



# PROJECT PORTFOLIO

Jainish Mehta

# SmartVision

The goal of this project was to help disabled individuals interact with their surroundings using a software that takes in images and converts it into text that is later converted into speech. I got hands-on experience with UI/UX designs, iOS mobile applications, and first-time exposure to Swift. I also learned more about computer vision and how to use Apple's Vision framework and CoreML models for image recognition.



## *Technical skills:*

- Vision API
- Swift
- git (Github)

# LengthCV

This side project involved using OpenCV, Python, SciPy, NumPy, and image processing to draw contours on an image of a object and find its dimensions using a coin as a reference object. This was done using pixel per metric analysis. Upon experimentation, it was accurate up to 90-92% of the time!

## *Technical skills:*

- Python
- OpenCV, NumPy, SciPy
- git (Github)

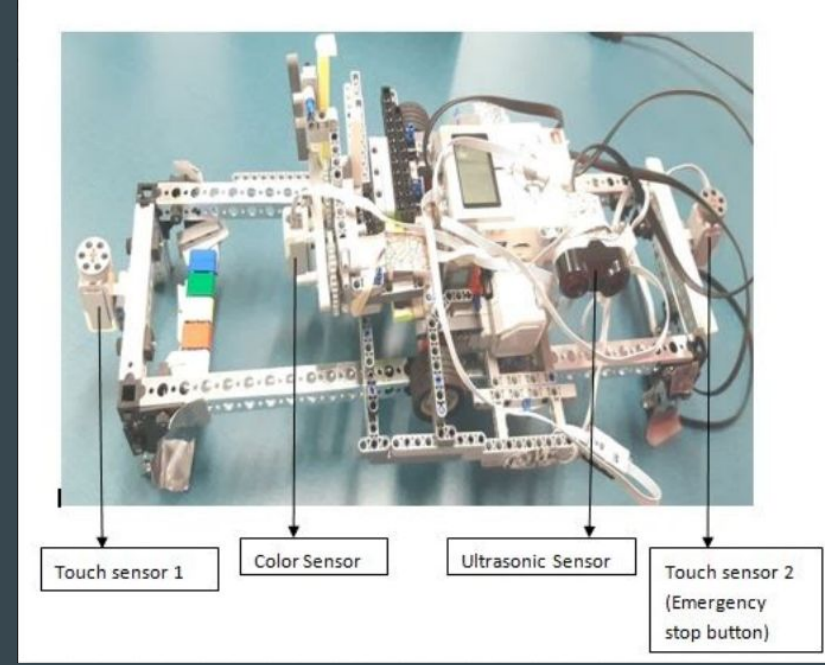
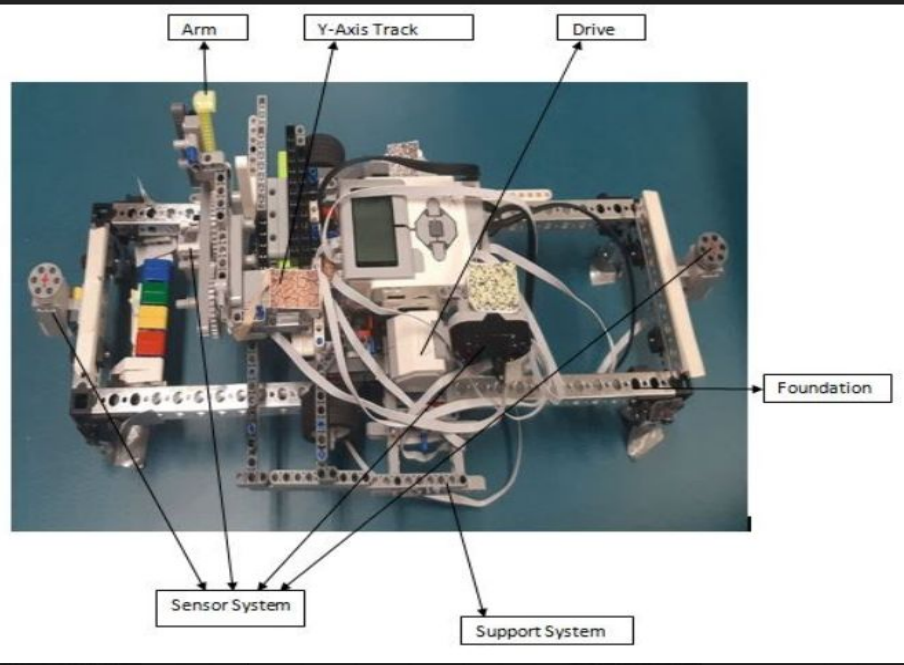


