As a requirement of CMPE2960, CNT Capstone, we are submitting this project

proposal for consideration. After discussions with our Capstone mentor, Blank, we have decided to build a portable speedometer using an Arduino Uno with a GPS module and an LCD display.

After performing some preliminary research, we decided to use a GPS module connected to an Arduino Uno R3 to create a real-time speedometer. The GPS module runs at 10Hz, so we plan to have our LCD display update data 10 times per second. The LCD display will show the users current speed as well as the maximum speed the user has travelled. The maximum speed will be reset every time the device is shut off. The device will also have 4 LEDs that will represent the direction the user is facing. To make this device portable, we will be using a 9V battery encased in a 9V battery holder that has a 5.5mm/2.1mm plug for powering the Arduino. The whole device will be encased in a custom 3D printed case that we will design. We will be coding this project in the C programming language, as well as utilizing pre-existing Arduino libraries.

Elements of this project that require further research:

* Using the C language with an Arduino
* Wiring the Arduino with external components
* 3D printing, and how to design our own 3D objects to be printed
* Receiving data from the GPS module, and translating that data into user friendly information
* Sending the information to the LCD display as well as lighting up the appropriate LEDs

Elements of this project that are currently available to us:

* Arduino libraries available online
* C learning resources available online and in libraries
* Varied colours of LEDs
* A 3D printer as well as resources on how to create our own 3D case
* 9V batteries

Elements of this project that we need to acquire:

* An Arduino R3 Uno
* A GPS module, LCD display and 9V battery pack for an Arduino
* A protoshield for the Arduino to connect the GPS, LCD display and the LEDs

We propose the following timeline for our project:

| Week | Activity |
| --- | --- |
| 1 - Jan 9 | Project selection and initial proposal |
| 2 - Jan 16 | Receive parts and discuss final proposal with mentor |
| 3 - Jan 19 | Submit final proposal |
| 4 - Jan 30 | Have the LCD display functional with the Arduino |
| 5 - Feb 6 | Progress report 1 |
| 6- Feb 13 | Have the GPS module set up |
| X - Feb 20 | Reading Week |
| 7 - Feb 27 | Displaying data from the GPS on the LCD display |
| 8 - Mar 6 | Have LEDs functional and responding to information from the GPS |
| 9 - Mar 13 | Progress report 2 |
| 10 - Mar 20 | Have battery pack connected to Arduino and powering device |
| 11 - Mar 27 | Design for the case |
| 12 - Apr 3 | Case printed and assembled, final testing of device |
| 13 - Apr 10 | TPS report |
| 14 - Apr 17 | Technical report due |
| 15 - Apr 24 | Final presentations |