Chris Agia

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EDUCATION

UNIVERSITY OF TORONTO
B.A.Sc. in Engineering Science
Year 4 - Expected May 2021
President's Scholarship Program
Robotics Major, Business Minor
Professional Experience Year
GPA: 3.82 / 4.0

SKILLS

PROGRAMMING
3+ years:
Python • C/C++ • MATLAB
1-2 years:
Assembly • Verilog HDL • Java

SOFTWARE TOOLS
Git • TensorFlow • NumPy
PyTorch • ROS • PCL
Simulink • Linux • Docker

PUBLICATIONS

[1] K. Zhang, H. Hu, A. H. Tan, M. Ruan, C. Agia, and G. Nejat. Sim to real: Deep reinforcement learning for autonomous robot navigation in rough terrain. *Manuscript in preparation*, 2020.

COURSEWORK

UNDERGRADUATE
Machine Learning, AI
Statistics, Bayesian Inference
Numerical Methods, Optimization
Mobile Robotics, Manipulators
Algorithms, Data Structures
Control Systems, Path Planning
State Estimation, Mapping
Dynamics, Systems Software
Microprocessors, Electronics

EXTRACURRICULARS

NSight Student Mentorship Program
Academic Teaching/Counselling
Varsity Blues Soccer Team
Health and Fitness
Guitar/Bass
Reading

EXPERIENCE

AUTORONTO | Computer Vision Engineer
UofT Self-Driving Vehicle Group - SAE/GM AutoDrive Challenge
August 2019 - Present | Toronto, ON

- Leading the development of a PointPillars 3D LiDAR detection pipeline for aUToronto's Object Detection Team

HUAWEI - NOAH'S ARK LAB | Deep Learning Research Intern
Autonomous Vehicles Research - Perception and Localization
May 2019 - Present | Toronto, ON

- Designed an F-CNN model that learns (end-to-end) to predict binary road masks from LiDAR point clouds at real-time speeds
- Developed a monocular SLAM system that integrates dense depth prediction with the traditional direct sparse odometry method for faster convergence
- Implemented a deep learning PointNet model for point-wise segmentation of stable and dynamic objects from 3D point sets
- Proposed a novel graph-based mapping method to improve multi-level surface localization and circumvent the UTM zone switching issue
- Performed extensive literature review on the topics of semantic segmentation, object detection, and learning-based localization

UNIVERSITY OF TORONTO | Undergraduate Researcher
Autonomous Systems Lab, Prof. Goldie Nejat - NSERC Grant
May 2018 – Aug 2018 | Toronto, ON

- Worked with a team of graduate researchers to investigate the application of Deep Reinforcement Learning (A3C) for autonomous rough terrain navigation
- Developed the ROS Navigation Stack for a Jaguar 4x4 search and rescue robot
- Improved the state estimation of the Jaguar 4x4 with an Extended Kalman Filter for sensor fusion of odometry information
- Implemented various SLAM methods to generate accurate 2D and 3D maps
- Coordinated several demos for corporate Vp's and news media

GENERAL ELECTRIC | Software Engineering Intern
May 2017 – Aug 2017 | Markham, ON

PROJECTS

AUTONOMOUS PACKING ROBOT | C, Assembly, Arduino
Microcontroller Subsystem Member - Team placed 3^{rd}/50

- Designed, built and programmed a robot that systematically sorts and packs up to 50 pills/minute to assist those suffering from dementia
- Created an efficient UI allowing a user to input packing instructions

HOSPITAL TRIAGE SYSTEM | Python - Machine Learning
Ontario Engineering Competition 2019 - 1^{st} Place Programming

- Developed a machine learning software solution to predict the triage score of emergency patients, allocate available resources to patients, and track key hospital performance metrics to reduce emergency wait times

WAREHOUSE LOGISTICS PLANNING | Python - Algorithms
UTEK 2019 Programming Competition - 1^{st} Place

- Created a logistics planning algorithm that assigns mobile robots to efficiently retrieve warehouse packages - A* Path Planning, Clustering