# Aktiv

This project involved creating a robot that was able to receive an input and type the response onto a computer keyboard. This required mapping the keyboard and maintaining accuracy using a PID controller. This project sparked my interest in robotics and its broader applications on a larger scale. At the end, we also tried to use computer vision open source code to get sign language as the user input. This code was written in Python and slightly modified for our purposes (nonetheless, it didn't work with this input too well). Some pictures are included in the next slide!

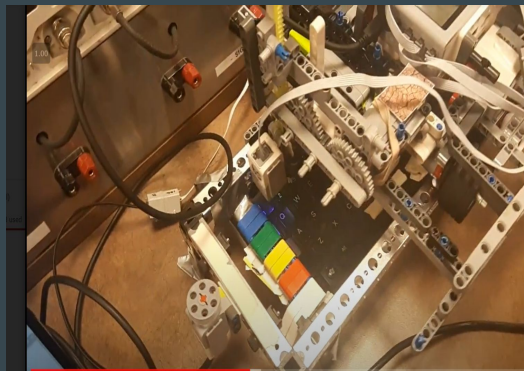
## *Technical skills:*

- C++
- RobotC
- some Python
- mechanical modelling



*Major parts of the Aktiv*

*The robot on the keyboard track*



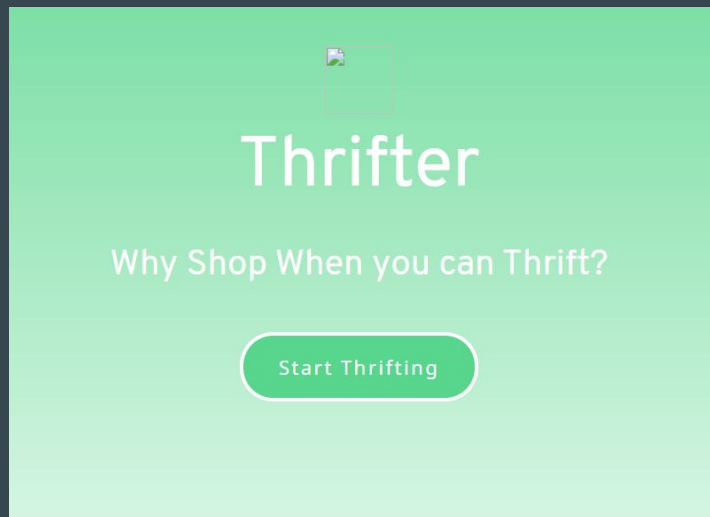
*Sensor Implementation*

# Thrifter

I worked with 3 others on a project aimed to encourage users to thrift shop in order to minimize the impacts of fast fashion on the environment. This web application worked by finding the most optimal match between a database of business-side clothing and a picture of clothing that a user inputs. This involved using Google Cloud Platform Vision API to convert each picture into a set of tags. A MongoDB database was used to store the business-side clothing. The backend server filtered each piece of clothing based on relevant manual tags in order to “clean the data” and determine which type of clothing the API interpreted it to be. Then, a KNN supervised algorithm was ran in a Express.js server to find the optimal match. This project related to my passion for sustainable development and machine learning. Check out some pictures on the next slide!

