sdmay19-21: Distributed mesh network for data collection and predictive analytics

Report 6

October 15th - October 19th

Client: Danfoss/ Radek Kornicki

Advisor: Crain Rupp

Team Members

Ryker Tharp — *Database Design* - Backend
Collin Vincent — *System Engineer* - Networking
Colton Smith — *Project Manager* - Backend
Gage Tenold — *Engagement Lead* - Frontend
Cody Lakin — *Software Developer* - Hardware Interfacing
Will Paul — *Lead Architect* - Hardware and Frontend

Summary of Progress this Report

Ryker and Colton determined that Firebase doesn't accomplish the goals of this project's database requirements, since it needs a connection to google servers to function properly. We're still working to translate messages sent through CAN, and are trying to configure the Pi's to properly connect to each other.

Pending Issues

Need realistic CAN message examples (Craig and Radek mentioned providing some)
Need a solution for forwarding messages through the network if two nodes are not within range of each other but a third device is in range of both

Plans for Upcoming Reporting Period

Figure out which of the Python libraries is most appropriate for our uses. Learn More about NumPy & Pandas - Python Data Analysis Library. Try to convert data from socketcan into a form usable for Craig's helper functions. (Cody)
Continue working with Electron, plan out how we'll build our front end with it. (Gage)
Research NodeJS ORM to fetch data from database.(Colton)
Script the databases and setup the algorithm for transferring updated information.
Complete install of Arch on a Pi and begin installing necessary libraries and python etc., work with Collin to make A bash script to automate setup (Will)

Gitlab Activity Summary

Added base pi image so every can clone to their own sd cards.
Added starting points and resources for decoding J1939 CAN BUS data with Python
Uploaded a base electron add to the Git.

Past Week Accomplishments (Week 6)

- Further understanding of CAN bus and working examples of interfacing with it in Python
- Acquired power cables and SD cards for Pi's from Radek
- Determined that Firebase isn't a suitable database technology for this project
- Got a basic Electron App up and running

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Ryker Tharp	• Finished researching Firebase, determined it didn't satisfy the project's low-connectivity requirement • Started research and setup of SQLite	5	36
Collin Vincent	• Cloned the image of the pi to all the sd cards that we now have • Researched GUN db for a database solution • Researched and tested avahi for dynamic ip address assignment without a centralized dhcp server	6	43
Colton Smith	• Tested GUN DB • Researched ORM for Node • Setting up SQLite DB	7	41
Gage Tenold	• Built a base Electron App • Worked a large amount with electron forge • Read up on how Electron handles notifications	7	40
Cody Lakin	• Read data with SocketCAN in Python from a virtual can bus • Played with Craig's helper.py, imported it to the previous program • Searched for helpful documentation	6	34
Will Paul	• Begin setup and install of entire system in development on the Raspberry Pis • Continue Research of PiCAN interfacing and J1939 • Begin Frontend development	9	32