

Aidan Keaveny

Mechanical and Mechatronics Engineering

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RESEARCH EXPERIENCE

Sept 2019 **Advanced Robotics Lab**, *University of Waterloo*, Waterloo, ON.

- Present
 - Generated real and synthetic RGB-D datasets, which contains over 100k images, with ground truth segmentation masks and 6-DoF pose to train deep learning frameworks, such as Mask R-CNN and DenseFusion, for robotic manipulation using stereo vision.
 - Developed a ROS node to validate our perception system throughout grasping experiments, investigated the trade-off between runtime and accuracy with different backbone feature extractors.

WORK EXPERIENCE

June 2021 **Squishy Robotics**, *Robotics Engineer Intern*, Berkeley, CA.

- Present
 - Developed a novel neural network for state estimation of a tensegrity robot, work was required to implement advanced control policies for a mobile robot with highly non-linear dynamics, work may be published.
 - Developed, implemented and validated a path planning algorithm for a tensegrity robot throughout various experiments.

Aug 2017 **PM Group**, *Mechanical Engineer*, Dublin, Ireland.

- June 2019
 - Received international work experience on the design, build and handover of a \$250 million pharmaceutical plant.
 - Held ownership of several equipment packages throughout detailed design (rotary heat sealer) and witnessed in-house testing of equipment (blister packer and capsule filler) at factory premises in Italy, UK and Ireland
 - Supported installation during construction and activities during commissioning and qualification, managed and coordinated solutions for ongoing punch items relating to equipment, clean rooms and utilities
 - Sub-contracted to the client as an interim drug processing engineer, utilized experience throughout the project lifecycle to help construct process, material and cleaning flow diagrams with plant operators

PROJECTS

Sept 2019 **UW Robotics Team**, *University of Waterloo*, Waterloo, ON.

- Present
 - Leading a project to automate keyboard typing based on knowledge gained from an online course, Berkeley's CS285. This will be the first implementation of reinforcement learning at the international URC competition.
 - Implemented a Cartesian controller with KDL inverse kinematics for ROS control and developed a tool to visualize 3D non-linear workspace of a robot arm
 - Developed a robotiq motor controller driver library in C++

April 2020 **Smooth Path Planning Framework for Robots**.

- Developed a global and local path planner to minimize longitudinal and lateral jerk.

April 2020 **Decreasing Smartphone Processing time for Human Activity Recognition using Machine Learning**.

- Studied the effects of pre-processing using LDA and PCA with non-linear SVM.

SKILLS

Software: Python, C++, MATLAB, Blender, SolidWorks, Arduino.

Libraries: PyTorch, Tensorflow, NumPy, SciPy, pandas, cvxpy, OpenCV, Matplotlib, ROS, Gazebo, MoveIt!.

EDUCATION

Sept 2019 **University of Waterloo**, *MASc Mechanical and Mechatronics Engineering*.

- Present
 - GPA: 3.9/4.0 (Autonomous Mobile Robots, Intro to Machine Learning, Pattern Recognition, Control of Machines)
 - Scholarships: Advanced Manufacturing MASc Fellowship in Engineering (2019) (\$50,000), Queen Elizabeth II Graduate Scholarship in Science and Technology (QEII-GSST) (2019) (\$15,000)

April 2017 **University of Alberta**, *BSc Mechanical Engineering with Distinction*.

- GPA: 3.9/4.0 (Rank: 5th of 187 graduates)

OTHER

Online Courses: Stanford's CS231n: Convolutional Neural Networks, Berkeley's CS285: Deep RL, Modern Robotics

Volunteering: Junior Achievements Ireland (2018), Hero Holiday Dominican Republic (2013 & 2014)

Hobbies: Sports (Golf & Hockey) and travel enthusiast.