EE/CprE/SE 491 WEEKLY REPORT 2

9/22 – 10/7

Group number: 32

Project title: Development of a Smart Sensing System for Road Performance Data Collection

Client &/Advisor: PROSPER - Bo Yang & Halil Ceylan

Team Members/Role: Victor Guerra, Ethan Young, Michael Petersen, Shlok Singh

o **Weekly Summary:** This week and last week we worked on a timeline as a group to get ourselves a bit more organized as well as the literature review. There were contributions made with finding and comparing different parts and microcontrollers including the start of a pro-con list. We also began researching the International Road Index. There were calculations found on the IRI as well as intervals for each data sampling. There still is much more to find out with the IRI specifically with using the physical hardware components.

o **Past week accomplishments**
   - Developed a timeline and workflow for the project
   - Began hardware research and considered Raspberry Pi vs. Arduino controllers
      - We decided that Arduino's are more cost effective and are fully featured for this project
   - Began software research into IRI calculations
      - We began considering how to develop testing data for our initial software calculations
      - The IRI calculations depend on frequency of measurements; we will need readings approximately every 300mm to sufficiently calculate IRI, which correlated to a 75Hz polling rate at the standard 80km/h (49.7mph) golden car test speed

o **Pending issues**
   - There will be noise from only an accelerometer. There two solutions; a high pass filter and gyroscope.

o **Individual contributions**

NAME	Individual Contributions	Hours this week	HOURS cumulative
Victor Guerra	Group Meeting + Literature Review	4	9
Ethan Young	2 Group Meetings + Literature Review	6	11
Michael Petersen	Group Meeting + Literature Review	6	11
Shlok Singh	2 Group Meetings + Literature Review	6	10

o **Plans for the upcoming week**
- Create finalized 'Parts List' and decided microcontroller + sensors required to begin initial design
- IRI research. Specifically how the data will come out of the sensors and into the algorithm.
- Research on gyroscope vs high pass filter.

o **Summary of weekly advisor meeting**

This week we met Yueyi and discussed our literature review. She pointed out some things that we need to take in consideration including noise of the accelerometer and what the data will look like when coming out of the sensors. We considered two options for noise reduction: filtering and gyroscopes. We also discussed changing adviser expectations where we will now report more frequently to our project lead in the form of Powerpoints.