

sdmay20-29: Self-Solving Rubik's Cube

Week 4 Report

February 23 - March 8

Team Members

Jacob Campen — *Hardware*

Taylor Burton — *Systems*

Casey Cierzan — *Materials*

Joseph Crowley — *Testing*

Luke Schoeberle — *Software Design*

Annie Lee — *Algorithms*

Patrick Levings-Curry — *Administrative*

Summary of Progress this Report

After this week, we have nearly completed our first prototype.

In the hardware realm, we 3D-printed more mechanical parts, and we received the first draft of the PCB for controlling the motors. We also received rechargeable batteries, but we determined that we will need to choose different batteries for the prototype due to charging issues. At this point, we need to test our PCB in the sphere, and we need to order better batteries for our prototype.

In the software realm, we slightly improved the Teensy motor control code, and we finished a significant amount of the solving algorithms. Currently, we have completed and tested the entire first layer, and we have made progress on the second layer. We will start the third layer soon.

Pending Issues

We need to ensure that our current PCB works as desired. We also need to choose better batteries and charging equipment for our application.

Plans for Upcoming Reporting Period

Name	Upcoming Tasks
Jacob	<ul style="list-style-type: none">● Test the PCB with the motor control software● Choose better batteries
Casey	<ul style="list-style-type: none">● Order more parts if needed● Assist Jacob and Taylor with their tasks
Joe	<ul style="list-style-type: none">● Test the PCB with the motor control software● Test the Teensy stepper code with the solving algorithms
Luke	<ul style="list-style-type: none">● Start the third layer edges● Implement communication protocols with the Teensy

Taylor	<ul style="list-style-type: none"> ● Improve the CAD model ● Choose batteries and charging devices
Annie	<ul style="list-style-type: none"> ● Finish the second layer edges ● Test the second layer edges fully
Keegan	<ul style="list-style-type: none"> ● Assist other members as necessary ● Choose better batteries

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Jacob Campen	3D-printed parts of the outer cube; Improved the PCB	12	123
Taylor Burton	3D-printed parts of the outer cube; Improved the PCB	13	122
Casey Cierzan	Ordered new components from ETG; Improved the PCB	13	123
Joseph Crowley	Improved the Teensy stepper code; Designed communication protocols	14	124
Luke Schoeberle	Finished the first layer corners; Tested the first layer solutions fully	14	123
Annie Lee	Improved the second layer edges; Learned to fully solve the cube	12	122
Patrick Levings-Curry	Researched batteries; Assisted other members as needed	12	121

Gitlab Activity Summary

Luke pushed the rest of the first layer algorithms and the appropriate testing code. Joe pushed some improvements to the Teensy code, and Annie pushed some improvements to the second layer algorithms.
