



IEEE Pittsburgh Section Bulletin



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

Contributors: Tom Dionise, Bob Grimes, Joe Kalasky, Gerry Kumnik, Heung-No Lee, Ralph Sprang, Dave Vaglia, and Mao Zhi-Hong.

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 www.ewh.ieee.org/r2/pittsburgh has past issues of the bulletin and lots of other useful information.

• *From the Chair*

One of our goals for this year is to increase member participation in the section. Please consider becoming more involved in your section. Attend a meeting, serve on a committee, or propose a meeting topic. If you don't find the meetings interesting or relevant to your specialty, tell us what you would be more helpful to you. Our goal is to meet the needs of every member, and we can more effectively meet your needs if we know what would be helpful to you. Also, there are still a few chair positions available. If you are interested in serving as a committee, chapter, or society chair, please let us know.

The section is funded by a "rebate" from IEEE. This is the mechanism that IEEE uses to share a portion of your membership dues with the section. Increasing our member activity and number of meetings results in a larger rebate, which in turn allows us to do more for you, our members.

Have you considered becoming a senior member? The annual dues are the same as a regular member, but there are several benefits to you and the section, including a larger rebate for the section, recognition of your accomplishments, a nice award plaque, and a free chapter certificate. The process is simple, but references are required for the application. If you are having trouble getting the references, let us know, and we can connect you with other members who can provide these references.

The Pittsburgh Section is part of IEEE-USA, the IEEE organization within the United States. IEEE-USA is part of IEEE, the worldwide organization. The process of identifying candidates for President-elect for IEEE has begun, and the international nominating committee is selecting candidates to run for that position. Candidates can also petition to run for office.

While the Pittsburgh Section by policy does not endorse candidates for IEEE office, we do encourage members to sign the petitions for candidates to appear on the ballot. By signing these petitions, you help ensure a choice of candidates on the ballot.

Presently we are aware of only one petition candidate, Dr. Ralph Wyndrum, the 2006 President of IEEE-USA. Dr. Wyndrum was very helpful to our section during his term and has strongly supported our Vision 20/10 initiative. Please see the article in this newsletter for information on how to sign his petition to appear on the ballot.

Feel free to contact me with any questions or concerns. Email is the best way to contact me, rsprang@ieee.org

Ralph Sprang

Section

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Communications Society

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Computer Society – Chair: John Twigg (see above)

Engineering In Medicine & Biology Society
Co-Chair: Bob Brooks

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Co-Chair: Dr. Zhi-Hong Mao
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Electromagnetic Compatibility Society

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

Power Engineering & Industry Applications Societies

Chair: Andrew Novotny (see above)

Magnetics Society – Chair: Dr. Ganping Ju
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Robotics Society – Chair: Dr. Guy Nicoletti
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Signal Processing Society – Chair: Dr. Heung-No Lee
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Committees

Consultants Network

Professional/Career Activities (PACE)

Chair: Joe Kalasky, P.E.
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Student Activities – Chair:

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Publicity – Chair: Thomas Dionise, P.E.
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Dr. Kalyan Sen (Kal) senkk@ieee.org (724) 696-1611

2008 PES General Meeting General Chair
Dave Vaglia (see above)

• *Magnetoencephalography*
A Window Into the Functioning of the Human Brain

Speaker: Robert J. Scwabassi, Laboratory for Computational Neuroscience, Departments of Neurological Surgery, Electrical and Biomedical Engineering, University of Pittsburgh

Date: Wednesday, January 31, 2007

Time: 11:45 AM Refreshments
Noon Fessenden Lecture and Graduate Seminar by Dr. Scwabassi

Place: 424 Benedum Hall, University of Pittsburgh, Oakland Campus

Sponsor: Signal Processing Society Chapter and University of Pittsburgh ECE Department. All IEEE members are welcome. This presentation may be of particular interest to members of the Engineering in Medicine and Biology Society and the Communications Society.

