

Yijia Wu

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EDUCATION

Worcester Polytechnic Institute

Ph.D. student in Robotics Engineering

Worcester, MA

Aug. 2022 – Present

Dartmouth College

M.S. in Computer Science

Hanover, NH

Sep. 2019 – June 2021

- **Thesis title:** “Zooming towards High Precision Pose Estimation”

- **Thesis advisor:** Professor Devin Balkcom

Beihang University

B.S. in Automation, Outstanding Graduate

Beijing, China

Sep. 2015 – June 2019

LANGUAGE AND TECHNICAL SKILLS

Programming Languages: Python, C, C++, MATLAB

Libraries / Frameworks: ROS, MoveIt, Gazebo, OpenCV, PCL, CUDA, pytorch

Engineering Software: Solidworks, onshape, EasyEDA

Hardware Platform: Arduino, Raspberry Pi, industrial robot arm (UR5, ABB IRB 120, Adept Cobra i600)

Languages: English, Chinese (Mandarin), Chinese (Cantonese)

PUBLICATIONS

- [1] Luyang Zhao, **Yijia Wu**, Julien Blanchet, Maxine Perroni-Scharf, Xiaonan Huang, Joran Booth, Rebecca Kramer-Bottiglio, Devin Balkcom, “Soft Lattice Modules that Behave Independently and Collectively” *IEEE Robotics and Automation Letters*, vol. 7, no. 3, pp. 5942-5949, July 2022
- [2] Samuel Lensgraf, Karim Itani, Yinan Zhang, Zezhou Sun, **Yijia Wu**, Alberto Quattrini Li, Bo Zhu, Emily Whiting, Weifu Wang, Devin Balkcom, “PuzzleFlex: kinematic motion of chains with loose joints,” *IEEE International Conference on Robotics and Automation (ICRA)*, 2020

RESEARCH EXPERIENCE

Underwater Modular Robot

Supervisor: Prof. Markus P. Nemitz

Aug. 2022 – Present

Worcester Polytechnic Institute

- Working on improving 3d printing technique to build functional watertight components for underwater robots

Robust Assembly of Compliant Modular Robots [1]

Supervisor: Prof. Devin Balkcom

June 2021 – Jan. 2022

Dartmouth College

- Improved robot module design and fabricated multiple modules, including 3D printing TPU-based structure, designing PCBs, assembling, wiring, and programming with Arduino
- Designed, implemented and tested robot basic functions and properties
- Designed the structure of the second version robot which extends the capability of multi-module structures

Zooming towards High Precision Pose Estimation

Supervisor: Prof. Devin Balkcom, Prof. Alberto Quattrini Li

Sep. 2020 – Sep. 2021

Dartmouth College

- Improved localization accuracy by analyzing multiples factors that could influence fiducial marker-based pose estimation accuracy with theoretical model, simulation, and field experiment
- Analyzed the benefit and limitation of using zoom camera to improve pose estimation accuracy and precision

Computational Joinery [2]

Supervisor: Prof. Devin Balkcom

July 2018 – Sep. 2018

Dartmouth College

- Built an error model to analyze the possible deformation of block-based structure with mass-spring model
- Improved the design of a parallel gripper and programmed a SCARA robot to build interlocking structure

WORK EXPERIENCE

Dorabot Inc.

Feb. 2022 - July 2022

Robotics Software Engineer

Peachtree Corners, GA

- Responsible for the testing, maintenance and deployment of the autonomous pallet jack system
- Maintained and developed the vision part of the palletizing project, including camera driver integration, calibration, data processing and model training

Dartmouth College

June. 2021 - Jan. 2022

Research Assistant

Hanover, NH

- Worked on “Robust Assembly of Compliant Modular Robots” project

Megvii (Face++)

Feb. 2019 - July 2019

Robotics Intern

Beijing, China

- Built vision-based robot manipulation demos with kinect and UR5 robot arm
- Developed mechanical, electrical components and wrote testing code for multiple projects

Cheitech

July 2017 - Dec. 2017

Mechatronics Engineer

Beijing, China

- Designed a EEG-controlled cable-driven hand exoskeleton for stroke patient and tested in hospitals
- Responsible for patent application and contacting manufacturers
- Won the First Price in International Contest of Innovation in 2017

ENGINEERING PROJECTS

Industrial robot simulation for JdeRobot Academy

June 2020 - Aug. 2020

Google Summer of Code

Hanover, NH

- Developed three industrial robot simulation exercises for students based on ROS, MoveIt and Gazebo
- **Pick and Place:** given object positions, pick and place objects on the table with parallel gripper and robot arm
- **Machine Vision:** given object shape and color, find the object position and avoid collision with the occupancy map build with with RGBD camera, pick and place with vacuum gripper and robot arm
- **Mobile Manipulation:** given object and goal position in the world, pick objects from one table, then navigate the mobile manipulator to place objects in goal positions

Highway Trash Inspection Robot

Sep. 2018 – Dec. 2018

Beihang University

Beijing, China

- Built a four-wheel-drive mobile robot platform with up to 20kg load to carry large battery and computer
- Won the First Prize in National Competition of Transport Science and Technology for Student in 2018

Foldable Worm

Dec. 2015 – May. 2016

Beihang University

Beijing, China

- Designed a foldable worm-shape robot with less than 5mm height and its wriggling locomotion mechanism