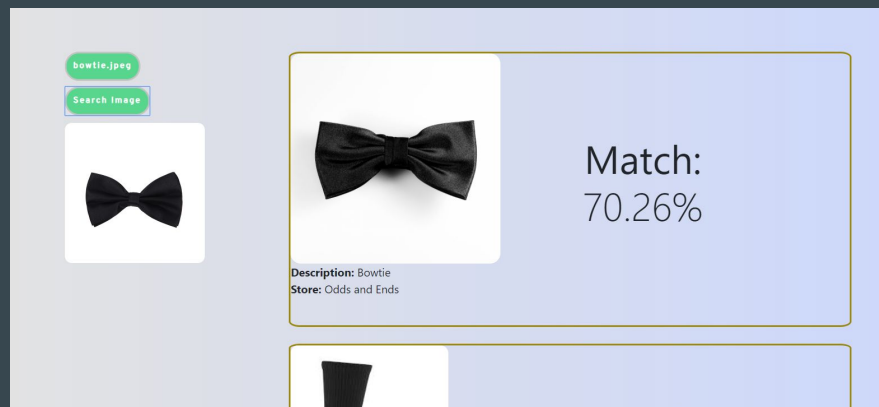
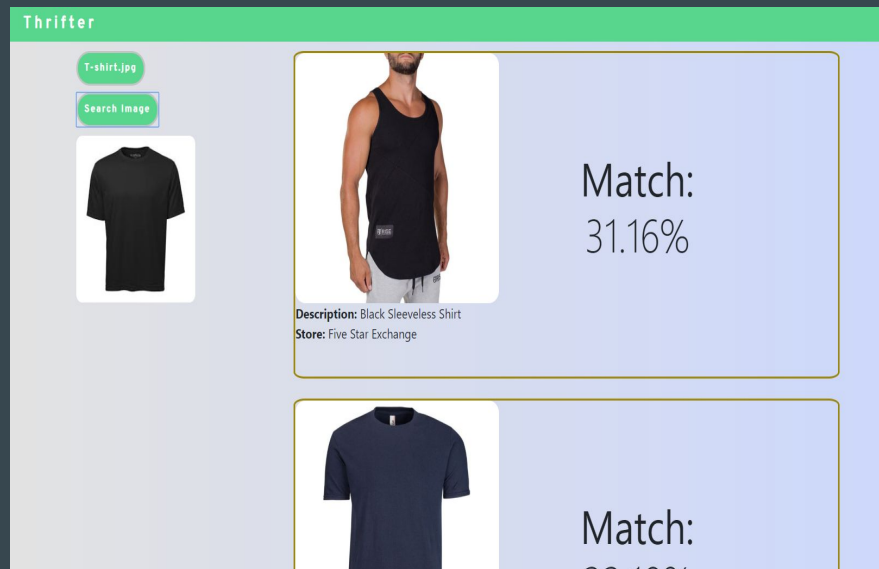
## *Technical skills:*

- Google Cloud Platform's Vision API
- Javascript
- HTML, CSS
- some MongoDB supervised learning
- NPM
- git (Github)



*Start Page of Thrifter*

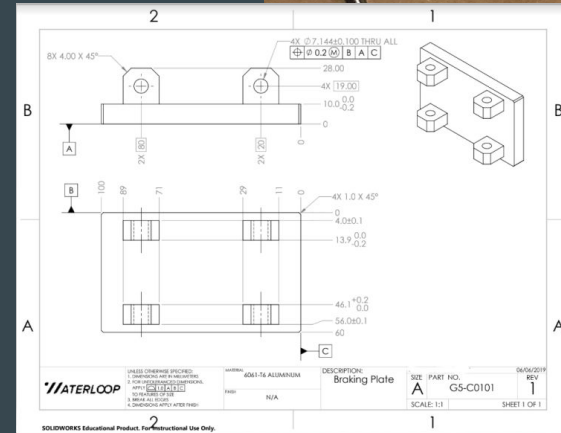
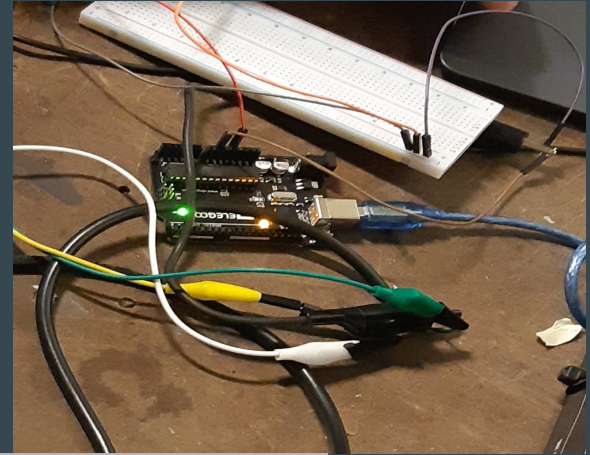
*Testing the  
Software with  
Different Pieces  
of Clothing*





