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SIGNAL

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

Inside this Signal...

Page 2

Chair's Comments

Page 3

MTT/AP/ED September Meeting: High Performance VCO Design in SiGe BiCMOS Technology

PES/ IAS has scheduled CAE Tour on Oct 11th ...

Lightning Master Corp.

Dr. Huseyin Arslan elevated to IEEE Senior Member Status

Page 4

Call for FWCS Section Officer Nominations

High-Tech Employment Shrinks in Second Quarter

Call for FWCS Power Engineering Society/Industry Applications Society (PE/IA) Chapter Officer Nominations

Page 5

Technology Within Your Reach: MS in Telecommunication and Networking at FIU

Page 7

IAS Distinguished Lecturer Series in November

Butch Shadwell's Brain Teaser Challenge Column

Page 8

IEEE SP/COMM Seminar on November 11

Students' Corner

Page 9

SouthCon '05 Registration Form



Automated Residual Bus Transfer



Date: Monday, 20 September 2004

Time: Registration and Breakfast (7:30 AM - 8:00 AM) Session - 8:00 AM - 12:00 PM

Speaker: **Jim Bowen, PE**, Technical Director, Powell Electrical Mfg. Co.,

Location: University of South Florida, College of Engineering CUTR building, Room 102.

Parking Permits available at Visitors Information area at main entrance.

Space is limited to 40 people so please sign up early

PDH Credit: There will be (4) four PDH Hours credited for this training. Include your license number and your name as it appears on your license with your reservation. Florida provider number EXP 00015.

Cost: Members, \$100; Non-members, \$150, Student Member \$25 Please send payment to: IEEE – FWCS 648 Timber Pond Drive Brandon, FL 33510-2937

RSVP: www.ewh.ieee.org/r3/floridawc/
Questions: Tom Blair at 813-228-1111, ext 34407; tbblair@tecoenergy.com

Continued on Page 6



Specification & Application Basics for Distribution Transformers



Date: Friday, 24 September 2004 at 8:30AM – 3PM

Time: Registration and Breakfast (8:00 AM – 9:00 AM) Session - 9:00 AM - 3:00 PM

Speakers: **John Sullivan, PE, and Tim Badger, PE**

Location: Lakeland Electric, 501 E. Lemon St., Lakeland, Florida (Conference Rooms 1A & 1B)

RSVP: www.ewh.ieee.org/r3/floridawc/

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Please sign up early!!**

PDH Credit: There will be (6) six PDH Hours credited for this training. Include your license number and your name as it appears on your license with your reservation. Florida provider number EXP 00015.

Cost: Members, \$50; Non-members, \$100, Student Member \$10 Please send payment to: IEEE – FWCS 648 Timber Pond Drive Brandon, FL 33510-2937

Questions: Jim Howard - 863-834-6506 or james.howard@lakelandelectric.com

Continued on Page 6

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All material for THE SUNCOAST SIGNAL is due by 7th day of the month preceding the issue month. Address all correspondence to:

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Chair's Comments

By John Conrad



I am very late in writing this column so hurricane Charley has come and gone sparing Hillsborough, Pinellas, Manatee, and Pasco residents in spite of all the dire predictions. Our hearts go out to our members in those counties who were not so fortunate. The TV pictures of the devastation leave us with a mixture of shock and guilt that it could have been us. We also have an overwhelming feeling of sympathy for all those suffering. Hopefully, the utility crews will get the power, water, and phones working again soon, so that the rebuilding can start in earnest. I am encouraged by the initial reports of help quickly arriving in the form of work crews, food, water, and other essential supplies.

On a lighter note, we must be coming around to the time when Professional Engineers have to renew their licenses because this appears to be Seminar September. On the 20th, Jim Bowen is giving a seminar on Automated Bus Transfer and on the 24th John Sullivan and Tim Badger are giving a seminar on Distribution transformers. Both of these seminars will award PDH credit for attendance. In addition, Kevin Kornegay is holding a seminar on High Performance VCO design in SiGe BiCMOS Technology on the 29th for the MTT chapter. A busy month once again!! Offering seminars for PE license renewal is an importance service that this Section provides to it's members and I would like to thank Art Nordlinger, Tom Blair, and Jim Howard for their efforts.

