

**sdmay20-29: Self-Solving Rubrik's Cube**

Week 1 Report

September 2 - September 22

**Team Members**Taylor Burton — *Systems*Jacob Campen — *Hardware*Joseph Crowley — *Testing*Casey Cierzan — *Materials*Annie Lee — *Algorithms*Luke Schoeberle — *Software Design*Keegan Levings-Curry — *Administrator***Summary of Progress this Report**

This week, we finalized our first design and began to gather the necessary parts for our first prototype. In the hardware realm, we ordered a large Rubik's cube, magnets, and Hall effect sensors for testing our rotation detection ideas. In the software realm, we chose a tentative data structure for storing the cube's state, and we have started researching the best solving algorithms for our modified cube.

**Pending Issues**

We are unsure if our parts order was submitted, so we will need to verify our order in the upcoming week.

Additionally, once our parts arrive, we will need to carefully test the interactions between them to determine the number of necessary parts in our first prototype.

**Plans for Upcoming Reporting Period**

Name	Upcoming Tasks
Jacob	<ul style="list-style-type: none"> <li>• Research more methods for compacting the design</li> <li>• Determine an overall starting point for the prototype</li> </ul>
Casey	<ul style="list-style-type: none"> <li>• Determine which motors and clutches should be ordered</li> <li>• Contact Lee Harker to verify that the previous order was placed</li> </ul>
Joe	<ul style="list-style-type: none"> <li>• Find ways to test software cases</li> <li>• Research methods to place more complexity in software than hardware</li> </ul>
Luke	<ul style="list-style-type: none"> <li>• Implement the basic rotation algorithms</li> <li>• Ponder more complex rotation cases</li> </ul>
Taylor	<ul style="list-style-type: none"> <li>• Test sensors and magnets for mechanical issues</li> <li>• Continue searching for possible motors</li> </ul>
Annie	<ul style="list-style-type: none"> <li>• Understand different algorithms</li> <li>• Experiment with open source rubik's cube program</li> </ul>

Keegan	<ul style="list-style-type: none"> <li>Continue to liaise with staff and faculty</li> <li>Assist other members with any problems or issues</li> </ul>
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### Individual Contributions

Name	Individual Contributions	Hours in this Week	Cumulative Hours
Jacob	<ul style="list-style-type: none"> <li>Reviewed older self-solving cubes</li> <li>Searched for clutches, magnets, and Hall effect sensors</li> </ul>	12	12
Casey	<ul style="list-style-type: none"> <li>Organized the current budget</li> <li>Ordered a large Rubik's cube, magnets, and sensors from ETG</li> </ul>	12	12
Joe	<ul style="list-style-type: none"> <li>Reviewed older self-solving cubes</li> <li>Researched solving algorithms</li> </ul>	12	12
Luke	<ul style="list-style-type: none"> <li>Pondered cube data structures and decided to use a [6][3][3] array</li> <li>Began to consider rotation algorithms</li> </ul>	12	12
Taylor	<ul style="list-style-type: none"> <li>Found good clutches and sensors</li> <li>Chose a possible system solution and pondered future system issues</li> </ul>	12	12
Annie	<ul style="list-style-type: none"> <li>Researched solving algorithms</li> <li>Deconstructed a standard cube to investigate its internal structure</li> </ul>	12	12
Keegan	<ul style="list-style-type: none"> <li>Deconstructed a standard cube to investigate its internal structure</li> <li>Contacted faculty members with group queries</li> </ul>	12	12

### Gitlab Activity Summary

Nothing to report.