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January 2009

Rock River Valley Section

[www.ieee.org/rrvs](http://www.ieee.org/rrvs)

Event

Sense

The Institute of Electrical and Electronic Engineers, Inc.

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RRV Section and PELS Chapter Meeting

## Design for Reliability of Energy Processing

**WHEN** Thursday, January 29, 2009

### WHERE

Rock Valley College, Woodward Technology Center, Rooms 117/119. I-90 to Riverside Blvd., exit and go west to Mulford Rd. Go south to 2nd light, turn east into RVC. Follow road to left to last building on right.

### AGENDA

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

### PROGRAM

The reliable operation of our electrical grid depends on the operation of different classes of energy processing systems, e.g., generators, transformers, power electronics systems. There are well-developed techniques to assess the effect of faults in conventional energy processing systems; however, these techniques do not seem to be suited to analyzing new energy processing systems, such as wind-based electrical generators. We will address the reliability implications on the electrical grid of wind-based power generation; with a focus on the need to develop new techniques to analyze the impact on the overall grid operation of failures in both wind generators and the grid itself.

We will look specifically at the power electronics interface between wind generators and the electrical grid. This interface is paramount to ensure a reliable operation of the wind generator. We will present a new methodology to analyze the reliability of power electronics systems. This methodology uses a state-space representation of the converter dynamics based on averaging and linearization. The methodology takes into account the uncertainty associated with the converter operational environment due to its interaction with the grid and the wind turbine.

### SPEAKER

**Dr. Alejandro Dominguez-Garcia** is an Assistant Professor in the Electrical and Computer Engineering Department at the University of Illinois, Urbana, where he is affiliated with the Power and Energy Systems area. His research interests lie at the interface of system reliability theory and control theory, with special emphasis on applications to power electronics, electric power systems, and safety-critical/fault-tolerant aircraft, aerospace and automotive systems.

Dr. Domínguez-García received the Ph.D. degree in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology, Cambridge, MA, in 2007 and

the degree of Electrical Engineer from the University of Oviedo (Spain) in 2001.

### MEAL INFORMATION

Dinner will feature Grilled Chicken Breast and a vegetarian entree. The costs are: member: \$5, non-member: \$10, student members: \$2, student non-members: \$5. Please make **dinner reservations** by calling **Ginger at 815-394-5696** or sending her an **email ([ginger.spinasanta@hs.utc.com](mailto:ginger.spinasanta@hs.utc.com)) by Tuesday, January 27, at 5pm**. Please include the following: your name, phone number, email address, IEEE member number, and choice of entree. 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 Ginger at 815-394-5696 for questions.

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### November RRVS Meeting Recap — Do you know where I now? Good!(!?)

The annual joint section/student branch November meeting was again hosted by the NIU Student Branch at the NIU DeKalb Engineering Building. Students met with professional members during the social and dinner (sponsored by Yen Ching) times.

The Rock River Valley Section extends its thanks to Jack Kozik, CTO, Director of Architecture, Americas for Alcatel-Lucent's Applications Business Group who delivered an interesting presentation on mobile network location based services. Location based capabilities have been around for about 10 years, mostly used for emergency personnel. Only recently have these services been available for consumers. Jack presented alternate techniques for finding the location of a cell phone. With a GPS chip, location can be determined using satellite information. Without a GPS, location can still be determined using uplink time difference of arrival or angle of arrival. Hybrid systems can also be used. When using location services it is important to reduce the power demands on the mobile unit. One method of doing this is geofencing where events are only activated when a position threshold is crossed. This can be used in several applications such as profiled advertisement and child monitoring.

### February RRV Section Meeting Preview — Making Fun: Your Future in Video Games

The process of creating next-generation video games and how the multiple disciplines work together to bring these titles to life will be reviewed. Guitar Hero will be available for attendees to try out. We will also review what recruiters from Activision look for in their new hires and what you can do to put a career in making games within your reach.

### 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, January 26, 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.

#### PRESENTATIONS

1. **"Installing Linux on a USB drive and its uses for system backup, diagnostics, and data recovery"** by William Boyle. A drive image and installation instructions will be made available for attendees as well as an ISO image to make a bootable CD. Bill will also talk about how he got started in consulting and how he finds clients, and some of the opportunities in industry today.
2. **"Product Safety"** by Harry Jones. Harry will also talk about opportunities in both consulting and employment.

#### SPEAKERS

**William Boyle**, President of Application Frameworks and Systems, Inc., has been a software engineer for over 25 years, working principally in the field of large-scale database systems, manufacturing cell control and execution systems, and large-scale distributed transaction processing systems and applications. As Principal Software Engineer at FASTech Integration (Boston, MA.) and Brooks Automation (Chelmsford, MA), Bill was a principal architect and engineer on such software products as the FACTORYworks MES which is currently in place at most of the 200 and 300 mm semiconductor, flat panel (LCD), and disc drive plants world wide.

**Harry Jones** is an expert in the area of product safety. He has several years of experience in the field of product safety involving appliances, combustion equipment, and related standards development. He has developed services and safety requirements for emerging technologies including fuel cells, hydrogen fuel, and infrastructure methods.

## **2009 IEEE RRVS Executive Committee**

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### **Northern Illinois University Student Branch Officers**

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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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Rock Valley College • River North Solutions**

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**RRVS Calendar**

<b>January RRVS Section Meeting</b> .....	<b>January 29</b>
Design for Reliability of Energy Processing Systems, Rock Valley College, Rockford, IL	
<b>February RRVS Section Meeting</b> .....	<b>NATIONAL ENGINEERS WEEK..... February 19</b>
Making Fun: Your Future in Video Games, Rock Valley College, Rockford, IL	
<b>March RRVS Section Meeting</b> .....	<b>March 26</b>
TBD, Rock Valley College, Rockford, IL	
<b>April RRVS Section Tour/Meeting</b> .....	<b>April 30</b>
Ingenium Testing, Rockford, IL	
<b>May RRVS Section Picnic/2009 Officer Elections</b> .....	<b>May 28</b>
Hamilton Sundstrand Park, Belvidere, IL	


**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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