# DUEN Tabling Machine (DTM)

Presented by the Fall 2025 Cohort:
Nonchalant Hustlers

# TABLE OF CONTENTS

# Objectives

**Project Goal**:

Design and manufacture a device that can help advertise DUEN at tabling events by giving visitors a fun, interactive experience.

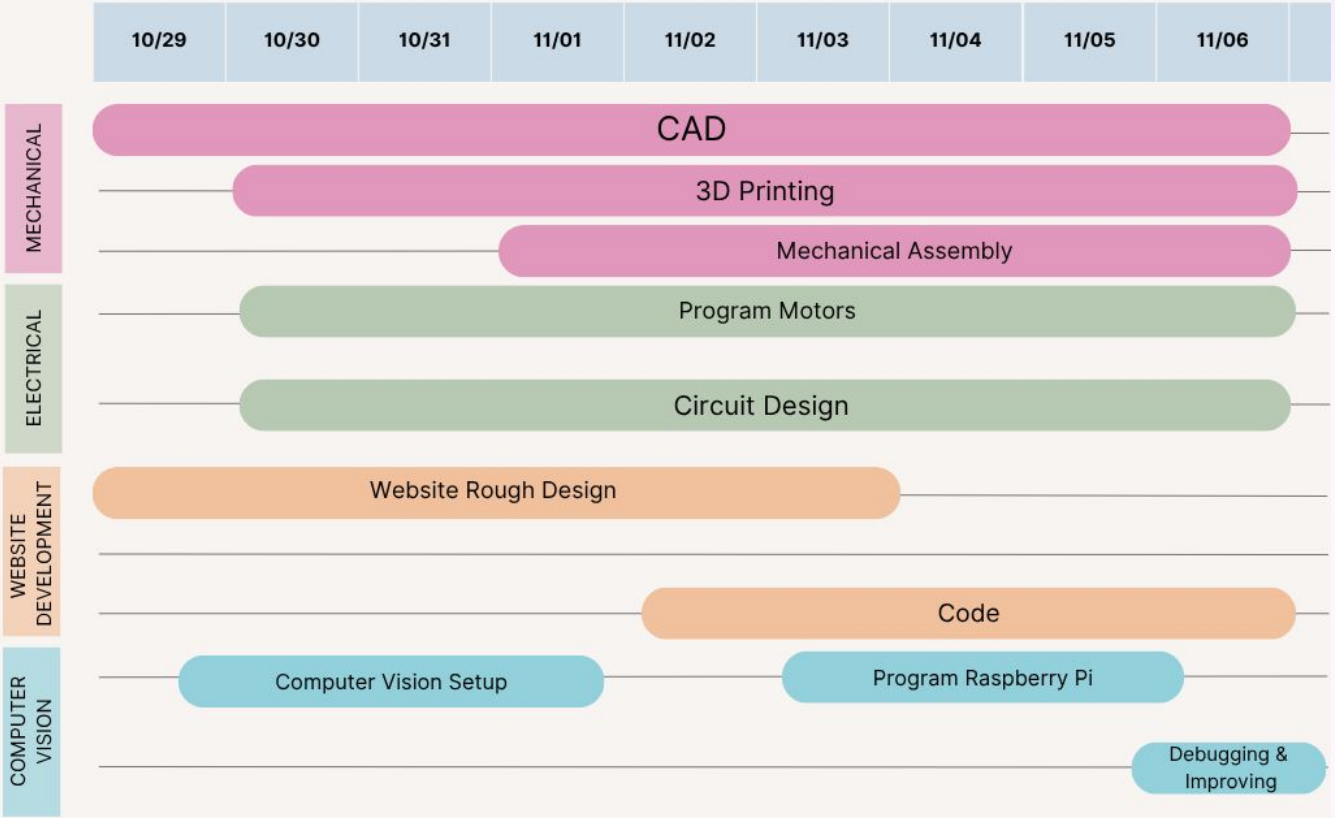
**Cohort Goal:**

To foster problem-solving, creativity, and collaboration within the cohort. Involve all majors and make the product aesthetically pleasing.

