# Eidan Erlich

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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 and Electromagnetism, Mechatronics Design

## SKILLS

**Languages**: Python, C++, Java, ROS2, 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

- Trained and deployed a **CNN and GAN model pipeline** for feature **recognition** and **replication** for effective video synthesis
- Improved model training efficiency by developing and implementing optimization tools, reducing training time by **over 40%**
- Developing a robust job queue system with **AWS integration**, reducing downtime, and ensuring uninterrupted processing
- Spearheading the development of research-based data logging, enhancing data tracking and analytics
- Implemented multi-video format compatibility with seamless integration, resulting in **over $1 million** in projected revenue

**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, C++,** and **ROS2** to track cars at **250+ kph**
- Integrating an end-to end **auto labeling and data generation** pipeline from recorded data to improve dataset quality
- Developing an **extended Kalman filter** that leverages sensor fusion techniques to precisely track opposing vehicle position

**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** and **TensorFlow**
- Implemented thorough **data pre-processing** steps to enhance model precision, achieving an **accuracy of 84%**

**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** principles in **C++** to track the real-time position of a 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%**