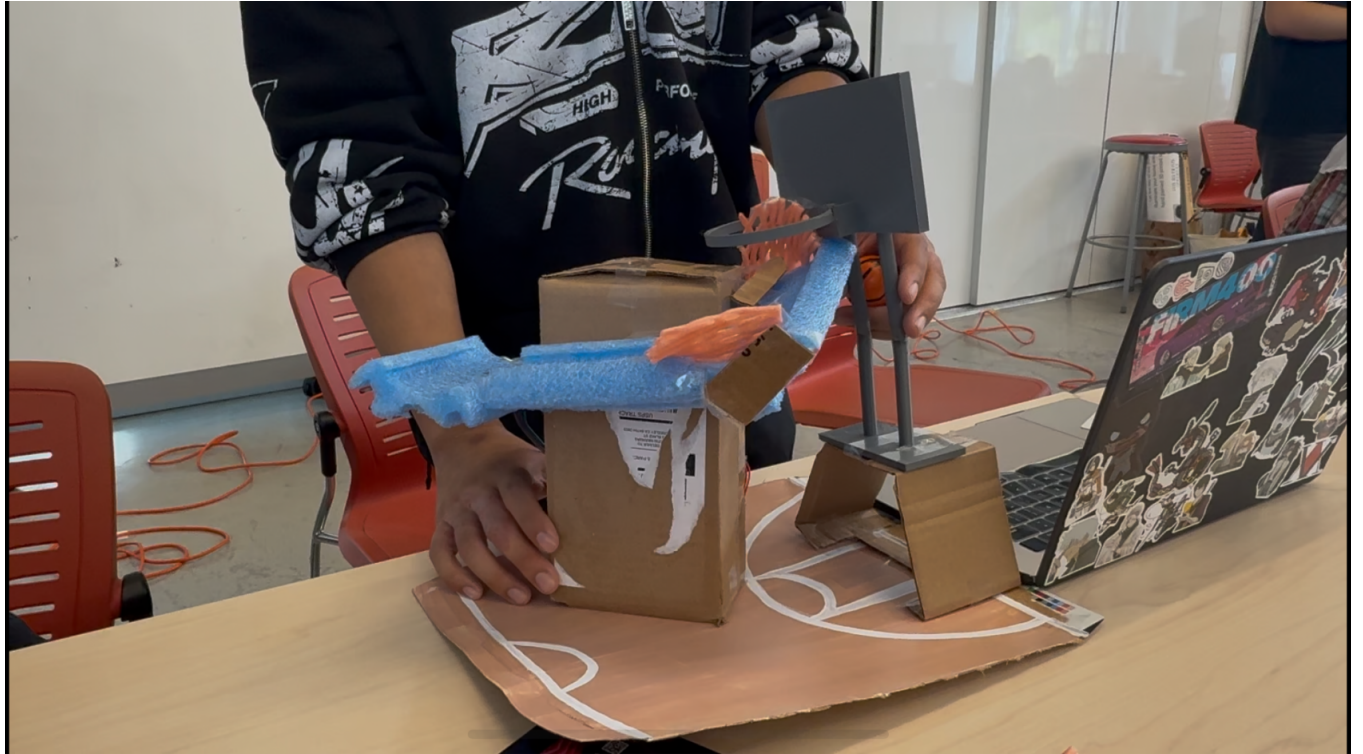


Basketball Forever

By Andrew Maramag

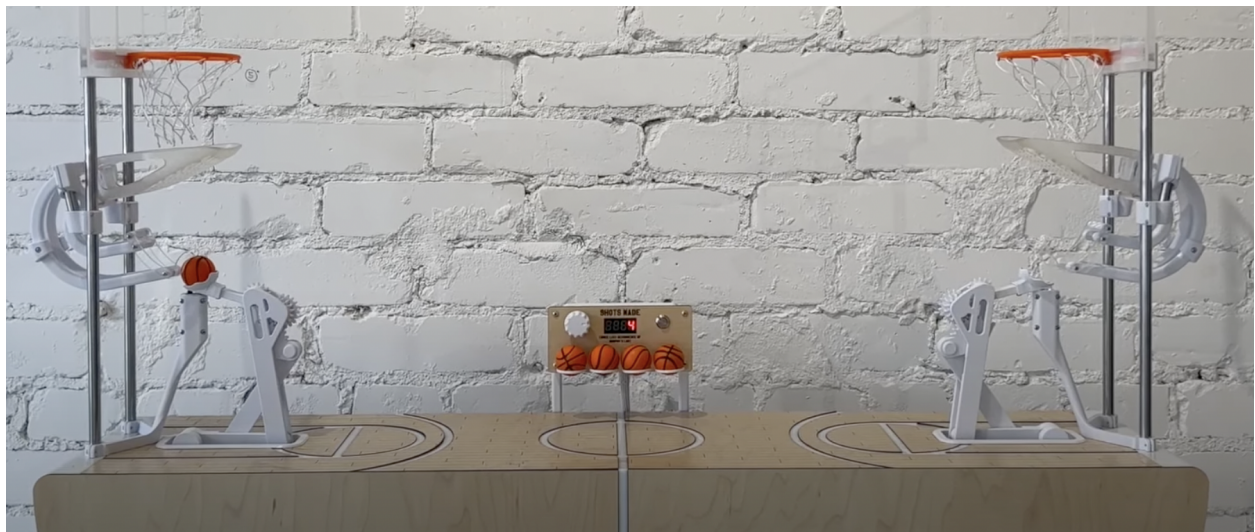


Showcase / Description of Finished Piece

My piece is an infinite and continuous dunking machine that you can leave on your desk as a little decorative trinket. It would continuously dunk the ball into a hoop and slide down the slide back into the scoop. It's very therapeutic to just watch the ball on it's cycle and I find it very relaxing.

It was originally supposed to launch the ball into the hoop, which then would slide into a different scoop that launches the ball into a different hoop that would slide into the original launcher/scoop.(Inspiration shown below). But as the process went on I ran into many different challenges that I'll explain in the process below.