# Overview

- Flappy Bird game controlled by arms
- Physical prize wheel with rigged/not rigged mode
- Door at bottom of machine retracts up
- Tray extends out with flyers

# TABLING MACHINE TIMELINE



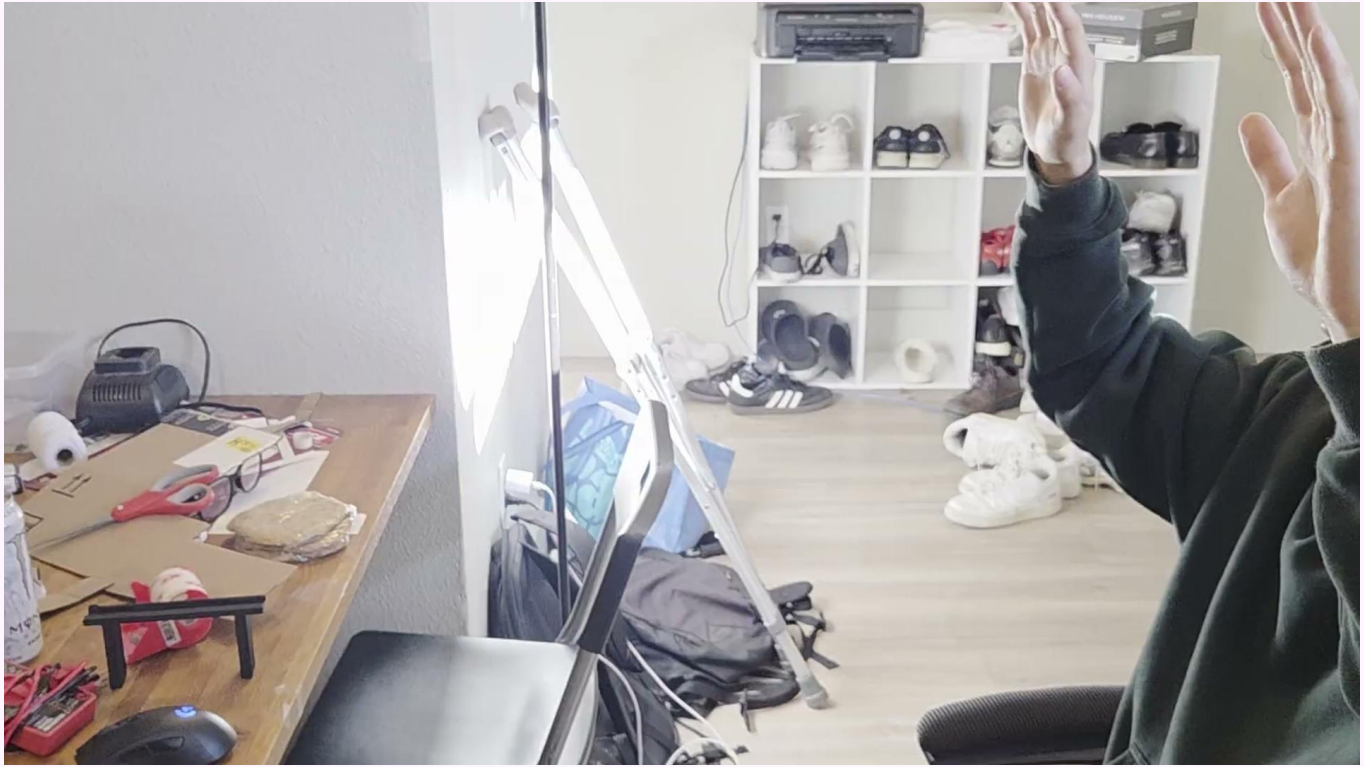
# Prototype

Version 1

Version 2

Version 3

# Demonstration

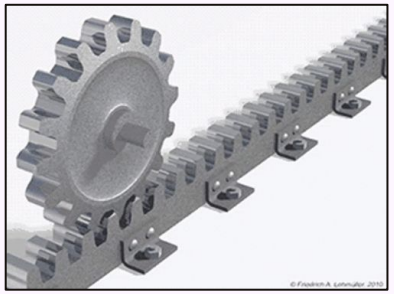


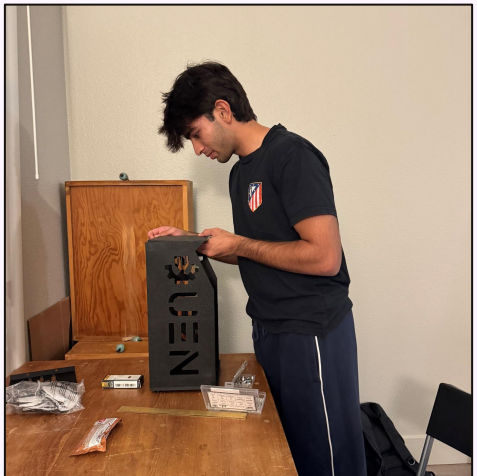
# User Guide

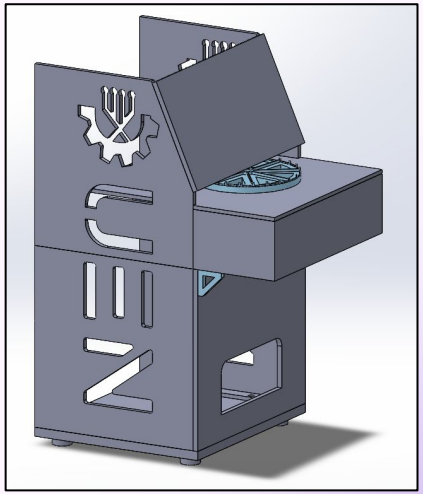
1. Position yourself in front of the camera. The camera focuses on the person closest.
2. Raise both arms above your head to start the game. The game will start in 3 seconds.
3. Bring your arms out to the side and flap your arms, navigating between all the pipes
