



# ELECTRICAL AND COMPUTER ENGINEERING SENIOR DESIGN DAY

Friday, April 27, 2007



**Electrical and Computer Engineering Department  
The University of Connecticut**

[www.ee.uconn.edu/SeniorDesign](http://www.ee.uconn.edu/SeniorDesign)

<b>Schedule</b>	
2:00 – 3:20	<b>Project Demonstrations (ITE C19 and ITE C43)</b>
3:30 – 7:30	<b>Oral Presentations (ITE 125)</b>
3:30 – 3:40	<b>Welcoming Remarks (Rajeev Bansal)</b>
3:40 – 4:00	<p><b>Remote Controlled Scoreboard</b>            Scott Hardison (EE), Jared Holtman (EE), Garret Mayhew (EE)            It is our aim to improve the electronic score keeping process by creating a remote controlled scoreboard that will allow for portable, multi-sport use. Our scoreboard eliminates the need to stand next to the scoreboard and manually change the score. Instead, one can push a button on the infrared universal remote control and update the score. Our scoreboard uses a variety of microcontrollers and TTL circuitry. The display uses high intensity LEDs for optimal visibility and durability.            Sponsor: ECE    Advisor: Q. Zhu (ECE)</p>
4:00 – 4:20	<p><b>High-Speed Digitizing Data Acquisition Board</b>            Joseph Cheng (EE), Khathoon Haffees (EE), Stephen Surace (CMPE)            Our project is to create a high-speed single channel data acquisition (DAQ) board that efficiently and cost-effectively obtains data in a similar manner to an oscilloscope, but with a user interface on a PC. A DAQ board is suitable for many applications in both laboratory and industrial settings. The information obtained can be transferred easily and efficiently due to its direct connectivity to the PC. Our data acquisition system occupies one PCI expansion slot in the PC, and uses an analog to digital converter together with a PC interface to control its actions.            Sponsor: ECE    Advisor: Q. Zhu (ECE)</p>
4:20 – 4:40	<p><b>A Speech Control System for Persons with Disabilities</b>            Danny Ho (EE), Kevin Tyler (EE), Vimal Vacchani (EE)            Our goal is to provide a PC-based speech recognition solution to facilitate the control of household devices for persons with physical disabilities. Some persons with disabilities may be lacking in mobility or fine-motor hand control, preventing them from controlling typical household devices (e.g., remote control for TV, light switch, etc.). Our goal is to implement a simple control system that offers these persons some control over common appliances/devices. This strategy would be useful for lessening the burden for persons with physical disabilities.            Sponsor: ECE    Advisor: M. Tehranipoor (ECE)</p>
4:40 – 5:00	<p><b>Improved Testing/Processing</b>            Michael Kelley (EE), Benjamin Romeo (EE), Jeffrey Travis (EE)            Phonon Corp. currently uses a Solitec track system to complete the beginning stages of their photolithography process. Although this system is effective, it is getting old and replacement parts are harder to come by. It is becoming critical to find a solution that does not include buying expensive replacement parts or a replacement for the entire system. The final design uses a Programmable Logic Controller to replace the old STD Bus cards that formed the control system. This provides a robust solution that can easily be modified through software.            Sponsor: Phonon Corp.    Advisors: M. Tehranipoor (ECE)</p>
5:00 – 5:20	<p><b>UConn SolElectric Vehicle</b>            Ricardo Rhone (EE), Rui Shu (EE), Alejandro Ubaldo (EE), Michael Witik (EE)            It is evident that we need an alternate source of energy for vehicle propulsion so that we do not rely on a depleting energy source that causes great harm to our environment. As a possible solution these problems, the UConn SolElectric Vehicle is a battery powered electric vehicle that utilizes the sun's energy to recharge the batteries. The UConn SolElectric Vehicle is able to move in the forward and reverse directions and is able to increase its speed in a gradual fashion.            Sponsor: ECE    Advisor: M. Fox (ECE)</p>