As always, do not hesitate to let us know if you have any ideas for improving the service provided by the Florida West Coast Section.

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MTT/AP/ED September Meeting

High Performance VCO Design in SiGe BiCMOS Technology

WHEN: Wednesday, September 29, 2004 6:00 pm
SPEAKER: Kevin Kornegay - Cornell University - School of ECE
LOCATION: TRAK Microwave Corporation 4726 Eisenhower Blvd., Tampa, FL
For driving directions, contact Ken O'Connor
PLEASE RSVP: Leave name & country of citizenship with Ken O'Connor at (727) 302 2357.
Email: kenoconnor@ieee.org

Bring a guest!! Non-members are welcome!!

ABSTRACT: The design of high performance monolithic VCOs using emitter degeneration is presented. The benefits of this approach are verified via simulation and experimentation. Several experimental VCOs are implemented in SiGe BiCMOS technology and compared to state-of-the art oscillators to evaluate the effectiveness of the technique. Lastly, design and layout guidelines are given.

BIOGRAPHY: Kevin Kornegay received his BEE from Pratt Institute in 1985 and his M.S. and Ph.D. from the University of California at Berkeley in Electrical Engineering and Computer Science in 1990 and 1992, respectively. In January 1998, he joined the faculty in the School of Electrical and Computer Engineering at Cornell University where he currently holds the rank of Associate Professor. His research interests include RFIC Design, MMWIC design, high bitrate wireless and wireline systems, and low power optical transceivers. He currently serves on the technical program committees of the International Microwave Symposium, the Radio Frequency Integrated Circuits Symposium, IEEE Compound Semiconductor IC Symposium, and the International Symposium on Low Power Electronic Design. He is an Editor of IEEE Electron Device Letters and the recipient of numerous awards which include the National Science Foundation CAREER Award, an IBM Faculty Award, the National Semiconductor Faculty Development Award, and the General Motors Faculty Fellowship Award. He is a Distinguished Lecturer of the IEEE Electron Devices Society, a member of the ETA KAPPA NU, TAU BETA PI, a Senior member of the IEEE as well as a member of the Electron Devices Society Education Activities Advisory Committee. From 2001-2003, he also served as a member of the Defense Science Study Group.

PES/ IAS has scheduled CAE Tour

When: OCT 11th 2004 11: 30 AM to 1 PM

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Mark Your Calendar!! Full details in Next Signal!!



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One FWCS Member Elevated to IEEE Senior Member Status

Congratulations to Dr. Huseyin Arslan who was elevated to Senior Membership at the June 2004 committee meeting. If there are any IEEE members that have more than 10 years experience and would be interested in Senior Membership in IEEE, please send an email to tom_blair@ieee.org and we will help you with the process. Senior Members and Fellows of the Section are requested to serve as the references for the Senior Member applicants.

Call for FWCS Section Officer Nominations

Your Florida West Coast Section (FWCS) Nomination and Appointments Committee is seeking candidates for the offices of **Chair**, **Vice-Chair**, **Secretary**, and **Treasurer** for the 2005-2006 term. All candidates should have indicated their willingness to serve if elected. Self nomination is acceptable.

Please send all nominations **no later than September 30, 2004** to:

Jim Beall (j.beall@ieee.org), or
Richard Beatie (r.beatie@ieee.org), or
Jim Howard (j.howard@ieee.org)

The qualifications of all nominees submitted will be discussed by the Nomination and Appointments (N&A) Committee. The N&A Committee will report its recommended nominees to the FWCS Executive Committee for approval. The FWCS Executive Committee will be requested to endorse the slate of nominees to be placed on the election ballot for election in December 2004.