4. Pass through 5 pipes to win the game. The wheel will spin and a prize will be given.

# Mechanics/CAD

- Chassis
  - Portable
  - Aesthetics
    - Arcade Machine
  - Wire management
- Flyer Dispenser
  - Rack and Pinion
- Door
  - Strings attached to spindle on motor
- Wheel
  - Axel attached to motor

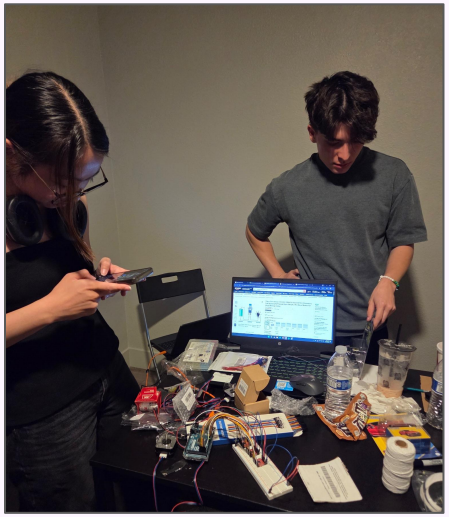


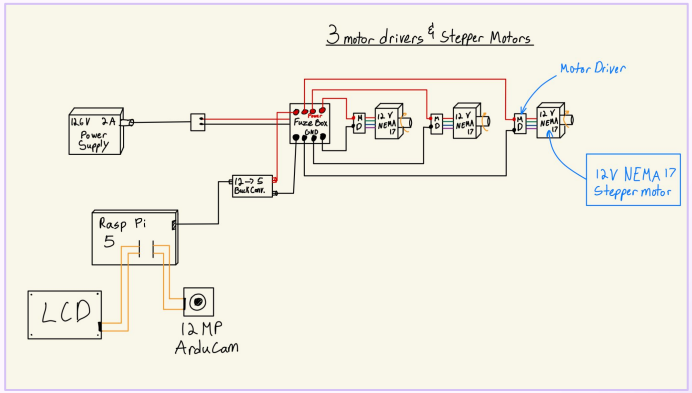




# Electrical/Hardware

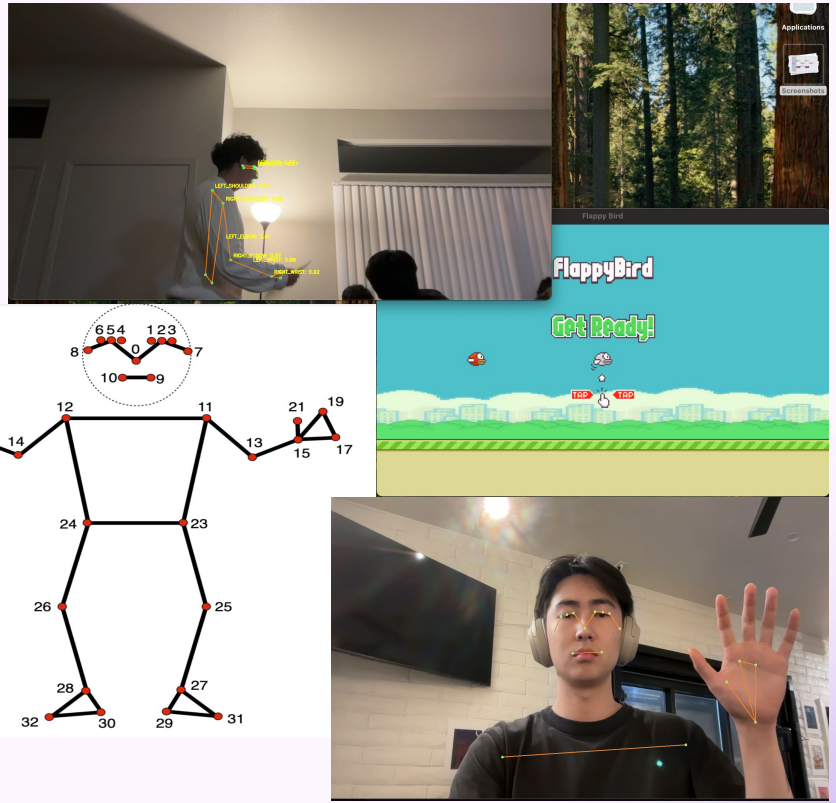
- Raspberry Pi
- Motor Drivers + Motors
- 12.6V/2A Battery
- 7in LCD Touch Screen
- Heatsink with Fan
- Push Buttons
- Challenges
  - USB-A to USB-C Issue
  - Fuse Box Blow
  - Motor Driver Replacement
  - GPIO Declaration
  - Tracking wheel starting position





