sdmay20-29: Self-Solving Rubik's Cube

Week 3 Report
October 8 - October 20

Team Members

Taylor Burton — *Systems Lead*
Jacob Campen — *Hardware Lead*
Casey Cierzan — *Materials Lead*
Luke Schoeberle — *Software Design*
Joseph Crowley — *Testing Lead*
Annie Lee — *Algorithms*
Patrick Levings-Curry — *Administrative*

Summary of Progress this Report

During this week, we made progress on our first prototype.
In the hardware realm, we experimented with the stepper motors on the large Rubik's cube, successfully turning an isolated side with the cube. We also improved the cube's usability by sanding the inner edges.
In the software realm, we wrote the more complex rotation code, and we examined efficient solving algorithms. We also started to consider software-hardware integration.

Pending Issues

Before we physically create our prototype, we will need to carefully model the system to determine the feasibility of our current parts.
We will also need to determine how to temporarily attach the motors within the cube, which may be difficult without 3D modeling.

Plans for Upcoming Reporting Period

Name	Upcoming Tasks
Jacob	• Plan testing apparatus • Determine mechanical limitations
Casey	• Order more parts if needed • Assist Jacob and Taylor with their tasks
Joe	• Write tests for the rotation code • Continue sanding the cube for ease of rotation
Luke	• Write tests for the rotation code • Investigate hardware-software integration
Taylor	• Acquire parts from ETG to test feasibility • Research possible CAD models for prototype
Annie	• Learn about more efficient algorithms • Implement algorithm from existing code

Keegan	• Prep large cub for prototyping • Research possible CAD models for prototype

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Jacob	• Determined how to wire the motor • Prepared the motor for turning an isolated side of the cube	12	36
Casey	• Received parts from ETG • Prepared the motor for turning an isolated side of the cube	12	36
Joe	• Sanded most of the large cube • Continued populating the website	12	36
Luke	• Implemented more complex parts of rotation algorithm • Improved overall rotation API	12	36
Taylor	• Experimented with cube torque • Determined how to wire the motor	12	36
Annie	• Investigated open-source algorithms • Reviewed code	12	36
Keegan	• Sanded most of the large cube • Continued assisting other members when necessary	12	36

Gitlab Activity Summary

Luke pushed the complete rotation algorithms to GitLab, and Joe and Annie reviewed his code.