High-Tech Employment Shrinks in Second Quarter, Despite Positive Signs on Unemployment Rates

WASHINGTON (26 July 2004) - The number of employed computer professionals dropped from the first to second quarters, according to data compiled by the Department of Labor's Bureau of Labor Statistics (BLS). At the same time, high-tech unemployment rates also fell. BLS reported a decline of 131,000 employed computer software engineers in the second quarter vs. the first quarter (725,000 vs. 856,000). Employed computer scientists and systems analysts have fallen 51,000 (621,000 vs. 672,000) during the same period, while computer hardware engineers dropped 3,000 (83,000 vs. 86,000). Computer programmers experienced a fall of 16,000 (575,000 vs. 591,000). Bucking the trend, the number of employed electrical and electronics engineers (EEs) rose by 24,000 from the first to second quarters (351,000 vs. 327,000). The increase, however, is still below the 363,000 quarterly average in 2003. BLS reported the EE unemployment rate, which stood at 5.3% in the first quarter, was 0.8% in the second quarter. While the increase in EE employment would indicate a falling unemployment rate, sampling errors could account for the substantial quarterly decrease, according to statistical consultant Richard Ellis of Ellis Research Services. A rate for computer hardware engineers wasn't reported because no one in this job classification among the survey population claimed to be unemployed last quarter. The unemployment rate for computer software engineers fell from 3.3% in the first quarter to 2.9% in the second. For computer scientists and system analysts, the rate went from 6.7% to 4.0%; for computer programmers it fell from 9.5% to 5.7%.

Source: IEEE-USA Newsletter. For more information on IEEE USA, go to <http://www.ieeeusa.org>.

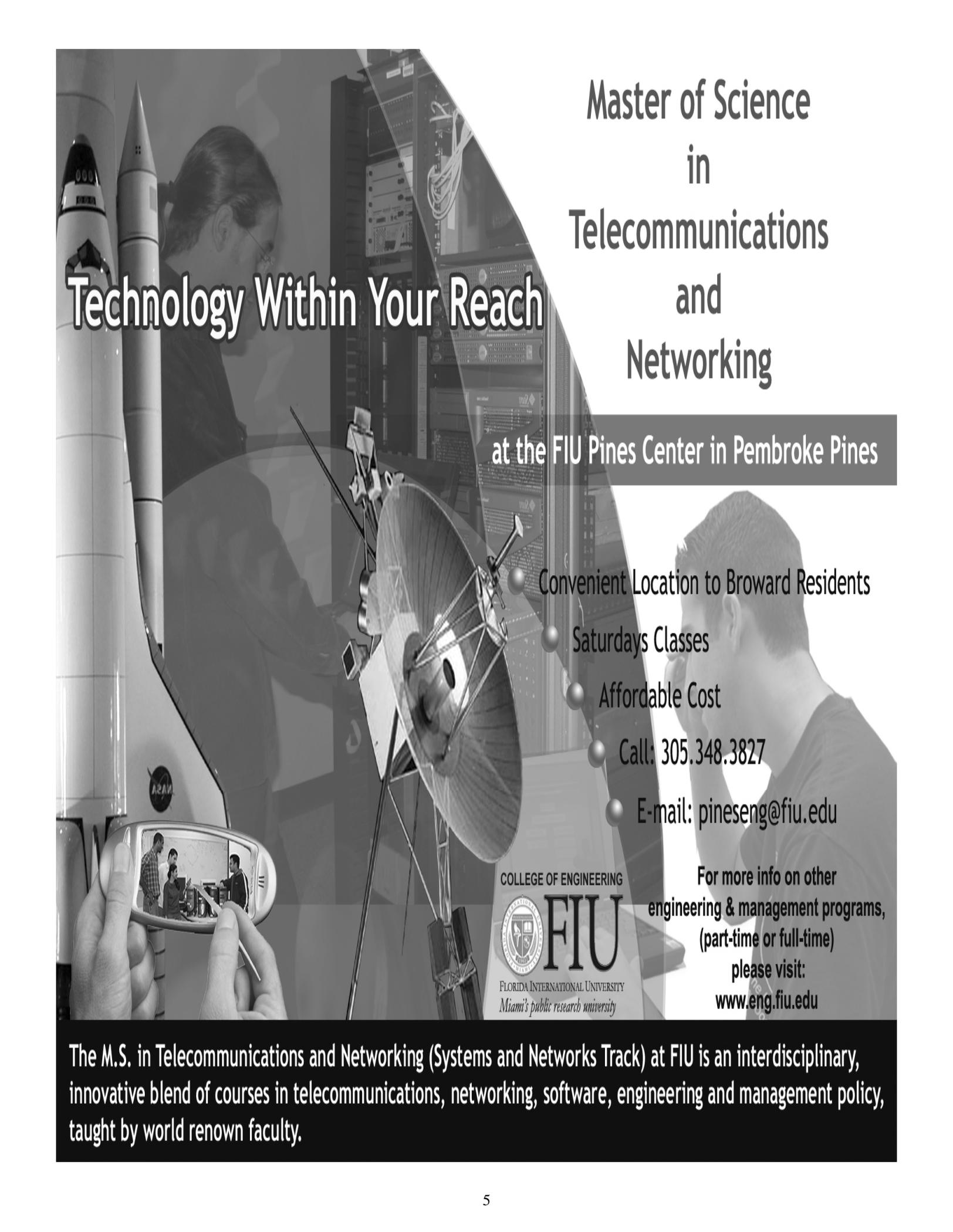
Call for FWCS Power Engineering Society/Industry Applications Society (PE/IA) Chapter Officer Nominations