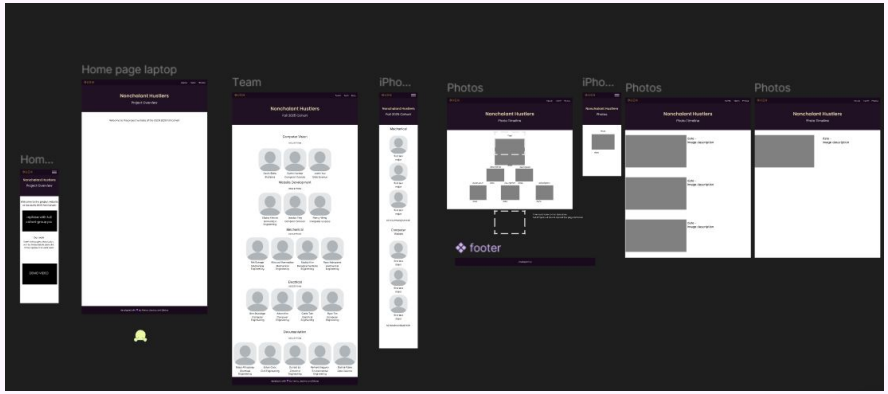
# Computer Vision

- Uses Google MediaPipe (pose estimation)
- Two states to register flap event
  - Up: Wrist and elbow above shoulder
  - Down: Wrist below elbow
- Challenges
  - Transition from webcam to AI Camera and raspberry pi implementation
- Solutions
  - Reflashed OS to bookworm. Rollback Python to 3.11.2

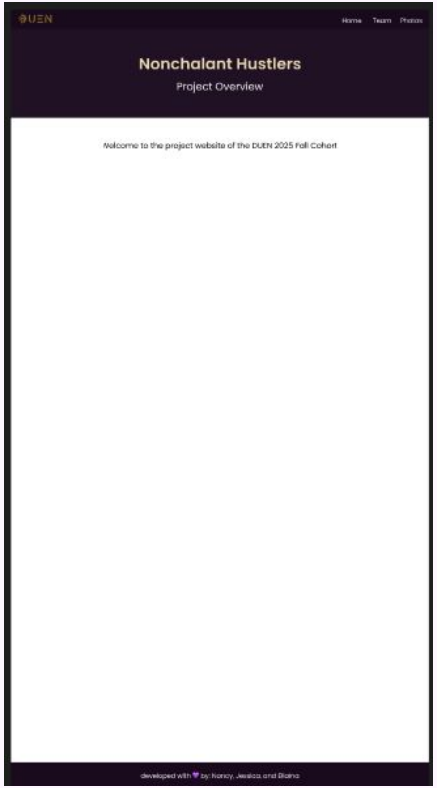


# Website Development

- Overview of the project
- Portfolio to showcase the project
- Used Figma to do a rough design of the website
- Used React & Tailwind CSS
- Website has 3 pages
  - Home Page
  - Team/Contribution Page
  - Photos/Timeline Page

