# RICHARD HU

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# EDUCATION

## University of Toronto – Mechanical EngineeringSeptember 2013 – April 2018

## *Bachelor of Applied Science*

Graduated with honours. Mechatronics & Bioengineering Stream, Robotics and Mechatronics Minor. GPA (3.81/4.00)

## University of Toronto – Mechanical EngineeringSeptember 2018 – Current

*Masters of Applied Science*

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

# AWARDS & SCHOLARSHIPS

* Shell Canada Limited Engineering Scholarship (2015)
* University of Toronto Excellence Award (2015)
* Dean’s Honour List (All Years)
* U of T Engineering Competition Junior Design “Best Innovation Award” and “Best Prototype Award” (2015)

# WORK EXPERIENCE

## Autonomous Maze Navigation Rover Design September 2017 – December 2017

## *Software & Systems Developer*

* **Developed a deliberate/reactive hybrid control architecture** that governed an autonomous rover to maneuvering through a maze, performing obstacle avoidance, localization, path-finding, pick up and payload delivery to designated location.
* Implemented 2D histogram localization, ultrasound obstacle detection and avoidance, A\* path planning algorithm using **MATLAB** and **Arduino** programming.

## Conavi Medical, Toronto May 2016 – August 2017

## *Mechanical Design Intern (16 months)*

* Lead 3 major technical design reviews of a R&D intravascular catheter with senior leadership. This lead to **accelerated project progress** and successful exist of development phase.
* Conducted engineering design testing in clean room environment, designed components critical to patient safety using **jig design**, **statistical analysis**, **tolerance analysis**, **MATLAB** and **SolidWorks**. Designed critical mechanical component in Catheter based on design testing results.

# RELEVANT PROJECTS

## Open Architecture Quadcopter Capstone Design September 2017 – April 2018

## *Project Manager & Mechanical Designer*

* Responsible for overall project direction, planning, client coordination. Plan project schedule and critical path, proactively engage with team members to assess design progress, coordinate with client and supervisor to ensure client interest is well represented in the design.
* Designed mechanical features of a quadcopter using **SolidWorks** and prototyped the designed parts with **3D printer** to conduct verification testing. Analyzed structural integrity of component under impact using **ANSYS Explicit dynamics** tool.

## Pico-Scale Hydro Turbine Design Thesis January 2018 – September 2018

## *Researcher*

* Used **SolidWorks** and **ANSYS** CFX simulation result to design and build a variable guide vane mechanism for a self-powered pico‑hydro turbine for a startup company that is in collaboration with University of Toronto Water and Energy Research Lab.

## Autonomous Turtle Bot January 2018 – April 2018

## *Software Developer*

* Used **Robot Operating System (ROS)** and **C++** to implement deliberate/reactive hybrid control architecture on a TurtleBot2 to explore and map an unknown environment.
* Used **OpenCV** and **Adaptive Monte Carlo Localization** to search for an conduct image identification in a known environment.

# EXTRACURRICULARS

### **Mechanical & Industrial Engineering Mentorship Program** September 2017 – Present

## *Mentor*

* Coached junior engineering students on establishing study goals, obtaining research opportunities and building skills through extracurricular.

**New Start**Toronto, August 2014 – September 2015

## *Tutor*

* Instructed a group of students ranging from high school, to 2nd year U of T students on Physics, Chemistry and Calculus.
* Counseled students in defining study goals and formulating personal study methods.

# SKILLS & INTEREST

**Software:** SolidWorks (Certified SOLIDWORKS Associate), Arduino, MATLAB & Simulink, Robot Operating System (ROS), Machining, Microsoft Excel, C, C++, ANSYS Explicit Dynamics.

**Soft Skills:** Leadership, Coaching, Project management, Outcome Oriented, Strong work ethic, Multitasking

**Language:** Fluent in English and Mandarin

**Interest:** Travelling (Currently planning a trip to Japan), Board Games, Skiing, Skating, Cooking, Food