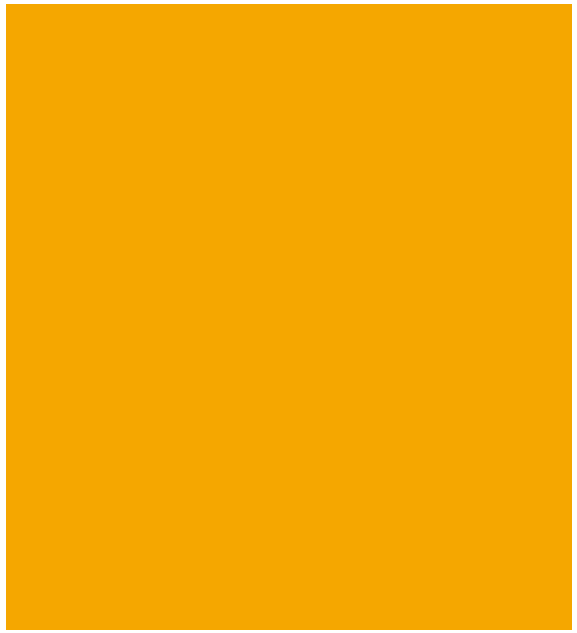
Project Portfolio

Elizabeth Shim

In-School Projects



Timeline of Projects

3D printed phone stand that was designed in Solidworks. Innovated with tolerancing, moments of inertia, center of mass and gravity. Two part phone stand that supports iPhone XR in both horizontal and vertical configuration.

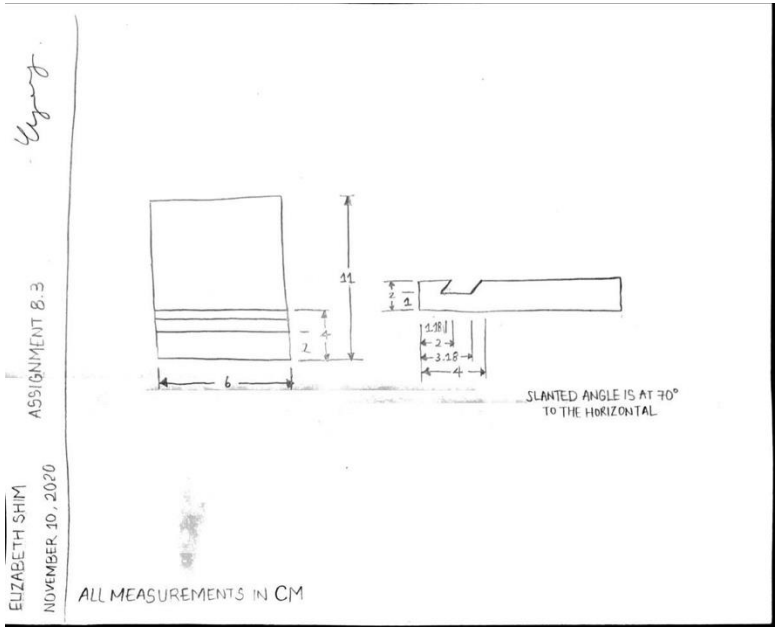
Created a line-following car that was coded in C and used hexadecimal instructions to carry out instructions. Used resistors, capacitors, sensors, and other circuit components.

