Eidan Erlich

emerlich@uwaterloo.ca
eidanerlich.github.io
linkedin.com/in/EidanErlich
+1 (647) 462-8746

Highly motivated aspiring engineer with firsthand experience in R&D and ML

EDUCATION

University of Waterloo, BASc, Mechatronics Engineering (3.75/4.00 GPA) Class of 2027

- Relevant Courses: Data Structures and Algorithms, Circuits, Mechatronics Design

SKILLS

Languages: Python, C++, Java, Git, HMTL, CSS, MATLAB

Libraries: PyTorch, Numpy, OpenCV, Scikit-learn, TensorFlow

Tools: Git, Docker, Arduino, Formlabs, SolidWorks, AutoCAD, Excel, MS Azure, JIRA

EXPERIENCE

Machine Learning Research Intern, Monsters Aliens Robots Zombies May 2023 – Present

- Spearheading the development of research-based data logging during training, enhancing data tracking and analytics.
- Designing and implementing a production flag, resulting in a decrease in training time and compute cost by **over 40%**
- Developing a robust job queue system with **AWS integration**, reducing downtime, and ensuring uninterrupted processing
- Utilizing **statistical analysis** to investigate data distribution, improving dataset quality and optimizing model performance
- Implementing multi-video format compatibility with seamless integration, persuading **4 clients** to adopt the product
- Employed Euler angles to optimize **pose tracking**, improving accuracy and reliability of **feature recognition**

Perception Team Developer, *MIT Driverless - MIT-Pitt-RW Indy Autonomous Challenge* Jan 2023 – Present

- Collaborating with undergraduate and graduate students to integrate data from 6 **cameras**, 3 **Lidar**, and 3 **radar** sensors
- Training and deploying **YOLOv5** for detecting race cars in real-time, using **Python** and **C++** to successfully **track cars at 200+ kph**
- Integrating a proprietary end-to end **auto labeling and data generation** pipeline from recorded data to improve dataset quality
- Developing and implementing an **extended Kalman filter** to precisely track and predict vehicle position through **sensor fusion**

Technical Biomedical R&D Project Manager, *Vitreous Retina Macula Specialists of Toronto* Feb 2022 – Oct 2022

- Proactively initiated, researched, and fully designed ophthalmological surgical instruments using 3D printing technology
- Facilitated the adoption of the ophthalmological surgical instruments project by the **UHN**, demonstrating the potential for further development and implementation in the healthcare industry
- Pioneered proof of concept for 3D printing in a clinical setting, leveraging **DFMA** to **reduce manufacturing costs by over 90%**
- Led a team of MD and masters' students, conducting **root cause analysis** and **DOE** on feedback to refine prototypes

PROJECTS

Farm Optimization Mobile Tool, *Boston Consulting Group - Hack The Globe* March 2023 – April 2023

- Developed a web and SMS platform using Twilio's and Soil-grid's **API** to provide insights on localized soil, crop, and climate data
- Leveraged **telemetry data** to calculate site-dependent irrigation capacity, optimize water usage, and utilize a **decision tree classifier** to select appropriate fertilizer for the specific crop and location using **scikit-learn**

Real-Time Rock-Paper-Scissors Prediction with OpenCV and Yolov5 Jan 2023 – April 2023

- Implemented a CNN model for predicting rock-paper-scissors movements utilizing **Yolov5, TensorFlow, and MoViNets**
- Implemented thorough data pre-processing steps to enhance model precision, **resulting in an 84% accuracy rate**

Machine Learning Home Price Prediction with scikit-learn in Python Dec 2022

- Trained 2 supervised machine learning models to precisely predict house prices by analyzing metrics from public datasets
- Utilized mean absolute error and cross-validation trade-off to optimize model performance, **increasing accuracy to 85%**

Autonomous Machine Vision Algorithm, *Toyota Innovation Challenge* Oct 2022

- Developed an autonomous machine vision algorithm to track a 1:24 scale car within a simulated manufacturing environment
- Utilized **OOP** in **C++** and tracked the real-time position of the car, with **100% successful object recognition and classification**

Chess Robot, *University of Waterloo* Oct 2022 – Dec 2022

- Designed and integrated a 3-axis claw system to move the claw and individual pieces with **+/- 1 cm precision**
- Developed and assembled the power system using motors, sensors, and actuators to ensure accurate movement
- Implemented **agile development techniques in C++** and integrated with the mechanical assembly

Electric Go-Kart Design Lead Sep 2021 – Jun 2022

- Fully designed and fabricated an electric Go Kart, sourced, and incorporated motor controllers, batteries, and mechanical modules
- Integrated electronic controls with the custom powertrain to optimize the power to weight ratio, **increasing power by 150%**