
January 1999

Rock River Valley Section
www.ieee.org/regional/section/rock_river/

Event

Sense

The Institute of Electrical and Electronic Engineers, Inc.

Joint IAS Chapter/PELS Chapter Meeting

Robust Power Converter Design

When February 4, 1999

Where Rock Valley College, Technology Center, Room 117. I-90 to Riverside Blvd., exit and go west to Mulford Rd. Go south to first light, turn east into RVC. Follow road to left to last building.

Agenda 6:00 PM Social
6:30 PM Dinner
7:30 PM Program

Program We will begin with a description of fault conditions and reliability issues under repetitive switching that cause field failures in power converters. We will then discuss our specific research results on DC/DC power converter reliability followed by our extensive research dealing with switch-level reliability under short-circuit and clamped-inductive switching conditions. We will describe in detail the failure physics of high-power modules, tradeoffs in soft-switching power converters and module packaging. The seminar will conclude with our results to-date on SiC diodes provided by NASA and our planned research collaboration in the future.

will describe...
tradeoffs in soft-switching power converters and module packaging ... and results to-date on SiC diodes provided by NASA ...

Speaker Prof. Krishna Shenai is the Director, MicroSystems Research Center (MSRC), Director, Power Electronics Research Laboratory The University of Illinois at Chicago. Prof. Shenai obtained his PhD degree in electrical engineering from Stanford University in 1986. Following an illustrious 12-year career in industry, he joined academia in 1993 and currently directs MicroSystems Research Center (MSRC) and Power Electronics Research Laboratory at the University of Illinois at Chicago. His current research focuses on power electronics and power semiconductor devices, and ultra low-power mixed-signal RF microsystems. He has authored over 250 refereed papers, 10 issued patents,

and one book. He is a Senior Member of IEEE, Editor of IEEE Trans. Electron Devices and Editor-in-Chief of IEEE Electron Devices Society Newsletter. In 1998, he was awarded the prestigious University Scholar Award by the University of Illinois for outstanding research and teaching.

Door Prizes Sponsored by RRVS and Best Buy

Meal Dinner will be buffet style (with a min. of 15) and will consist of chicken, veggie's, salad, dessert. Please make your reservations by calling **Gloria at 815-226-5247 by Monday, February 1, (please include your e-mail address in the information you provide Gloria - thanks)**. The cost of the dinner is **\$5 for IEEE members and \$14 for non-members**. Unemployed members may call one of the officers for special arrangements.

Note The meeting is open to the general public. You need not be an IEEE member. Guests are welcome. However, please call to enable us to make appropriate arrangements.

Chicago/Rockford Consultants Network Meeting

The next meeting will be on Monday, January 25. Dinner is 6:15 PM at Bakers' Square (corner of US 14 Northwest Highway and N. North), and the meeting at 7:30 PM at the Palatine Public Library (700 North Court, Palatine, IL 847-358-1216).

RRVS Officer Nominations Being Accepted

Please submit a name(s) to Bob Parro via e-mail at b.parro@ieee.org whom you would like to nominate to serve as an RRVS Officer for the 1999/2000 meeting season. Elected officer positions are Chair, Vice Chair, Treasurer, Secretary. The prospective nominee must be an IEEE member in good standing belonging to the RRVS section and 12 RRVS member signatures must accompany the nomination.

November Meeting Recap

By Don Zinger

The November meeting of the IEEE Rock River Valley Section, held annually in the Engineering building at the NIU Campus, began with a wonderful meal supplied by Yen Ching of DeKalb. The approximately 45 people in attendance then settled down to hear the main speaker, Thomas M. Jahns.

Tom Jahns is currently a professor at University of Wisconsin. He arrived at the Madison campus after 15 years of working at GE Corporate R&D and a 2-year research sabbatical at MIT. As a past president and current distinguished lecturer of the IEEE Power Electronics Society, he is

well known in the field of power electronics. His current research is in the field of electrical power systems which was the subject of his presentation entitled, "Are the days of the 12 V Automotive Electrical System Numbered."

In his presentation he discussed the limitations of the current 12 V electrical systems. Not only will the sheer size of future loads be a problem, but the complexity of the loads will also make changes in the automotive power system necessary. With future options, loads are expected to increase to over 2000 watts from today's average of only about 800 watts. If the voltage remains constant this increase in power would cause an increase in current and therefore an increase in the size and weight of conductors. A voltage of 42 volts is suggested as a compromise between safety and conductor size.

