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**THE
SUNCOAST
SIGNAL**

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

<http://www.ieee.org/fwcs>

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you value the IEEE*



**Robert M. Gray 2006 IEEE
Signal Processing Society
Distinguished Lecturer
SP/COM FWCS January Chapter Event**

Date : Friday, January 20, 2005
Time: To be announced
Speaker: Robert M. Gray
2006 IEEE Signal Processing Society Distinguished Lecturer
Lucent Technologies Professor of Engineering Stanford University
Vice Chair of the Department of Electrical Engineering
Location: University of South Florida
Room details to be announced.
Cost: Free (RSVP required)

Professor Gray's research interests include data compression, quantization, and statistical classification, information theory and rate-distortion theory, statistical clustering algorithms, image segmentation, retrieval, and content-addressable browsing, and statistical signal processing. For more information on Prof. Gray visit <http://www-ee.stanford.edu/~gray/>

More information will be announced on the FWCS website as it becomes available. A meeting reservation link will also be provided. <http://ewh.ieee.org/r3/floridawc/>.



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Nota Bene: The January ExComm meeting is on January 10, 2006.

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All material for THE SUNCOAST SIGNAL is due in electronic form by **1st Friday after the 1st Tuesday** of the month preceding the issue month.

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Announcement:

FWCS Officers for 2006

The FWCS Executive Committee decided that all present officers will remain in their current positions for 2006. These positions and officers follow.

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TREASURER: Ralph Painter

SIGNAL EDITOR: Dr. Paul Schnitzler

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BYLAWS: Richard Beatie, PE

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Over 100 Engineers Attend the 4th Annual Programmable Logic User's Group's PL-UG Fest



PL-UG Fest occurred on November 15 and was a full day of vendor and user presentations focused on hardware design using Complex Programmable Logic Devices (CPLD) and Field Programmable Gate Array (FPGA) technology. This was the 4th annual event organized by the Florida West Coast Computer Society, the Aerospace & Electronic Systems Society (AESS) and the Programmable Logic Users Group (PL-UG). Over 100 electronic design engineers attended, making this year's PL-UG Fest the largest to date with four concurrent tracts of presentations by engineers and vendors.

The event was free for the attendees. Breakfast was sponsored by Semtronic Associates, lunch was provided courtesy of Xilinx and snacks were sponsored by Marathon Sales. There were plenty of door prizes for the attendees from a 60GB IPOD to development kits. Xilinx provided the keynote lunch speech: "Triple Module Redundancy and Configuration Scrubbing in a High Reliability Environment".

"A Future Engineering Computing Facility with Linux" was presented by Paul Solorzano of Raytheon. Jack Killingsworth of Siliconexion presented "Board Level Simulation with Free Foundry Models", and Kent Ulrich of First Pass Design gave "An Introduction to Vital Models".

The vendor presentations included Actel's CoreMP7, a soft ARM7 family processor. Agilent Technologies gave a seminar on their new application, the FPGA dynamic probe. Avnet's Ben Harding hosted a 3 hour seminar "Developing with Embedded Linux on the Virtex-4 FX". Compunetics presented PCB design considerations for the FPGA product developer. Lattice presented non-volatile, reconfigurable FPGAs and presented the MICO8 FPGA microprocessor. Mentor Graphics presented "Developing and Managing FPGAs with HDL Designer" and "Complex FPGA Verification using the Questa Advanced Functional Verification Platform".



Nallatech presented managing a high-performance reconfigurable computing environment with multiple FPGAs. TSI-EDA presented a FPGA high speed design flow. Xilinx's three presentations included how to control signal integrity on circuit card assemblies with the Virtex4 family, an introduction of the Spartan 3E, and the development of DSP systems with Xilinx devices.

Exhibiting vendors included Agilent Technology, Avnet-Memec, Lattice Semiconductor, Marathon Sales/Altera, Satcon, Siliconexion, Nallatech, Compunetics, TSI-EDA and Xilinx.



PL-UG is a non-profit organization. The yearly PL-UG Fest is a service for the local electronic engineers to network with their peers and see the latest vendor tools and devices. PL-UG encourages quality design and verification methods and tools associated with programmable logic devices. Membership is free and in 2006, PL-UG will establish new chapters on Florida's east coast. To join PL-UG, go to www.pl-ug.org.

—Jim Lumia, AESS and Computer Society Chair



Editor's Column

Your editor will pass this month (I know how much this will pain you).

