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: 3.67/4.0

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

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 2017 – Aug 2017

Algorithm Engineer, Research Department

Responsible For Aubo Force Feedback System and 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 and torque of end-effector by $J^T[F_x, F_y, F_z, \tau_x, \tau_y, \tau_z] = [\tau_1, \dots, \tau_6]$ and C++ Eigen, publishing to Wrench topic
- Marked force threshold when end-effector closing to object, measuring force difference; when too larger, updated as touched
- Designed a tile-like board with a nozzle in the middle and mortar tunnel for reuse of algorithm of sucking and releasing tile
- Located the board in smaller car by searching AR code for Aubo robot, calculating a path to suck the board with Force Feedback
- Sucking board to initial position, calculating a path based on reachable range to conduct a Z path, informing nozzle to stop at corner

PROJECTS AND RESEARCH

Research of Neural Network on Dynamic of Three-Link Robot for Rapid State Prediction *ColumbiaU* Mar 2019 – Apr 2019

- Loaded collected states and torque data based on analytical model of real three-link robot to the DNN built by PyTorch in ROS
- Trained the DNN to predict the state at the next time step based on present state and torque, with a median error lower than 0.2

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%

Research of Evolutionary Algorithm on NP problem for Feasible Solution, *ColumbiaU* Sep 2018 – Oct 2018

- Applied Genetic Algorithm (Genetic Programming) on TSP problem and Symbolic Regression by C++ and Python respectively
- Encoded each solution to TSP as an array and each city in the array as gene, to Symbolic Regression as a tree and node as gene
- Conducted mutation, crossover and selection operations to find the solution with best fitness within the given running time

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, Java, C++ , MATLAB, PyTorch

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