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Section 502

Project Proposal

Our proposal is a Google Cardboard application that will connect to a small motorized car. The overall goal is to make the small car drive-able by using only your phone and your head. This will use the blue tooth technology in the phone to send information from the gyroscope and other sensors inside the phone to steer the car.

**System Concept**

The system is based around the premise of virtual reality. You get to see what is happening in a monitor mounted onto your head and interact with it like a game of sorts. With our project, we are applying this to a small motorized car. On the car will be a Bluetooth receiver as well as a small camera. The camera will send a feed to the phone where it will be displayed in the two eye slots that are in Google Cardboard. This will give the appearance of being on the small car as it drives around. To control the car as it drives around the motion of the users head will control both direction and speed. Tilting the head to the left and the right will steer the car in the same direction, while looking upwards increases the car’s speed and looking down slows it down. This decision was made based on the premise that the user should take off the Google Cardboard by looking down.

There are two parts to this project that will both require work and time. The building of the small car is to be done on an Arduino, while the app will need to be developed. For this project the app has been decided to only be supported on Android (it could work on other phones but won’t be guaranteed). The app will likely use Android Lollipop API to get information from the phone before sending it to the car.

The car will be made using an Arduino breadboard as well as a motor, 4 wheels, and a Bluetooth receiver. The receiver will receive input from the phone, and adjust its course accordingly. This will likely record some form of mounting on the wheels or a steering wheel-like structure to be added to the system.

Some fail safes will need to be added to protect the system a bit. If the headset is tilted too much upward, there will be an upper cap on speed based on the angle and a cutoff if the headset is lifted about say 60 degrees. This would prevent someone from resting the cardboard on their head while talking to someone and ruining the system. Moving the head downward is not particularly dangerous to the system as it slows down the car so no fail safe will be necessary downward. Maximum caps for left and rightward direction will be added, although probably not so much that donuts will not be possible (as people will probably want to do those).

**Budget/BOM:**

Google Cardboard: $14.95 <https://www.unofficialcardboard.com/products/headsets/google-cardboard-vr-headsets/>

Arduino: Already in class (We believe)

Arduino Bluetooth receiver: $9.99 <http://www.amazon.com/Baitaihem-Arduino-Wireless-Bluetooth-Receiver/dp/B00J1D6UBA>

Android Phone: Provided by Omar

4 Wheels: Provided from a Car-Building kit already owned.

**Work Plan/Responsibility:**

Josh: Josh will primarily handle the app and connecting to the Bluetooth, as well as helping with the mounting system on the small car.

Omar: Omar will primarily handle connecting the Bluetooth to the Arduino, as well as the motor and wheels, and will coordinate with Josh on the mounting system.

**Time Schedule:**

Week of 3/23: Order parts and start app initialization

Week of 3/30: Receive parts , start Arduino Bluetooth connection and wiring motor, record left/right movement in app

Week of 4/6: Begin wheel mounting work, handle upward/downward motion

Week of 4/13: Finish Wheel mounting, finish sending information to Bluetooth

Week of 4/20 onward: Testing/Improvements