Richard **Gao**

(+732) 616-5432 | rgao@olin.edu | www.richgao.com | hardlyrichie | hardlyrichie

Skills

Programming Python, MATLAB, C, C++, Java, Javascript, ROS, Arduino, PyTorch, Docker, Git, Unix
Web HTML5, CSS3, SASS, React, Redux, Django, Node.JS, Firebase, MongoDB, SQL, Hugo

Education

Olin College of Engineering
Needham, MA

Candidate for Bachelor of Science in Engineering with Computing — *May 2022*

- GPA: 3.96/4.0
- *Coursework includes:*
  Machine Learning, Software Design, Data Structures and Algorithms, Discrete Math, Fundamentals of Robotics*, Software Systems*, Data Science* (* currently enrolled)

Experience

Real Steel
Needham, MA

Real Time Human Tracking Shadow Boxing Robot; (`https://youtu.be/1XufNJylf4Q`) — *October 2019 - December 2019*

- Created multithreaded framework centered around Python's multiprocessing queues to perform the skeleton tracking, joint solving, visualizations, and communication simultaneously
- Performed human skeleton tracking using the Kinect v1 and opensource software OpenNI2 and NiTE2 to obtain joint coordinates
- Implemented inverse kinematics solver given human joint coordinates using ikpy and onshape-to-robot to obtain robot joint angles
- Simulated robot motions in a physics engine using pybullet to facilitate easy integration with mechanical team

Poker Card Classification
Needham, MA

ML Computer Vision Project; (`https://bit.ly/2WusBAt`) — *September 2019 - October 2019*

- Implemented a CNN with transfer learning using the ResNet18 architecture in PyTorch to classify poker cards by suit and number

EnergySage
Boston, MA

Software Development Internship — *June 2019 - August 2019*

- Created and updated Django templates and views, bringing the Buyer's Guide Epic, a comparison platform for energy products, to production
- Upgraded dependencies and wrote characterization tests in preparation for migrating from Python 2 to Python 3
- Improved test coverage by writing Django unit tests that maintained the code base for agile development

The Gauntlet
Needham, MA

Quantitative Engineering Analysis Final Project; (`https://bit.ly/2Npzn7T`) — *April 2019 - May 2019*

- Created a MATLAB script that takes LIDAR data from a Neato robot vacuum and directs the robot toward an intended target using a potential field behavior architecture
- Applied RANSAC and gradient descent algorithms to strategically drive the robot around obstacles detected

Text-to-Portrait
Needham, MA

Olin Robotics Lab Project; (`https://youtu.be/_iO4P9R-ilU`) — *September 2018 - December 2018*

- Implemented framework that retrieves images from google search upon text input and extracts edges using Canny edge detection with OpenCV
- Communicated position coordinates to UR5 arm with ROS to move robotic arm along an optimized path to draw images

Activities

Olin Robotics Lab
Needham, MA

Researcher of HIRo (Human Interactions Robotics Laboratory) — *September 2018 - PRESENT*

- Researched real time object detection and localization with OpenCV in order to facilitate controlling two twin UR5 robotic arms in creating modular structures with 3D cubes

Honors & Awards

MIT Reality Virtually Hackathon
Boston, MA

Best in Mobility/Communication — *January 2019*

- Created an AR experience on the Magic Leap headset that uses IBM Watson Text to Speech and a Keras model for hand gesture recognition to display a virtual speech bubble, aiding in learning sign language and easing communication for the hearing impaired

Eagle Scout
Freehold, NJ

Project: CABC Church: Lines, Signs, and Landscaping — *October 2016*

- Planned, and led a service project to repaint the parking lot at the CABC Church. Raised $2000 for the Church through various fundraising activities