Ruohan Zhang

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EDUCATION

University of Illinois Urbana-Champaign (UIUC) Champaign, USA
Degree: Doctor of Philosophy (expected) *Sept. 2023 – Present*
Major: Electrical and Electronics Engineering

University of Science and Technology of China (USTC) Hefei, China
Degree: Bachelor of Science *Sept. 2019 – Jul. 2023*
Major: Electronic Engineering and Information Science
GPA: **4.05**/ 4.30 Rank: **1**/ 96

- Guo Moruo Scholarship (Highest Honor for Undergrads, 1%)
- China National Scholarship 2021, 2022 (1%)

RESEACH INTEREST

Active Perception, Tactile Sensing, Robot Learning, Sensor Fusion, Control and Simulation

RESEARCH EXPERIENCE

Towards Scalable and Damageless Harvesting: A Sensorized Gripper with In-Hand Tactile Perception
Advised by Professor Wenzhen Yuan, RoboTouch Lab, UIUC *Oct. 2024 – Aug. 25*

- Designed and fabricated compact optical-mechanical components that enabled seamless integration of sensing and actuation in a robotic gripper.
- Developed a ROS-based real-time control pipeline (25 Hz) with tactile algorithms for **force prediction** (R^2 = 0.95), **slip detection** (F1 = 0.69, ~110 ms early warning), and **fruit softness estimation** (94.6% accuracy).
- **Integrated** perception modules into a unified pipeline, achieving **100% grasp success with ±0.1 N force variation,** enabling consistent, damage-free handling in agricultural trials.
- Work under review of **IEEE Robotics and Automation Letters** (RAL).

Vision-based Proprioception and Tactile Sensing for Soft Robotics
Advised by Professor Wenzhen Yuan, RoboTouch Lab, UIUC *Sept. 2023 – Sept. 2024*

- Developed a novel embedded-camera pipeline that enabled **sub-millimeter tactile reconstruction** of contact surfaces using photometric stereo and deep learning.
- Implemented **real-time proprioception algorithms** for soft grippers, allowing **precise geometry reconstruction from minimal contact** with latency under **40 ms**.
- Published in the **International Journal of Robotics Research 2025** (IJRR); selected as a **keynote talk at ICRA 2025**. [link]

Design and Innovation of Quadrotor UAV
Advised by Professor Wei Lu, USTC *Mar. – Jul. 2021*

- Built a Quadrotor UAV from scratch, achieving **stable hovering within ±3 cm drift.**
- Designed logic control circuits, power management systems, and optimized flight algorithms.
- Implemented real-time parameter adjustments, improving response time and flight speed.

INDUSTRY EXPERIENCE

Research Assistant, Microsoft Research Asia

Advised by Professor Chong Luo, Intelligent Multi-media Lab, MSRA *Sept. 2022 – Jul. 2023*

- Researched on generative AI techniques, focusing on enhancing machine learning algorithms for video processing and generation.
- Developed a novel object tracking pipeline based on diffusion model under heavy occlusion scenarios, reaching **state of the art** at the time.
- Collaborated with a team to design and implement efficient code, enhancing computational speed and memory usage for large-scale datasets.

PROFESSIONAL & ACADEMIC ACTIVITIES

- Reviewer for IEEE International Conference on Robotics and Automation (ICRA) and IEEE Robotics and Automation Letters (RAL)
- Teaching Assistant: ECE205 (Spring 2025), ECE206 (Fall 2025), UIUC. Led lab sessions, graded assignments, and supported students in embedded system design.

TECHNICAL SKILLS

- **Programming:** Python, C++, C, MATLAB
- **ML/AI:** PyTorch, Diffusion Models
- **Robotics:** ROS, SOFA
- **Simulation & CAD:** Abaqus, Comsol, SolidWorks