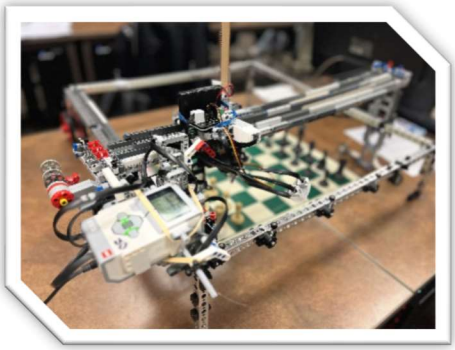
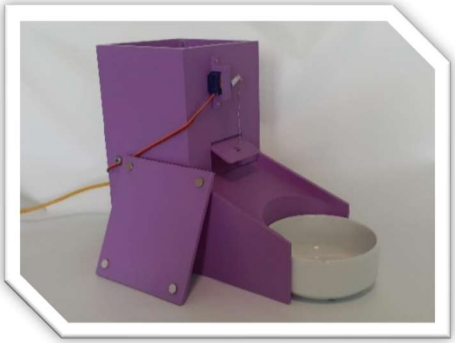
PROJECTS

Chess Robot



- Designed and built an **autonomous** chess robot, which performs moves against players.
- Capabilities include maneuvering chess pieces, executing moves, receiving player input, and chess clock integration.
- Designed and assembled a robotic claw, pulley systems, and precise actuation mechanisms, using **3D printed** and **laser-cut** parts.
- **Debugged** mechanical and software systems, solving integration issues.
- Programmed the robot in **C++** and **RobotC**. Built feedback loops with the use of color sensors and motor encoders.
- Project details: https://owenmoogk.github.io/projects/chess-bot

AI-Powered Cat Feeding Robot

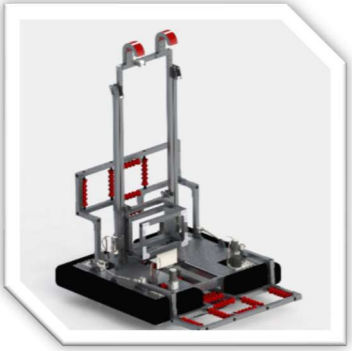


- Designed and programmed a **3D printed** robot to autonomously feed pets.
- Developed CAD models for 3D printing in **SolidWorks**.
- Built microcontroller circuits, integrating an **Arduino** with other simple electronic components, such as LEDs, limit switches, and servos.
- Utilized **Computer Vision** to detect a cat via an onboard webcam.
- Programmed the robot in **C++** and **Python** to detect a cat's presence and dispense food, given specific criteria.
- Project details: https://owenmoogk.github.io/projects/cat-feeder

Custom Built MacroPad

- Designed, built, and programmed a complete MacroPad. Capabilities include executing complex keystroke instructions, Spotify API calls, and much more.
- Designed the custom **3D printed** housing and keycaps in **SolidWorks**.
- Designed a custom **PCB (printed circuit board)** for ease of integration.
- Built a custom mounting system that allowed integration with existing keyboards.
- Integrated hardware switches with an **Arduino Nano**, which interfaces with a PC.
- Programmed logic with **C++** and **Python**.
- Project Details: https://owenmoogk.github.io/projects/macropad

Vortex - FRC Robot Design Challenge



- Designed a complete FRC Robot in **SolidWorks**, with the design intended to be used in a competitive robotics match.
- Integrated object intake systems with a robot feeder and shooter, giving full control to game pieces.
- Designed an object elevator, opening additional manipulation and movement opportunity.
- Designed a swerve drive system for optimal movement and drivability.
- Project Details: https://owenmoogk.github.io/projects/vortex

These are some of my favourite and most applicable projects.

For a complete list of projects and more details, please visit my website's project page, located at: https://owenmoogk.github.io/projects