
October 2002

Rock River Valley Section

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Event

Sense

The Institute of Electrical and Electronic Engineers, Inc.

Computer/Control Systems, IAS Chapters Meeting

Programmable Logic Controllers for Multi-Axis Machine-Tool

When October 24, 2002

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 Presentation

Program

The control unit in a machine tool plays a big role in the operation, function, reliability, and accuracy of the machine tool performance. The lecturer describes the changes in the machine tool technology since the PLC was first used as a control unit in machine tools. The history and the advantage of the PLC will be reviewed. High-Level control functions such as PID (Proportional Integral Derivative), which is used in analog I/O modules, and the networking capabilities will be described. The lecturer will explain one of his projects, converting an analog control unit to the PLC controller.

PLC

There will be some demonstration of the PLC controllers.

Speaker Joe Etminan is a professor of EET at Rock Valley College, and member of the RRVS Executive Committee. He received his B.S. degree in EET, MS degree in IT from Alabama A&M University, and recently he earned his second MS degree in EE from NIU. RVC students under his guidance have received several national awards in robotics including the first place award in the SME National Robotics Contest. While teaching at RVC, he has worked concurrently as a consultant Engineer at Dixon Automatic Tool Company. His work include research, design, and development of PLC controller and motion control systems for multi-axis machine tools.

Door Prizes

Sponsored by RRVS.

Meal/Reservations

There will be meat, vegetarian selections for meal choices.

Please reserve your space and/or dinner selection by **calling Ginger at 815-394-5696 or sending an email (ginger.spinasant@hs.utc.com) by Monday, October 21, at noon.** Please include the following information: your name, phone number, email address, and IEEE member number. Dinner is \$2 for student members, \$5 for members, \$13 for non-members.

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.

September Meeting Recap

Tokyo Institute of Technology's Professor Hirofumi Akagi spoke about Power Electronics for Improving Power Quality. Of interest was the way Prof. Akagi tied the technology to the practical product applications in industry – for example, the popular 210 to 280 km/hour Shinkansen express-train system from Osaka to Tokyo uses many large induction motors with high-power power-electronics drives. Although these motors are in the megawatt-size, the power electronics circuits have been successfully arranged so that the power quality at the AC input side is very high and the cost of energy for each passenger for the 515 km trip is estimated to be only about 200 Japanese yen (less than 2 US dollars) which has allowed this form of transportation to become widely used. Other uses of this technology are in home appliances, electric vehicles and utilities.

From a technology standpoint, Professor Akagi presented a novel harmonics elimination method using a transformerless power electronics circuit to obtain unity power factor in a medium voltage high power ac/dc rectifier system. In this approach, an LC resonant network and an active switching circuit are utilized resulting in lower weight and size than in the conventional approach utilizing the transformers. Also discussed was the second generation of a power device called IEGT (Injection Enhanced Gate Transistor by Toshiba, Japan) rated at 4.5 kV and 1200 A dc current with 3 kA in 1 ms surge capability. These devices are currently used in a high power (21 MVA) static var compensator and resulted in a 33% reduction in size compared to the previous designs using classic GTO devices.

(Above) Prof Akagi delivering his presentation to Rock River Valley Section members (Below) NIU students with Prof Akagi

Prof Don Zinger (left) and Prof Hirofumi Akagi

November Meeting Preview

Our annual joint section/student section meeting will be held at NIU's Engineering Building in DeKalb. This meeting will feature Prof Phil Krein discussing his area of specialization in power electronics on Thursday, November 21. Please consider joining us in DeKalb.

All Electronic Delivery of the RRVS Newsletter

The RRVS Newsletter is now available online. Members who would like to have a copy emailed to them, please send an email request to b.parro@ieee.org. Email notification of availability of the newsletter at the section website (see page 1, upper right corner) will be sent to all members with whom we have a valid email address on file. Please check for a valid email address.

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.

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*Messages for student officers can be left at the NIU Dept of
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***The Rock River Valley Section gratefully acknowledges the following
companies and university for supporting Section Officers:***

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Calendar

- October Section Meeting** **October 24**
 Prof Joe Entminan will provide an overview of Programmer Logic Controllers
- November Section Meeting** **November 21**
 Prof Phil Krein (U of I) will discuss Trends in Power Electronics at NIU in DeKalb

Time-Sensitive Material

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