Your FWCS PE/IA Chapter Nomination and Appointments Committee is seeking candidates for the offices of **Chair**, **Vice-Chair**, and **Secretary/Treasurer** for the 2005-2006 term. All candidates should have indicated their willingness to serve if elected. Self nomination is acceptable.

Please send all nominations **no later than September 30, 2004** to:

Jim Beall (j.beall@ieee.org), or
Jim Howard (j.howard@ieee.org), or
Art Nordlinger (a.nordlinger@ieee.org)

The qualifications of all nominees submitted will be discussed by the Nomination and Appointments (N&A) Committee. The N&A Committee will report its recommended nominees to the FWCS PE/IA Executive Committee for approval. The FWCS PE/IA Executive Committee will be requested to endorse the slate of nominees to be placed on the election ballot for election in December 2004.



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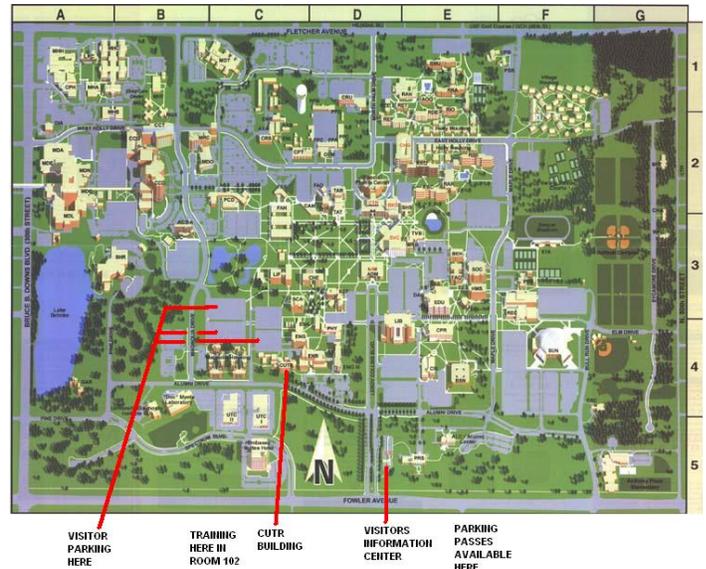
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PES/IAS: Automated Residual Bus Transfer...

Contd. from Page 1

This class begins by providing a thorough discussion of a traditional residual bus transfer scheme. This includes a review of the logic scheme necessary to ensure an automatic transfer. A relay coordination commentary provides guidance for minimizing transfer time. The discussions describe additional coordination concerns when downstream feeder breakers and upstream source breakers are considered. A procedure for plotting under-voltage relay characteristics on time-over current coordination curves is also provided. Reaccelerating rotating motors with internal residual voltage is reviewed to illustrate safe equipment practice and control of machine torque within acceptable NEMA MG-1 limits. Modern control equipment advantages and disadvantages are compared with the traditional discrete device residual bus transfer system.



