTech Spectacular Begins September 30**

The SciTech Spectacular (formerly the SciTech Festival) returns to Pittsburgh September 30 through October 9 at the Carnegie Science Center and other venues in the area. It's a celebration of creativity and innovation, where you and future engineers can experience our region's science and technology accomplishments in a fun, dynamic atmosphere. Call (412) 237-3335 or visit www.SciTechSpec.org for more information. This event is not sponsored by IEEE, but it is likely to be of interest to our members and their families.

• **PACE Meeting Report**

The August 16 PACE meeting was limited to 20 attendees and we reached capacity. Mr. Matt Fenton, president of Oxford Solutions, gave a lively and valuable treatment to Technical Job Placement Strategies. He provided electrical engineering employment data for the nation and for the Pittsburgh region. Attendees were enlightened on the trend from the traditional to the vibrant consulting work environment. The meeting went a long way toward attaining the Section's goal of increasing the career services provided to our members.

If you are an IEEE member and wish to explore Oxford Solutions, please contact:

Scott Willard, Technical Recruiter, swillard@oxfordsolutionsinc.com

Jeff Petrunak, IT Recruiter, jpetrunak@oxfordsolutionsinc.com

Our thanks go to IEEE member Chuck Jewart and the University of Pittsburgh for providing the meeting location.

2005 Calendar Meeting of Pittsburgh Section of IEEE

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exec.Comm.	20 Point Park Univ.	17 UPitt Oakland	17 CMU	21 UPitt Greensburg	26 Papa J's	16 UPitt Oakland	No meeting	18 D'Imperio's	10 Settlers Cabin			
Section		19 Robot Car Race		28 History Dinner					10 Picnic			
Life Member	Westinghouse Museum tour & Nuclear Pgm					23 Distributed Generation		18 Siemens Fuel Cells		20 Comm. Radio Birthplace		
Communication			25 New Tech. for Tele. Mon.									
Computer			16 Nxt Gen Search Eng									
EMB												
PES/IAS	26 Adaptive Identification	23 Rail Guns	30 Project Management	28 Electric Transmission: End of an Era	31 Wind Farm Tour	20 Robot Servicing of Hubble 29 Shielding Theory	27 Electric Vehicles and the Land Speed Record	26 Pirates game	28 Nuclear Control Room simulators	25 Life Safety in Industry		
Magnetics			31 Half Metal Spin Torque	29 Magnetic Recording					29 Dyna in micro & nano			
Robotics					5 Miniature Micro/Nano Robotics	20 Robot Servicing of Hubble						
Signal Processing				20 Wireless Ntwk Des.					13 Bounds in MIMO			
Consultants Network				26 Contract Employment	24 Consult Acct reqmt.	28 Non-disc. Agreement	26 Net-working		27 TBD			
GOLD					21 1st mtg							
Prof Activities (PACE)								16 Job Placmnt Strat.				
Students Activities				15 GE Plant tour								

TBD = to be determined