—PS



Fault Calculations and Selection of Protective Equipment

Date: Wednesday, March 22, 2006
Time: Registration & Breakfast: 8:00AM – 8:45AM
 Seminar: 9:00AM – 3:00PM
Speaker: Dr. Ralph E. Fehr III, Instructor – Power and Energy Systems, University of South Florida
Location: Seminole Electric, 16313 North Dale Mabry Hwy, Tampa, FL 33618
Cost: \$150 Members, \$225 Non-Members, \$100 Students Includes Breakfast, Lunch, & seminar text, “INDUSTRIAL POWER DISTRIBUTION” (a \$75 value)

RSVP: Online at:
<http://www.ewh.ieee.org/r3/floridawc/>
 (Select Reservations)

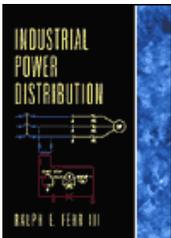
Make checks payable to: IEEE FWCS. Send checks to:
 Ralph Painter, IEEE FWCS Treasurer
 648 Timber Pond Drive
 Brandon, FL 33510-2937

Space limited to the first 50 registrants!!!

Questions: Tom Blair at 813-228-1111, ext 34407 or
thblair@tecoenergy.com

PDH Credits: 5 professional development hours will be awarded. Be sure to enter you name and PE number on the signup website as it appears on your license. Florida exempt provider #00015.

Seminar Text



Your local IEEE PES/IAS Chapter is offering this 5 hour seminar on Fault Calculations and Selection of Protective Equipment by Dr. Ralph E. Fehr III

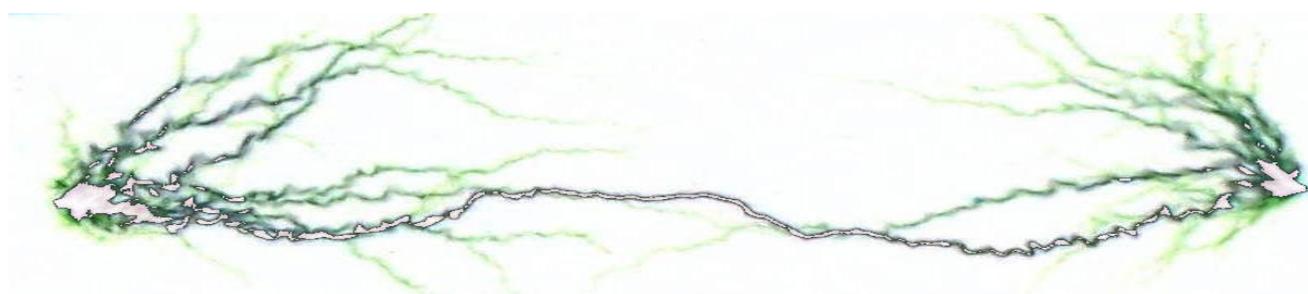
This training session will be devoted to the calculation of fault currents and the sizing of protective equipment such as circuit breakers and fuses. The method of symmetrical components will be used to analyze unbalanced fault conditions. The text for the training will be “Industrial Power Distribution” written by Dr. Fehr. A copy of the text is included in the training costs.

A \$75 Value

Dr. Ralph Fehr earned his B.S. degree in electrical engineering from the Pennsylvania State University in 1983, his M.E. degree in electrical engineering (power) from the University of Colorado at Boulder in 1987, and his doctorate in electrical engineering from the University of South Florida in 2005. He has worked in the generation engineering field designing power distribution and control systems for nuclear and fossil-fired power plants. Dr. Fehr also has worked for electric utilities for over 15 years in the operations, planning, and design areas, including transmission, distribution, and substation engineering.

Dr. Fehr has taught courses ranging from computer operating systems to mathematics to power system analysis for several institutions, including the University of New Mexico at Albuquerque, the Pennsylvania State University, the University of Colorado at Boulder, St. Petersburg [Florida] Junior College, and the University of South Florida at Tampa. He has also taught review courses for candidates for the professional engineer examination through the Florida Engineering Society for ten years.

Dr. Fehr is a Senior Member of IEEE and is a registered professional engineer in New Mexico and Florida. His biography is published in *Who's Who in Science and Engineering* and *Who's Who in American Education*.





