

EE/CPRE/SE 491 - sdmay29

Automating Inventory Management & Routing through Sensor Networks

Week 10 Report

11/12/18 - 11/25/18

Client: Jimmy Paul

Faculty Advisor: Goce Trajcevski

Team Members:

David Bis - *Meeting Facilitator*

Hanna Moser - *Meeting Scribe*

Adam Hauge - *Report Manager*

Sam Guenette - *Public Relations*

Ben Gruman - *Resource Acquisition*

Noah Bix - *Documentation Manager*

Past Week Accomplishments

The team's Final Presentation has been scheduled for Tuesday December 4, 2018 at 11:30am in Coover Hall room 3043. Feedback has been given for the Design Document and Project Plan so this reporting period was largely spent working on improvements in our documentation based on the given feedback. The revised version of our design document will be posted on the team website by December 2, 2018. Both the Design Document and Project Plan will be ready for the team presentation to faculty panel on December 4.

- **Design Document** - All
 - Team met together and all worked to update and revise the project design document
 - Updated revision will be posted to team website by December 2, 2018

- **Network Design** - Adam
 - Updated method in which sensor modules connect with server
 - Implements 3-way-handshake methodology
 - Created pseudocode for algorithm to be used in design document
 - Created new graphic depicting the algorithm for design document

- **Master-Slave Network** - Adam
 - Generated all specifications for the proposed design of the sensor network
 - Designed solution for first-time network setup
 - Implemented method for configuring wifi connection for setup

- **Sensor Design** - Noah
 - Designed a schematic for both the sonar sensor and weight sensor using Fritzing
 - Design will possibly be altered to try and get multiple sensors on ESP chip
 - For now one sensor will be connected to each ESP chip

- **Refactored Monitoring Component Backend** - Sam
 - Designed update component combining weights of monitoring components monitoring the same product. Accounting for refactored database
 - Finalized database refactoring and cleanup
- **Purchased Remaining Parts for Scale** - Ben, David
 - Went to Lowe's to purchase materials to build scale
 - Materials include: bolts of varying sizes, corresponding nuts to match necessary sizes
- **Researched Routing Algorithms** - David
 - Researched potential routing algorithms for optimal route planning
 - Optimal route planning similar to Travelling Salesman Problem, could run into performance issues if a large amount of stops are needed
- **Front-end Research, Screen Sketch Update, & Coding** - Hanna
 - Researched React Data Grid
 - Display data in rows instead of boxes
 - More data displayed per pages
 - No cost to use as add-on
 - Row Select feature will allow for modal pop-up
 - Allows for extensive customization
 - Features in different npm packages
 - All source code in single repository
 - Updated screen sketches to reflect React Data Grid design
 - All boxes containing data converted to rows
 - Green and red coloring of rows kept to specify whether threshold met
 - Added modal and toast popup screen sketches
 - When user selects row of data on data display page, modal will open allowing for user to update threshold of product
 - When user selects row of data on device setup page, modal will open allowing for user to update product the device is monitoring
 - On both data display and device setup pages, toast popup will verify with user whether update was successful or not
 - Updated navigation bar to match Crafty red schema and also added tabs for Devices and Inventory to the bar
 - Installed React Data Grid and began experimenting with code

Pending Issues

- **Design Document** - All
 - Testing and Implementation documentation still needs to be completed by the end of the coming week
- **Routing Algorithm** - David
 - Since the routing algorithm is NP-Hard, performance testing will need to be tested for feasibility.

- The route processing will likely be done after hours at Crafty when implemented, so it is not necessary to be instantaneous. However, it would be nice to have an idea of what the worst-case scenario time would be using the largest possible number of stops.

Plans for Upcoming Reporting Period

- **Senior Design Presentation** - All
 - Preparation for presentation will occur up until December 4
- **Project Plan and Design Document** - All
 - All project documentation will be posted to team website by December 2
- **Network Setup** - Adam
 - Initial network setup methodology will be implemented and tested
- **Complete Building Scale** - Ben, David
 - Assemble the scale now that all of the parts have been collected
- **Build Sonar Sensor** - Noah
 - Once sonar sensor arrives start building it
- **Continue Experimenting with React Data Grid** - Hanna
 - See what features has to offer
 - How this will apply to project/screen sketch layout

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
David Bis	Design Document Purchase Scale Parts Routing Algorithm	9	77
Hanna Moser	Design Document Refactor Screen Sketches Research React Grid Download and Experiment React Grid Update Navigation Bar	9	73
Adam Hauge	Design Document Network Design Master-Slave Network	8	78
Sam Guenette	Design Document Refactored Back-End Monitoring	8	75
Ben Gruman	Design Document Purchase Scale Parts	8	47
Noah Bix	Design Document	8	65

	Sensor Design Schematic		
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Gitlab Activity Summary