

Preliminary Schedule

CS 851 – Fall 2001

## Large Scale Deeply Embedded Networks

Directed by: [Jack Stankovic](#), [Sang Son](#), [Tarek Abdelzaher](#), and [Chenyang Lu](#)

Time: Monday & Wednesday 10-11:15

Place: Olsson Hall 228E

URL: <http://www.cs.virginia.edu/~cl7v/cs851.htm>

Dense collections of smart sensors, processors, and actuators, networked to form self-configuring teams provide a basis for a new computing paradigm that challenges many classical approaches to distributed computing. For example, consensus, group membership, approaches to dependability, networking, real-time service, and control algorithms all fundamentally change when confronted with this new environment. This seminar will study a large number of research papers that deal with various aspects of smart sensor/processor/actuator networks. Students will present papers, contribute to discussion, and perform a project either on a network of [motes](#) (tiny devices consisting of sensors, radio (wireless) transmission, and processing power) or on a sensor network simulator called [sensorsim](#).

Prerequisites: Graduate student status, background in operating systems and computer networks is desirable.

Enrollment: A maximum number of 20 students may enroll in this class due to space limitations. Enrollment is under the permissions of the instructors only.

### Outline of Course

- I. Introduction (2 lectures)  
Motivation; applications; types of systems to be investigated; objectives and logistics of the course; introductory vision papers
- II. TinyOS and Motes (2 lectures)  
The hardware, TinyOS, programming environments, and source code of the mote testbed
- III. SensorSim: Sensor Network Simulation (1 lecture)
- IV. Location Service (3 lectures)
- V. Ad hoc Wireless Sensor Networks: MAC, Addressing, and Routing (4 lectures)
- VI. Project pre-proposals (2 lectures)
- VII. Group Management and Consensus (4 lectures)
- VIII. Real-time and Stream Data Management (3 lectures)
- IX. Tentative: Control Theory in Computer Systems (3 lectures)  
Background (tutorial) and methodology; Decentralized control; Integration with middleware
- X. Project Presentations (4 lectures)