Automotive Software Engineering

By Jacob Neiheisel & Cooper Myers

High Level Description

We created a tilt-compensated compass for our term project, in order to replicate an automobiles navigation system.

Hardware Used:

- Raspberry Pi 3B+
- Inertial measurement unit with accelerometer, magnetometer, GNSS receiver, and gyroscope
- LCD display
- Button with breadboard

We read input telling us the direction and degree of rotation using our IMU. From there, we implemented the factor of tilt with a reading on our display.
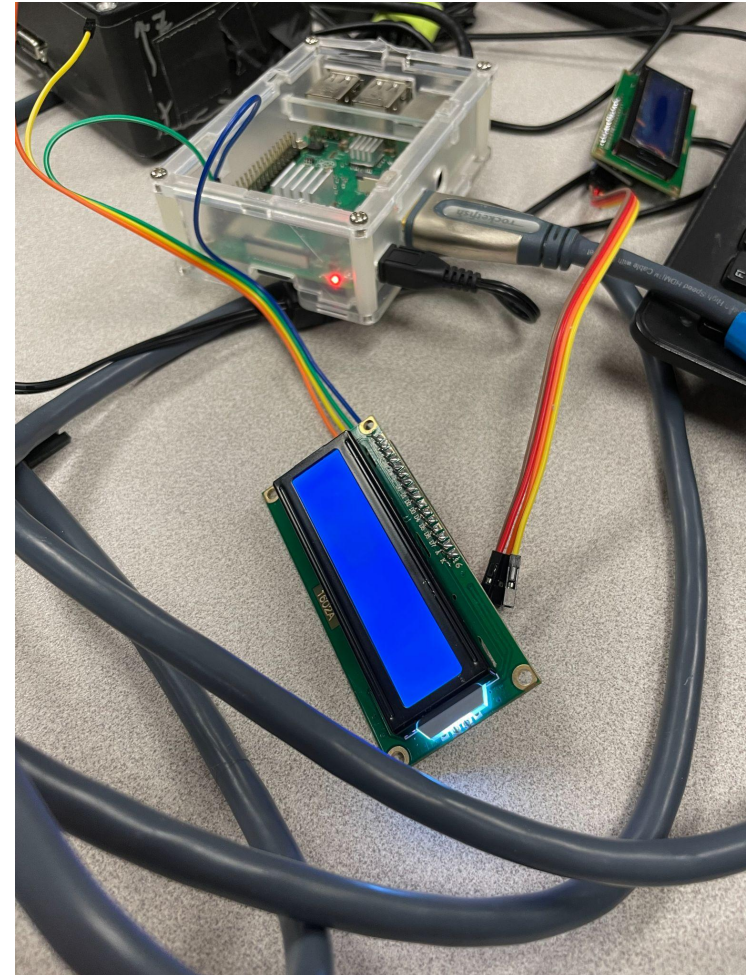
Timeline - Project Time Goals

Which tasks have we accomplished from 12/3?

Configuring our Pi
Interfacing the Pi and IMU
LCD Display/Button wiring
Button functionality within C++
Magnetometer data computed
Fully functional program
Output display all motions

New Changes

We decided to fully implement C++ rather than using Python due to make file compatibility, easier printing libraries, and overall functionality.

We are also using one LCD display rather than two seven segment displays that were envisioned, mainly because we needed more space for data, and the wiring setup did not require any soldering.

We also added a button to our design to allow for a controlled amount of use, rather than reading only ten seconds at a time.

Video Demonstration