RSVP: Not required

The ECE Department of the University of Pittsburgh is presenting the Fessenden Lecture Series in Spring 2007 to commemorate the pioneering contributions of Reginald A. Fessenden, the first Chairman of the Electrical Engineering Department of the University of Pittsburgh, to the birth of radio. In addition to his 500 inventions, Fessenden made the first AM radio voice transmission in December 1906.

Abstract: The ion flow associated with synaptic activity of groups of neurons within the human brain produces small magnetic fields (on the order of 10^{-14} Tesla) which may be observed outside the human head using technology based on superconducting quantum interference devices. This talk will discuss a system we have recently acquired (Neuromag[®], Elekta, Inc) which is capable of non-invasively recording these magnetic fields. Our system contains 306 superconducting sensors mounted within a low temperature dewar, allowing 306 separate recordings of neuronal activity to be made. The spatial distributions of the magnetic fields may then be analyzed to localize the sources of activity within the brain. The most frequently used computational model is that of a current dipole. The computed locations of the sources are then superimposed on anatomical images, such as CTs or MRIs to provide information about the relationship between structure and function in the human brain. We are investigating the use of this system to 1) enhance pre-surgical planning by non-invasively localizing eloquent areas within the brain; 2) enhance localization of seizure foci by mapping sources of spiking activity; 3) assess distributions of brain activity related to cognitive function. Other research which will be summarized includes computational approaches to extending the source localization problem to deep brain sources and the development of source enhancement techniques which will increase the sensitivity of the device even further.

About the author: Robert J. Scwabassi received the BSE degree from Loyola University of Los Angeles, MS, Engr, and PhD degrees in electrical engineering from the University of Southern California, and the MD degree from the University of Pittsburgh. He has done postgraduate work at the Brain Research Institute and the Neuropsychiatric Institute of the University of California, Los Angeles. Dr Scwabassi is currently a Professor of Neurological Surgery, Psychiatry, Neuroscience, Electrical Engineering, Mechanical Engineering, and Biomedical Engineering. Dr. Scwabassi has published over 500 papers, chapters and conference proceedings. Dr. Scwabassi is also a Registered Professional Engineer.

- ***Lessons from Wearable Computing and Beyond***

Speaker: Dr. Daniel P. Siewiorek, Director, CMU Human-Computer Interaction Institute
Date: Thursday, February 8, 2007
Time: Noon: Lunch See below for details.
1:00 PM: Presentation
Place: George Westinghouse Technical Center, Building 801, Room 2C14
Directions to the Technical Center are below. Room 2C14 is the same room where the Life Member Chapter has met in the past. It is located off the second corridor halfway between the lobby and the cafeteria.
Sponsor: IEEE Life Member Chapter. All IEEE members and their guests are welcome.
Questions: Contact Bob Grimes, Life Member Chair at r.d.grimes@ieee.org

Abstract: The confluence of decades of computer science and computer engineering research in multi-modal interaction such as speech and gesture recognition; machine learning such as classification and feature extraction; software such as web browsers and distributed agents; electronics such as energy efficient microprocessors and head mounted displays; and design methodology in user-centered design and rapid prototyping have enabled a new class of computers - wearable computers. We will review over 15 years of experience in developing and deploying wearable computers in domains as diverse as manufacturing, maintenance, operations, and medical monitoring leading to lessons that are not taught in the classroom. These experiences are summarized in categories for easier recall: User, Corporal, Attention, Manipulation, and Power (UCAMP). We will conclude with a projection of future directions in human-based mobile computers.



About the speaker: Dr. Siewiorek is the Buhl Professor, Electrical and Computer Engineering & Computer Science at Carnegie Mellon University. Dr. Siewiorek's contributions have shaped the evolution of computer systems throughout the last four decades, including microprocessors, reliable and fault-tolerant computer systems, wearable computers and context-aware computing. Most recently he was awarded the SIGMOBILE's 2006 Outstanding Achievement Award at MobiSys 2006 in Uppsala, Sweden.

The mission of the Human-Computer Interaction Institute is to create effective, usable, enjoyable experiences with technology through interdisciplinary research in engineering, design, computer science, and the behavioral and social sciences, and to understand the impact of technology on individuals, groups, and organizations.

