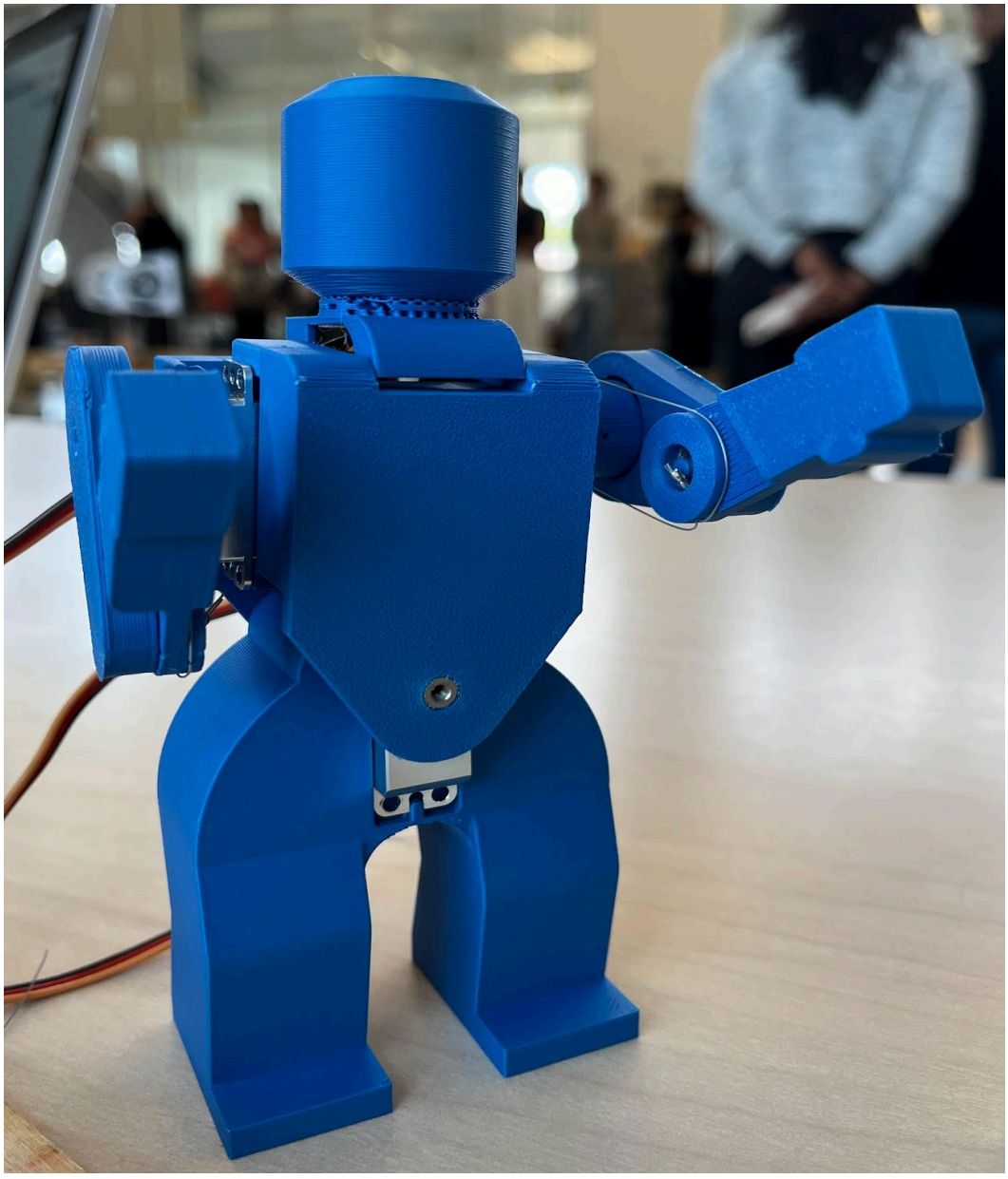
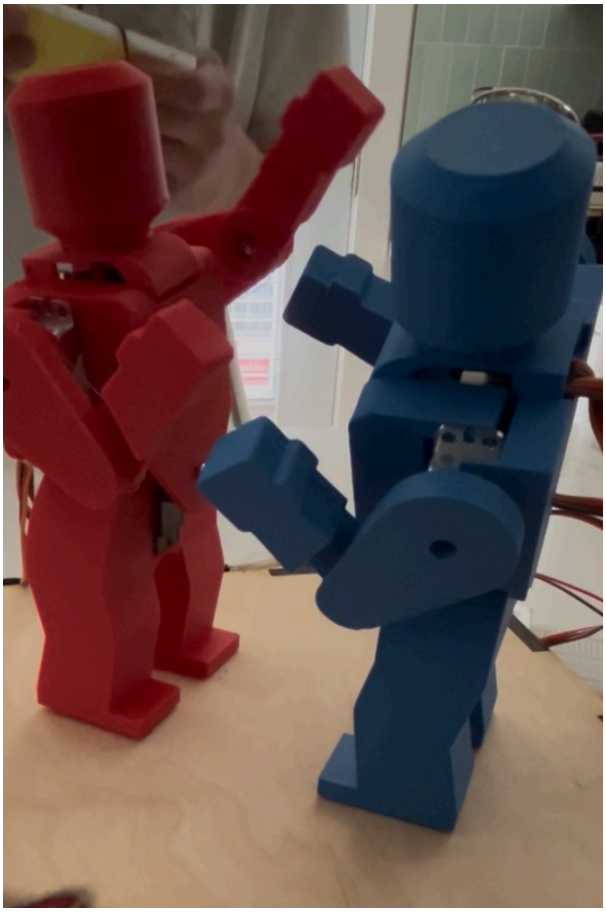
Punchy Fellows

