

sdmay19-03: 3D Metal Printer - Phase II

EE/CprE/SE 491 Weekly Report 7

November 5 - November 12

Client/Advisor: Dr. Bigelow

Team MembersThomas Waters — *Team Lead, Computer Engineer*Ariel Rizshky-Yakobson — *Computer Engineer*Alvin Rymash — *Electrical Engineer*Jacob Gosse — *Electrical Engineer*Armand Hernandez — *Software Engineer*Carter Cahill — *Software Engineer*

Summary of Progress this Report

The progress of our 3D printer has been going slowly and steadily. There are a few things that are keeping us back from the testing phase, however we were still able to make a lot of improvements. During this week, we discussed with Dr. Bigelow on potential ways we can equalize the pressure. We decided to disassemble the camera and found a glass piece to drill a hole on. This way the pressure can be equalized from inside the camera itself and the vacuum chamber. After drilling a hole, we also tested the camera inside a vacuum test chamber. The results turned out great and it was able to withstand a low pressure environment. This was one of the biggest factor we were most concerned about as a group as we were all not sure whether the camera would be able to withstand the vacuum environment. Our group also continued to have weekly meetings with the mechanical engineers to get the print bed made. This is one of our biggest obstacle because it needs to be made precise or there would be issues with layering out the metal powder.

Pending Issues

The main pending issues we have is still the print bed because without this part, there can be no testing done as we are working with a class 4 laser. Also, another pending issue we have is we still need to create a code to get the barometer, oxygen sensor, and temperature sensor working.

Alvin Rymash and Jacob Gosse (Electrical Engineers): The big pending issue for the electrical engineers is that the barometer were missing cables that connect it to the Arduino board. We still need to get ordered in to be able to test it and get the code synchronized to the Arduino board.

Thomas Waters and Ariel Rizshky-Yakobson (Computer Engineers): Mainly issues with the print bed and getting the print bed design finalized and made.

Plans for Upcoming Reporting Period

Our plans for the upcoming week is to start designing a software that could connect the three main sensors we have into one software. This way there will be less programs running at one point and it will be much easier for us to control the environment. Another thing we plan on working on is implementing a feature to get a 3D model from AutoCad or similar software to transfer over to gcode and print from the 3D file.

Computer Engineers

Thomas Waters and Ariel Rizshky-Yakobson: Mainly focusing on getting the print bed and roller finalized. Also start looking at manuals and information regarding the laser, whether it is software related or hardware.

Electrical Engineers

Alvin Rymash and Jacob Gosse: Continue researching on the sensors and how to implement them into one software to make it more efficient.

Software Engineers

Armand Hernandez and Carter Cahill: Working on the printer software to see whether it can accept a 3D designed file from AutoCad and have it read through the gcode.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Thomas Waters	Continued to work with the mechanical engineers to finalize the design of the print bed and roller.	15	85
Ariel Rizshky-Yakobson	Continue to help Thomas work with the mechanical engineers to get the print bed made	10	66
Alvin Rymash	Discussed with Dr. Bigelow regarding ways to drill a hole on the camera and get the camera tested under low pressure environment.	15	85
Jacob Gosse	Worked alongside Alvin to get the camera tested and making sure it can withstand inside the vacuum chamber.	15	87
Armand Hernandez	Continued to make improvements to the software including finding out ways to convert a 3D AutoCad file to the gcode and getting the printer to print from there.	15	75
Carter Cahill	Continue to work with Armand on the software.	15	82