

# 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 improve 3d printing technique to build watertight functional 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

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### **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

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### **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