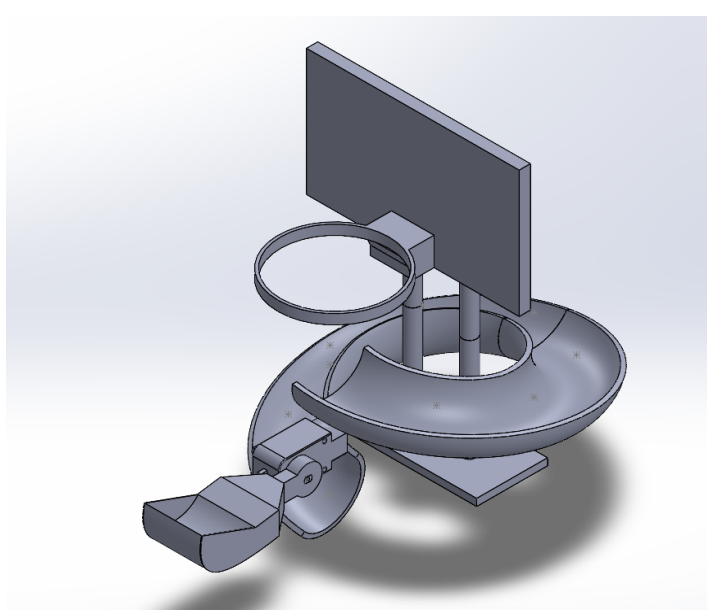
I feel that this piece is very reminiscent of life in many ways, as my original path strayed so differently. I had such a picture-perfect idea, and even on paper, my design was fairly ideal, yet in bringing these ideas to reality, I faced so many challenges. Just like life, you can have a perfect plan, yet it doesn't always pan out the way you wanted it to. Similarly, the one thing I wish I had more of was time, which is ironic as the ball cycles around stuck in a loop, yet at the same time, it symbolizes everyone's want for more time. It teaches a lesson that at the end of the day, you might not be able to shoot the shot, but just work with what you have, and sometimes you have to just force in a dunk.



