OWEN MOOGK

Mechatronics Engineering Student

at the University of Waterloo

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# EXPERIENCE

## Personal Projects 2019 – Present

* Developed complex webpages using HTML, CSS, JavaScript, and ReactJS.
* Implemented advanced algorithms and data structures to solve problems.
* Designed and built full stack applications with ReactJS and Django (Python).
* Built a responsive personal portfolio website with ReactJS, showcasing many personal projects and endeavours (linked above).

## Formula SAE Team – Powertrain Member September 2022 – Present

* Working to design and build a powertrain system for a Formula racecar.
* Designing assembly and manufacturing aids in SolidWorks.
* Fabricating parts using 3-axis milling machine and lathe.

## FIRST Robotics – Subteam Lead August 2018 – September 2022

* Led a subteam of students using project management and teamwork skills to design and build a robotic subsystem.
* Designed flexible assemblies and functioning systems in SolidWorks for manufactured and 3D printed fabrication.
* Fabricated complex parts and assembled robotic systems.
* Sponsorship program lead, using networking and interpersonal skills to attract and retain sponsorship for the team.

## Electric Car Team – Senior Student September 2021 – June 2022

* Designed and manufactured a fully electric racecar in under a year.
* Designed a 3D printed emergency stopping system in OnShape.
* Optimized drivetrain systems to increase efficiency.

## Merry Hill Golf Club – Clubhouse Employee May 2020– September 2022

* Demonstrated excellent customer service by implementing communication, responsibility, and cooperation skills.
* Navigated difficult situations through accountability and professionalism.

## Choose to Lead – Student September 2018 – June 2022

* Developed teamwork, cooperation, management, and leadership skills in a variety of community activities and volunteering efforts.
* Developed public speaking skills, hosting the Waterloo Regional Mayors forum.

## SHAD Canada – UPEI Fellow July 2021

* Engineered an award-winning solution interfacing Canadians with their water consumption habits, including custom 3D printed pipe mounting.
* Networked and learned from global leaders regarding environmental sustainability and business practices.

# EDUCATION

## Mechatronics Engineering – University of Waterloo 2022 – 2027

Candidate for Bachelor of Applied Science, studying Mechatronics Engineering. Working with likeminded students building collaboration, time management, and technical skills. Maintaining a grade average above 95%, with a 4.0 GPA.

# SKILLS

## Software

Proficient in many languages, including Python (4 years), JavaScript/jQuery (4 years), C++ (2 years), Java (1 year). Experienced in object-oriented programming.

Experience implementing and utilizing advanced data structures and algorithms.

Experience with XML and JSON scripting.

Experience in software documentation and testing/debugging.

## Frameworks / Tools

Proficient in website and full-stack development with HTML (5 years), CSS/LESS (5 years), ReactJS (3 years), Django (2 years), Git/GitHub (4 years), Visual Studio Code (5 years).

Proficient in creating and utilizing REST API solutions and user authentication systems (JWT), with Django and SQL databases.

## Other

Experience in customer service and leadership roles, demonstrating teamwork and cooperation. Eager to learn new skills on the job.

# ACHIEVEMENTS

## JamHacksV Winner

Won first place in the JamHacksV hackathon, where I designed and built an AI-powered cat feeding robot in 48 hours.

## Harvard CS50

Completed the Harvard CS50 computer science course, in which I learned software design principles, C++ and Python, and built a full stack application.

## AP Scholars Award

Awarded the AP scholars Award for exceptional performance on Chemistry, Physics, and Economics advanced placement exams, all of which I achieved a qualifying score.

# PROJECTS

## AI-Powered Cat Feeding Robot

This robot was designed and built in 48 hours, for the JamHacksV Hackathon, with the functionality to feed a cat. The robot uses an offboard camera to recognize when a cat has approached the robot, with computer vision and artificial intelligence. It then sends a serial code to an Arduino in the robot, which opens a hatch that releases a controlled amount of food to the cat. The entirety of the robot housing was created in SolidWorks and 3D printed, as shown. Additional features include LED displays to allow the user to know the status of the robot, as well as fill level detection and automated emails, to notify the user when the tank needs to be refilled.

Skills: C++, Python, SolidWorks, Arduino, Artificial Intelligence

For more information: <https://owenmoogk.github.io/projects/cat-feeder>

## Personal Website

Over the COVID-19 pandemic, I found myself left with plenty of free time I had spent on my FIRST Robotics team. As such, I decided to spend some time learning website development. I built many different websites for different purposes, ranging from visualizing computer algorithms to web scraping for GitHub user information. With these skills, I built out a personal website, to document my projects and work. Due to the early versions of the code being verbose and repetitive, I also learned how to use the ReactJS framework. The website has a catalogue of my many projects, as well as past work experiences and a bit about me.

Skills: JavaScript, ReactJS, HTML, CSS

Find it at: <https://owenmoogk.github.io>

## FIRST Robotics Competition

As a part of a FIRST Robotics Team, each year we are tasked with creating a robot to compete in a challenge, and to design and fabricate the robot in 6 weeks. On this team, I lead a subteam of students to design and build a subsystem that could maneuver game pieces and interact with its surroundings. With my subteam, I developed complex SolidWorks models and assemblies, fabricated aluminum and steel parts, and assembled the subsystem. I led this subteam of 8 people, using teamwork and collaboration skills to coordinate progress and solve problems along the way. In addition, I also worked on the team as a sponsorship lead, using networking and interpersonal skills to attract and retain sponsors and funding for the team.

Skills: SolidWorks, Machining, Leadership

For more information: <https://owenmoogk.github.io/projects/2702-2020>