

# 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. *Under Review, Tech Report, ICRA, 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

- Implemented a U-Net Fully Convolutional Network that predicts a binary road mask from LiDAR point clouds in real-time
- Developed 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 (50+ papers) on the topics of object detection, semantic segmentation, 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<sup>rd</sup>/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<sup>st</sup> 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<sup>st</sup> Place

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