Hurricane Wilma – The FPL Experience

- Date:** Wednesday, January 18, 2006
- Time:** 12 Noon (Lunch Included – Reservation Required)
- Speaker:** Mr. Wendell Payne, Manager, FPL System Operations
- Location:** Florida Reliability Coordinating Council (FRCC)
1408 N. Westshore Boulevard, Suite 1002
Tampa, Florida 33607-4512
- Cost:** \$10 Members, \$15 Non-Members, Student Members \$5
- RSVP:** Online at: <http://weiquality.com/fwcs-pes1/index.html>
Make checks payable to: IEEE FWCS
Send checks to: Ralph Painter, IEEE FWCS Treasurer
648 Timber Pond Drive, Brandon, FL 33510-2937
- Questions:** Jim Howard at 863-834-6506 or jim.howard@lakelandelectric.com

On October 23-24, 2005 Hurricane Wilma crossed south Florida as a Category 3 Hurricane leaving a path of destruction across the state. FPL, which serves both sides of Florida in the area Wilma crossed experienced major damage to their system. This included substation, transmission, and distribution damage. Mr. Payne will share with us the damage sustained, work required to restore, and general information about the work FPL had to do to get its Customers back in service.



IEEE Teacher In-Service Program

The FWCS is off to a good start with the IEEE Teacher in-Service Program (TISP). Earlier this year Sean Denny was asked to chair this worthwhile project to help teachers educate "the technological literacy of tomorrow's engineers." This successful program was founded right here in the Florida West Coast Section by Doug Gorham and Ralph Painter.

Recently, in Atlanta, Doug and Ralph provided a training program for IEEE members who will be working with local high school teachers. In addition to Sean, Jim Howard and Carlo Dionson took this seminar.

Since August, Sean has been networking to line up influential members of the Hillsborough and Pinellas County School Boards and as well as interested members in the IEEE FWCS. Among those involved so far are Felix McCauley, Bob Orlopp, Nancy Marsh, Jason Broughton, Bruce Furino, and Tom Blair.

Now we need your help! How about the members of GOLD and students at University of South Florida? Some important dates are coming up in the spring. Tom, Ralph, and Sean will be presenting a Motor Controller Lab to a Northeast High School Advanced Placement Physics Class in March. Jason Broughton asked for a couple of presentations for newly hired Science/Math teachers in Hillsborough County. Although the dates have yet to be announced, we need to know who we can count on. Mr. Broughton also plans to have a similar presentation in February in Hillsborough.

Engineers who are interested in working with this exciting new program should contact Sean Denny at venner20@aol.com. In addition, Sean will provide a FREE training opportunity to teachers wish to sharpen engineering skills; this is based on the IEEE TISP website: www.ieee.org/education/precollege/.

In addition, Bruce Furino, College of Engineering and Teachers and Computer Science University of Central Florida, is leading the Engineering Education Conference in Orlando, April 28, 2006 This one-day workshop will include a segment on TISP that Sean Denny will deliver.

—SD



What Is A UL Listing And What Does It Involve?



Date, etc: Please visit registration website for Date, Time and Location Information.

PDH Credits: 4 professional development hours will be awarded. Be sure to enter you name and PE number on the signup website as it appears on your license. Florida exempt provider #00015.

Cost: \$75 Members, \$125 Non-Members, \$15 Students—Includes Breakfast & Lunch

RSVP: Online at: <http://www.ewh.ieee.org/r3/floridawc/> (Select Reservations)

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Space limited to the first 50 registrants!!!

Questions: Tom Blair at 813-228-1111, ext 34407 or thblair@tecoenergy.com



Do you know the difference between the UL markings shown above? If not, you will benefit from this training. Each UL Mark has its own specific meaning and significance. The UL Mark on a product means that UL has tested and evaluated representative samples of that product and determined that they meet UL's requirements. Under a variety of their programs, products are periodically checked by UL at the manufacturing facility to make sure they continue to meet UL requirements. This seminar will cover what the requirements are for a product to be UL Listed.



SOUTHCON/2006

MARCH 7-9, 2006—ORLANDO, FL

Be sure to mark the **new dates** for Southcon/2006. Southcon will be moving to March 7-9, 2006.

The 2006 event will include:

- * 2 ½ days of exhibits and tutorials
- * Exhibitor Workshops on “applications oriented” topics presented on the exhibit floor.
- * A Blue Ribbon Panel will present a lively discussion on Off Shore Manufacturing and Out Sourcing.

For complete Conference information as well as an up to date listing of exhibitors please visit the Southcon website at www.southcon.org.

