Wilmington Section ISA
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Wilmington Section ISA

ISA–The Instrumentation, Systems, and Automation Society

Check out our web page at http://www.isa.org/community/wilmi

Wilmington ISA

IEEE/ISA Joint Section Meeting
Self-Organizing Wireless (Ad-Hoc)
Networks for Instrumentation

Presented By
Professor Chien-Chung Shen
University of Delaware

6:00 PM, Tuesday, January 25, 2005
University of Delaware, Perkins Hall in the
Gallery Room (113)
RSVP to: Mike Morkun or Matt Murphy

The Sensor

January 25th Meeting
6:00 PM at UOD

Self-Organizing Wireless (Ad-Hoc) Neworks for Instrumentation

Presented by: Professor Chien-Chung Shen University of Delaware Computer and Information Sciences Department

The advent of technology has facilitated the development of small, low power devices that combine programmable general purpose computing with multiple sensing and wireless communication capability. Composing these sensor nodes into sophisticated, ad hoc computational and communication infrastructures to form sensor networks will have significant impact on applications ranging from military situation awareness to factory process instrumentation, control, and automation. For instance, several thousand sensors are thrown from an airplane and rapidly deployed in a disaster area.

The sensors self-organize to form an ad hoc communication network to facilitate disaster relief missions. In this talk, we will describe the concepts, the software and hardware components, and current and potential applications of wireless ad hoc sensor networks, giving a timely picture of progress and developments for practicing engineers.

FUTURE EVENTS

Feb 22nd - ISA CAP Program Presentation by Nick Sands

March 22nd - Cyber Security by Tom Good, DuPont

April 26th - Annual Shrimp Boil at ACE

May 24th - Section Meeting

June 28th - Picnic

Bio: Professor Chien-Chung Shen

Professor Shen is an Assistant Professor at the University of Delaware in the Department of Computer and Information Sciences. His teaching activities include courses on Operating Systems, Wireless Networks and Mobile Computing, Computer Networks and Distributed Computing.

Professor Shen is head of the DEGAS (pronounced duh-GAH) networking group, which stands for Distributed, EnerGy conscious, Ad hoc and Space networking group. They are part of the Computer and Information Sciences research facility at University of Delaware located in Newark, Delaware.

Their current projects are funded by ARL/CTA and NSF and are currently investigating an integrated solution space for the problems of ad hoc networking using Swarm Intelligence.

They also work on the use of directional antenna in improving routing metrics in ad hoc networks. In previous projects, they have worked on problems such as ad hoc space networks and routing issues in such systems.

Sandwiches and drinks provided by IEEE/ISA will be served at 6:00 PM
Presentation to start at 6:30 PM

Location:

University of Delaware, Perkins Hall, in the Gallery Room.

(John A. Perkins Student Center is on Academy Street, between Lovett Avenue & Courtney Street, Newark. Gallery Room is Room 113.)

Maps and Campus directions available at University of Delaware website, www.udel.edu.

RSVP: Matt Murphy –

matthew.f.murphy@usa.dupont.com

Scholarship update:

Our Scholarship committee is working with the University of Delaware to finalize the criteria for the Dan Roarty Memorial Scholarship. The committee has decided to award $2,000 for the scholarship that will be split equally between The College of Engineering and Engineering Technology Department. Our goal is to work with the University for a 2005 award.

2004 Wilmington ISA Show
November 11th at the
Holiday Inn Select-*Wilmington*

The biannual Exhibit and Technical Seminars was held at the Holiday Inn Select on November 11. WISA did not forget our vetrans either: every person attending the show was given an American flag pin to wear. The show was sucessful, but smaller than in past years. The show brought together 31 vendors and 102 interested users and consumers of instrumentation, control systems, and related equipement and services. There were 4 excellent technical seminars; Network Security by Anthony Morrone of eDMZ Security, Batch Control by Al Rogers of Applied Control Engineering, RFID by Rich Ungerbuehler of XCS Corp., and S95 Enterprise Connections by Ray Walker of Dupont.

Many thanks to our presenters. New this year was a co-sponsored ISA training class EC505, Safety Instrumented Systems: The Must Know for Implementation. We had 5 students for the course. Financially the show was close to even, bringing in $706, a little below our goal.

Thanks to the Wilmington Section volunteers that made the show possible:

Joe Baker, Bill Balascio, George Bentinck, Larry Brown, Shawn Coughlan, Bob Crowder, Ted Furst, P.C. Gopalratnam, Cullen Langford, Ken Lawrence, Vic Maggioli, Mike Morkun, Tammy Mukoda, Matt Murphy, Kong Nguyen, Steve Prettyman, Nick Sands, Merlynn Wegter.

President's Message
By Ken Lawrence

We had a great planning session at our WISA Committee meeting in December. Besides toasting in the New Year, we actually got some work done and worked toward what we hope will be an interesting series of meetings and topics leading to our Annual Picnic in June.

