



**From  
the  
Chair**

Three officers from the Executive Committee were able to participate in the Washington Fly-In event that was organized by the IEEE-USA during March 8<sup>th</sup> and 9<sup>th</sup>. We presented our concerns in regards to job outsourcing to the aides of U.S. Senator Arlene Specter, and also to the aides of Representatives Tim Murphy, and Melissa Hart.

The monthly Executive Committee meeting was held at Carnegie Mellon University. Members of the CMU Student Chapter were present and actively participated in the meeting. Dr. Savvides from CMU gave a technical talk on Pattern Recognition for Biometrics (which is face, fingerprint and iris recognition) including a live demonstration of face recognition.

Most of the eight Chapters in our Section have planned for activities during the current year. The Engineering in Medicine and Biology Chapter is dormant for the last two years. We certainly do not want to lose this Chapter. We solicit your help and participation in this very important Chapter where your contribution will be truly appreciated. Please contact me at (724) 696-1611 or [senkk@ieee.org](mailto:senkk@ieee.org) if you are interested.

- Kal Sen

**IEEE Pittsburgh Section  
Annual History and Awards Dinner  
End of an Era: A History of Transmission  
John A. Casazza, IEEE Life Fellow  
IEEE Distinguished Lecturer**

The National Academy of Science has called our national electric power system the “greatest technical achievement of the 20<sup>th</sup> century!” The key to this system is its transmission grid. This presentation will cover its history – the role of people, institutions, and technology – and is based on the speaker’s personal experience.

Success of the transmission system in the past included the development of new and improved equipment, the connection to an integrated system, the coordination between companies, and the encouraging political developments. This presentation also covers how the coordination of technical and institutional procedures was achieved through creation of new professional, business, and governmental organizations.

Past successes were based on transferring knowledge between generations of engineers and competition in developing new equipment. Our present grid has been greatly harmed by the failure to continue the transfer of such knowledge over the past 25 years leading to a turbulent period of poor government policy, blackouts, and huge cost increases. The presentation concludes with the speaker’s own views as well as the review of some of the technical and political solutions that are being proposed to solve the current problems.

Mr. Casazza is the President of the American Education Institute, a nonprofit organization that he founded in 1994, which is dedicated to provide the education needed in setting electric power policy. He is a past Director for the Georgia Systems Operation Company, has been a member of the Executive Committee of the New York State Electric Reliability Council and the Energy Engineering Board of the National Research Council. He is a past President of CSA Energy Consultants and Vice President for Planning and Research for the Public Service E&G Co. Recently, he helped to form Power Engineers Supporting Truth dedicated to improving the technical competence of government officials and the leadership role of engineers ([www.PEST-03.org](http://www.PEST-03.org)).

Place:	Westinghouse Museum (APICS Castle) 235 Commerce St, Wilmerding PA 15148
Date:	April 28 <sup>th</sup>
Social & Dinner:	5:30 PM (\$20 per person, \$35 per couple)
Awards:	6:40 PM
Program:	7:00 PM

The program that is scheduled for the evening will be of particular interest to members of the Power Engineering Society and Industry Application Society.

Please RSVP by April 21<sup>st</sup> by sending a check payable to “IEEE Pittsburgh Section” to Dr. Tom McDermott, 72 Dutch Lane, Pittsburgh, PA 15236. There is no charge to attend the awards and presentation only, but still RSVP. For more information, contact Tom at (412) 650-8491 or [t.mcdermott@ieee.org](mailto:t.mcdermott@ieee.org).

**Buffet Dinner Menu**  
*Chicken, Fish, Beef*  
*Potato*  
*Salad*  
*Vegetable*  
*Fruit*  
*Rolls & Butter*  
*Dessert*  
*Coffee & Tea*



## Modern Wireless Network Design Based on Constrained Capacity

Matthew Valenti  
West Virginia University

In 1948, Claude Shannon introduced the concept of channel capacity, which quantifies the possible tradeoffs between energy, noise, bandwidth, and data transmission rate. While Shannon's work showed what was possible, it left how to get there as an open problem. Since then, mathematicians and engineers have been hard at work developing error control codes that approach Shannon's capacity. A breakthrough occurred in 1993 with the development of turbo codes, which come within a fraction of a decibel from capacity. Since then, variations on the turbo theme, including Low Density Parity Check (LDPC) codes, have closed the gap to capacity even further and it is now safe to say that Shannon's open question of how to achieve capacity has been answered.

The availability of capacity approaching codes has major implications on how modern wireless transmission systems should be designed. It now makes sense to directly use channel capacity to design and analyze modulation schemes and networking protocols, knowing that afterwards you can always pick an "off-the-shelf" capacity approaching code. This talk will present a tutorial on how to compute the capacity of any modulation format by using Monte Carlo integration. The focus is on non-binary modulation, and space-time block coding is presented within this framework as a type of multi-antenna modulation. As most off-the-shelf codes are binary, the capacity of M-ary modulation when using a binary code is discussed, and ways to improve performance by iteratively passing information between demodulator and decoder will be explored. The performance of hybrid-ARQ error control schemes, which involve the retransmission of incorrect packets, will be discussed within this framework. Finally, the design of multi-terminal wireless networks will be discussed by generalizing results for the two-terminal case.

Mr. Valenti is currently an Assistant Professor in the Lane Department of Computer Science and Electrical Engineering at West Virginia University. He received a BSEE from Virginia Tech, an MSEE from Johns Hopkins University, and a Ph.D. in Electrical Engineering from Virginia Tech. Currently, he serves as an Associate Editor for IEEE Transactions on Vehicular Technology, and works on several international conference committees.

