



## Harry's Happenings

I attended the IEEE Region 2 meeting (Pittsburgh section is a member of Region 2), and I was certainly impressed with how smoothly and well organized the meetings were done. Region 2 consists of 10 sections and has 36,113 members. The Region reports to the RAB (Regional Activity Board), which reports to the Board of Directors. The Board of Directors reports to the members!

One obligation the Pittsburgh section has is to grow and support the section members. It is with this in mind that the section supported joint IAS/PES chapter meetings with Kal Sen as the PES chapter chair. Some members view this as an attempt to bypass the section bylaws and merge the two chapters together. For those that have thought this, I apologize. For those that feel the section has overstepped its' authority, I don't apologize. To explain, I offer the personal observation that the IEEE society often appears as a closed society with a culture steeped in a resistance to change. If it takes getting some people mad about the way the section is attempting to encourage participation, then I encourage YOU the membership to let us know what YOU want! Otherwise, my vision is to encourage members to speak out and tell us what programs that they are interested in attending. The April IAS/PES meeting that Kal is chairing is your chance to do just that. I'm willing to make changes in the section. I'm also willing to take chances, make mistakes and learn from my mistakes. Let me know what your thoughts are on this and other matters. -Harry Hagerty



## Recent Developments in Electric Power Transmission Technology

Dr. Kal Sen, Fellow Engineer,  
Curtiss-Wright Electro-Mechanical Corporation



With transmission lines becoming loaded to their capacity and new lines being hard to site and build, the ever-growing need for transporting more electricity can be met by installing new transmission lines or by using the existing ones in a more efficient way. The latter approach is to maximize the active power flow that generates revenue while minimizing the reactive power flow that only heats up the line and contributes nothing to the useful energy delivered.

Traditional solutions, such as the shunt compensator, the series compensator, and the phase-shifting transformer affect both the active and the reactive power flow in the transmission line simultaneously. With the use of a Unified Power Flow Controller (UPFC), which is based on Voltage-Sourced Converter (VSC) technology, the active and the reactive power flow in the line can be regulated independently. All VSC-based Flexible Alternating Current Transmission Systems (FACTS) controllers have two major drawbacks. These are their high installation and operating costs.

In order to address these two issues, a new concept in FACTS controller is proposed. The new concept is more reliable, more cost-effective, and based on proven technology of transformers and load tap changers. The Sen Transformer (ST) is a new family of power flow controlling transformers that provides the same independent active and reactive power flow control as the UPFC, but with a 5:1 reduction in equipment cost and 10:1 improvement in operational cost.

Place : Room N550, Boyce Campus, CCAC  
Date: April 10, 2003  
Dinner: 6:00 PM. No-charge Buffet.  
Program: 7:00 PM

From Pittsburgh, travel Parkway East (Rte. 376) - to Monroeville. Take Exit 14B, last exit on the Parkway East, to go toward Plum. Cross one traffic light (Old Wm Penn Highway). Make a right turn at the Stop Sign to be on Beatty Road. While on Beatty Road, turn left at second Stop Sign to be at the Boyce Campus. Enter school through Front Door.

If traveling the Turnpike, take Exit 6 (Monroeville). After the Toll Plaza, get in the left lane to get on Rte. "Business-22". At the first light, turn right. Cross the traffic light (Old Wm Penn Highway) and follow above directions.

This meeting will be of particular interest to members who belong to the PES and IAS societies. Reservations are required for the dinner. If you have questions or you would like to RSVP for dinner, please contact Kal Sen at (724) 696-1611 by April 7<sup>th</sup>.

## An FPGA Implementation of the Graph Encoder-Decoder for Low Density Parity Check Codes

Ms. Gavatri Mehta



Low density parity check (LDPC) codes have become an exciting topic of research in the field of communications. LDPC codes were discovered by Gallager in 1962 and tremendous efforts have been devoted by many researchers to analyze and provide efficient techniques to improve the performance of such codes. The aim of this project is to design a new code and the corresponding low complexity and efficient decoding algorithm. Advanced digital signal processing algorithms and system architectures which enable low complexity and fast decoding solutions are developed. A fully parallel decoder architecture is proposed to maximize the throughput and decoding speed of the system dramatically. The LDPC encoder-decoder is implemented on to a Xilinx Virtex-II chip.

Place : Room 503, IS Building, University of Pittsburgh  
Date: April 11, 2003  
Program: 3:00 - 4:00 PM

## 2002-2003 Pittsburgh Section IEEE Program Calendar

Group/Society	September	October	November	December	January	February	March	April	May
ExecCom Harry Hagerty (412) 492-0943	21 Boyce Park	17 WVU	21 Pitt Greensburg	18 Point Park	16 Point Park	20 Point Park	26 Univ. of Pitt	17 Point Park	15 Point Park
Section Mtgs Harry Hagerty (412) 492-0943	21 Annual Fall Picnic					15 IndEEE 500 Robot Car Race	20 Job Search Skills Workshop		1 History Dinner
Upper Mon Matt Valenti (304) 293-0405		17 COTS Visualization				24 Practical Perspectives Digital Comm.			
Industry Applications Harry Hagerty (412) 492-0943		12-17 37 <sup>th</sup> Annual IAS Meeting						10 Power Transmission Technology	
Magnetics Miklos Gyimesi (412) 268-2308	18 Adv. Magnetic Materials								
Computer Gerry Kumnik (412) 487-1430		17 COTS Visualization				15 IndEEE 500 Robot Car Race			
Communication Prashant Krishnamurthy (412) 624-5144			22 Precision Alignment using GPS					11 Low Density Parity Check Codes	
Power Eng. Kal Sen (724) 696-1611								10 Power Transmission Technology	
Robotics Guy Nicoletti (724) 836-9922			21 Virtual Surgery						
Signal Processing Pat Loughlin (412) 624-9685									
EMBS Bob Brooks <a href="mailto:rbrooks@medrad.com">rbrooks@medrad.com</a>									

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