Richard Hu

(647) 995-9055 | richie.hu@mail.utoronto.ca | rhklite

Education

University of Toronto *Toronto, Canada*

Master of Applied Science, Mechanical Engineering *Sept. 2019 - April Present*

Research Deep reinforcement learning and virtual-to-real transfer of mobile robots. GPA (4.0/4.0)

University of Toronto *Toronto, Canada*

Bachelor of Applied Science, Mechanical Engineering *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*

- **Autonomy** Designed a mobile robot platform for urban search and rescue in ROS and C++
- **Machine Learning** Developed a deep reinforcement learning network and virtual-to-real transfer pipeline
- **Localization** Implemented lidar and vision based SLAM for real time pose estimation
- **Control** Optimized a robust motion contoller for rough terrain navigation
- **Deployment** In house experimental testing with autonomous point to point navigation

aUToronto - SAE AutoDrive Challenge (2018, 2019 Winner) *Toronto, Ontario*

Planning and Control Team *Sept. 2018 - Present*

- **Autonomy** Aim to develop a level 4 autonomous vehicle using ROS and C++ in a team of 30+ students
- **Localization** Implemented real-time kinematics GPS for precision localzation
- **Planning** Optimize trajectory planner for real time performance
- **Simulation** Evaluation of planning and control system using kinematics and dynamics model

Toward Smart Cities: Road Accident Prevention *Toronto, Ontario*

Data Scientist *Sept. 2018 - Dec. 2018*

- **Smart City** Developed data-driven accident prediction pipeline using Python and SKlearn in a team of 5
- **Machine Learning** Researched and benchmarked supervised learning models: Random Forest, SVM, and Deep Neural Network
- **Data Engineering** Data collection, visualization, feature engineering, and negative sampling

Autonomous Turtlebot Navigation *Toronto, Ontario*

Developer *Jan. 2018 - Sept. 2018*

- **Mapping** Developed coverage and exploration algorithm using ROS and C++
- **Computer Vision** Used OpenCV for object detection and identification
- **Social** Implemented person following and emotional model for human-robot interaction

Autonomous Maze Navigation Rover Design *Toronto, Ontario*

Developer *Sept. 2017 - Dec. 2017*

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

Conavi Medical *Toronto, Ontario*

Mechanical Engineer - Novasight Hybrid System *May. 2016 - Aug. 2017*

- **Management** Directed technical design reviews with senior leadership; accelerated the exit of the project phase
- **Operations** Established a inventory system with full traceability for FDA 510k submission validation
- **Research** Investigated potential design hazards and risks of catheter rotary assembly
- **Manufacturing** Streamlined and optimized assembly and calibration work instruction

Honors & Awards

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