Place: Benedum Hall, Room 424  
University of Pittsburgh  
Date: April 20<sup>th</sup>  
Program: 12:00 Noon

If you have any questions, or would like more information, please contact Mike McCloud at (412) 624-9674 or [mccloud@ieee.org](mailto:mccloud@ieee.org).

### Life Member Chapter Issues Associated with the Interconnection of Distributed Generation to the Electric Power Supply System

Mr. Joseph L. Koepfing

### Meeting Postponed

The Life Member Chapter meeting scheduled for April 8<sup>th</sup> has been postponed until May. A date for this meeting will be announced in the May Bulletin. This postponement is due to health problems that the speaker has encountered on a trip he took in late March.

Please look for updated information in the May Bulletin, and we wish Mr. Koepfing a full and speedy recovery.



### Graduates of the Last Decade

IEEE GOLD is starting up here in Pittsburgh. Graduates Of the Last Decade (GOLD) is for new professionals and aims to help with networking and social events for our members. If you have graduated within the last decade then you are already a member. We will be hosting an initial startup event some Saturday afternoon in May at Dave and Buster's in order to gauge what you want from GOLD.

If you have any questions or would like to suggest functions that you would like to participate in, please feel free to contact Chuck Jewart at (412) 913-0063 or [cjewart@engr.pitt.edu](mailto:cjewart@engr.pitt.edu).

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## Wind Farm Site Tour



With wind farms sprouting up in Western PA like the daffodils in spring, this will be an opportunity for you to learn more about them. FPL Energy (a sister company of Florida Power and Light) owns and operates the wind farms here in western PA, and will host the tour. More information regarding wind farms can be found on the Miami Herald web-site article :

<http://www.miami.com/mld/miamiherald/business/11154022.htm>

The exact date in May for the tour is yet to be determined by FPL Energy. It will probably be late afternoon during a weekday, and last about 1.5 hours. Drive time from downtown will be about 1.5 hours. As this will be a site visit, there will not be a technical presentation. If there is enough interest, we may do that later in the year. Also, the tour leader will not be a technical person, but she is willing to get answers to technical questions if they are submitted in advance.

FPL Energy suggests a group size of about 20 people. If you have any questions about the details of the tour, would like to reserve a spot on the tour, or would like to submit a technical question to be answered, please contact Dave Vaglia at (412) 491-6944 or [davevaglia@ieee.org](mailto:davevaglia@ieee.org).

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### Consultants Network

### Everything You Always Wanted to Know About Contract Employment

Ron Kubitz, TSC  
Peak Technical Services

Contract employment from A-Z will be covered in this seminar. Topics will include: how to better market yourself, choosing a contract agency, negotiating a rate, and what to expect in a contract position. Advantages and disadvantages of this type of a relationship will also be explored.

Mr. Kubitz is the President of Niche Operations of PEAK Technical Services, Inc. PEAK Technical Services provides engineers, designers and drafters for projects across the United States. The PEAK website states, "Our only business is getting the right people to the right places, at the right time."

Place:	Westinghouse Energy Center Monroeville
Date:	April 26 <sup>th</sup>
Social:	6:30 PM
Program:	7:00 PM

The Pittsburgh Section IEEE Consultants Network is a valuable resource for consulting information and networking with IEEE members. If you have any questions, or would like to register for the seminar, please contact George Crawford at (412) 675-9164 or [gwc2@psu.edu](mailto:gwc2@psu.edu) by April 19<sup>th</sup>.

Directions: From downtown Pittsburgh, take the Parkway East Outbound to Exit 14A (Monroeville). Cross the traffic light (Business 22) and proceed on Rt. 48 South for two traffic lights. Turn left onto Northern Pike. Proceed East ~ 0.2 miles and turn right at the first traffic light onto Westinghouse Drive. Travel 0.7 mile to the three flags where the main entrance is located. Parking in the evening will be plentiful in the large area in front of the building. Enter the main entrance. Check with the security inside. You will be directed to the proper auditorium for the presentation.

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

## 2004-2005 Pittsburgh Section IEEE Program Calendar

Group/Society	October	November	December	January	February	March	April	May	June
ExecCom Kalyan Sen (724) 696-1611	25 WVU	18 Point Park	16 Point Park	20 Point Park Officer Elections	17 Pitt - Oakland	17 CMU	21 Pitt - Greensburg	19 Restaurant in Pittsburgh	ExecCom does not meet in summer
Section Mtngs Kalyan Sen (724) 696-1611					19 Robot Car Race		28 History Dinner		
Life Members Bob Grimes							8 Distributed Generation <i>POSTPONED</i>	TBD Distributed Generation	
IAS & PES Charles Urso (412) 338-4871 Faruq Ahmed (724) 477-1253	6 Power Electronics 28 Tutorial	4 Tutorial 11 Industrial Power Systems 17 Tour Alleg. Eng.	2 Dist. Generation 9 Voltage Sag	26 Adaptive Identification	23 Rail Guns	30 Project Management		TBD - Wind Farm Tour	
Computer John Twigg (724) 387-2772		6-12 SC2004 Conference	15 Software Quality			16 Next Gen. Search Engines			
Communication Prashant Krishnamurthy (412) 624-5144		12 RFID Privacy				25 New Techniques for Telecom Monitoring			
Robotics Guy Nicoletti (724) 836-9922 Ron Stone (412) 488-1100	26 Image Processing		9 Patient Recovery						
Prof. Activities Joe Kalasky (724) 838-6492	2 Consulting Seminar								
Signal Processing Mike McCloud (412) 624-9674	26 Image Processing	3 Tracing Traitors 18 Double- Disp. Channels					20 Wireless Network Design Based on Constrained Capacity		
Magnetics Ganping Ju (412) 918-7046						31 Half Metals Spin Torque and Nanorings			
Constants Network George Crawford (412) 675-9164							26 Contract Employment		