EE / CprE / SE 4910 - sdmay26-07
Salt Spreading Autonomous Mobile Robot
Week 3 Report

10/08/2025 - 10/14/2025
Client: student-led
Faculty Advisor: Alexander Stoytchev

Team Members:

Isaac Blandin - Scheduling Lead, CAD Co-lead
Dylan Bunting - Electronics & QA Lead
Hoyt Dzwoniarski - Creative Design Lead
Thomas Huedepohl - CAD Co-lead
Mikhail McDade - Communications Lead
Shobhit Singh - Meeting Moderator, Secretary

Weekly Summary

This week's key points were on project organization, figuring out the framework for logistics, and assigning specific technical research tasks to recoup time lost during the rechartering process. We held an advisory meeting with Dr. Stoytchev on October 9th to figure out whether the Agile/Scrum framework was a good approach. Hashing out what our upcoming week should look like and what tasks to assign each group member, and setting up separate boards for electrical and software. And Logistics for 3D printing and laser cutting certifications were discussed.

Past Week Accomplishments

- 10/08/2025 - Refined Draft of Phase 1 Proposal
    - Completed for submission to the advisor. The draft focused on absolute needs and design constraints identified in the previous week’s brainstorming.

- 10/09/2025 - Weekly advisor meeting with Dr.Stoytchev (4:30)
    - Key outcomes included establishing the Agile/Scrum workflow (Electric and Software boards), defining documentation requirements (weekly reports, paper trails), discussing prototyping logistics(3D printing, laser cutting), and assigning the initial technical research tasks (Motors, Platform, Salt System, Sensors, Software).
- 10/10/2025 - Research Task Division

    - Individual and pair research tasks were formally divided among the team members.
- 10/11/2025 - Initial component sourcing Research
    - Began compiling reference pictures and prices for potential platforms, motors, and dispensing mechanisms from online sources.
- 10/13/2025
    - Started to finalize the documentation for the first major deliverable and PowerPoint for the advisor meeting.

Time Tracking

Name	Individual Contributions	Hours This Week (Period)	Cumulative Hours
Isaac Blandin	Research Sensors, Navigation, Software & Computation	7	20
Dylan Bunting	Research Motors, Power, Software & Computation	5	16
Hoyt Dzwoniarski	Research Platform Mechanics, Software & Computation	5	16
Thomas Huedepohl	Research Motors, Power, Software & Computation	5	16
Mikhail McDade	Research Platform Mechanics, Software & Computation	5	17
Shobhit Singh	Research Salt Systems, Sensors, Navigation, Software & Computation	6	18

Plans for the Upcoming Week

- Research and Design Tasks (Assigned Roles)
    - Salt Systems (Shobhit):
        - Research alternatives to salt (sand, eco-friendly materials) and spreading methods.
        - Investigate mechanisms for detecting remaining substance in the storage tank.
        - Analyze potential wind dispersion issues and mitigation strategies

    - Platform & Mechanics (Mikhail & Hoyt):
        - Research existing robotic platforms/autonomous lawn mowers.
        - Gather specifications for battery life, weight capacity, tire design, and ground clearance of motorized bases
    - Motors & Power (Thomas & Dylan):
        - Research suitable motors and power sources, specifically considering tool-based batteries for high power and easy replacement.
        - Compile a list of at least 10 items with pictures and a detailed pros/cons analysis for each.
    - Sensors & Navigation (Shobhit & Issac):
        - Research and compare GPS options (accuracy, cost) and local localization methods (e.g., IR beacons vs. Wi-Fi-based positioning).
        - Investigate required sensors like camera sensors, bumpers, and edge detection/path-staying methods.
    - Software & Computation (Issac & Team):
        - Evaluate onboard computational requirements and decide between an onboard control system vs. a companion app-based system.

- Documentation and Meetings
    - Design Document Part 1 & 2: Complete the drafts for the Introduction and Requirements documentation.
    - Weekly Documentation (All Members): Submit the weekly report (5 bullet points + 1-2 Paragraphs) to Dr. Stoytchev
    - Prepare a 5-minute PowerPoint summarizing research findings for the next advisor check-in.
    - Attend the weekly meeting on Thursday at 4:30 P.M

Summary of weekly advisor meeting

We met with our Faculty Advisor, Dr. Stoytchev, to discuss project organization, prototyping, logistics, and next week's tasks. The meeting adjourned with the following conclusions of the grading breakdown, which includes a 20-minute presentation to three professors in December and a second-semester evaluation by an industry panel. Weekly reports and documentation contribute significantly to the grade. We would implement the Agile/Scrum methodology, implementing two boards (Electrical and Software) with a representative for each. Distinct, weekly individual tasks will be assigned to prevent overlap, as per a past team's cautionary table. Logistics for using and prototyping equipment, like ordering 3D printing filament from ETG and obtaining laser cutting certification. A possible team visit to Menards for physical hardware research. The strategy is to develop multiple prototypes, starting simple, then developing into more complex versions. Key research areas were defined, determining onboard computational requirements, exploring open-source options to speed up some of the more tedious tasks, researching motors (potentially using tool batteries), and deciding on navigation sensors (GPS, IR beacons, bumpers, path tracking, and Wi-Fi positioning feasibility). And the final proposal process and the upcoming deadlines for the requirements documents and kickoff presentation were confirmed.