



ECE Department News

Volume 1, Issue 1

October, 2011

Letter from the Chair

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This new school year brings many changes and challenges, not the least of which is a new organizational structure for St. Cloud State. We are joining with four other departments to form the School of Computing, Engineering and the Environment. The goal is to build on commonalities in programs and courses to better serve our students and industry in Minnesota. The new school brings challenges in developing our identity, but also new opportunities for collaboration among faculty in both research and curriculum.

We also start the new school year with a new focus on un-

dergraduate education. We are working on new curriculum through this year with an emphasis on hands-on learning and the soft skills engineers need to succeed. We will also work to create a common first year with many of the programs in the new school, giving students an opportunity to decide between several programs of study after their first year.

With the funding of the new ISELF building on campus, we are looking forward to a new, multi-disciplinary Senior Design lab, allowing us to incorporate multiple engineering and scientific disciplines into

the senior capstone project. This new space will allow us to quickly reconfigure space for new corporate-sponsored projects, and bring various other science and engineering students to the projects

Our faculty are seeing changes as well. Dr. Aiping Yao has been promoted to full Professor, and Dr. Mahbub Hossain has introduced a new power sequence that he has designed, which is very popular with the students.

Mark C. Petzold, Chair

About the Department

- 45 Graduates last year
- 255 total students in the two programs
- 7 labs devoted to undergraduate education
- Founded in 1983 with the Electrical Engineering program
- Computer Engineering added in 2001

Emerson Equipment Donation

Emerson Process Management Rosemount has donated a mesh network setup consisting of their Smart Wireless Gateway and wireless temperature, pressure, and level sensors. The gift will allow our students to do senior design projects using the mesh network, as well as explore and understand the workings of a

mesh network in the classroom.

“Over the years we have had many St. Cloud State graduates who contribute to making our products better and Rosemount a stronger company. Our donation of wireless measurement equipment is part of our on-going commit-

ment to work closely with the engineering departments to ensure a continuous flow of top caliber graduates into the future.” says Bob Karschnia, Vice President of Wireless Rosemount, Inc.

We certainly appreciate this substantial gift and their support for our students.

ST. CLOUD STATE UNIVERSITY

Ripley Rendezvous

Two senior design students, Patrick Notch and Nick Friebel, accompanied Dr. Petzold to the Boy Scout Ripley Rendezvous at Camp Ripley. The Ripley Rendezvous is a major summer Scouting event where over 3,500 Boy Scouts and their leaders get together for camping, demonstrations, and fun.



Senior Electrical Engineering Student Patrick Notch shows the parts of a robotic vehicle to Boy Scouts at the Ripley Rendezvous

Patrick, Nick, and Dr. Petzold demonstrated some robots and robotic concepts to the scouts as they came through. While they didn't talk to all 3,500 Scouts, they did demonstrate their robots to several hundred

of the boys in support of the new Robotics Merit Badge.

Patrick Notch and Nick Friebel are currently finishing their Senior Design project, an autonomous robot for measuring river ice thickness. They are working with Alex Eha, an Electrical Engineering student, and Patrick Hancock and Eli McElwain, both Mechanical Engineering students.

Society of Women Engineers

The Society of Women Engineers at St. Cloud State University is involved in a lot of activities both on and off campus. One of our most important events through the school year is the Horizons Conference. This conference invites middle-school girls from area schools to spend a day on campus understanding and enjoying the field of sciences and engineering. There are a variety of workshops hosted by different departments on campus, keynote speakers

and a fun engineering project as part of the conference.

The chapter has also been a part of SWE's

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Regional Conference for many years now. This has been great as it gives us the opportunity to showcase our chapter and SCSU at a regional level. We were also involved in the planning and participation of SCSU at the first National Science and Engineering Festival hosted in Washington DC in Fall of 2010.

IEEE Student Section

At SCSU, the IEEE chapter is run completely by students. Last year, we had about 20 regular attendees at our meetings. Among these attendees, four (4) sophomores worked on a LED display project, with the help of upper class students. The project that used 140 LEDs was a success as it created more interest and a better visibility for IEEE when displayed during the Open House. The members decided to take it to the next level

and make it bigger using 3100 LEDs. The IEEE officers offered a soldering tutorial to allow more members to be involved in the project.

