

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

Dean's List - Fall 2018, Winter 2019

Robotics Major, Business Minor

Professional Experience Year

GPA: 3.82 / 4.0

SKILLS

PROGRAMMING

3+ years:

Python • C/C++ • MATLAB

1-2 years:

Java • Assembly • Bash • Latex

SOFTWARE TOOLS

PyTorch • TensorFlow • NumPy

ROS • PCL • OpenCV • SciPy

Pandas • Git • 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, Drums

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 (vehicle-pedestrian) with 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 - *[patented]*
- 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 USRA 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 3rd/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 - 1st 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 - 1st Place

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