

Richard Hu

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Education

University of Toronto

Toronto, Canada

Master of Applied Science, Mechanical Engineering

Sept. 2019 - April Present

Research Learning-based rough terrain navigation for mobile robots research at Autonomous Systems and Biomechatronics Lab

University of Toronto

Toronto, Canada

Bachelor of Applied Science, Mechanical Engineering, With Distinction - Dean's Honours List

Sept. 2013 - April 2018

Specialization Mechatronics Stream and Bioengineering Stream, Robotics and Mechatronics Minor. GPA (3.81/4.00)

Experience

Autonomous System and Biomechatronics Lab

Toronto, Ontario

Researcher

Sept. 2018 - Present

- **System** Designed an autonomous mobile robot system using ROS and C++
- **SLAM** Implemented Lidar based and vision based SLAM for autonomous navigation
- **Control** Developed position controller and velocity controller for skid steer control
- **Hardware** Installed auxilliary computing units and sensors with mounts designed using SolidWorks
- **Reinforcement Learning** Sim to real transfer of learned policy onto the autonomous mobile platform for rough terrain navigation

Conavi Medical

Toronto, Ontario

Mechanical Engineer - Novasight Hybrid System

May. 2016 - Aug. 2017

- **Design** Designed components that were critical to patient safety using MATLAB and SolidWorks
- **Research** Investigated potential design hazards and risks for ensuring patient safety
- **Manufacturing** Fabricated catheter manufacturing jigs and drafted assembly work instructions
- **Operations** Directed major technical design reviews with senior leadership. Accelerated the exit of the project phase
- **Management** Established a management system with full traceability, gaureeted validity of 510k submission to FDA

Projects

aUToronto - AutoDrive Challenge

Toronto, Ontario

Mapping and Localization Team

Sept. 2018 - July. 2019

- **Mapping** Processed semantic map using python, QGIS and Open Street Map
- **Localization** Implemented real-time kinematics GPS system for localzation

Toward Smart Cities: Data-driven Road Accident Prevention

Toronto, Ontario

Data Scientist

Sept. 2018 - Dec. 2018

- **Machine Learning** Implemented SVM, Random Forest, and Deep Neural Network model for road accident prediction using Sklearn
- **Data Engineering** Processed weather, traffic, and geography data; performed feature-engineering and negative sampling

Autonomous Turtlebot Navigation

Toronto, Ontario

System Design

Jan. 2018 - Sept. 2018

- **Mapping** Developed coverage algorithm for mapping using ROS and C++
- **Vision** Used OpenCV for image detection and identification

Autonomous Maze Navigation Rover Design

Toronto, Ontario

Developer

Sept. 2017 - Dec. 2017

- **Autonomy** Implemented localization, obstacle detection, and path planning in MATLAB and Arduino
- **System** Designed architecture for autonomous payload pick-up and delivery in a maze

Honors & Awards

2018 **Best Undergraduate Poster Presentation**, CFD Society of Canada

Winnipeg, Ontario

All Terms **Dean's Honour list**, University of Toronto

Toronto, Ontario

2015 **University of Toronto Excellence Award**, University of Toronto

Toronto, Ontario

2015 **Shell Canada Limited Engineering Scholarship**, University of Toronto

Toronto, Ontario

2015 **Best Innovation Award and Best Prototype Award**, U of T Engineering Competition Junior Design

Toronto, Ontario