Mr. Bowen has 18 years experience with Exxon where he worked in all facets of Electrical Engineering involved with the petrochemical process. He had responsibilities on several large projects including Co-generation, High Voltage Gas Insulated Switchgear, large variable speed drivers, and various other grass-root projects. He also held the post of the Regional Engineer for Exxon Chemicals Europe for three years.

At Powell Electrical Manufacturing Company, Jim holds the post of Technical Director. As Technical Director, he provides leadership, training and mentoring in the utilization of equipment rated 38 kV and below. He authors the Powell Technical Briefs, a popular 1 to 3 page article, addressing technical problems commonly found in the Electrical Power work place.

PES/IAS: Specification & Application Basics for Distribution Transformers... *Contd. from Page 1*

Your local PES/IAS Chapter will be presenting another outstanding seminar on Friday, September 24, 2004 at Lakeland Electric. This seminar will cover Distribution Transformer topics from their design to usage and will provide the attendees with an in-depth basic understanding of devices that everyone depends on. There will be a discussion about transformer impedance vs. available fault current and voltage regulation, as well as how to correctly size transformers for residential and commercial applications. Also, how important is it to track transformer failure rate by manufacturer and year of manufacture. There will be a discussion on the importance of transformer losses and how they relate to initial costs. The course topics are: (1) Transformer basics (2) Connections (3) Protection (4) Transformer loading (5) Practical applications & problems (6) Transformer Economics.

SPEAKERS:

Tim Badger is a graduate of Mississippi State University with a BS in Electrical Engineering, and spent the majority of his career at Tampa Electric Company with 10 years in Power Production, 5 years as Meter Engineer, 7 years in Standards and 11 years in Distribution Engineering. After his retirement from TECO, Tim is working as a contract engineer for Synergetic Design Inc at Lee County Electric Coop. He is a Senior member of IEEE and a Registered Professional Engineer in the State of Florida. Tim is married with two children and two grandchildren, and his hobbies include golfing and spending time on the computer.

John Sullivan is a graduate of Georgia Institute of Technology with a Bachelor of Electrical Engineering, and spent the majority of his 37 year career at Tampa Electric Company, in Underground Engineering Design & Field Applications, Voltage Regulation & Power Factor Correction, Protection & Coordination, Distribution Planning, and Standards, where he spent 15 years with transformer product responsibility. John is a Senior Member of IEEE and a Registered Professional Engineer in the State of Florida. He is a member of the IEEE Power Engineering Society (PES), IEEE Standards SA, PES Transformers Committee, and Chairs two IEEE Working Groups.

Industrial Power Systems: A Facilities Engineering Perspective

<p>Date: Monday, November 15, 2004 Time: Registration and Lunch 11:00 AM - 12:00 noon Lecture - 12:00 NOON - 1:00 PM Speaker: BARRY C. BRUSSO, Principal Facilities Engineer and Manager Electronic Systems Support, S & C Electric Company Location: TECO Hall, Tampa Electric Company, 702 N. Franklin Street, Tampa</p> <p>Space is limited to 35 attendees.</p>	<p>Cost: Members \$10, non-members \$15, student members \$5 Please make checks payable to: IEEE – FWCS Parking: Metered street parking is available. Reasonably priced parking is also available at the Ashley Street Garage next to the Public Library, approximately two blocks from TECO Plaza. RSVP: http://www.ewh.ieee.org/r3/floridawc/ Questions: Tom Blair at 813-228-1111, ext 34407 or tblair@tecoenergy.com</p>
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Abstract: Typically the resident plant facilities engineering staff for an industrial facility are ultimately involved in the day to day on site performance, application, operation and maintenance of the plant power systems. It is critical to have this staff take the lead in planning, design, preparation of specifications, installation oversight and commissioning of new power systems. We will focus on the facilities engineers' role as the owner's representatives and the engineering steps they must follow to reach the project objectives associated with new and retrofitted industrial power systems.

