

Dynamic 3D Wood Printing

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ABSTRACT

The research being conducted is how to make 3d wood printed parts stronger and to have them be able to have more use. 3d wood printing has the potential to be more impactful than just doing arts and crafts. This process should help find a key to make the material less brittle so it can be used in a lot more applications. Making a safe and convenient way to 3d print wood is a huge factor. In gearing it to help it be used in many different areas. This process can provide a lot of utility when all the processes are put together well to deliver something that can have an impact for a lifetime.

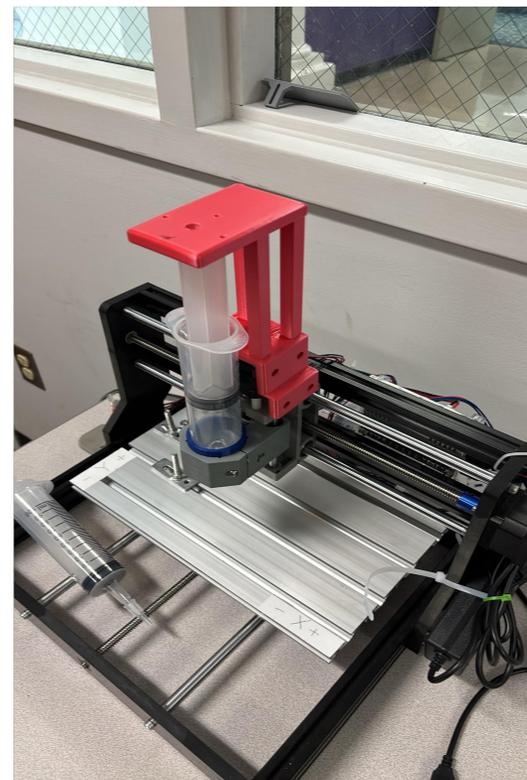
INTRO / GOALS / OBJECTIVES

1. To have a motor that can push the syringe properly to dispense the material
2. Make 3d wood printing less brittle
3. Have a more convenient gantry system
4. Make plenty of samples to do further testing with



System Description

The system will consist of a gantry system machine that is capable of moving in the X, Y, and Z directions. The Gantry system will have a slot that is modified to fix a syringe into the circle slot on the Z axis. This syringe will hold the wood material needed to be used to make wood models. The system will move by having a code entered into it to print the wood shape.



METHODS

Grinding wood with a coffee grinder to make it wood dust to pass through a sieve to be mixed for testing.

To get a valid idea for where to start we began testing what should be a similar consistency of material. We took peanut butter and melted it down with different times in the microwave. We held multiple trials.

Trial 1- consisted of heating the peanut butter for 30 seconds and immediately put in a syringe.

Trial 2- consisted of the leftover peanut butter that had cooled for about 5 minutes.

Trial 3- consisted of peanut butter that was heated for 15 seconds and then put into the syringe.

Trial 4- consisted of peanut butter and a slight mixture of flour. We heated the material for 15 seconds and then put it into the syringe.



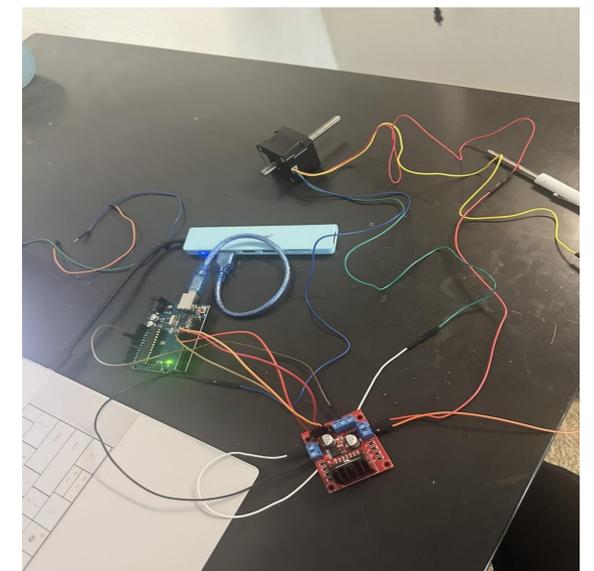
Trial 1 Trial 2 Trial 3 Trial 4

Results

We have a gantry system set up and a motor system in the works to push the syringe to deposit the material while the system is moving in the shape we want the material to make. This setup will be used to do further testing to determine if the material we use is stronger than the last sample.

Conclusions and Recommendations

For the trials we have discovered that Trial 3 would be the best pick due to the consistency when pushing the materials out of the syringe. The material maintained a solid structure and held better than in previous trials. Things are set up to do some more testing to find ways to make the material stronger.



References

Phenolic Novolac And Resol Resins - Phenolic thermosetting resin. (2025). Plenco.com.
<https://www.plenco.com/phenolic-novolac-resol-resins.htm#3>