Navigational Heads-Up Display

One problem drivers face is distraction from looking at their mobile device while navigating rather than watching the road. This problem can be solved with a heads-up display placed directly on the driver’s windshield. By using a mobile device with a custom GPS application, the following design will be able to send navigation information to a device that will display the navigation information on the car windshield. The design includes two primary components, a mobile device and a system unit, where the System Unit is composed of a portable power supply, a single board computer, and a display. For the final implementation, the mobile device is an android device, the portable power supply is a battery, and the display is a small projector. The design has a very strong software focus, and the main intention of the design is to produce a fully functional Android mobile application that pairs along with prototype hardware elements.

In this project, I had three specific tasks that I needed to complete. One task was to correctly display the street name, the turn direction, and the number of feet until the next direction. My second task was to configure the raspberry pi in such a way that our application was able to connect via bluetooth and startup the HUD screen when the device is powered on. This was accomplished by using the programming language Python. The main script would connect the raspberry pi to the phone via bluetooth, receive information from the phone application, and then display that information. The bluetooth configuration and program startup were both accomplished through python scripts that were configured to run on startup. The third
task was to help design the HUD box. Another team member and I spent time designing the box and then configuring the hardware so that the device would fit and function appropriately. The fourth and final task was to act as our design team’s “Team Leader”. As team leader I need to make sure we were hitting our deadlines throughout the project process. Also, my job was to handle any internal disagreements the team had on the design of the project. This gave myself the opportunity to be apart of all areas of the project and also was a great introduction to project management.