Nicholas Seifert

Individual Senior Design Contribution

My primary personal contributions to the heads-up display project were integrating the Bluetooth functionality into the android app, as well as refactoring the Python code on the Raspberry Pi that created the graphics in the heads-up display. Also, a role that I took on was assisting with design challenges where other group members were struggling. These included small code changes that configured the size of text and images in the heads-up display, as well as assisting with setting configurations for the Raspberry Pi.

In setting up the Bluetooth functionality into the Android mobile application, I was responsible for making sure that data encoded as a string in the JavaScript Object Notation (JSON) format could be successfully transmitted through an Android devices Bluetooth adapter to a Raspberry Pi. This was done programmatically through Java and involved first discovering and pairing to the Raspberry Pi through identification of the Raspberry Pi’s device name, connecting to the Raspberry Pi, and finally sending the JSON encoded string over the established connection as a byte array.

To refactor the Python code that produced the heads-up display, I took the Python code that was written by my teammates and turned it into a single Python class that could be utilizes more effectively. Initially, the code that was written by my teammates would dynamically allocate objects frequently without deleting them while the display updated with new text and images. As a result, the Python application would crash after being used for a short time. I refactored the code in such a way that limited the number of objects that were dynamically allocated, and just changed old objects that were already made instead of creating new ones constantly.