

sddec18-22 Automower (Autonomous Lawn Mower)

Weekly Report #8

Reporting Period: 3/28/18 - 4/4/18

Client: Micron Technologies/Ryan Marion

Advisor: Dr. Jones

Team Members

Sam Tinklenberg - Team Leader

Andi Li - Meeting Facilitator/Software Dev

Bryton Hayes - Test Engineer

Grant Duncan - Software Lead

Joel Seaser - Hardware Lead

Summary of Weekly Report

This week we finished the Phase 2 bill of Materials and sent them to Dr. Jones. We started work on getting the Raspberry pi to do what we will need it to do. We also created a database and other things to get communication between the phone and raspberry pi to work. We converted the existing model into a more accurate one in solidworks. We finally got parts in, so we have been making lots of technical progress.

Previous Week Tasks Completed

General Tasks:

- Finish phase 2 bill of materials and order parts
- Technical challenge lightning talks.

Specific Tasks:

- Finish testing high resolution PWM output
- Created 3d model in solidworks which used the parts from Andy Marks (Appendix c.)
- Raspberry pi
 - HTTP server.
 - Server uses lighttpd.
 - PHP using fastcgi is functional.
 - SSL cert has been added for point to point encryption.
 - Started writing PHP scripts to handle requests.
 - Database
 - Created users for db access and administration.
 - Created tables for schedule and errorlog. (Table a and b in appendix)
 - Software
 - Updated all repositories and updated other software.
 - Remove unnecessary software. Eg: Libreoffice.
 - Firewall
 - Installed UFW for a lightweight firewall.
 - Blocked all incoming connections except for ones on the same network.

- Mobile Application
 - Created a JSONParser for use with the database.
 - Created a class that deals with sending information to the database.
 - Updated Schedule to use the database and general performance improvements.

Tasks In Progress for this Week.

General Tasks:

- Receive parts and find workspace/ storage for them
- Setting up and testing GPS module with arduino mega

Specific Tasks:

- Raspberry Pi
 - HTTP Server
 - Handle HTTP post and get requests.
 - Get php scripts to work to add stuff to database.
 - Networking
 - Work on getting the phone and raspberry pi to be able to connect together more automatically and less manually.
 - Database
 - Create other tables for more information from the arduino.
 - Firewall
 - Make a little bit more robust.
- Mobile App
 - Create methods that query the database to show current schedules.
 - Create a method to calculate the next mow time.
 - Create methods for sorting the database by time and deleting outdated rows.
 - Add Weather to database tables.

Tasks Up for Next Week

General Tasks:

- Disassemble Reel blade and figure out how to mount it and attach belt from motor
- Perimeter wire prototype

Specific Tasks:

- Testing with motors and controllers to arduino
- Raspberry pi
 - Authentication
 - Come up with a way to authenticate users when they try and send requests to the web server.
 - Connectivity
 - Connect the raspberry pi to the local network automatically.
 - Come up with a solution for the raspberry pi to still be functional when it loses connection while it mows.
- Mobile App

- Push notifications.
- Bluetooth connection to Raspberry Pi.
- View GPS data from mower.

Division of Work

Team Member	Contributions	Hours this week	Total Hours
Sam Tinklenberg	Web server, firewall, databases on raspberry pi. Android code for sending requests to server.	12	47
Andi Li	Created 3d model on solidworks	8	39
Bryton Hayes	Finished PWM testing for motor control, phase 2 bill of materials, and GPS research	9	48
Grant Duncan	Worked on mobile application -- implemented a JSONParser, Created a method to send data to the database, updated/improved scheduler to use new database.	9	43
Joel Seaser	Worked on Phase 2 Bill of materials and finalized design for perimeter wire	5	37.5

Summary of Weekly Advisor Meeting

This week with our meeting with Dr. Jones was fairly short. He gave us our arduino, Raspberry pi, and gps. We discussed what we would be doing with the microcontrollers. Bryton also showed him this PWM graphs and explained to Dr. Jones what the results were. Overall, Dr. Jones said everything seemed to be going ok.

Appendix

a.

Table Name: Schedule		
Column	Type	Description
id	Int	Auto increment, primary key
time	time	Time of mow
date	date	Date of mow
notes	varchar(50)	Notes or description of time.

b.

Table Name: ErrorLog		
Column	Type	Description
id	int	Foreign key to Schedule.id, primary key
code	varchar(20)	Error code
desc	varchar(100)	Error details, where something failed.

c.