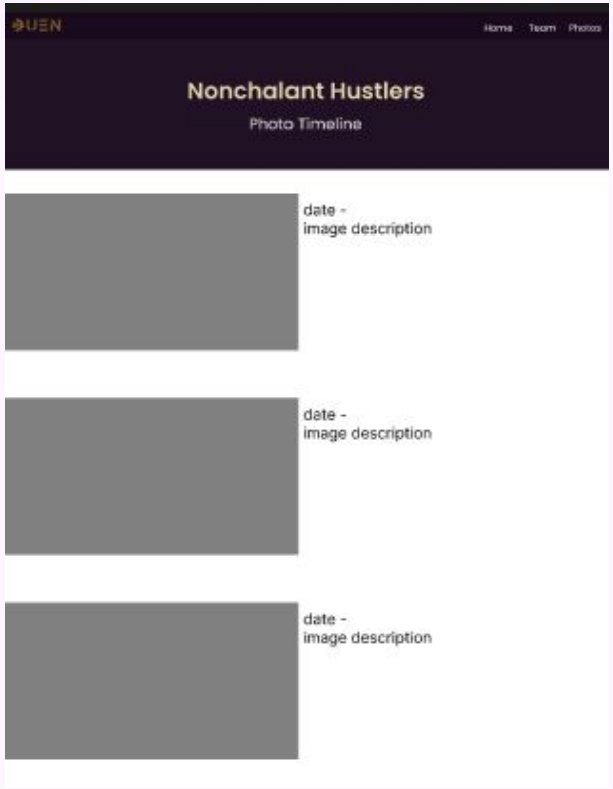


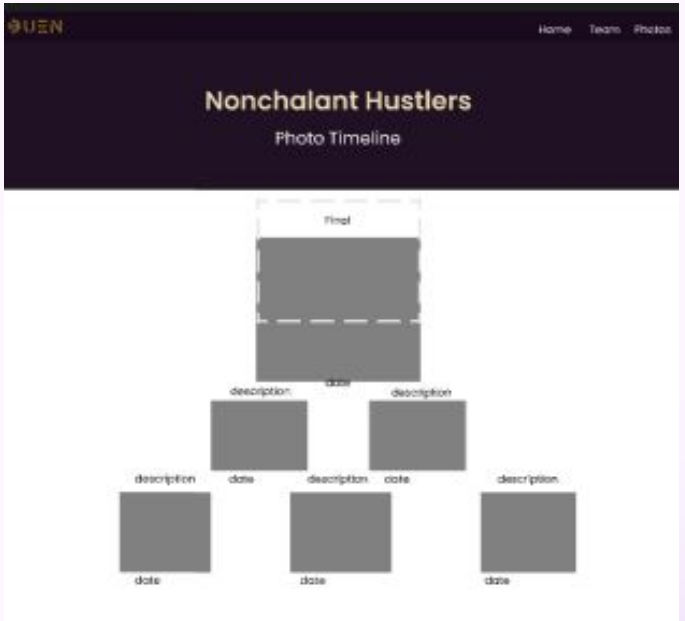
# Website Development - Home

# Website Development - Teams


# Website Development - Photos



# Budget

| ITEMS | PURPOSE | QUANTITY | COST FOR 1 | TOTAL COST |
|---|---|---|---|---|
| Raspberry Pi 5 (8GB RAM) | Microprocessor | 1 | $87.00 | $87.00 |
| Assorted Wires | to connect diff circuit elements | 1 | $6.98 | $6.98 |
| Ribbon Cables | connect AI camera to Raspberry | 1 | $10.00 | $10.00 |
| AI Camera | computer vision hand motion detecting | 1 | $25.00 | $25.00 |
| Ring Terminals | | 1 | $10.00 | $10.00 |
| LCD Screen | Display what camera sees | 1 | $60.00 | $60.00 |
| Battery | Power the system | 1 | $30.00 | $30.00 |
| SD Card | to store camera data | 1 | $13.99 | $13.99 |
| Active Cooling Heatsink | cool the raspberry | 1 | $9.97 | $9.97 |
| BreadBoard | Wiring and prototyping | 3 | $5.99 (1.99 per) | $5.99 |
| String | | 1 | $4.00 | $4.00 |
| Glue | | 1 | $9.00 | $9.00 |
| Nuts and Bolts | | 3 | $6 | $18 |
| Buck Converter | | 1 | $10 | $10 |
| Stepper Motor | | 3 | $10 | $30 |
| Stepper Motor Driver | | 1 | $10 | $10 |
| fuse box | | 1 | $12 | $12 |
| Solder board | | 1 | $10 | $10 |
| Buttons | | 1 | $8 | $8 |
| PLA Filament | | 2kg | $16 | $32 |
| PETG Filament | | 1 | $16 | $16 |
| | | | | |
| | | | TOTAL | $417.90 |

# Future Improvements

- Improve rack and pinion reliability
- Eliminate extra vibrations from motor
- Add rig toggle buttons and emergency shut off
- Wire management and housing
- Change timing of wheel
- Aesthetics

# Thank You

## Questions?

nonchalanthustlersdavis@gmail.com
(408) 800-7976
https://jytingy.github.io/duen_website/