Yijia Wu

(603)322-3490 | ywu21@wpi.edu | Worcester, MA, USA, 01609

Education

Worcester Polytechnic Institute — Worcester, MA
Ph.D. student in Robotics Engineering — *Aug. 2022 – Present*

Dartmouth College — Hanover, NH
M.S. in Computer Science — *Sep. 2019 – June 2021*

- **Thesis title**: "Zooming towards High Precision Pose Estimation"
- **Thesis advisor**: Professor Devin Balkcom

Beihang University — Beijing, China
B.S. in Automation, Outstanding Graduate — *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 — Aug. 2022 – Present
Supervisor: Prof. Markus P. Nemitz — *Worcester Polytechnic Institute*

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

Robust Assembly of Compliant Modular Robots [1] — June 2021 – Jan. 2022
Supervisor: Prof. Devin Balkcom — *Dartmouth College*

- Improved robot module design and fabricated multiple modules, including 3D printing TPU-based structure, designing PCBs, 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 — Sep. 2020 – Sep. 2021
Supervisor: Prof. Devin Balkcom, Prof. Alberto Quattrini Li — *Dartmouth College*

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

Computational Joinery [2] — July 2018 – Sep. 2018
Supervisor: Prof. Devin Balkcom — *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 an 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
- Developed and maintained the vision part of the palletizing project, including camera driver integration, calibration, data processing, and model training

Dartmouth College Sep. 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, testing code for multiple projects

Cheitech July 2017 - Dec. 2017
Mechatronics Engineer *Beijing, China*

- Designed an EEG-controlled cable-driven hand exoskeleton for stroke patients and tested it 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 built with RGBD camera, pick and place with a 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 a large battery and computer
- Won the First Prize in National Competition of Transport Science and Technology for Students 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