Brief Biography: Barry C. Brusso received the B.S.E.E. degree from the University of Illinois (Champaign-Urbana) in 1967 and joined the Westinghouse Electric Corp. the same year. He joined Fidelity Electronics Ltd., in 1975 as Senior Engineer in the Biomedical Engineering Division, with overall responsibility for development and production. In 1978, he joined the S&C Electric Company as Facilities Engineer in the Plant Engineering Division and presently holds the dual positions of Principal Facilities Engineer and Manager – Electronic Systems Support with overall responsibility for electrical engineering of the manufacturing facilities and design and fabrication of the product's quality inspection/testing equipment. For over 21 years he managed the Metrology and Communication Systems Department maintains corporate standards and performs calibrations of the measuring and test equipment for the entire company. Barry has served as a member-delegate to the National Conference of Standards Laboratories for over 10 years. He is an IEEE Fellow, recipient of the IEEE Third Millennium Medal and a member of the following IEEE Societies: Industry Applications, Dielectrics and Electrical Insulation, Instrumentation and Measurement, and Power Electronics.

Brain Teaser Challenge Column

By Butch Shadwell

August BTC The timing is such that I haven't received any answers to the last BTC as I write this. It was a very easy one so maybe some just didn't want to bother. As you may recall as result of Dr. Pepper research I needed to know; "the equation for the cross-over frequency of a simple one pole RC filter. If I want the knee (- 3db) at 5 Hz and the capacitor is 1 μ F, what should my resistor be?"

I must have been really sleepy, to have left that one as simple as that. Of course, the equation is $f_c=1/(2\pi*R*C)$. Solving for R, we have $R=1/(2\pi* f_c *C)$, which makes the answer 31.9 K Ω . As you all know, this is the point where the resistive component and the capacitive reactance are equal.

September BTC Over the years, I have come to depend on these columns as a sort of therapeutic outlet. Some place where I can vent my frustrations freely, without fear of reprisal of unfair judgment. Maybe I was wrong about that?

Anyway, I don't think we've ever discussed my interest in thermal emission spectroscopy. TES, as we like to call it, is a form of orthogonal imaging. That means that the value of a spatially displaced pixel is determined by the specific combination of wavelengths in the energy that illuminates it. Sounds a lot like color TV. However, in this case, specific spectral content is more important than intensity. It is a form of qualitative analysis.

In a recent sensor design, I used a quantum well infrared photo-detector, or QWIP. In order to test the detector, we illuminated it with an IR LED at 1 meter distance, with the sensor in the center and perpendicular to the transmission axis of the LED. Our QWIP has an area of 0.1 cm² and the LED emits 20 mw/Sr. With a photo-responsivity at this wavelength of 0.6 A/W, what current should we see from this detector during this test?

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.

Developing New Coding and Modulation Methods to Exploit Space, Time and Frequency Diversities



Date & Time: 6PM, Thursday, November 11, 2004

Location: Raytheon Company, 1501 72nd Street North, St. Petersburg, FL

Speaker: Dr. K. J. Ray Liu, Dept. of ECE and Institute of Systems Research, Univ. of Maryland, College Park

Reservations: Please <http://www.ewh.ieee.org/r3/floridawc/>

or notify Dr. Mohamed Nezami at (727) 302-3412.

Raytheon



Abstract: First, we will briefly review some of existing space-time block codes (STBCs) that can guarantee full diversity in space and time domains. Then, we will focus on the STBCs from orthogonal or block-orthogonal designs. These codes not only achieve full diversity, but also have a very simple maximum-likelihood (ML) decoding algorithm. Finally, we will talk how to combine orthogonal or block-orthogonal designs with sphere packing to further increase the coding advantage. We will briefly review previous works on Space Frequency (SF) coding. Then, we will introduce a systematic design method to construct full-diversity SF codes by taking advantage of the existing Space-Time (ST) codes and discuss an approach to design SF block codes that can guarantee full-rate full-diversity transmission in MIMO-OFDM systems. Finally, if coding delay is allowed, we will discuss how to obtain a Space-Time-Frequency (STF) code that reaches the maximum achievable diversity in space, time, and frequency.