By Gabriel Sianez



Showcase / Description of Finished Piece



“Punchy Fellows” is a continuation of a project I attempted to make in my very first electronics class, MECENG 100. It is also heavily inspired by the classic game “Rock ‘Em Sock ‘Em Robots” released in 1964 by the toy company Mattel.

“Punchy Fellows” takes this classic game and turns it into an electronic to be controlled by two wireless controllers allowing players to control their fellow using button switches and tilts.

“Punchy Fellows” differs in the fact it cannot freely move along the ring to avoid punches like “Rock ‘Em Sock ‘Em Robots.” Instead, “Punchy Fellows” uses a “slip” mechanism in which the robot can rotate side to side to avoid punches. “Punchy Fellows” does have a major flaw though, the punches cannot reach the enemy’s head to actually punch off their head.

Full Video

The project uses a total of 6 servos, 3 for each robot. 2 of the servos are controlled using gyroscope info around the z-axis to detect when a user tilts their controller. The data received from the gyroscope is then used to calculate a position and then map that position to an angle replicated by the servos. The other 4 servos are controlled by simple button pushes on controllers in which one a button corresponds with an arm, allowing for users to control the arm they choose whenever they want. The button pushes and gyroscope data is all sent over wirelessly through ESPNow, for real-time control. Therefore, a total of 2 controllers, each equipped with two buttons and a gyroscope, act as the senders to a receiver that actuates all 6 servos.

Process

Inspiration 1:



Inspiration 2:



Ideation/Design Process:

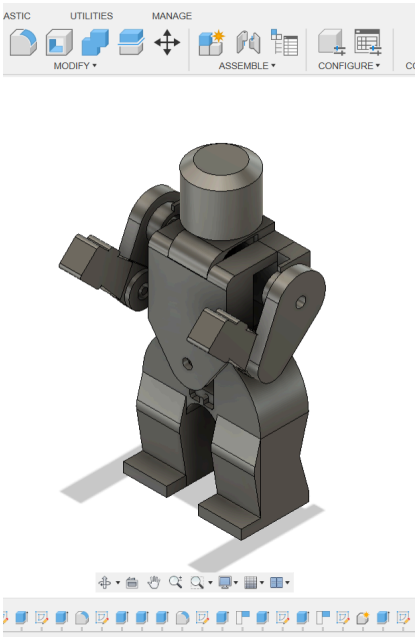
Inspiration 1:

- "Rock 'Em Sock 'Em Robots" is the core inspiration behind my project and my inspiration 2
- Design, color, and actuation is inspire by the game created by Mattel