<b>Schedule (cont.)</b>	
5:20 – 5:50	<b>Sandwiches &amp; Refreshments</b> ITE Lobby
5:50 – 6:10	<b>Sustainable Dwelling</b> Benjamin Fishman (EE), Gregory Giustino (EE) Paul Mott (EE) In the aftermath of natural disasters, such as hurricanes, earthquakes and tsunamis, large numbers of people are suddenly without homes. Even those who find temporary housing often do not have an intact utility infrastructure to connect to. The sustainable dwelling addresses this problem by providing an inexpensive and self-sustaining structure to victims of a disaster. The dwelling uses solar thermal and photovoltaic panels together with a radiant heating system to keep the house comfortable while requiring no external energy source. Sponsor: ECE Advisor: M. Fox (ECE)
6:10 – 6:30	<b>Wireless Sensor Network</b> John Akin (EE), Jamal Beckford (EE), Matthew Pearson (CMPE), Cameron Sprague (EE) Our group is implementing a wireless sensor network. In our system there are three wireless nodes controlled by a computer. The computer communicates to the nodes using the low power ZigBee 802.15.4 protocol. In addition to conveying video and sound information, the nodes are also mobile and can be controlled through the computer base station. The robots can also operate on standby and motion tracking mode autonomously. Sponsor: ECE Advisor: J. Chandy (ECE)
6:30 – 6:50	<b>GigE Interface Board</b> Pratibha Anand (EE), Kolawole Ladoja (CMPE), Eric Petrichenko (EE) The GigE Ethernet Board project was to create an interface between a Gigabit Ethernet RJ45 port and the SATA port of a Xilinx/Digilent XUP2VP board. The main problem is that the protocol used by the Ethernet interface is not compatible with that of the SATA interface. As such, the GigE Ethernet Board will take care of this issue while maintaining a speed of 1 Gigabit per second. The final product will be implemented in the creation of a high-speed active storage network. Sponsor: ECE Advisor: J. Chandy (ECE)
6:50 – 7:10	<b>Design of a Hairspray Manufacturing System</b> Jonathan Hsieh (EE), Diana Inthapanhya (ME), Dustin Rhodes (EE), William Royle, (ME), Joseph Rosa (ME) For our project we will demonstrate a scaled model of the final design of the minor ingredient addition part of the hairspray manufacturing system at Unilever in Clinton, CT. The model will include electrically controlled valves, a flow meter, a level sensor, and four tanks introducing selected minor liquid ingredients into the final mixture for the making of the hairspray products. All parts are electronically controlled by a microcontroller with appropriate logic codes for accurate addition and to avoid human error. A final design proposal will be provided to Unilever to complete the current idling part of the hairspray manufacturing system. Sponsor: Unilever Advisor: R. Bansal (ECE), R. Jeffers (ME)
7:10 – 7:30	<b>Electromagnetic Phantom for the Human Body</b> Enes Basic (EE), Jason Deguzis (EE), Omar English (CMPE) This project focuses on creating a medium that has electromagnetic properties similar to those of a human body. The medium must be accurate for the frequency range of 20 MHz - 3000MHz as well as stable for a significant period of time. Also, the operating code for a previously developed automated antenna test system will be modified using Visual BASIC. Modifications include automatic graph creation after taking a measurement and a way to easily compare the phantom test results with the human test results. The final medium will be tested using this updated automated testing system at MegaWave Corporation, the sponsor of this project. Sponsor: MegaWave Advisor: R. Bansal (ECE)

## **You're Invited**

The Electrical and Computer Engineering Department would like to invite you to the Spring 2007 Senior Design day to be held at the University of Connecticut on Friday, April 27, 2007, from 2:00 PM to 7:30 PM.

You will have the opportunity to tour the Senior Design Lab, view presentations of projects completed by the graduating seniors, and view presentations by all Senior Design students.

## **Directions**

Directions: Interstate 84 to Exit 68. Route 195 south. Descend hill into University of Connecticut and follow the signs to South Garage. *[Take the first right after mirror lake (Mansfield road). Take the second left (Gilbert Road). At the end of Gilbert Road turn right onto Hillside Road. Parking is available in South Garage, on your left.]* From South Garage, take a left onto Hillside Road and a right onto Fairfield Way. The Information Technologies Engineering (ITE) Building is the second building on the right of Fairfield Way, located between the School of Business and the Library. Please contact Prof. Rajeev Bansal at (860) 486-2878 if you have questions.

## **About ECE Senior Design**

Computer and Electrical Engineering Design I and II is a two semester design sequence (ECE/CSE 290 and ECE/CSE 291) taken by all senior Computer Engineering and Electrical Engineering students at the University of Connecticut.

The course objective is to provide an opportunity for students to apply their engineering knowledge to solve open-ended design problems using a multidisciplinary team approach.

Students work in teams of three or more students. Each team is multidisciplinary in nature. This is normally accomplished by including students from different programs (EE, CMPE, and ME). In some cases, all participants on a particular team may be from the same program. In such a case, team members are chosen such that the members have different concentrations, expertise, or strengths.

## **Thanks to Our Sponsors**

MegaWave Corp., Phonon Corp., Unilever

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