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CPRE 546

Final Project

**Goal:**

We wish to be able to tell the speed of wavelengths through a material by finding out what material is between 2 motes. We have 4 material which is can be: Ceramic, wood , Foam or Metal

**Design:**

#### Temperature inside testing chamber : 76 Degrees Fahrenheit

**Files Description:**

**Sender.c –**  The File responsible that loops through power levels and blindly sends radio transitions , does not receive in any manner

**Receiver.c –**  receives radio transitions and figures out what power level it is receiving on, after the power is found it calls functions in lookup.h to figure out what the material is

**Lookup.h -**  The file where all of the data we collected in the collection phase is stored, also has the function to figure out what values the current received transitions most closely matches

**Set Up/Collection/Testing :**

This project is a continuation of programming project #2. We have created three different programs ( along with other files) to achieve our goal: The first one makes the mote loop through the power levels and send messages out, the second receives the messages and process the data, and the last is the data processing function which goes through our lookup table and display what material It is going through at the current moment along with the likelihood of the other material.

We started out testing by placing 2 motes a foot apart in the Testequity faraday cage located in cover. Then we placed a material between the 2 motes and made sure it fit snuggly into the center to ensure that all the radio transition had to go through the material. We then looped through all of the power levels and collected the RSSI values for each material. Once all of the data is collected from the receiver we would put the averaged RSSI values into our lookup table.

In Testing to find the material the receiver node first reicieves the broadcast from the sender motes, then it figures out the tx level, which is used to query the RSSI values. Once the closest material of stored rssi is found to the received RSSI we can determine the likely of material. The program then will display the likelihood of the current material is.

**Observations:**

**Results:**

ERROR – 404 – Results Not Found