Directions: The George Westinghouse Technical Center is easily accessed at Exit 10A of the Parkway East (Interstate 376) in Churchill Borough. The guard at the gate can direct you to the meeting room, cafeteria and parking.

Lunch: Arrangements for lunch between 12 and 1PM have been made with the Technical Center's Cafeteria. Please make your selection and tell the cashier that you are with the IEEE Life Member Group that is paying for the lunch. You may eat in the cafeteria or take a carry-out lunch back to the meeting room.

- ***Engineers Week 2007 - Robot Car Race***

The Computer Society Chapter of the IEEE Pittsburgh Section is sponsoring the IndEEE 500 cm Robot Car Race at the Carnegie Science Center (CSC) on **Saturday, February 17** as part of the Engineers Week activities. Eighth grade students from local schools use Lego Mindstorm kits and Labview software to build and program their cars. The cars must be programmed to follow an S-shaped curved track to the finish line. The students receive t-shirts, drinks and prizes for their participation. Volunteers are needed to help the students work through construction and programming of their car. Volunteers will be trained on the car the day of the race. Construction begins at 12:00 noon and the race is over by 4:30 PM. You may volunteer for all or part of that time. Laptop computers are needed for programming the module. If you are able to help out, please contact Gerry Kumnik at (412) 487-1430 or g.kumnik@computer.org.

- ***Engineers Week 2007 - Call for Volunteers***

Once again the IEEE will have a demonstration table for Engineers Week at the Carnegie Science Center (CSC) on **Saturday, February 17**. Volunteers are needed to take a turn at the table for about 1 hour each. If you are interested, please reply with the time slot you would like by February 11. The first 1-hour slot begins at 10 AM and the last begins at 4 PM. There will be over 60 such tables sponsored by engineering societies and companies. The CSC expects more than 600 engineers and several thousand children and adults to attend. The volunteers get an E-Week T-shirt, free admission, free parking, and \$2 off coupon for family members.

In general, the idea is to get the children involved. The IEEE table will be setup about 8 AM including some signage and pamphlets on careers in electrical engineering. We will demonstrate some simple electrical circuits: hands-on items for the children. Do you have other ideas? Something you would like to demonstrate? Please bring it with you.

A Volunteer Orientation will be held on Wednesday, February 7, 2007 at 5 PM at the Carnegie Science Center in the 3rd Floor Overlook. The orientation is helpful but not required. Pizza and soft drinks will be provided. *To volunteer to help with the IEEE table for 2007 Engineers Week, just email tom.dionise@ieee.org, and you will be given more details and be included in future mailings.*

For a \$2 off coupon for admission to the Carnegie Science Center during National Engineers Week, February 16 & 17, contact Jace Cochrane at jacejc@pghmail.com. You will be emailed a pdf file of the coupon.

- ***Society on Social Implications of Technology***

The Pittsburgh Section is trying to form a local chapter of the IEEE's Society on Social Implications of Technology. The scope of the society includes such issues as environmental, health and safety implications of technology; engineering ethics and professional responsibility; history of electro-technology; technical expertise and public policy; and social issues related to energy, information technology and telecommunications. We are in the process of filing a petition with IEEE HQ to establish the local Chapter of SSIT. If you are an SSIT member and have not signed the petition, contact Joe Kalasky at (724) 838-6492 or j.kalasky@ieee.org. If you would like to join SSIT, type the link www.ieeessit.org and join on-line. You are then immediately able to sign our petition. Joe Kalasky has volunteered to be the first SSIT Chapter Chair.

- ***Clustering and Classification via Lossy Data Compression***

Speaker: Professor Yi Ma, Electrical & Computer Engineering Department, University of Illinois at Urbana-Champaign
Date: Wednesday, February 28, 2007
Time: 12:00 Noon - 1:00 PM
Place: Room 424, Benedum Hall, 3700 O'Hara Street
University of Pittsburgh, Oakland Campus
Sponsor: Engineering in Medicine and Biology Society-Pittsburgh Chapter
All IEEE members and their guests are welcome.