Speaker Brief Biography: Prof. K. J. Ray Liu received the B.S. degree from the National Taiwan University in 1983, and the Ph.D. degree from UCLA in 1990, both in EE. He is a Professor and Director of Comm. and Signal Processing Laboratories of ECE Department and Institute for Systems Research of University of Maryland, College Park. His research contributions encompass broad aspects of wireless communications and networking in which he has published over 300 refereed papers. Dr. Liu is the recipient of numerous honors and awards including IEEE Signal Processing Society 2004 Distinguished Lecturer, the 1994 NSF Young Investigator Award, the IEEE Signal Processing Society's 1993 Senior Award (Best Paper Award), George Corcoran Award in 1994 and Engineering Faculty Award in 1996 (both from the University of Maryland). Dr. Liu is a Fellow of IEEE. Dr. Liu is the Editor-in-Chief of IEEE Signal Processing Magazine and was the founding Editor-in-Chief of EURASIP Journal on Applied Signal Processing.

Students' Corner

Welcome back students! As always, the student branch has come up with ways to keep your semester interesting, social and educational! Once again we challenge you to attend as many events as possible. We can be contacted at ieee@eng.usf.edu, you can drop by and visit in ENB 380-C or give us a call at 813.974.4776.

As many of you are aware, IEEE serves as a great networking tool, establishing relationships between students and industry professionals. Not only are students welcome at all IEEE events they are encouraged to attend with the student rate. Sign up for IEEE today and see what it can do for you!

Upcoming events include: (1) Student Professional Awareness Conference; (2) FWCS-IEEE Student Branch Welcome Back Picnic; (3) Student Branch Monthly meetings (4) Casino Night; (5) Tailgate parties with ASME and ECC; (6) Fall student mentor day (7) Fall Senior Awards Banquet (8) Dates and times of all events will be posted on the student list-serve. Not on the list-serve? Visit <http://mailman.acomp.usf.edu> and look for the "ieee" list.



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Electronically www.southcon.org

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On-Site

Bring this form with you to Southcon/2005 for FREE admittance.

1.

First Name		Last Name	
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Company			
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City	State	Zip	Country
() Telephone	() Fax		

2. Principal Job Function
(check only one)

- AA Engineer - Design
- AB Engineer - Manufacturing
- AC Engineer - Quality/Test
- AD Engineering Services
- AE Engineering Management
- AF Corporate/General Management
- AG Press
- AH Purchasing/Procurement
- AJ Marketing/Sales
- AK Student/Educator
- AL Other

3. What is the Primary End Product at this Location
(check only one)

- CA Communication Systems
- CB Components/Materials/Hardware Supplies
- CC Computers/Systems and Sub-systems
- CD Consumer Products, Automotive & Appliances

- CE Contract Services-Design/Manufacturing/Test/IC Foundry etc.
- CF Controls
- CG Military/Government/Avionics
- CH Medical Electronics
- CJ Semiconductors/ICs
- CK Test/Masurement/Inspection
- CL Distributors
- CM Other
- BF Contract Services - Design/Manufacturing/Test
- BG EDA Tools & Engineering Software
- BH Interconnection Devices
- BJ Laser & Electro-Optical Devices
- BK Microwave Components
- BL Packaging Hardware/Enclosures
- BM Power Sources
- BN Production Equipment
- BP Production Tools & Supplies
- BQ Sensors & Transducers
- BR System Boards
- BS Test & Measurement Equipment
- BT Other

4. Product Interest - Which of the following do you specify, recommend, approve, purchase or influence the purchase of?
(check all that apply)

- BA ASICs, PLDs, FPGAs
- BB Board Level Products
- BC Semiconductors/ICs
- BD Components other than IC's
- BE Computers/Peripherals/Software

5. Years Involved in Industry

- DA 1 - 2
- DB 3 - 5
- DC 6 - 9
- DD 10 or more

6. Size of your organization

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September 2004 Calendar of Events

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7 5:30PM: <i>IEEE FWCS Executive Mtg. TECO Hall, Tampa</i>	8	9	10	11
12	13	14	15	16	17	18
19	20 8AM-12PM: <i>PES/IAS Seminar: Automated Bus Transfer, USF</i>	21	22	23	24 8:30AM-3PM: <i>PES/IAS Seminar: Distbn., Transformers, Lakeland Electric, St.Pete</i>	25
26	27	28	29 6pm: <i>MTT/AP/ED Seminar:High Perf VCO, TRAK Microwave Corp, Tampa</i>	30		

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