



FLORIDA'S STEM UNIVERSITY®

RMC - CSE Project Plan

Liam Sapper



The Who

- CSE Project Member: Liam Sapper - lsapper2020@my.fit.edu
- Faculty Advisor: Dr. Marius Silaghi - msilaghi@fit.edu
- Client: FIT's Robotic Mining Competition team (RMC), and by extension, NASA (the host of the Robotic Mining Competition).
- Head of RMC project:
 - Sidney Causey (scausey2021@my.fit.edu) - Aerospace Engineering

Project Goals

- The goal of this project is to provide the client, RMC, with working software subsystems that will guide the movement and mining of their robot, both manually and autonomously.
- As the rest of the team is made up of aerospace and engineering students, they do not have the same depth of knowledge in implementing the software needed, specifically for the autonomous movements of the robot. I will help bring Software systems to ensure stable traversal over lunar terrain, both manually and autonomously.
- Software systems to ensure stable mining of lunar material, both manually and autonomously. This software should also be able to communicate how and when lunar material should be excavated and deposited.

Features

- Base software allowing for manual use of traversal and mining capabilities.
- Automated maneuvering software, which should be able to correct for any difficulties faced while navigating terrain.
- Automated mining software, which should be able to determine when material should be mined, how much has been mined, and when to stop mining.

Technical Challenges

- While I am not entirely unfamiliar with working with hardware or machine programming thanks to classes taken, I do not have a lot of experience outside of that, nor am I as experienced with autonomous programming. So why am I taking on this project?
- The ability to work with robotics and machine programming is something I wish to improve, and working at NASA has been a dream of mine. Plus, my understanding of these systems will grow as I am currently taking the classes that will allow me to complete my tasks this semester.
- Along with this, there are several resources available at FIT that will be a large help in completing this project.

Milestone 1 - (Oct 2): Tasks

- Review the code level and select language in which to use for developing the subsystems.
- Provide small demos within selected language.
- Create Requirements Document.
- Create design document.
- Create test plan.

Milestone 2 - (Oct 30): Tasks

- Implement a simulator for testing.
- Design test vectors for main requirements that can be verified by simulator.
- Look up documentation of involved hardware.
- Research relevant algorithms for autonomous tasks

Milestone 3 - (Nov 27): Tasks

- Implement code in simulator that passes test vectors.
- Implement unit tests for verifying simulated code.
- Look up libraries for selected algorithms from task 2.
- Implement/adjust any missing/existing techniques.



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RMC Team Contact

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