Abstract: For many problems in computer vision, image processing, and pattern recognition, we need to process and analyze massive amounts of high-dimensional mixed data such as images and gene expression data. By “mixed data,” we mean that the given data set consists of multiple heterogeneous subsets (which have different geometric or statistical characteristics), but each subset can be more easily modeled or represented than the whole data set together.

In this talk, we address two fundamental questions: “How to *cluster* and *classify* such high-dimensional mixed data?” We contend that both the (unsupervised) clustering and (supervised) classification problems can be cast as a lossy data compression problem and solved efficiently within a unified mathematical framework. In theory, this approach offers some distinguished advantages over conventional methods for clustering and classification, especially in dealing with several difficult issues that often arise in practice: regularization of degenerate distributions, selection of models with different complexities, and rejection of outliers.

Our work establishes a strong connection between information theory, especially the rate-distortion theory, with data clustering and classification, and it leads to extremely simple but effective algorithms. We will demonstrate the success of these algorithms in a few biomedical applications including, but not limited to, natural image segmentation and microarray data clustering.

About the speaker: Yi Ma is an associate professor in the Electrical & Computer Engineering Department of the University of Illinois at Urbana-Champaign. His research interests include computer vision and systems theory. Yi Ma received two Bachelors degrees in Automation and Applied Mathematics from Tsinghua University (Beijing, China) in 1995, a Master of Science degree in EECS in 1997, a Master of Arts degree in Mathematics in 2000, and a PhD degree in EECS in 2000, all from the University of California at Berkeley. Yi Ma received the David Marr Best Paper Prize at the International Conference on Computer Vision 1999 and the Longuet-Higgins Best Paper Prize at the European Conference on Computer Vision 2004. He also received the CAREER Award from the National Science Foundation in 2004 and the Young Investigator Award from the Office of Naval Research in 2005. He is an associate editor of *IEEE Transactions on Pattern Analysis and Machine Intelligence*.

- ***Edit the Bulletin***

The current editor of the IEEE Pittsburgh Section bulletin will retire after the June 2007 issue. A new volunteer (or volunteers) is needed. If you are interested, please contact Ralph Sprang, Section Chair, or Jace Cochrane, Bulletin Editor, to learn more about this opportunity.

- ***Assistance Requested: History of Standards in AIEE/IRE/IEEE***

Last year the then current chair of the IEEE-Standards Association, Don Heirman, asked if I would undertake the task of the preparation of the history of standards related to IEEE. My initial goal is to prepare a chronological listing of key historical events pertaining to AIEE/IRE/IEEE standards. What is known is that AIEE was founded in 1884 and a standing committee on standards was established June 1891. The first action on a standard was the introduction of the name Henry for a practical unit for induction. The IRE was founded in 1912 and its first standards committee was started the same year to prepare reports dealing with definitions of terms, letter and graphical symbols, and methods of testing and rating equipment.

To capture the history on standards, since there are few records, will require the assistance of many IEEE members. It has occurred to me that Pittsburgh, which was one of the leaders in the electrical and electronics industry for many years, must have retired engineers who have participated either directly or indirectly in the development of standards. Many may have memories of an important standards development or events that related to standards development that they could share. Thus, I am seeking any information that the Pittsburgh IEEE members may have or may remember. Actual records of such events would be a great help, if they exist. I would like to think of this as a pilot project that, if successful, could be undertaken by other Life Member Chapters.

My email address is: joseph_l_koepfinger@msn.com . The telephone number is 412 264 6148. I look forward to hearing from you.

*Joe Koepfinger, Member Emeritus
IEEE-SA Standards Board*

- ***Request for Your Support of Ralph W. Wyndrum, Jr.***

Members of IEEE Pittsburgh:

Last summer we were fortunate to have Ralph Wyndrum Jr, then President of IEEE-USA visit us in Pittsburgh to help move our Vision 20/10 program forward. Ralph spent two days with us visiting supporting companies and organizations. He ended his visit with a speech on the competitiveness of our US engineering workforce.

