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Embedded Systems

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**Statement of Work - Baylor Baja Data Acquisition**

Scope of Work

Our team will be responsible for implementing a system that will provide real-time data to the Baylor Baja Car’s team during their competition. The system will satisfy the following criteria: the data will be easily accessible, the data will be useful to the team during the testing of the car and during competition, and the system will be able to survive the stresses of the Baja competition.

In order to fulfill these criteria, the system will be composed of a public website which will display the desired data from the sensors, a way to transfer the data from the car to the website, durable sensors on the car to collect the data, and a power supply to run the embedded device (BeagleBoneBlack). The data will be stored in a database for later analysis by the Baja team. While the data is being collected, it will be displayed to the website in real time.

Some software and hardware from a previous team will be used in creating the system, however much of the software will be written in C and the NodeJS programming language to work with the BeagleBoneBlack. We plan to display the car’s speed and RPM (using Hall Effect sensors), GPS location (using a GPS), Temperature (using a temperature sensor), and acceleration (using an accelerometer) on the website. This data will be sent to the database (which the website will query) over a Wi-Fi connection (perhaps the driver’s phone hotspot) or alternatively over a cellular network.

In addition to this, work has already been started by another team to create an LCD dashboard for the Baja car. This dashboard would display the speed and RPMs of the vehicle. We will be working closely with that team and will know more details when we meet this upcoming Monday, March 19th.

Stretch Goals

If time permits, other features we would like to include in our project are listed below:

* Record and display to the website the temperature of the engine.
* Text or email alerts when unusual data is recorded (such as a sudden spike in acceleration indicating a crash).

Period of Performance

The period of performance for this project is March 13th - April 24th, 2018.

Deliverables and Schedule

The final deliverable will consist of a report, the software code developed to support the system, and the hardware used in the system. The report will detail the key design decisions, any diagrams that would help in understanding the final system, and a guide on how to use the final product.

The schedule for the project is as follows:

* Teams formed: February 27th, 2018
* Draft SOW delivered: March 13th, 2018
* SOW revisions: through March 27th 2018
* Final project delivered and presented: April 24th, 2018