EE/CPRE/SE 491 - sdmay29
Automating Inventory Management & Routing through Sensor Networks
Week 3 Report
9/17/18 - 9/23/18
Client: Crafty
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

- **Sensor setup -** Adam
    - Learned how to write programs onto an Arduino
        - Practiced using David's Arduino kit
    - Learned about wireless microcontroller communication
        - Methods researched
            - Ad hoc network using sockets
            - UART communication
        - Done using an actual Arduino and Raspberry Pi
    - Affirmed that sensor network will behave as a master-slave network
        - Easy to implement
        - Microcontrollers processing sensor input will send data directly to master microcontroller
            - Master microcontroller will process and send all data to database
        - This will enable us to arrange our sensors in a variety of ways to adjust for each client site
    - Implemented basic socket network between microcontroller and PC
        - Successfully transmitted data between both systems
        - Implemented 3-way handshake communication to ensure no packets were dropped
    - Attempted to implement communication via UART communication
        - More difficult to implement
        - Probably not ideal to use for solution
    - Decided that Raspberry Pi will be used as master microcontroller
        - Has built-in wifi connectivity
        - Began developing Python code
- **Web Project Set-Up** - David
    - Set up back-end for web project

        - Simple NodeJS run-time using ExpressJS framework
        - Constructed API endpoint architecture to help realize the Controller component of our intended MVC architecture
    - Set up front-end for web project
        - Made using ReactJS
    - Wrote script to easily deploy both front-end and back-end simultaneously for easy testing on local machines
    - Basic architecture for web application is now complete. This should make it much easier to work collaboratively on the project moving forward.
- **Designed and Implemented Database & Web Project Connection** - Sam
    - Designed database schema capable of maintaining all of the valuable data points necessary for project.
    - Implemented database into project using MySQL
    - Developed Back-End of Web Project
        - Developed database connection using NodeJS and express framework
        - Developed Backend Model Framework
    - Developed Hardware-to-Database Connection
        - Built microcontroller code that connects and sends data to the database
- **Sensor Research** - Noah
    - Found helpful manuals on how to select the proper RFID sensor
    - Searched different companies that sell RFID sensors
    - Narrowed down the selection for RFID sensors but ran into problems with price, connecting device
- **Started to create front-end pages using ReactJS**
    - Create screen sketches of how pages are to be laid out
    - Page to select specific office
        - Once office selected will be taken to page with status of products at that office
    - Page that displays products at certain office
        - Attributes of each product
            - Current weight
            - Set threshold value
            - Whether threshold has beens met
        - Search bar to look up specific products

Pending Issues

- **RFID Sensors -** Noah
    - Need to collaborate with team to choose the right RFID sensor for our communication setup
    - RFID's may be over budget
- **Microcontrollers -** Adam
    - Need to determine whether it will be more cost effective to use Raspberry Pi or Arduino for our slave microcontroller

        - Raspberry Pi would require Analog to Digital Converters
        - Arduino would require wifi connection unit
- **Test Server from ETG** - David
    - Sent a request in during reporting period for a test server for project integration testing
    - Currently waiting on IP from ITS before the ETG deploys it for our usage

Plans for Upcoming Reporting Period

- **Raspberry Pi vs Arduino -** Adam
    - Research price points for various Arduino and Raspberry Pi models
        - Determine which would be cheaper to get
            - Raspberry Pi with an Analog to DIgital converter or
            - Arduino with wifi connection unit
    - Make final decision on UART vs Ad Hoc Network
- **Passing Data -** Adam, Sam, David
    - Implement a system for passing data wirelessly from master microcontroller to online database
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Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
David Bis	Set up front-end and back-end of project, began implementing API architecture	8	19
Hanna Moser	Developed simple web page showing different products and their status	5	16
Adam Hauge	Researched different sensor setup strategies	7	19
Sam Guenette	Design and Setup Relational Database, Developed Backend Database Connection and a Model Back-end Architecture, Developed beginning Software for Microcontroller & Database Communication	7	19
Ben Gruman	No contributions this week	0	9
Noah Bix	Researched possible RFID selections	4	14

Gitlab Activity Summary

Action: closed, Sun Sep 23 2018
Author: dsbis
Title: Establish API endpoint architecture, Type: Issue

Action: pushed to branch api_skeleton, Sun Sep 23 2018
Author: dsbis

Action: pushed new branch api_skeleton, Sun Sep 23 2018
Author: dsbis

Action: opened, Sun Sep 23 2018
Author: guenette
Title: Model Relational Setup, Type: Issue

Action: closed, Sun Sep 23 2018
Author: guenette
Title: Database Setup, Type: Issue

Action: pushed to branch mvcSetupSam, Sun Sep 23 2018
Author: guenette

Action: opened, Sun Sep 23 2018
Author: guenette
Title: Database Design, Type: Issue

Action: opened, Sun Sep 23 2018
Author: guenette
Title: Microcontroller Data Transcription, Type: Issue

Action: opened, Sun Sep 23 2018
Author: guenette
Title: Model Migration, Type: Issue

Action: opened, Sun Sep 23 2018
Author: guenette
Title: Database to Backend Connection, Type: Issue

Action: opened, Sun Sep 23 2018
Author: guenette
Title: Model Setup, Type: Issue

Action: pushed to branch mvcSetupSam, Sun Sep 23 2018
Author: guenette

Action: pushed to branch mvcSetupSam, Sun Sep 23 2018
Author: guenette

Action: pushed to branch mvcSetupSam, Sun Sep 23 2018
Author: guenette

Action: pushed new branch mvcSetupSam, Sun Sep 23 2018
Author: guenette

Action: pushed new branch master, Thu Sep 20 2018
Author: dsbis

Action: opened, Mon Sep 17 2018
Author: Ben Gruman
Title: Research Mechanical Sensors, Type: Issue

Action: opened, Mon Sep 17 2018
Author: dsbis
Title: Research RFID Sensors, Type: Issue

Action: opened, Mon Sep 17 2018
Author: ahauge
Title: Research Microcontrollers, Type: Issue

Action: opened, Mon Sep 17 2018
Author: guenette
Title: Front-End View, Type: Issue

Action: opened, Mon Sep 17 2018
Author: guenette
Title: Establish API endpoint architecture, Type: Issue

Action: opened, Mon Sep 17 2018
Author: dsbis
Title: Server Setup, Type: Issue

Action: opened, Mon Sep 17 2018
Author: guenette
Title: Database and Hardware Communication, Type: Issue

Action: opened, Mon Sep 17 2018
Author: guenette
Title: Hardware Order, Type: Issue

Action: opened, Mon Sep 17 2018
Author: guenette
Title: Database Setup, Type: Issue

Action: opened, Mon Sep 17 2018
Author: guenette
Title: Database Design, Type: Issue