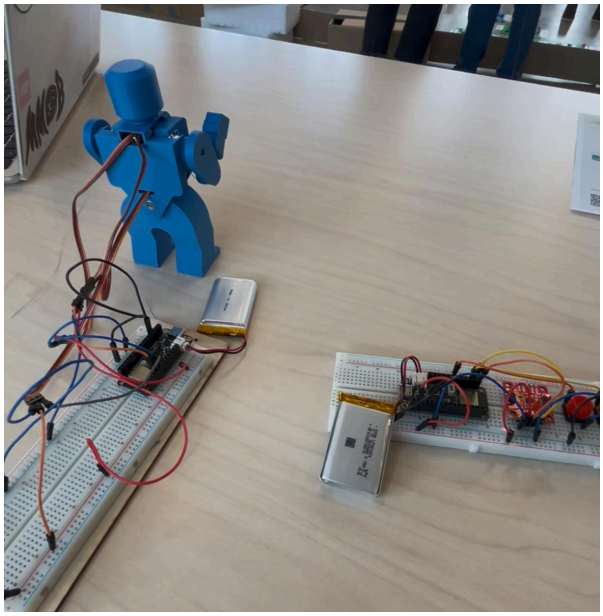
Inspiration 2:

- Inspiration 2 shows a past project created in my MECENG100 course (Electronics for the Internet of Things" from Fall 2024
- Original project featured two robots created through laser cut wood, very large DC motors, and controllers that required physical motion in order to throw a punch
- Collection and wireless transmission of data was heavy incorporated into my project for DESINV 23
- ME 100 Project Video

CAD Model:



Solo Figure:



Prototyping/Building Process:

CAD Model:

- To improve the overall design from my ME 100 lasercut project, I used Computer-Aided Design software to create components of the figures to customly fit the servo dimensions I used
- This model was then imported to a 3D printer to create the final physical component

Solo Figure:

- The solo figure marked the first major milestone of my project
- This figure was controlled wirelessly and was what I used for the Jacob's Design Showcase
- The solo figure set the foundation to create the second figure, allowing for to players to use the project and control a figure with their own controller

Conclusion / Reflection

My initial project idea was to create an AI robot that could converse back with a user. This desire came from the feeling of needing to compete and stay relevant with the current robotics industry, which is the integration of AI. However, I did not have much passion for AI. My shift to the project I made was one from my actual desire to improve upon a project I made in the past. The improvement of the project was one that I had desired since I finished the course back in the fall semester of 2024, MECENG 100. DESINV 23 gave me an opportunity to revisit this project and work on something that I had been wanting to improve for months. In addition, it allowed me to further explore a field of robotics I am actually passionate about, which is the replication of the human body with actual bodily movement.

Although still imperfect, I am very proud and satisfied of how this project turned out. Aesthetics and compactness was something that I largely wanted to improve since my ME 100 course. The next step of the project is to fix a major design flaw, which is the fact the figure arms do not reach the enemy heads to knock them off. After that, I believe I can put the wire strippers down and shut off the 3D printer for it to be complete.

What I took away from this project the most is that passion is what drives and creates quality. Perhaps artificial intelligence integration will be my next robotics obsession but for now, it is still bodily movement replication. What I would like for others to take away from my project is the inspiration to continue exploring a field and interest they are obsessed with rather than trying to follow the norm and what is big during the moment. To innovate and complete their interests rather than embedding themselves into new areas they have no current interest in. For passion is what drives the creation of great and fulfilling projects.

Links

Code	https://drive.google.com/drive/folders/19xwiLr-Zn7hhDwIwxmdWUSGdzuOdv5O1?usp=sharing
Final video	https://drive.google.com/file/d/1jNdatKNwxJJo1Jc2iGsNIcDZ5nP-F7Uv/view?usp=sharing

Sources

MECENG 100 Project Video	ME 100 Fighting Robots Project.mov
ChatGPT AI (Code)	https://chatgpt.com/c/681ed1db-f960-8005-bc5b-87bdf9f62f65
LSM6DSO Gyroscope Tutorial	https://learn.sparkfun.com/tutorials/qwiic-6dof-lsm6dso-breakout-hookup-guide
Inside “Rock ‘Em Sock ‘Em Robots” Video	https://www.dailymotion.com/video/x621nrg