EE / CprE / SE 4920 - sdmay26-07
Salt Spreading Autonomous Mobile Robot
Status Report 2

02/06/2026 - 02/12/2026
Client: student-led
Faculty Advisor: Alexander Stoytchev

Team Members:

Isaac Blandin - Project Manager & Software Team Lead
Dylan Bunting - QA Lead & Electrical Team
Hoyt Dzwoniarski - Electrical Team
Thomas Huedepohl - CAD Lead and Electrical Team Lead
Mikhail McDade - Software Team
Shobhit Singh - Scribe & Software Team

Work Period Summary

This week, our teams have continued their work on their subsystems to attempt to meet our end-of-month goal to start small-scale subsystem integrations. Advancements have been made in GPS, waterproofing, electrical overhauls, path planning, and path following.

Past Work Period Accomplishments

- Isaac:
  - Continued debugging of the GPS receiver communication with the main controller
    - Was not able to determine the cause of the I2C communication error, but have now shifted to serial communication with success
  - Successfully established bi-directional communication between Gthe PS receiver and the main controller
    - GPS correction data received from Iowa Real-time Network via main controller and sent to GPS receiver, GNSS-RTK data sent from receive.
  - Executed initial tests of GPS accuracy with real time correction data.
    - Observed sub-inch accuracy at times, but need to create a script to pipe data into a file for data analysis and verification.
  - Created a CAD model for a permanent battery mount..
- Thomas:
  - Acquired and purchased the rest of the components for the salt spreader control, started PCB design for the power distribution board.

Past Work Period Accomplishments (cont.)

- Dylan:
  - Finished prototype of waterproof enclosure
  - Starting 3-D printing parts for project
- Mikhail:
  - Fixed comple issue with the test server that will run on Arduino
  - Continued working on grid-based path finding.
- Hoyt:
  - Worked on planning and drafting future plans for electrical system
- Shobhit:
  - Implemented the polygon overlay on the map in-app, re-iterated the design a few times for better user experience. The overall system works with a few minor bugs with on-device gps location.
  - Worked on debugging some crash issues one the esp32 vision module caused due to a process management flaw in the real-time system design implementation.

Time Tracking

Name	Hours This Period	Cumulative Hours
Isaac Blandin	6	18
Dylan Bunting	5	11
Hoyt Dzwoniarski	3	9
Thomas Huedepohl	4	10
Mikhail McDade	4	10
Shobhit Singh	4	11

Plans for the Upcoming Week

- Electronics enclosure prototyped & dimensioned for final CAD model and 3D print.
- Battery mount installed, retention mechanism designed.
- Continued development on path planning and path following.
- Continued development of computer vision.
- GPS testing with data analysis & visualization. (static, dynamic, multi-pathing, etc.)
- GPS data added to server & displayed on companion app.
- (if parts come in) begin construction of next drivetrain prototype phase.

Summary of weekly advisor meeting

This week, our team-advisor meeting consisted primarily of status updates, and Dr. Stoytchev gave guidance for the near future in requesting:

- Visualized data of GPS accuracy
- GPS-based point-to-point navigation demonstration.
- Cardboard prototype of next planned prototype for dimensioning and to test component accessibility.
- Update on drive train reconfiguration.
- Begin work on bump sensors in the near future
- Circuit design diagrams for current prototype.
- Testing and increased development velocity of salt spreading subsystem
- Determine the minimum standards we are willing to present at the end of the semester.
- Addition of emergency-stop style kill switches to the robot.

Additionally, our advisor stressed that our team must increase the hours members dedicate to the project and recommended increasing the project's overall development velocity. He made sure to highlight dedicating more time now, as we will get more busy as the semester progresses.