CI 103 - Team Profile

Complete the information below for your project. This will inform the instructor about how teams are organized and/or changed. Note that team membership changes are subject to final approval by the instructor.

Team

Lab section: 064

Team Number 046 (Use the same team number from CI102)

Team Members and Roles

List the full name and user ID of every member of your team. Assign initial roles that team members will play. Team members without specific roles should be assigned as "Developer".

Name	User ID	Role
Matthew Horger	Mh3294	Hardware Developer
Kevin Tayah	Kst46	Software Developer
Jake Rauch	Jrr355	Business Developer

Describe your project below (150 – 300 words):
This project will develop a modular helmet that allows users to detect blind spots, record collisions, and monitor GPS coordinates and features in order to track their rides. The helmet will be developed with an Arduino Uno processor (the heart of our modules), HC-SR04 ultrasonic modules in order to detect objects in blind spots, collision sensors to detect impacts, and a GPS breakout module; all powered by a AA rechargable batteries. The hardware portion of this project will be accompanied by a mobile app that allows users to pinpoint specific routes with detailed elevation maps using Google's JSON api's. The purpose of this app is for users, such as skaters and cyclists, to initially test inspect their desired route in order to determine the rate of elevation change in order for their riding purposes, such as workout, coasting, etc. This initial testing phase will be free for users. This project also consists of a Plone Content Management System (CMS) database in order to store locational data from the helmet / application combo. This CMS will allow for an map overlay to allow for waypoints for user location.

Describe the results of your CI102 prototype below: (Answer questions such as: did your prototype work as expected? Did your prototype influence how you will build your final product? Will you re-use your prototype or will you discard it? 150-300 words)

Our prototype worked as expected; the helmet could detect motion and alert the audience via the buzzer and our mobile application was successfully able to demonstrate hill data and other analytics. We did have a few typos in our mobile application that needed to be fixed and our helmet did not have the sensors that we expected. These limitations will be addressed in our final product in CI 103. We also were influenced by the fact that data from the Arduino was only able to be seen via USB connection. Going forward for our final product, we are striving to establish a database so that any user with a proper account can view the data without plugging in the helmet. We will re-use the prototype (as we purchased all the materials ourselves) and could use two other products supplied by the college. A GPS module for our helmet and a weatherproof case to protect the modules.

Identify the open issues and/or technology gaps related to your project: (100-300 words)

One issue is GPS connection and data exchange. For the helmet to exchange data not via USB, the Arduino needs either GSM or Wi-Fi connection to communicate with our content management system. Unfortunately, we do not have the funds to supply either the module or the service to provide such feature for our project. However, we intend to create the database and establish accounts so that if we can receive help from the college, we can close this technology gap. Another issue is reliability of the helmet. Obviously, we can't handmake our own helmet from scratch at this point. Therefore, we need some kind of case to prevent weather damage and any damages that may occur during usage. We hope to address this either by having the college suggest a potential case or we can research an appropriate case, purchase it, and duct tape it over the modules.