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ECE 387

16 February 2017

Midterm Project Proposal

**Project:**

I am planning to use a GPS module to deliver current coordinates as well as point to the location of user specified coordinates. Target coordinates will be input via a keypad. Data and directional display will be shown via LCD panel. I may include a magnetometer and accelerometer so basic orienteering data can still be given without a GPS signal.

**Components:**

Processor: ATmega2560 on an Arduino Mega 2560 R3 board

I chose the Arduino Mega because it is one of the few microcontrollers in its price bracket with enough pins to accommodate the amount of I/O my system requires.

GPS Module: USGlobalSat EM-506

This is a 48 channel GPS receiver that can be equipped with a high power antenna at the user’s discretion. The fact that this receiver will still work without a more powerful external antenna is ideal since power is limited in my desired application.

Other Sensors (Optional): STMicroelectronics LSM9DS1

This is a sensor module that contains a magnetometer, accelerometer, and gyroscope. Each is these sensors draws a relatively small amount of power and they could give a lot of useful information for navigation even in the absence of a GPS receiver.

**Deliverables:**

* Show current GPS coordinates
* Have display point to a different set of GPS coordinates
* Display current heading and speed
* Allow the user to input new Coordinates

**Timetable (Tentative):**

26 Feb – Have the parts assembled on a breadboard with input functioning for all sensors

5 Mar – Have code functioning well enough for a preliminary demo

12 Mar – Have the GitHub wiki nearly completed

16 Mar – Hard deadline for demo and wiki

**Anticipated Challenges:**

This implementation may require taking multiple serial inputs at once. The challenge will not be in gathering all the data, but rather in deciding which sets of data will take priority based on the knowledge that the accuracy of each sensor is not constant.