We are starting off the year with our January joint meeting with IEEE. With all the turmoil and disasters going on in our world today, self-organizing wireless instrumentation that can be rapidly deployed for disaster relief sounds like an interesting and timely topic for engineers.

With ISA producing more certification programs to help engineers advance and grow in their careers, we thought it would be a good opportunity in February to have Nick Sands introduce the Section to the new ISA Certified Automation Professional (CAP) program. Nick will give an overview and discuss some of the thinking behind how CAP came about and what to expect from the program.

In March we welcome Tom Good from DuPont to give us his take on Cyber Security of Process Control Systems. We had a slight weather problem with a tornado back in September when Tom was supposed to speak to our section on this topic.

Other highlights for 2005 will be our Annual Shrimp Boil in April and Wilmington Section Picnic in June. Our May program is still to be determined.

Happy New Year!

W.L. Gore Career Fair

W.L. Gore and Associates is having a career fair on January 26, 2005. Gore began in 1958 and is best known for their Gore-Tex fabrics. They also have medical, industrial, and electronics divisions. Their fluoropolymer products provide innovative solutions throughout the industry and they have repeatedly been named among the '100 Best Companies to Work For in America'. They are looking for experienced process and quality engineers, as well as product development.

The career fair is an open house event from 3:00p.m. to 7:00p.m. at the Embassy Suites in Newark, Delaware. All are welcome to bring their resumes or just come to learn about Gore, and the Gore culture.

Embassy Suites/Newark
654 South College Avenue
Newark, DE 19711

FROM POINTS NORTH OF DE: take I-95 South towards Delaware. Continue on I-95 to Exit 1, Route 896 North, Newark, Delaware. Be sure to take the exit toward the University of Delaware, not Middletown. Continue north on Route 896 (South College Avenue). At the fourth (4th) traffic light, make a U-turn. The Embassy Suites will be on your right, just before the next light.
FROM POINTS SOUTH: Take I-95 North through the Fort McHenry Tunnel. Continue on I-95 North through the Delaware Toll Booth ($2 toll). Continue on I-95 to Exit 1, Route 896 North, Newark, Delaware. Be sure to take the exit toward the University of Delaware, not Middletown. Continue North on Route 896 (South College Avenue). At the fourth (4th) traffic light, make a U-turn. The Embassy Suites will be on your right, attached to TGI Fridays and next to the Sleep Inn.

1001 Things to Know About Temperature Control - BBB (Borrow)

Advanced Temperature Control by Gregory McMillian Reviewed by Nick Sands

Take 800 pages of detailed advice on temperature control based on years of practical experience and compress it into 160 pages to get Advanced Temperature Control, by Greg McMillan. McMillan is an ISA fellow, a former "Control Engineer of the Year", one of the first inductees in to the "Process Control Hall of Fame", an affiliate professor at Washington University in St. Louis, and because he shares his 33 years of experience at Monsanto and Solutia, one of ISA's most prolific authors. There is no doubt that McMillan knows his stuff, but it can challenging to follow in this compressed format (which may be the structure of ISA's ILM series) The title is apt: this is no introduction to temperature control. There are no basics in this book, but rather the details that even experienced engineers may not know.

The book starts with a few opening words and dives into a very detailed discussion on measurement error. McMillan gives the explanations and equations for errors due to conduction, radiation, dynamics, process velocity, sensor, nonlinearity, decalibration, insulation, and leadwires. After reading the details on all these errors its hard to trust any temperature reading.

After measurement, the focus shifts to control. Practical open and close loop tuning methods are covered.

Because controller gains are rate dependent in many temperature loops, there can be significant benefits from the application of auto-tuners or fuzzy logic controllers. A key message is that almost all temperature control loops are tuned with excess reset and insufficient gain and derivative. Further analysis provides general relationships of tuning constants to process dynamics. The benefits of standard control strategies such as cascade control and ratio control are evaluated against the challenges of temperature loops. There is also a brief section on model based temperature control.

The second half of the book examines temperature control for specific process equipment, albeit in a general cases. This is where the brevity of the book can mean the reader is left to work out the missing steps in the discussions. On exchanger control there are suggestions on stability and design as well as the impact of typical strategies on dynamics. The chapter on reactors deals mainly with jacketed CSTRs, highlighting the need for cascade control and considerations for split range controllers. Distillation column temperature control, a topic that fills volumes, is covered in one condensed chapter. There is only room for general advice and considerations. But the final chapter on all other process equipment is even more compressed. Seven different processes are mentioned in one paragraph.

While any book by Greg McMillan is worth reading and a good addition to a control library, this book is not at the top of the list.

There are equations that allow a control engineer to quickly assess errors and exchanger performance capability and a collection of temperature control tips and fact like no other. It can be a challenge to understand or even accepts all of the statements since in this brief format there is not room to develop or prove some concepts, only to list them. There are several appendices that further develop the equations and a thorough set of exercise questions. Advanced Temperature Control, available from ISA for $45 (member price), is worth reading and rated a borrow (BBB).