

November 2009

Rock River Valley Section

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Event



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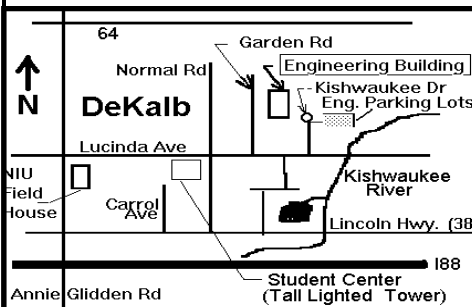
Annual Joint IEEE RRVS, RRVS NIU Student Branch and
IEEE Control Systems Society Chapter Meeting

A Tutorial on the Dynamics and Control of Wind Turbines and Wind Farms

WHEN Thursday, November 19, 2009

WHERE

Northern Illinois University, DeKalb, IL; Engineering Building, Auditorium room 354. Please call Don Zinger at 753-0540 if you need directions from outside DeKalb. From



Annie Glidden and Lucinda, take Lucinda east to Kishwaukee Dr. (0.5 mi). Turn left (north) on Kishwaukee Dr. to parking lot at end of street (0.25 mi). The engineering building is across Kishwaukee Dr. to the northwest (large steel and glass building). Parking passes required, will be provided at the registration table in the Engineering building when you arrive.

AGENDA

6:00 PM Networking
6:30 PM Dinner
7:30 PM Presentation

PROGRAM

Wind is recognized worldwide as a cost-effective, environmentally friendly solution to energy shortages, and wind energy is currently the fast-

est-growing energy source in the world. Despite the amazing growth in the installed capacity of wind turbines in recent years, engineering and science challenges still exist. These large, flexible structures operate in uncertain environments and lend themselves nicely to advanced control solutions. Advanced controllers can help achieve the overall goal of decreasing the cost of wind energy by increasing the efficiency, and thus the energy capture, or by reducing structural loading and increasing the lifetimes of the components and turbine structures.

This talk will provide a broad overview of wind energy systems. We will describe the main components of wind turbines, the sensors and actuators, the different operating regions, and we will outline the current state of the art in wind turbine modeling and control. We will also highlight growing areas of importance and areas of future work, including combined feedforward and feedback control of wind turbines using novel sensing technologies, wind turbine wake modeling and coordinated control of arrays of turbines on wind farms, and modeling and control of floating offshore wind turbines.

SPEAKER

Lucy Y. Pao, Professor of Electrical, Computer and Energy Engineering at the University of Colorado at Boulder, received the B.S., M.S., and Ph.D. degrees in Electrical Engineering from Stanford University. She has interests in the areas of control systems (with

applications to flexible structures and wind turbines), multisensor data fusion, and haptic and multimodal visual/haptic/audio interfaces.

Professor Pao is the General Chair for the 2013 American Control Conference. She is also the Scientific Director for the Center for Research and Education in Wind (CREW), a multi-institutional wind energy center involving the University of Colorado at Boulder, the National Renewable Energy Laboratory, Colorado School of Mines, and Colorado State University, in partnership with the National Center for Atmospheric Research and the National Oceanic and Atmospheric Administration.

MEAL INFORMATION

Dinner will feature Chinese buffet from Yen Ching in DeKalb. The costs are: member: \$5, non-member: \$10, student members: \$2, student non-members: \$5. Please make **dinner reservations by calling Laura at 815-753-9974 or sending her an email (lmweber@niu.edu) by Tuesday, November 17, at 5pm.** Please include the following: your name, phone number, email address and IEEE member number. Unemployed members may call the treasurer for special arrangements.

NOTE

The meeting is open to the general public. You need not be an IEEE member to attend. Guests are welcome. Please call Laura at 815-753-9974 for questions.