Ralph now has requested our support. Specifically, Ralph wants to run as a petition candidate for IEEE 2008 President-Elect. To do this, he needs 3000 signatures on his petition for his name to be placed on the ballot. Members, Senior and Life Members, and Fellows are eligible to sign the petition, as well as the newly designated class of Graduate Student Members.

You can sign the petition electronically by logging into www.ieee.org/petition. That will take you directly to the web authentication page. You will need your member number and pin, OR your IEEE user name and password (IEEE web account information).

Ralph's qualifications include being the 2006 President of IEEE-USA; 2004 VP of TAB; and earlier, Publications VP; CPMT Society President; and a member of the CPMT and Communications Society Boards. In those positions, he worked closely with the Educational Activities Board, the Regional Activities Board, and Regions 7 and 8 supporting the expansion of member services, professional mid-career education, and K-12 programs in Science, Technology and Mathematics. For more information on what Ralph has been doing, log onto his personal website at www.wyndrum.com/election .

Signing the petition does not mean that you have to vote for him during the general election. It is just to get his name on the ballot. Thank you for your consideration.

Dave Vaglia, Immediate Past Chair



- ***Wanted: A Few Good Men and Women***

The international Power Engineering Society of IEEE will meet in Pittsburgh in 2008 from July 20 – 24. The meeting is expected to have more than 1500 attendees and will include technical paper presentations, committee and working group meetings, local tours, awards, and more. **We are now forming the core working group of volunteers to plan and coordinate the conference. We need Pittsburgh member support for many of the local activities.**

The Technical Chair for the conference is Dr. Kalyan (Kal) Sen, senkk@ieee.org (724) 696-1611. The General Chair is David J. Vaglia, P.E., davevaglia@ieee.org (412) 374-6513. Please contact either of us and let us know that you are interested in helping out!

- ***Advertise in the IEEE Pittsburgh Bulletin***

Reach over 2500 members of the IEEE Pittsburgh Section every month. The bulletin is issued on or about the 1st of every month. Final advertising copy must be submitted in an electronic form compatible with Word. The ad and payment must reach the newsletter editor by the 20th of the preceding month to be included in a particular bulletin. Prices shown are for one month.

<u>Ad size</u>	<u>Business</u>	<u>University</u>	<u>IEEE Member</u>
Full page (8-1/2 x 11)	\$250	\$190	\$190
½ page	\$130	\$100	\$100
1/3 page	\$85	\$65	\$65
¼ page	\$65	\$50	\$50
Business card size	\$40	\$30	\$20

• **Keep Receiving the IEEE Pittsburgh Section Bulletin**

Sometimes members of the IEEE Pittsburgh Section report that they are not receiving their Bulletin announcement/link via email each month. Here are some troubleshooting tips.

- Is your IEEE membership still current? **Members who have not renewed for 2007 will not receive the March Bulletin announcement/link.**
- Does IEEE headquarters list you in the Pittsburgh Section or another section? If you aren't in the Pittsburgh Section, you will not receive the Bulletin.
- Does IEEE headquarters have your current email address? Did you change your email address recently?

To check on or correct problems in any of these areas, call IEEE headquarters at 1-800-678-4333. Try to have your IEEE member number handy when you call.

- Is your spam blocker blocking the Bulletin announcement/link? You'll have to fix this yourself.

2007 Calendar – Meetings of IEEE Pittsburgh Section

	Jan	Feb	Mar	Apr	May	June	July
Executive Committee	18 - 7pm Panera Beard Oakland	15					
Section		17 Engineers Week table					
Communications							
Computer		17 Robot car race					
EMBS		28 Data Compression					
EMCS			Date TBD Seminar by Joffe & Oliver				
PES/IAS	3, 10, 17, 24, 31 PE Prep class 30 AdCom	7, 14, 21, 28 PE Prep class	5, 7, 14, 21, 28 PE Prep class	4, 11, 18 PE Prep class			
Magnetics	17 Imaging Mag Surface						
Robotics							
Signal Processing	31 Magneto- encephalogra phy						
Upper Mon							
Consultants Network							
Life Member		8 Wearable Computing					
GOLD							
PACE							
Student Activities							