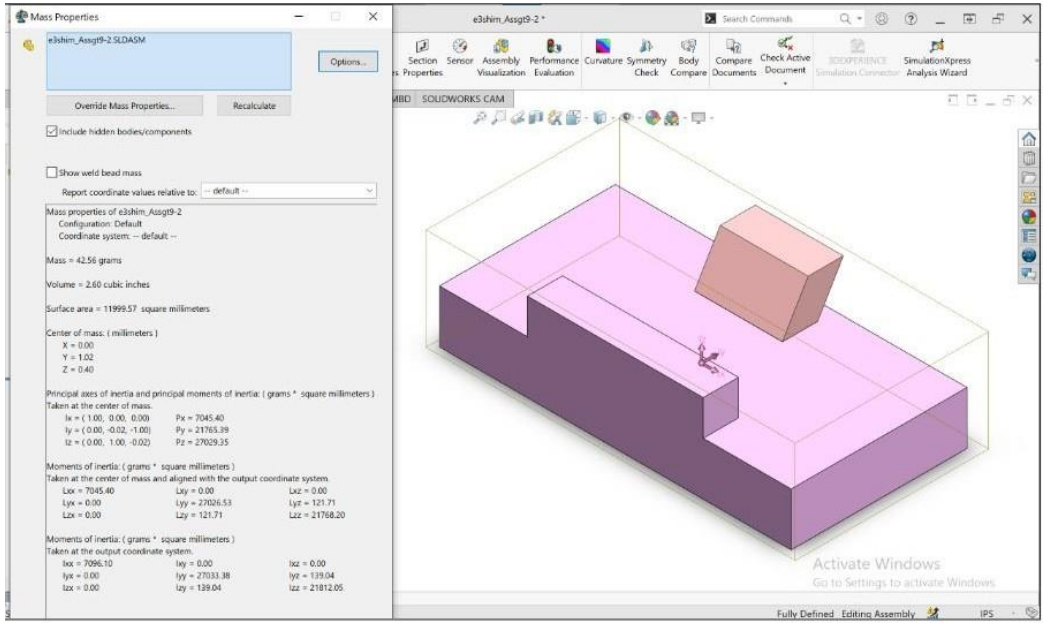
Designed using microcontroller STM32F401 with usage of GPIO pins, circuitry implementation, switches and motors. Introduced ADC functions and polling interrupts.

Designed using Vention. Chose fasteners, shafts, pulleys, bearings, and aluminum extrusions to fulfill specifications and criteria. Used AutoCAD for measurement details and outline.

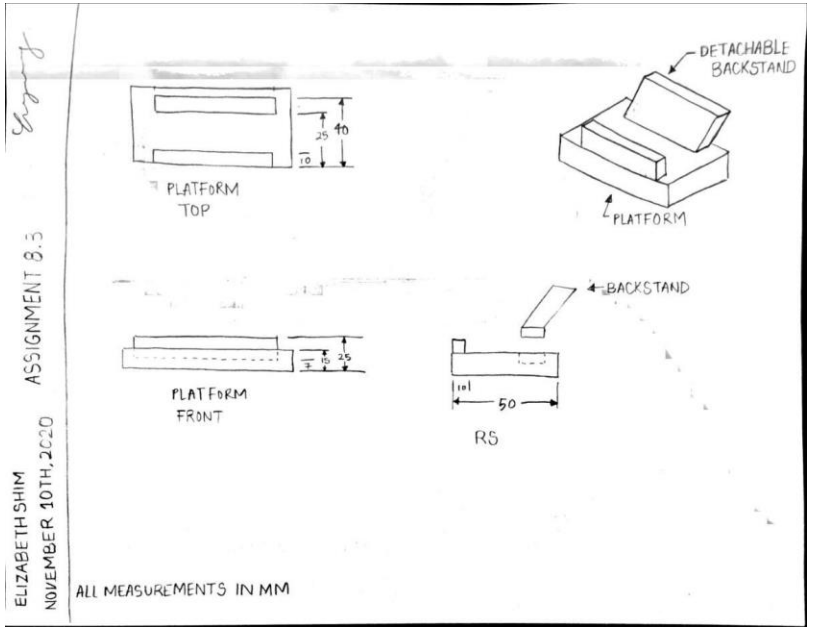
Coded a game in C that used GLCD library implementation on a microcontroller. Pointers, structs, addressing, threads, and mutexes were used. Push buttons, LED lights, and joystick interaction were included.