October RRV Section Meeting Recap

The October RRVS meeting featured Curt White, a 44 year practitioner in EMC applied to aerospace products at Hamilton Sundstrand, a position from which he recently retired. Curt White gave an insightful presentation on the properties of ferrite materials and how those properties affect electrical circuit behavior. Ferrite materials are often misunderstood by designers. Some ferrites are highly conductive, some highly resistive and some have dimensional resonance frequencies which may shatter the ferrite material if excited at these frequencies. Two basic modes of application of ferrites are: 1) in lower frequency region – good transformer and inductor with low losses 2) in higher frequency region - good variable resistance for EMC where dissipation of undesired signal is the goal. Normally ferrites have rapid rise of resistance with frequency up to ferromagnetic resonance frequency and rapid loss of inductance beyond ferromagnetic resonance frequency. Inductance is constant below ferromagnetic resonance. Winding capacitance shunts desired inductance. Curie temperature is the temperature beyond which magnetic properties in the ferrite material cease.



January RRV Section, Control Systems Society Chapter and Rock Valley College Meeting Preview — Future Electronic Power Distribution Systems – A Contemplative View

Please join us at Rock Valley College's Woodward Technology Center on Thursday, January 28th, for a thought provoking presentation by IEEE Control Systems Distinguished Lecturer Dushan Boroyevich. Dr. Boroyevich is the American Electric Power Professor at the Department of Electrical and Computer Engineering at Virginia Tech, and co-director of the NSF Engineering Research Center for Power Electronics Systems (CPES). Dr. Boroyevich is a Fellow of IEEE.

IEEE Chicago/Rockford Consultants' Network Meeting

** A joint Affinity Group of the IEEE Chicago and Rock River Valley Sections **

The next meeting will be on **Monday, November 23, 2009**. The **optional informal dinner** is at 5:30 PM at Bakers' Square, 270 E. Northwest Highway (corner of North Court), just south of the library, and the meeting at 6:45 PM at the Palatine Public Library, 700 North Court, Palatine, IL 847-358-1216. Please go to <http://ewh.ieee.org/r4/chicago/cn/> for more info. Attendees may earn 1 PDH. The two topics will be:

- **Annual member's meeting — Election of Directors**
- **"Real Time Embedded Systems" (rescheduled from 28 September)" by Andy Mehta**

What are Embedded Systems? Many choices of microcontrollers are available. How is one selected for an application? Evaluation criteria include speed, memory, inputs/outputs, analog, digital, sensors, and battery powered applications. Hardware design, software development aspects, and development tools will be discussed. Andy will also explain how he made his start in consulting.

Andy has over 25 years of experience in Embedded Systems. He is the President of amVare Technologies Inc., a company specializing in hardware and software development of Embedded Systems. The company has also developed LED Lighting products, Electronic Appliance Controls and Defense Systems. Andy has a BSEE from the University of Jodhpur, India, and an MSEE from Illinois Institute of Technology.

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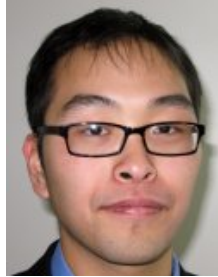
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Messages for student officers can be left at the NIU Dept of Electrical Engineering, (815) 753-9974 or e-mail at sb.niu@ieee.org

The Rock River Valley Section gratefully acknowledges the following companies and colleges for supporting Section Officers:

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RRVS Calendar

- November Rock Valley College Meeting (10:00am-7:00pm) November 5**
 “Mechatronics Mobile”, Woodward Technology Center Parking Lot, Rock Valley College, Rockford, IL
- November RRVS GOLD (Graduates of the Last Decade) Meeting (6pm) November 12**
 Bears-49ers Football Game, Old Chicago Restaurant, 6280 E. State St, Rockford, IL
- November Joint RRVS and NIU Student Branch Meeting November 19**
 “A Tutorial on the Dynamics and Control of Wind Turbines and Wind Farms”, NIU Engineering Building, DeKalb, IL
- Christmas Break December**
- January RRVS Meeting January 28**
 “Future Electronic Power Distribution Systems – A Contemplative View”, Rock Valley College, Rockford, IL
- January RRVS IEEE 125th Anniversary Celebration Dinner January 30**
 Keynote: “What Congress Has Planned For Us In 2010”, Russ Harrison, Chief IEEE Lobbyist in Washington, D.C.

Rock River Valley Section Chapters

Industry Applications Society Chapter
Established 1992

Joint Computer/Control Systems Society Chapter
Established 1995

Power Electronics Society Chapter
Established 1996

Electromagnetic Compatibility Society Chapter
Established 2007

Time-Sensitive Material

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