JARC – Racecar Data Acquisition System & Emulator

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Overview

By connecting an Arduino to the race car via an adapter, we will be able to compile vehicle sensor data onto a SD card. Then we will develop a data graphing software that effectively organizes all of the data and displays it in a user-friendly and easy to understand way. The telemetry system will be built using an Arduino kit and an OBD-II adapter with open source Freematics OBD-II libraries (1). To test the telemetry system and software we will also be creating an advanced car emulator composed of various switches and knobs (2).

OBD-II Emulator

The emulator simulates OBD-II data sent by vehicular sensors.

Telemetry System Hardware
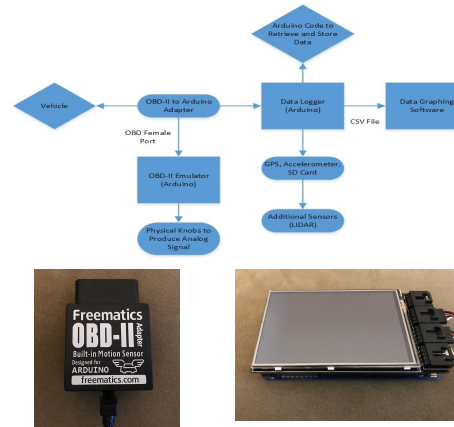
Data Graphing Software

The software graphically displays data collected by the telemetry system.

Team Organization

Chandler (EE):	Ryan (EE):
Mix of both hardware and software components.	Focus on hardware and constructing race car emulator.
Jonathan (CSE): Focus on software and creating a user friendly interface.	**Ahmad (EE):** Focus solely on hardware components.

Purpose

Modern race car telemetry systems are used professionally so the cost of these systems is not a concern such as it is to amateur racers. Entry level data loggers cost upwards of 600 dollars so we set a goal to create an affordable yet efficient data acquisition system for racecars as long as they have an OBD-II port (3). Even though this has been attempted in the past, we have also set another goal to make the software we develop user friendly since past attempts were difficult to use.

References

1. GPS/Arduino/CAN/OBD-II: https://freematics.com/products/freematics-obd-ii-uart-adapter-mk2/
2. Emulator ex:https://freematics.com/products/freematics-obd-emulator-mk2/
3. https://www.petreldata.com/product/solostorm-gps-obd-ii-and-video-logger-for-android-v2-2/ (current gold standard for amateurs)

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