Process

Ideation/Design Process:

1. Originally I wanted to make a full court with basketball hoops on each side that launched one ball into each hoop creating a continuous cycle that can run on forever. (I'm definitely going to continue this project going into the summer)
2. I wanted the ultrasonic sensor to detect when the ball is in the scoop to activate with motor to launch. Additionally I wanted another ultrasonic sensor to detect when the ball goes through the hoop to count score and display it on [p5.js](#) which I would connect to have a score board.
3. I started the process with a cardboard mock of the design that worked fairly well. It launched the ball pretty well but it wasn't able to continuously do so since the cardboard would keep shifting and changing the shot that should be repetitive.
4. From this I believed it should be fine if it was sturdier so I created a cad model of the project. It has 4 main components that I had to split to be able to 3d print: The hoop, the slide, the key, and the scoop. I made hoop to resemble proportions similar to an actual basketball hoop based on a ping pong ball as the ball, for example the rim is around 3 times the size of a basketball diameter so I did 3 times the size of a ping pong ball for my rim. I also made the key and scoop separate components to be able to switch out different scoops for different launch angles while the key would fit onto the given motor and fit on the end of the scoop.



5. After making the CAD I used Jacob's Self-Service Printing to print the parts. This was actually the most time consuming part. I sent in the first parts which was the smallest and it took me around 8 days and 7 failed prints to finally come out with nothing. Finally I was able to ask my friend to print and use the actual jacob's makerspace printers but time was already running out. They were able to finish some parts of the print a few days before the showcase and the actual hoop hadn't finished until the day of the showcase.
6. While the prints were going I was making my mockup slide and launcher. But as I finally got the print for the scoop I found out the scoop was actually too heavy to launch the ball and it was too late to buy a stronger motor so I ended up switching it from shooting the ball to dunking it.
7. I made a very ugly slide from cardboard and foam and it finally worked although very inconsistently. I connected all the wiring with a button first to make sure it worked then added the ultrasonic sensor and fixed up the code. I then added the hoop once I got it and scrapped it all together the best that I could.

Improvements if I had more time

- Finish up the last 3d printed parts to make it overall more appealing.
- I also realized that I needed to add compartments to store the electrical parts like the ultrasonic sensors in the hoop and near the launcher, so I would redo the CAD to add that.
- I would also look for a stronger motor of course to follow my original design.
- I would hook up [p5.js](#) to count each shot as a score board.
- Add board that was laser cut to look like a basketball court to secure the parts to instead of just a cardboard.
- Just overall complete and clean it up much more to be more visually appealing.

Below are some pictures of the process:

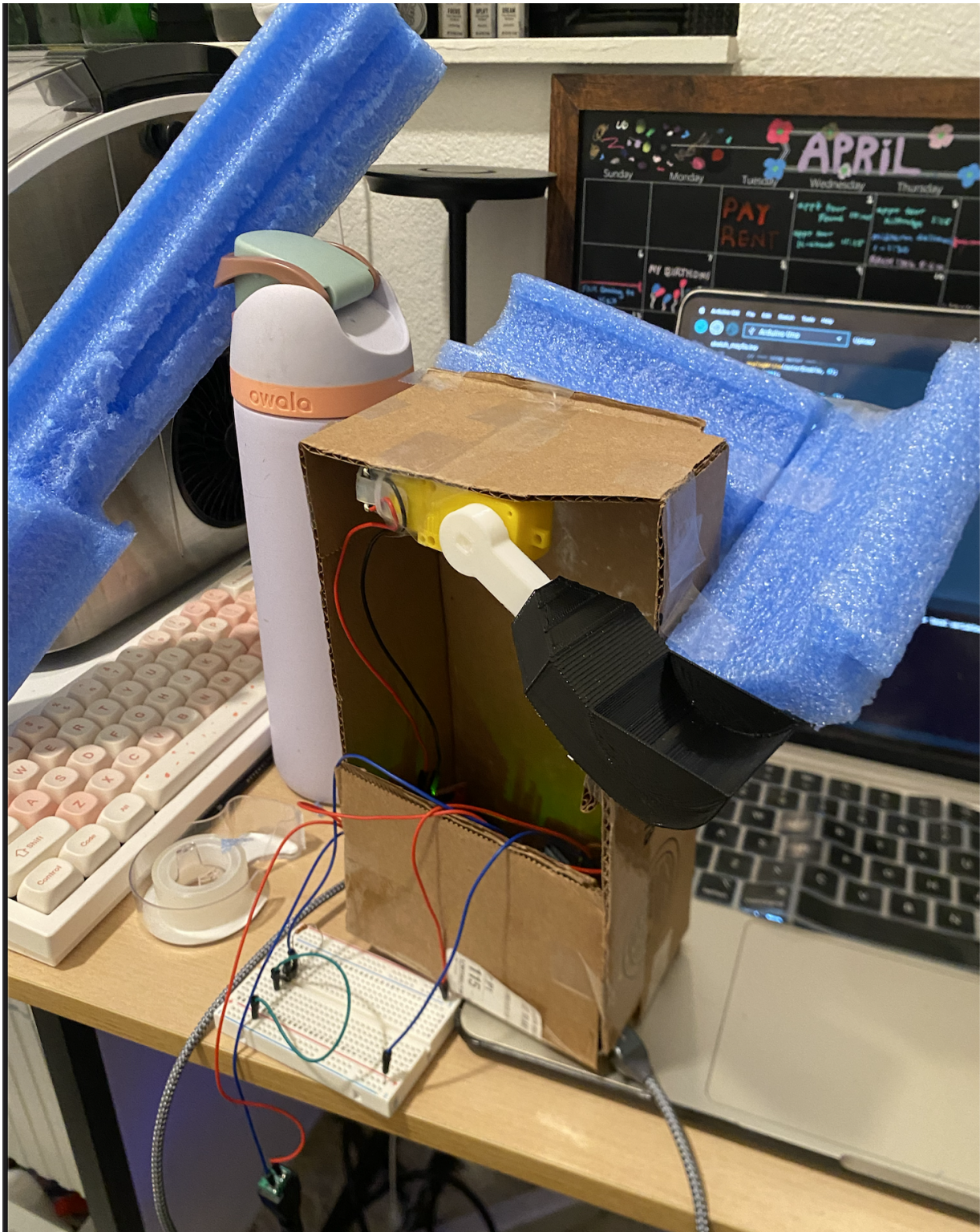
Object Printed Successfully!

Hi Andrew

Your **Hoop_17632085.gcode** has been printed successfully! It took **20h 40m**.



[Download the video](#)



[Process Video](#)

Conclusion / Reflection

To be completely honest, I was really disappointed with my “finished piece.” I realized that it’s one of my first times bringing something from a design on CAD and paper to real life on my own (without a team). I also realized that I had only worked with metal and metal machining and manufacturing processes, which are usually much more precise than PLA from 3DPrinters. I really overestimated how exact my tolerances of 3d parts would be and how direct the process would be, as it took me over a week to get a successful print of the scoop/thrower and the hoop (which printed the literal morning of the showcase). It definitely was not my best or most proud piece, but I had learned so much about the process of bringing your design to reality. I learned so much about the different challenges besides the design process, and looking back, I actually enjoyed the stressful and frustrating 3d printing process because I learned so much for next time. It also gave me an art piece that I think really symbolizes the reality of life versus the perfect idealization someone may plan out or think of.

I also want to thank you guys for such a great semester which I learned so much. Thanks for being so understanding as I went through many personal issues, and please keep teaching more students this class, it was so great and helpful in so many ways!

Links

Code	code
Final video	Video

Sources

If you used tutorials, Stack Overflow code, or other third-party materials, you should cite them here! It’s good practice and this way you’ll be able to find it again in the future :-)

If there are sections of your code that are from third-party sources, try to directly cite them in your code using a *//comment*, too.

ChatGPT	https://chatgpt.com/
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Youtube Inspiration	https://youtu.be/LloG_Jn_TI0?si=eWojkvsrhoevcHJI