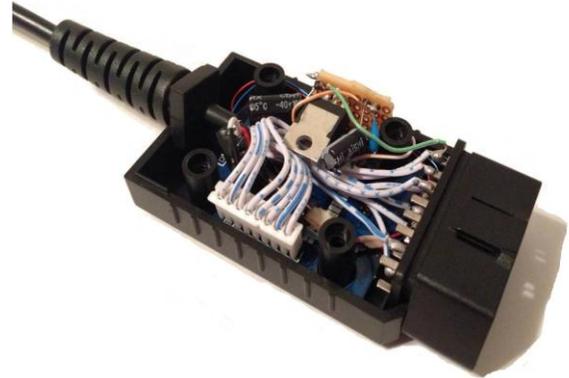
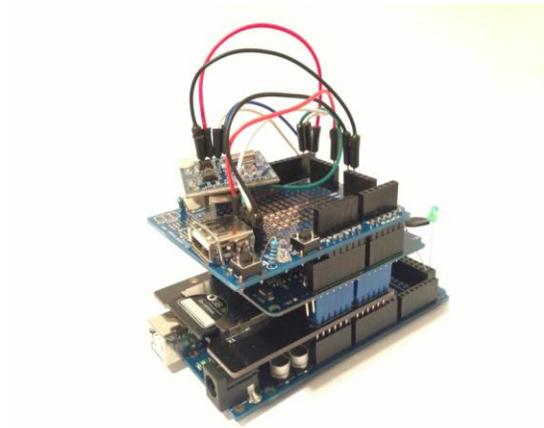


MPG: iPhone Driving Assistant

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Eric Gilbert
Jonathan Maldonado
Gregory Paton

Advisor: Prof. Gruteser



Introduction

Fossil fuel consumption and carbon dioxide pollution are two very big issues in our world today. One of the largest contributors to these problems is the driving people do every day. What people may not know is how dramatically the way that they drive affects how much fuel their vehicle consumes. By adjusting the way that you drive and performing routine maintenance on your vehicle you can save the amount of gas you use, thus reducing pollution and saving money.

Motivation

Most people don't know that they're driving style affects gas mileage. Even if they do, they may not know what changes they need to make. That is where the MPG iPhone app comes in. Using this app will help users track their gas mileage and see how their driving style affects fuel consumption. MPG allows a user to easily sync their iPhone with logged driving data to see how they've driven.

Design

The system relies on the OBD (on-board diagnostic) port on the user's vehicle, an interface required by law to be installed on all vehicles manufactured since 1996. Using an Arduino Mega microcontroller we are able to log Speed, RPM, and Mass Air Flow data from the vehicle to an SD card. The microcontroller is attached to a BLE (Bluetooth Low Energy) module that allows the data to be sent wirelessly to the iPhone. The iPhone can then process all the logged data to

compute fuel consumption. Using this computed data the app gives the user a score based on current and past performance. A user can use this as personal motivation to drive better, or use it to compete with their Facebook friends or Twitter followers.

Conclusion

One of the biggest problems with our system was timing. The OBD port takes approximately 250ms to return data. This limited the number of data points logged and likely reduced accuracy. However, calculated distance based upon speed and time was about 95% accurate. We found that this was close enough for our measurements. Also, there are many further applications, which could be possible based on the various data available over OBD. However, not all parameters are universally supported, so we decided to use values that are common to most vehicles. Overall, we feel our product can definitely help drivers be more aware of their fuel consumption and learn to drive more efficiently.