QI WANG

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EDUCATION

Columbia University, *New York, NY* — Sep 2018 – Dec 2019

M.S. in Mechanical Engineering (Concentration: Robotics and Control), CGPA: 3.7/4.0

- Related coursework: Algorithms, Robot Learning, Data Science for Mechanical Systems, Neural Network, Big Data Analytics, IoT.

City University of Hong Kong, *Hong Kong, HK* — Sep 2014 – Jul 2018

B.E. in Energy Science and Engineering & Minor in Computer Science, First Class Honor, CGPA: 3.72/4.30

INTERNSHIPS

RoboticPlus, *Shanghai, China* — Jun 2019 – Aug 2019

Algorithm Engineer, Research Department, Main Tasks: Tiling Robot Force Feedback System, Mortar Injection by Tiling Robot

- Fetched currents of joints by Linux SDK and joint torques by sensor, training a linear regression to transform current to torques
- Calculated force of end-effector by $J^T[F_x, F_y, F_z, \tau_x, \tau_y, \tau_z] = [\tau_1, \dots, \tau_6]$, MoveIt! and C++ Eigen, published to a topic in 100 Hz
- Marked force threshold when end-effector close to object, computing force difference; when it too larger, updated state as touched
- Searched position of board by scanning AR code by camera of Aubo robot, sucking the board with Force Feedback System
- Sucking board to initial position, planning a Z path and stopping nozzle at corner; after path completion, placing board back

PROJECTS AND RESEARCH

Research of Grasp Learning based on Joints and EMG for Rapid Grasp State Detection, *ColumbiaU* — Feb 2019 – May 2019

- Trained machine learning models (KNN, Kernel Ridge and PCA) on ROS for hand grasps data, including joints and EMG
- Published predictions of lost parts of testing hand grasps data to a specified topic, and estimated the accuracy up to 97%

Design, Simulation and Analysis of Movable Robots using Evolutionary Algorithm (EA), *ColumbiaU* — Sep 2018 – Dec 2018

- Built visualized environment (gravity, collision, friction) and cubes (hard, soft, contracting) as robot basics in OpenGL by C++
- Applied Random, Hillclimber and EAs to evolve robots with various morphologies and movement methods to find fastest one

Estimating State of Mobile Robot by Implementing an Extended Kalman Filter, *ColumbiaU* — Nov 2018 – Dec 2018

- Applied EKF to predict 2D position and orientation of mobile robot by current forward translational and rotational velocities
- Localized robot based on distance to the landmark from sensor to maintain predicted states within an acceptable range for a time

Motion Planning on Robot Arm to Reach Target Position, *ColumbiaU* — Oct 2018 – Nov 2018

- Simulated 7-DOF KUKA robot arm in a 3-D space with obstacles on ROS
- Realized RRT and PRM by Python to generate a safe motion plan without collision to move robot arm to the target position

Software Design Coursework Project: Self-Serving Dining Software *Master Foodie*, *CityU* — Jan 2018 – May 2018

- Utilized the Visual Paradigm to draw Use Case, Class and Sequence Diagram for the software development after analysis
- Implemented suitable design patterns, like Singleton, Factory etc. using Java in BlueJ and improved it through testing

EXTRACURRICULAR ACTIVITIES

Robotics Club in Columbia, Member — Sep 2018 – Present

Hong Kong Institute of Engineering, Member — Mar 2015 – Present

HONORS AND AWARDS

Dean's List — 2015/2016, 2016/2017, 2017/2018

Commercial Radio 50th Anniversary Scholarship (10k HKD per time) — 2015/2016, 2016/2017, 2017/2018

CityU Scholarship (40k HKD per academic year) — 2016 – 2018

HKSAR Government Scholarship Fund – Talent Development Scholarship (10k HKD) — 2015/2016

SKILLS

Skills: Microsoft Office, Database Application, Web Page Design, ROS, Python, C++ , Java, MATLAB, PyTorch, Spark

Certification: Computer Science and Programming Using Python (MITx), AI and Machine Learning Specialist (Lynda)