Besides this technical activity, IEEE has organized a Jamboree on March 20th, inviting four (4) professional Engineers from different companies to talk about their jobs and give tips. There was a good turnout: about 30 students attended and had

the opportunity to network with the engineers.

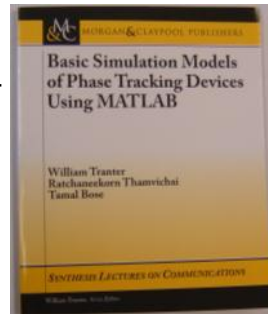
IEEE members also volunteered to help out at the Open House and during the Horizons Conference organized by SWE.

Dr. Yi Zheng

Dr. Zheng's research activities involve developments of electronic devices and embedded system applications using sensors, signal processing, microcontrollers, FPGAs, and software with students. He has joined with Dr. Aiping Yao in the development of Shear Wave Ultrasound Vibrometry (SDUV) at the Mayo Clinic for non-invasive quantitative measurement of tissue elasticity and viscosity for livers, myocardium and arteries. He has also worked with his students and to develop high speed backplanes that operate beyond 10 Gbps with Mr. Joel Goergen, now a Distinguished Engineer with Cisco Systems.

Dr. Kay Thamvichai

Dr. Thamvichai has published a book with Drs. William Tranter and Tamal Bose of Virginia Tech. The book, "Basic Simulation Models of Phase Tracking Devices Using MATLAB" is part of the Synthesis Lectures on Communications series. Dr. Thamvichai was a Visiting Research Professor at Virginia Tech from January of 2009 to July of 2010.



Dr. Mahbub Hossain

Dr. Hossain has developed a new sequence in power engineering at the senior level. The two courses, "Power Systems and Electric Machines" and "Power Electronics" have proven to be quite popular with students.

In support of this sequence, Dr. Hossain has been working on two grants in collaboration with other institutions nationwide. If awarded, these grants should provide opportunities for our students in this growing area.

Last Year's Senior Design Projects

Students spend two semesters working on their Senior Design projects from the proposal phase to finished prototype. Students work in groups of 2 to 3 students. The senior design projects finished in the last school year are:

- Organic Semiconductors
- Autonomous Following Vehicle with Obstacle Avoidance
- Dynamometer Modernization
- Unmanned Aerial Vehicle
- Solar Powered Wireless Mailbox
- 3-D LED Display Cube
- Solar Powered Pontoon Boat
- Autonomous Infrared Tracking Camera
- Omnidirectional Vehicle with GPS Tracking Capability
- Robotic Painting System
- CAN Data Logger
- Wireless Vital Sign Monitoring System
- Solar Tracker and Residential Grid
- Remote Home Control System
- Environmental Monitoring Device

Electrical And Computer Engineering Department Faculty

Dr. Mike Glazos
Specialty: Control Systems

Dr. Kay Thamvichai
Specialty: Digital Signal Processing

Dr. Ling Hou
Specialty: Control Systems

Dr. Aiping Yao
Specialty: Digital Communications, Wireless Communication, Digital Signal Processing, Ultrasound

Dr. Mahbub Hossain
Specialty: Integrated Circuit Design, Semiconductor Device Modeling and Characterization

Dr. Tim Vogt
Specialty: I.C. design, magnetic memories, solid state devices

Dr. Yi Zheng
Specialty: Embedded system design and applications, EM and ultrasound sensors, EMC/EMI and signal integrity, signal processing, ultrasound, and wave propagation.

Dr. Mark Petzold
Specialty: Wireless Communication, Signal Processing, MATLAB

**Electrical &
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Supporting students is our number one goal and we owe it to them to provide the resources necessary if we want to continue to be at the forefront of applied research in the state and region. The cost of providing these real world opportunities continues to rise. With your generosity and support we will be able to recruit and retain our students with scholarship assistance, we will give them enhanced experiences on the most up to date technology and instrumentation and we will be able to assist them in guiding and presenting their research through student professional development funds. Please consider helping our students with your gift today!

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