Daniel Robson

University of Waterloo, 3B Mechatronics Engineer

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WORK EXPERIENCE

Software Engineer | Cepton Technologies

Aug 2020 – Present | Ottawa, ON

- Redesigned the object tracking logic that matches objects with clusters from the proceeding point cloud frame with a K-d Tree implementation, increasing the maximum number of trackable objects by 900%.
- Modelled the non-linear kinematic bicycle model using an extended Kalman filter to improve vehicle tracking in the perception software.
- Refined the logic for the splitting and merging of clusters and objects to utilize a K-d Tree, contributing to the improved performance and accuracy of object tracking.
- Developed a cloud change detection module that utilizes ICP to periodically check if a sensor has moved from its installment position, notifying the user if the sensor has shifted.
- Engineered an ML pipeline for object classification that optimizes normalization and classification model parameters for small datasets. The final model classifies clusters at the same accuracy as manual classification methods.

Jan 2020 – May 2020 | Ottawa, ON

- Designed a Camera LiDAR Extrinsic calibrator that finds the homogeneous transform between a LiDAR and Camera using a chessboard as a calibration object. This transform is used in an overlay application to align the LiDAR point cloud with camera output.
- Created a method to locate a chessboard within a point cloud using DBSCAN, RANSAC and OpenCV methods. This is necessary to determine the transform between the camera and LiDAR.
- Implemented a density-based clustering algorithm that finds all clusters within a point cloud. It removes outliers and is used to locate the point cloud of the chessboard.

Embedded Systems Engineer | Savormetrics

May 2019 – Aug 2019 | Mississauga, ON

- Automated product testing procedures to control multiple devices using serial port communication in bash, increasing the rate of data collection by over 1000%.
- Created visualizations using Python that organized complex sensor output data for quick analysis by the AI team.
- Designed and 3D printed various product components for precise testing. A few designs were incorporated into the final product, including a sensor casing.

Software Developer | Teranet

Sept 2018 – Dec 2018 | Mississauga, ON

- Designed an offline testing environment to mimic registry responses using C#, allowing the international team to perform uninterrupted application testing.
- Embedded an exportable SQL table displaying the health of every webpage and service into an existing web application, allowing users to easily monitor server health.

PROJECTS

Line Following Robot – MTE220 | Sept 2019

- Designed a line following robot, from the PCB soldering to the embedded programming in C.

Operation Robot | Dec 2017

- Programmed a LEGO robot in C capable of playing the board game Operation.

SKILLS

Proficient

C++, Python

Working Knowledge

C, MATLAB, C#, Java, JavaScript,

COURSES

- Algorithms and Data Structures
- Microprocessor Systems
- Numerical Methods
- RTOS

HOBBIES

- Sourdough Baking
- Gardening
- Mechanical Keyboards
- Piano
- Soccer