As the number of loads increases so does the size and complexity of the power system. With the increased complexity the current point-to-point wiring system would become impractical. To clean up the wiring problems future vehicles will have a multiple bus system, a control bus as well as the power bus.

Future loads under consideration are new lighting systems, electrically assisted breaks and steering, and the use of electrically operated valves as opposed to current cam driven systems. This last one would add a new dimension to the control of the motor. Tom Jahns also discussed the possibility of using the same machine for starting the motor as for generating power. With the increased loads the torque requirements of the generator start coming more in line with that of the starter making the system more

practical.

The presentation by Dr. Jahns was very interesting and appreciated by all who attended. It made for a pleasant and informative evening for everyone.

Submissions to *Event Sense*

Send articles and job ads to the *Event Sense* editor, Bob Parro, via e-mail (preferred), or fax. Job ads will run for two consecutive months. Contact the *Event Sense* editor if the ad needs to run longer. Please make submissions by the twenty-fifth of the month. All submissions are subject to editing for style, clarity, and space considerations.

e-mail: b.parro@ieee.org
fax: (815) 394-2497

RRVS Executive Committee

(l-r) **standing:** Larry Wachowiak, Treasurer; Hassan Mansir, IAS Chapter Chair; Don Zinger, NIU Student Branch Counselor; Matt Zimmer, Secretary and IAS Chapter Vice Chair; Roger Caruana, Education and Technical Activities Chair; **seated:** Caio Ferreira, Past Section Chair and current IAS Chapters' Department Chair, Bob Parro, Section Chair; Bill Barber, Section Vice Chair and Membership Chair; Jim Buerosse, PELS Chapter Chair; Paul Peterson, Joint Computer/Control Systems Chapter Chair and Awards Chair

The Rock River Valley Section would like to give recognition to the following area companies and university for supporting Section Officers:

Sundstrand Corporation • William Barber & Associates • Northern Illinois University

Rock River Valley Section of the IEEE 1998-1999

[W W W : www.ieee.org/regional/section/rock_river/]

Elected Executive Committee

| | | | |
|------------|-----------------|----------------------|----------------|
| Chair | Bob Parro | b.parro@ieee.org | (815) 394-2947 |
| Vice-Chair | | | |
| Secretary | Matt Zimmer | m.zimmer@ieee.org | (815) 394-3456 |
| Treasurer | Larry Wachowiak | l.wachowiak@ieee.org | (815) 394-5676 |

Appointed Executive Committee Chairs

| | | | |
|------------------------------|----------------|------------------------|----------------|
| IAS Chapter Chair | Jim Buerosse | j.buerosse@ieee.org | (815) 226-6078 |
| IAS Chptr. Vice Chair | Matt Zimmer | m.zimmer@ieee.org | (815) 226-3456 |
| Comp/CS Chapter Chair | Paul Peterson | paul.peterson@ieee.org | (815) 226-2584 |
| PELS Chapter Chair | Vietson Nguyen | aaejvn@snds.com | (815) 394-3230 |
| Educational Activities | | | |
| Technical Activities | | | |
| Membership | Bill Barber | b.barber@ieee.org | (815) 235-4110 |
| Awards | Paul Peterson | paul.peterson@ieee.org | (815) 226-2584 |
| Publicity, Newsletter Editor | Bob Parro | b.parro@ieee.org | (815) 394-2947 |
| Nominations | | | |

Northern Illinois University - Student Branch Officers

| | | | |
|------------------|------------------|-------------------|----------------|
| St Br Counselor | Prof. Don Zinger | d.zinger@ieee.org | (815) 753-0540 |
| St Br Chair | Jamie Phillips | | |
| St Br Vice-Chair | Michelle Marotta | | |
| St Br Secretary | Rob Reeder | | |
| St Br Treasurer | Ryan McMillin | | |

*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*

Electronic IEEE Membership Application

An electronic on-line application is available at

www.ieee.org/join.html

Calendar

January Section Meeting **Feb 4**
Robust Power Converter Design

February Section Meeting **Feb 25**
Joint RRVS IEEE/ASME - Computing With Words presented by Prof Lotfi A. Zadeh, the "Father of Fuzzy Logic"

Time-Sensitive Material

Inside This Issue

| | |
|--|---|
| - January Section Meeting Notice | 1 |
| - Chicago/Rockford Consultants Network Meeting | 2 |
| - RRVS Officer Nominations Being Accepted | 2 |
| - November Meeting Recap | 2 |
| - RRVS Website & Officer Contact Information | 3 |
| - Calendar | 4 |