Register now at www.southcon.org

For questions concerning attending or exhibiting at Southcon/2006, please contact Sue Kingston at s.kingston@ieee.org or call (310) 937-1006.

Southcon is sponsored by the IEEE, Region 3, IEEE Florida Council and Florida/Sunshine Chapter of ERA

Is It True “The World Is Flat?”

***2006 IEEE-USA Annual Meeting
& Leadership Workshop***

3 -5 March 2006

Hyatt Regency St. Louis at Union Station One St. Louis
Union Station, St. Louis MO 63103

Details next month and at:

<http://www.ieeeusa.org/calendar/conferences/2006workshop>



Precollege Teacher Grant

In January 2006, IEEE-USA's Precollege Education Committee (PEC) is unveiling its Precollege Teacher Grant Program. These grants offer small amounts of funding (up to a maximum of \$1,500) to teachers and engineers who partner to introduce engineering to students. The teacher must work with an IEEE member to develop or implement a project or program. For more details, visit: <http://www.ieeeusa.org/volunteers/committees/pec/teacher-grants.html>

Brain Teaser Challenge Column –

By Butch Shadwell

December BTC Last time, after cousin Frida got her PhD, she took one of her new designs to a job interview. “She brought in an ionization smoke detector. This detector uses an Am241 radioactive source. Who can tell me the dominant mode of decay for this radioisotope?”

In most ionization smoke detectors there is a tiny amount of americium dioxide present within a bonding compound on a metal substrate. This is dangerous stuff, so don't experiment at home. Americium, element 95 on the periodic table, is an artificial element. Man-made within nuclear reactors, americium is not naturally found on earth (although huge amounts are created and thrown into interstellar space during supernovae).

Am241 decays with a half life of 432 years into another artificial element, neptunium, Np237. For each americium atom, the nucleus spits out an alpha particle (helium nucleus) traveling at a significant fraction of the speed of light.

An atomic bomb can be constructed from smoke detectors. Americium 241 is a fissile material, the critical mass being around 80 kg. Billions of smoke detectors would have to be scavenged to get enough. Another problem is the heat generated in the sub-critical mass of americium by its radioactivity - about 10kW! But I bet you already knew that. (Some information collected from www.lateralscience.co.uk .)

January BTC You may not know that I have been writing these columns for over fifteen years now.

I started writing these things because I met so many EEs who had lost track of much of their fundamental training in science and math. So I thought I would try to find an amusing way to get them to think about those things again. I hope I have succeeded in some small way, at least to amuse some folks. The hardest challenge has always been to design the technical problem just hard enough to spur the interest of readers. If it is too hard, no one seems to want work that hard, or to take a chance on getting the wrong answer. If it is too easy, most think “why bother”.

So why this little rant? Just to give you folks a little insight as to from whence this comes, and to fill a little space. So for *la question du mois*, if I were to design a circuit that did a perfect mathematical square of a bipolar sine wave input signal, what would the output look like? Many years ago I built a very neat version of such a circuit. We'll discuss it in the next answer column.

Reply to Butch Shadwell at b.shadwell@ieee.org (email), 904-223-4510 (fax), 904-223-4465 (v), 3308 Queen Palm Dr., Jacksonville, FL 32250-2328. (<http://www.shadtechserv.com>)
The names of correct respondents may be mentioned in the solution column.

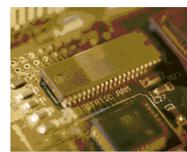
The New Energy Policy

Our PE/IA Chapter held a successful meeting in December where John Twitchell, from the NERC staff, reviewed the



steps to be taken and the timetable for NERC's transition from an organization with voluntary industry standards compliance to one who's standards are mandatory in the US and Canada.

Here is John Twitchell from NERC receiving a gift from Ghaff Khazami for the presentation. (Photo—Jim Howard)



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January 2006 Calendar of Events (For more information see P. 1 *Inside this Signal...*)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Happy New Year	2	3	4	5	6	7
8	9	10 <i>5:30PM:</i> <i>IEEE FWCS</i> <i>ExCom Meet'g,</i> <i>TECO Hall,</i> <i>Tampa</i>	11	12	13	14
15	16	17	18 <i>Noon</i> <i>Hurricane</i> <i>Wilma--FPL</i> <i>FRCC, Tampa</i>	19	20 <i>SP/COM</i> <i>Distinguished</i> <i>Lecturer</i> <i>USF</i>	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

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IEEE/IAS Annual Meeting Oct. 2006 Tampa!

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