# University of Waterloo, Waterloo Design Team

I worked for the mechanical and embedded systems subteams for Waterloo. I created a design for the battery enclosure and braking plates (braking system) for the Hyperloop using Solidworks, considering requirements such as materials and location of holes to fit pins. I also worked on figuring out how to receive responses from a RobotEQ controller using an Arduino and CAN-bus principles. Additionally, I was required to interpret information about an incremental rotary encoder using C programming.

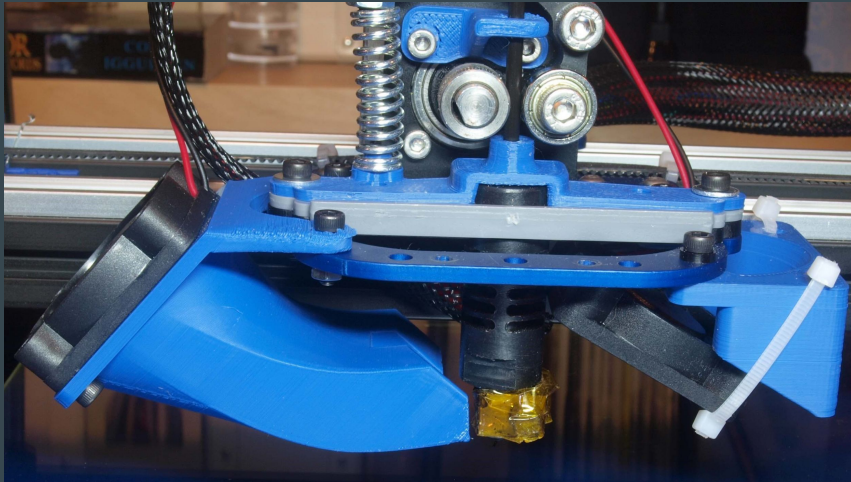




# Rapid Prototyping (3-D printing) Optimization

I worked alongside a graduate biomedical engineering student on a study about rapid prototyping cardiac anatomy of patients with congenital heart disease to be used as an education tool for surgeons.

I performed tests and created models to determine optimization for transparency, 3D printing material, nozzle and bed temperature, and cooling systems.



# City of Edmonton Youth Council

I was honored to serve in the health and wellness subcommittee wherein I was able to create projects that destigmatized mental health, as well as encourage healthy lifestyles for physical health. I worked on surveying people after StepUPYEG was launched. This project aimed to revamp the University of Alberta staircase with motivating messages to promote well-being. I also led discussions about the planning, logistics, and implementation of SpotlightYEG that aimed to normalize mental health discussions as youth express themselves and their stories through fine arts. Through this, I was able to pursue a passion of mental health and learn more about leadership.



# More Projects to Come...

These are just *some* of the major projects I was involved in, in which I learned much more about the software development process, as well as about teamwork. I hope to continue more projects into the future, including modelling data analytics for COVID-19, creating a movie recommendation system (still in progress, using Python and scikit-learn), and many more projects, especially relating to machine learning!

Thanks for reading!