Elliot Preston-Krebs

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EDUCATION

University of Toronto   **Toronto, ON**

Bachelor of Applied Science, Computer Engineering, Year 4   *Class of 2024*

- **Minors:** Robotics & Mechatronics; Artificial Intelligence
- **Relevant Courses:** Data Structures & Algorithms, Software Engineering, Robot Modeling & Control, Fundamentals of AI, Intro to Machine Learning, Programming C & C++

TECHNICAL SKILLS

Programing Languages

- Modern C++/C, Python, MATLAB/Simulink, ARMv7, Verilog

Technical Skills

- OOP(C++ & Python), PyTorch, RVIZ, Gazebo, Docker, Endpoint Dev, MongoDB, Arduino, GIT

PROFESSIONAL EXPERIENCE

Zebra Technologies – Robotics Automation   **Toronto, ON**

Robotics Software Developer   *May 2022 – Aug 2023*

- Worked on complex research and software problems involving the optimization of Autonomous Mobile Robots (AMRs) and human interactions in dynamic warehouse environments
- Implemented cutting edge algorithms for optimization, path planning, vehicle routing, and scheduling the robot pick ups in C++
- Spearheaded metrics collection and analysis of the algorithm used for grouping customer orders onto robots and produced local/global minima to serve as a benchmark for production algorithms
- Tested algorithms in a physical warehouse environment and verified new features on robots

University of Toronto – Sargent Group   **Toronto, ON**

LiDAR Researcher   *May 2021 – Aug 2021*

- Worked independently to build a LiDAR system that could reconstruct 3D images to compare commercial and lab-fabricated photodetectors
- Orchestrated multiple motorized stages and actuators to collect and process signal data to train and test a machine learning model which predicted range with an accuracy of 0.13 mm
- Deployed ML model in conjunction with scanning apparatus to recreate 3D images in Python

PERSONAL PROJECTS

Walking Compass Gait Robot   **Toronto, ON**

Robot Design Project   *July 2023 – Present*

- Designed and constructed a walking compass gait robot using an Arduino to control servo motors and sensors for precise leg movements, satisfying stability criteria.
- Employed a data-driven design approach through MATLAB simulations which analyzed the robot's torque requirements given a motion plan and physical robot parameters
- Implemented a feedback-linearization controller using real-time sensor data to ensure precise and stable robot control throughout its motion plan

Computer Vision for Autonomous Vehicles   **Toronto, ON**

Machine Learning Project   *Jan 2022 – April 2022*

- Created an application that could detect and outline humans, cars, trucks, buses, and motorcycles in traffic and dashcam footage
- Implemented a Region based Convolutional Neural Network(R-CNN) machine learning architecture with a ResNet backbone
- Trained the model using COCO_2017 and Pascal datasets and achieved bounding box and detection accuracies greater than 90%