Day 2 – Wednesday, November 24

Morning

09:00

Lecture: "Making Sense of Sensors"

Lecturer: [Andries Stam](), [Almende](), The Netherlands

10:30

Lecture: "Low-Power Wireless Links"

- The challenges of low-power communication
- The vagaries of low-power connectivity: path loss, fading, shadowing
- Multihop communication
- Coverage and connectivity

Afternoon

Hands-on Tutorial: "*More Steps in TinyOS*"

Getting the mote to send and receive radio packets

- Getting feedback from the mote
- Reading packets from a mote (serial communication)

Hands-on Session: "*Understanding Wireless Propagation with TinyOS*"

You will be provided with a piece of code that enables a mote to transmit or receive radio packets, measure the signal strength of received packets, and send the signal strength measurements to the serial port. The code will be thoroughly illustrated by the instructor. Because debugging is probably the most challenging aspect of sensor network programming, the code will have a few bugs. Your tasks include:

- First, find and fix the bugs! (The time allotted for this activity will be limited -- if you cannot find the bugs, your instructor will graciously tell you where they are after the end of the allotted bug-finding time)

- Program your nodes with the bug-free code (one designated transmitter and multiple receivers)

- Collect signal strength data in the room with various transmitter/receiver positions (bring a measuring tape to measure the inter-node distance)

- Process your data to show how received signal strength relates back to inter-node distance

- Repeat your measurements in the presence of obstacles (e.g., a human body or a chair) in between nodes, and process your data to quantify the impact of such obstacles (shadowing)