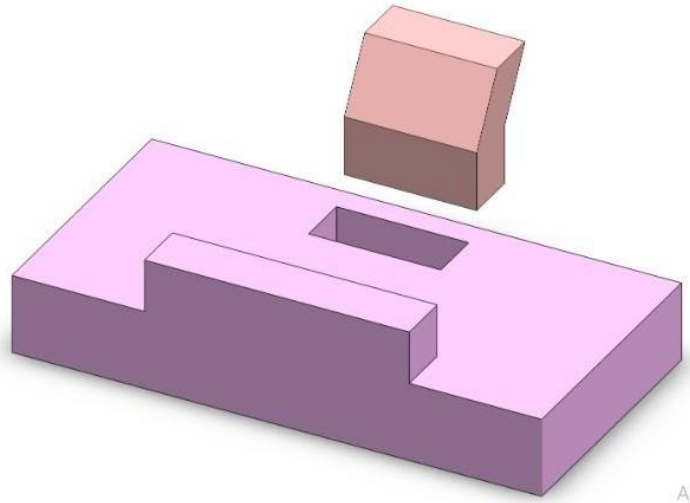
3D Printed Phone Stand



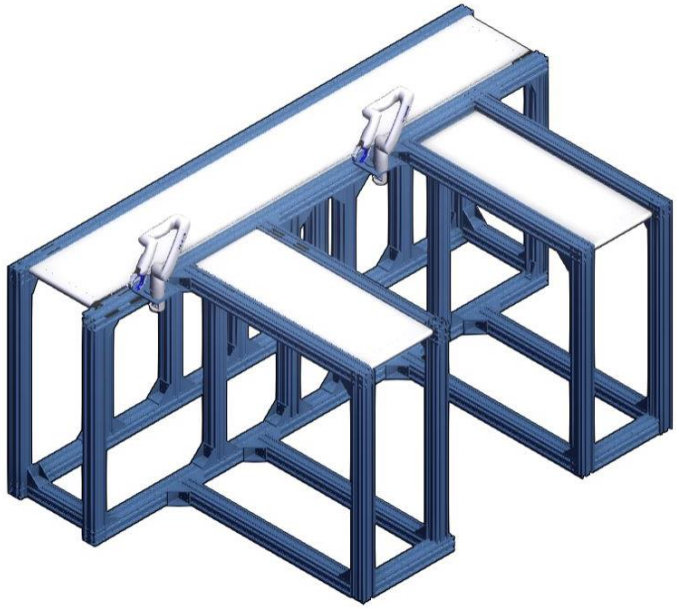


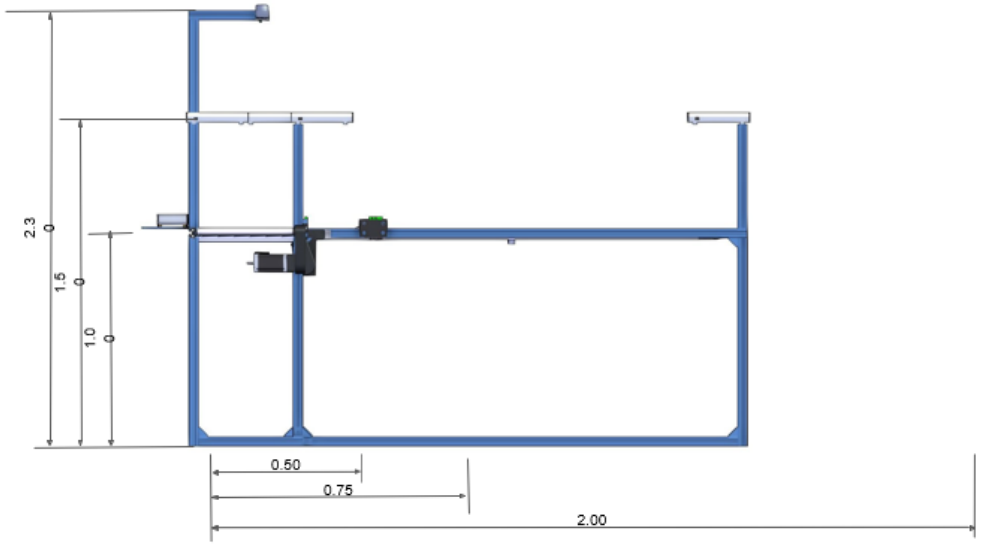
3D Printed Phone Stand





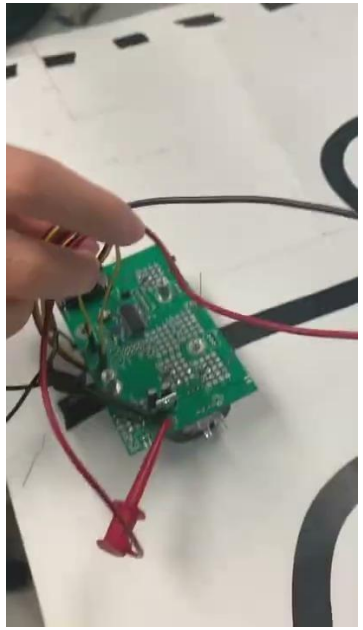
Conveyor Belt System



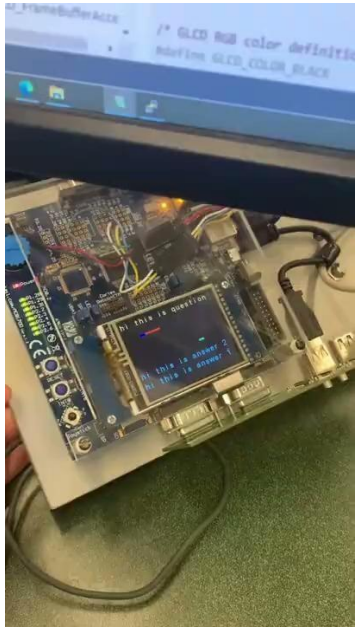


Software Examples

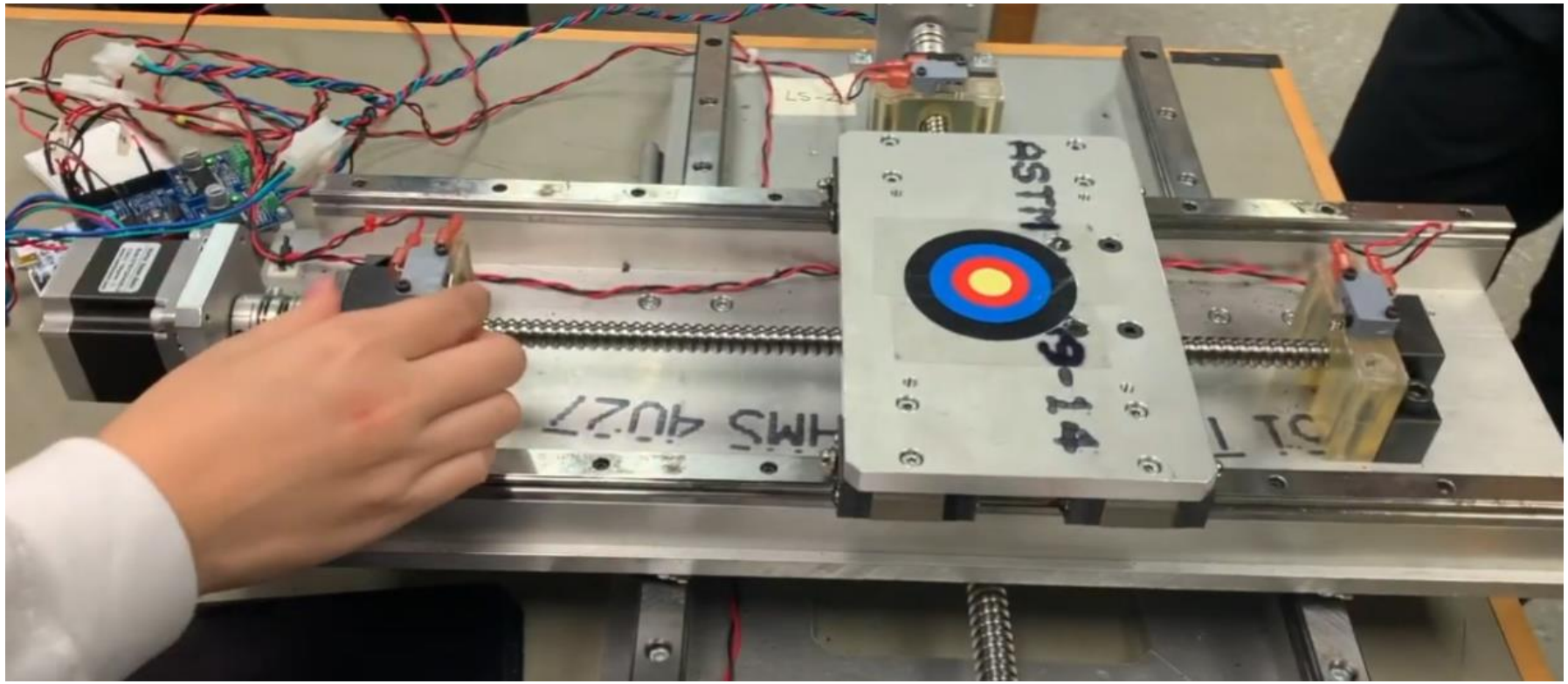
Robot Car



GLCD Game



2 Axis Limit Switch

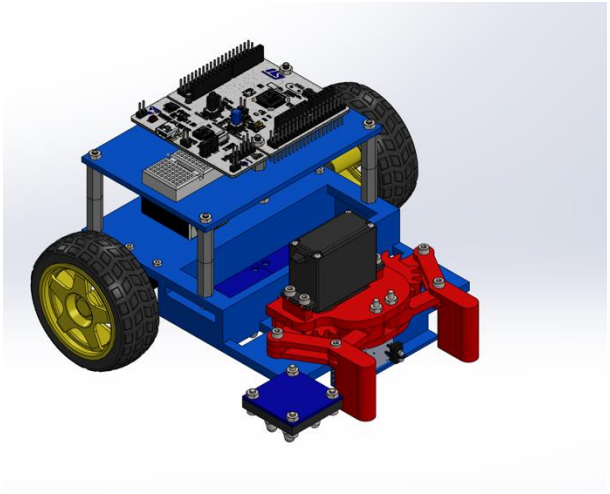


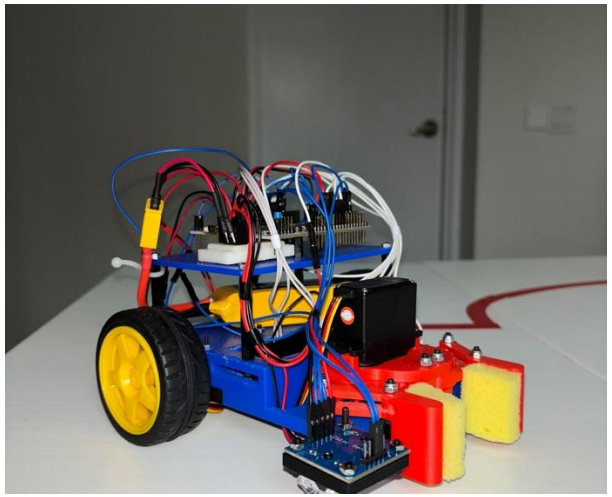
Design Course

MTE 380

Autonomous Robot

Worked on a design project where the team of 4 developed a line-following autonomous robot. This robot was designed to navigate a specified course and execute tasks like detecting Lego figures, picking them up, and delivering them safety to designated drop-off points.





Autonomous Robot

Software + Controls

- Used a STM32F01 Nucleo 64 board
- Motor control and characterization through PWM modulation
- Coded an analog-to-digital converter to acquire sensor readings
- PID controller implementation
- Autonomous line navigation and task execution with polling and interrupts

Electrical

- RGB sensor integration
- IR sensor integration
- Power supply
- I/O input and outputs to rest of system

For Fun Projects

Discord Bots

An enjoyer of discord bots for personal use and for friends. Some of the bots' functionalities:

Quote bot: prompt the bot to give a randomized quote with a randomized photo of favourite idols.

Pomodore bot: enter a time, bot will execute alarm with song of choice.

Exam bot: friendly competition between friends to make bets and guesses on exam marks. Bot keeps track of our scores and does the math.