

Zizhe Zhang

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EDUCATION

University of Pennsylvania, GRASP Lab Aug 2024 – Present
Philadelphia, PA
Master of Science in Engineering (M.S.E.) in Robotics
Advisor: Profs. Nadia Figueroa and Dinesh Jayaraman

University of California San Diego, Jacobs School of Engineering Jan 2023 – Mar 2023
San Diego, CA
Visiting Student

Southeast University, School of Instrument Science and Engineering Aug 2020 – Jun 2024
Nanjing, China
Bachelor of Engineering (B.E.) in Measuring Control Technology & Instruments
Advisor: Prof. Yuan Yang

PUBLICATIONS

(* and † denote equal contribution)

Viability-Preserving Passive Torque Control

Zizhe Zhang*, Yicong Wang*, Zhiquan Zhang, Tianyu Li, and Nadia Figueroa
Under Review at IEEE International Conference on Robotics & Automation, 2026 [\[arXiv\]](#) [\[PDF\]](#) [\[Website\]](#)
IROS Workshop on Building Safe Robots (**Best Student Paper Award**), 2025
IROS Workshop on Exploring the Role of Energy in Robot Learning and Control (**Best Contribution Award**), 2025

Flow with the Force Field: Learning 3D Compliant Flow Matching Policies from Force and Demonstration-Guided Simulation Data

Tianyu Li*, Yihan Li*, **Zizhe Zhang**, and Nadia Figueroa
Under Review at IEEE International Conference on Robotics & Automation, 2026 [\[arXiv\]](#) [\[PDF\]](#) [\[Website\]](#)
IROS Workshop on Exploring the Role of Energy in Robot Learning and Control, 2025
IROS Workshop on Contact and Impact-aware Manipulation, 2025

VLMgineer: Vision Language Models as Robotic Toolsmiths

George Jiayuan Gao*, Tianyu Li*, Junyao Shi, **Zizhe Zhang**†, Yihan Li†, Nadia Figueroa, and Dinesh Jayaraman
International Conference on Learning Representations (ICLR), 2026 [\[arXiv\]](#) [\[PDF\]](#) [\[Website\]](#)
Robotics: Science and Systems (RSS) Workshop on Robot Hardware-Aware Intelligence (**Oral Spotlight**), 2025

Image-Based Visual Servoing for Enhanced Cooperation of Dual-Arm Manipulation

Zizhe Zhang, Yuan Yang, Wenqiang Zuo, Guangming Song, Aiguo Song, and Yang Shi
IEEE Robotics and Automation Letters (RA-L), 2025 [\[arXiv\]](#) [\[PDF\]](#) [\[Website\]](#)

RESEARCH AND INDUSTRY EXPERIENCE

Visiting Scholar, Duke University Durham, NC
Robot Dexterity Lab, advised by Prof. Xianyi Cheng Jun 2025 – Aug 2025

- Working on developing an adaptive compliance motion representation for generalizable robotic manipulation and physical human-robot interaction (In Progress).
- Investigating how compliance affects sim-to-real transfer and cross-platform generalization (In Progress).

Graduate Research Assistant, University of Pennsylvania Philadelphia, PA
Figueroa Robotics Lab, advised by Prof. Nadia Figueroa Nov 2024 – Present

Working on machine learning applications in control theory and robot manipulation. Projects include:

- Ensuring viability of passivity-based torque control via learned surrogates, enabling safe pHRI (*Under Review; IROS Workshops 2025; Extended Journal Version In Preparation*).
- Designing a general-purpose robot and training reinforcement-learning-based control policies for versatile tasks (In Progress).
- Implemented vision-based learning with force feedback for contact-rich manipulation tasks (*Under Review; IROS Workshops 2025*).
- Utilized Vision Language Models (VLMs) for robot tool-action co-design (*Under Review; [RSS Workshop 2025](#)*).

Technical Intern, Schneider Electric
Working in the Kylin project, including:
• IGBT thermal simulations.
• Capacitor lifetime assessments.
• EMC testing.
• Circuit design.

Shanghai, China
Jun 2023 – Aug 2023

Undergraduate Research Assistant, Southeast University
Robotic Perception and Control Lab, advised by Prof. Yuan Yang

Nanjing, China
Dec 2023 – Aug 2024

Worked on developing visual-servoing-based robotic control architectures. Projects include:
• Designed an enhanced dual-arm collaborative control system based on image-based visual servoing ([RA-L 2025](#)).
• Designed a shared teleoperation system control based on visual servoing (*Bachelor Thesis*).

Automotive Safety Technology Lab, advised by Prof. Dong Wang

Mar 2022 – Jun 2023

• Applied edge detection to classify Martian topography and identify soft-ground hazards.
• Designed a wheeled-leg ground-detection mechanism for rover traversal and analyzing force signals to predict mobility.

Advanced Navigation Technology Lab, advised by Prof. Xuanpeng Li

Jul 2021 – Sep 2021

• Utilized the PYTS library for signal visualization and building a CNN to extract and classify features from ADS-B radio signals.

HONORS AND AWARDS

GAPSA Individual Grant , University of Pennsylvania	2025
Best Contribution Award , IROS Workshop on <i>Exploring the Role of Energy in Robot Learning and Control</i>	2025
Best Student Paper Award , IROS Workshop on <i>Building Safe Robots</i>	2025
IROS-SDC travel award , Committee of IROS 2025	2025
Outstanding Bachelor's Thesis , Southeast University	2024
Merit Student , Southeast University	2021

SERVICE

Reviewer

IEEE International Conference on Robotics and Automation (ICRA)	2026
IEEE Robotics and Automation Letters (RAL)	
IEEE Transactions on Robotics (TRO)	
IEEE Transactions on Industrial Electronics (TIE)	
IEEE Transactions on Industrial Informatics (TII)	

Teaching Assistant

ESE 5000 Linear Systems Theory, University of Pennsylvania, advised by Prof. George Pappas	Fall 2025
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Volunteer

Robotics: Science and Systems (RSS)	2025
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SKILLS

Programming C, C++, Python, MATLAB

Tools CMake, PyTorch, ROS, RLBench, ManiSkill, CoppeliaSim, PyBullet, Issac Gym/Sim/Lab, MuJoCo

Robots UR3, UR3e, Franka Emika Panda, Franka Research 3