Jialiang (Alan) Zhao

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Learning-based Control, Perception & Prediction | Robotic Manipulation | Software Development & Research

EDUCATION

Carnegie Mellon University — Pittsburgh, PA — *Aug. 2018 - May 2020 (Expected)*
M.S. in Robotics, *Research Track* — GPA: 4.17 / 4.33 — The Robotics Institute (RI)
Advisor: Prof. Oliver Kroemer — Research Topic: Precise Robotic Grasping and Assembly
Selected Coursework: Deep Reinfocement Learning, Kinetic Dynamics and Control, Planning in Robotics, Computer Vision

University of California, Berkeley — Berkeley, CA — *Aug. 2017 - May 2018*
Visiting Student & Researcher — GPA: 4.0 / 4.0 — Department of Electrical Engineering and Computer Science (EECS)
Advisor: Prof. Ruzena Bajcsy — Research Topic: Control & Planning for Active/Passive Exoskeleton
Selected Coursework: Robotic Manipulation, Artificial Intelligence, Mechatronics Design

Beijing Institute of Technology — Beijing, China — *Sept. 2014 - May 2018*
Bachelor of Science in Automation — GPA: 95.8 / 100, Rank 1 / 200 — School of Automation
Selected Coursework: Control Theory, Machine Learning, Engineering Mechanics and Dynamics

EXPERIENCE

Intelligent Autonomous Manipulation Lab (RI, CMU) and — Pittsburgh, PA
National Robotics Engineering Center — Aug, 2018 - Now
Research Assistant | Supervised by ***Prof. Oliver Kroemer***
Precise, robust robotic grasping and autonomous assembly.

Epson Canada (Robotics Research Team) — Toronto, ON
Research Internship | Supervised by ***Dan Rico*** — July, 2019- Sept, 2019
Robust and fast robotic bin-picking of deformable parts.

HART Lab (EECS Department, UC Berkeley) — Berkeley, CA
Undergraduate Researcher | Supervised by ***Prof. Ruzena Bajcsy*** — July, 2017 - May, 2018
Modeling and control of an active/passive upper limb assistive exoskeleton.

National Key Lab of Intelligent Control & Complex System (Beijing Institute of Technology) — Beijing, China
Undergraduate Researcher | Supervised by ***Prof. Liwei Zhou*** and ***Prof. Hongbin Ma*** — July, 2017 - May, 2018
Learning based visual perception and mobile robot path planning.

RESEARCH PROJECTS

Precise Grasping and Assembly | The Robotics Institute, Carnegie Mellong University — Aug. 2018 - Now
- Precise Grasping: developed a system to plan robust and precise robotic grasps by estimating post-grasp object displacement as a probabilistic distribution. (published) | **CNN, Sim2Real, Supervised Learning**
- Robotic Assembly: aimed to solve gear insertion and bracket assembly problems in millimeter accuracy with Bayesian Optimization and Curriculum Learning. (on-going) | **BayesOpt, Curriculum Learning**
- Built and parallelized a simulation system to collect *millons* of grasps and assembly manuevers. | **V-REP**

Robust Grasping and Bin Picking | Epson Edge Robotics Research — Jul. 2019 - Sept. 2019
- Designed a grasping planner that predicted robustness of grasps for industrial deformable parts, by learning a representation of object geometry from CAD model. | **Representation Learning, CNN, Deformable Object Grasping**
- Built and parallelized a simulation system to collect *millons* of grasps. | **V-REP, PyBullet**

Active/Passive Upper Limb Assistive Exoskeleton | University of California, Berkeley — Jul. 2017 - Apr. 2018
- Built a torque controller with Unscented Kalman Filter state estimation, which could provide force on demand in lifting; modelled system dynamics with 6-axis force/torque sensor and encoders on NI DAQ platform.
- Designed and built an active/passive mechanism (powered by servos and elastic bands) which could be easily mounted on human arms.

Autonomous Tennis Ball Collecting and Serving Robot | Beijing Institute of Technology — Apr. 2015 - Jan. 2017
- Designed and built a mobile robot platform with tennis ball following, collecting, and serving functions.
- Achieved vision based obstacle avoidance, and landing position control with <1.5m error for ball serving.
- Built a web-based monitor and remote control interface with Python Flask; built a voice control interface with iFly dataset.

PUBLICATIONS & HONORS

Research Papers
- ***J. Zhao***, D. Troniak, O.Kroemer. "Towards Robotic Assembly by Predicting Robust, Precise and Task-oriented Grasps" *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS),* 2020 (under review)
- ***J. Zhao***, J. Liang, O.Kroemer. "Towards Precise Robotic Grasping by Probabilistic Post-grasp Displacement Estimation" *Field and Service Robotics (FSR),* 2019 (presentation)
- ***J. Zhao***, H. Ma, J. Shi, and Y. Liu. "Introduction and Initial Exploration to an Automatic Tennis Ball Collecting Machine." *IEEE European Conference on Mobile Robotics (ECMR),* 2017 (presentation)
- J. Shi, H. Ma, and ***J. Zhao***. "Web-Based Human Robot Interaction via Live Video Streaming and Voice." *International Conference on Intelligent Robotics and Applications (ICIRA)*, 2017. Lecture Notes in Computer Science, vol 10462. Springer, Cham
- ***J. Zhao***, Q. Gao. "Annotation and Detection of Emotion in Text-based Dialogue Systems with CNN." arXiv:1710.00987

Selected Honors
National Scholarship of 2015 and 2016 — Outstanding Graduates of Beijing, 2018 — Fellowship of Academician Zhou, Liwei, 2016
Fellowship of Xu, Teli, 2017 — Siemens Cup Automation Contest 2nd Place, 2015 — Intel Cup National Contest in Robotics, 3rd Prize, 2016

SKILLS

Python, C/C++, MATLAB, Tensorflow, PyTorch, Linux