Yongqiang Zhao

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EUCATION

Southeast University (985, Double First-Class University) *Nanjing,China*

MSc, Control Science and Engineering (Top 3 in China) Sep. 2021 - Present

- **Supervisor:** Prof. Kun Qian
- **Research Interests:** Robotic Manipulation, Tactile Sensing, Robot Learning
- **MSc Project:** Learning of Robot Manipulation Skills Based on Vision and Tactile sensing in Contact-rich Environments
- **Modules:** Matrix Theory in Engineering (97/100), Numerical Analysis (93/100), Intelligent Robot (90/100), etc.

Southeast University (985, Double First-Class University) *Nanjing, China*

Bachelor of Engineering, Robot Engineering (Top 3 in China) Sep. 2017 - Jun. 2021

- **GPA:** 3.86/4.00, **Ranking:** 13/156
- **Final Year Project:** Depth Completion and Object 6D Pose Estimation Using RGB-D Images
- **Modules:** Analytic Geometry (97/100), Digital & Logic Design (98/100), Robot Software Engineering (94/100), etc.

PUBLICATIONS

- ***Journal Papers***

[1] **Zhao, Y.**, Jing, X., Qian, K.*, Gomes, D. F., & Luo, S.* (2023). **Skill Generalization of Tubular Object Manipulation with Tactile Sensing and Sim2Real Learning.** Robotics and Autonomous Systems, 160, 104321. [Link]

[2] Qian, K.*, Duan, Y., Luo, C., **Zhao, Y.**, & Jing, X. (2023). **Pixel-Level Domain Adaptation for Real-to-Sim Object Pose Estimation.** IEEE Transactions on Cognitive and Developmental Systems. [Link]

[3] **Zhao, Y.**, Qian, K.*, Duan, B., & Luo, S.. **FOTS: A Fast Optical Tactile Simulator for Sim2Real Learning of Tactile-guided Robot Manipulation Skills.** IEEE Robotics and Automation Letters (Under review).

- ***Conference Papers***

[1] **Zhao, Y.***, Liu, K., Lu, G., Hu, Y., & Yuan, S. (2020, October). **Path Planning of UAV Delivery Based on Improved APF-RRT* Algorithm.** In Journal of Physics: Conference Series (Vol. 1624, No. 4, p. 042004). IOP Publishing. [Link]

[2] Sun, C., Duan, B., Qian, K.*, & **Zhao, Y.** (2023, July). **Learning Tactilemotor Policy for Robotic Cable Following via Sim-to-Real Transfer.** In International Conference on Intelligent Robotics and Applications (pp. 63-73). Singapore: Springer Nature Singapore. [Link]

- ***Invention Patents***

[1] Chen, D., **Zhao, Y.**, Bi, Z., Shao, G., & Yu, W.. **A Method for Indoor Unmanned Aerial Vehicles Formation Flight Based on Frame-by-Frame Recognition and Generation of Raw Point Clouds.** Chinese Patent, CN 111580554 B.

[2] Qian, K., Jing, X., Bai, J., **Zhao, Y.**, & Shi, K.. **A Domain Transfer-Based Robot Grasping Pose Detection Method Under Single-View Point Cloud.** Chinese Patent, CN 112489117 B.

[3] **Zhao, Y.**, Qian, K., Duan, Y., Jing, X., & Kong, W.. **An Object Pose Estimation Method Based on Domain Adaptation and Deep Completion.** Chinese Patent, CN 113297988 A. (Wait for authorization)

PROJECTS

Sim2Real Tactile-Guided Robot Manipulation Skills Learning *Jan. 2022 - Present*

- Construct tactile-motor policy learning framework for both tactile images and flows.
- Propose a pixel-level unsupervised domain adaptation network for planar pose estimation.
- Learn and zero-shot Sim2Real transfer various robot manipulation tasks using improved SAC.
- As a leader, conceive and validate the majority of research methods, as well as guide other five team members including undergraduates and graduates.

Design and Simulation of Vision-based Tactile Sensor *Sep. 2021 - Dec. 2022*

- Reproduce and improve the design of GelSight-like sensors.
- Simulate the optical and mechanical responses including lighting, shadow, and marker motion.
- As a leader, implement the initial experiment and guide other seven team members to manufacture and utilize tactile sensor and simulator.
- Work has been submitted to IEEE Robotics and Automation Letters.

Object Pose Estimation Using RGB-D Data for Robot Grasping *Sep. 2020 - Jun. 2021*

- Introduce depth completion method and propose performance evaluation indicator.
- Optimize the estimated poses through confidence set and weighted summation in DenseFusion.
- Conduct real-world grasping experiments based on the model trained on pure simulation data.
- As a main personnel, participate in the validation of multiple module methods and real-world experiments.

AWARDS

2022-2023	National Scholarship (top 1% of 600 students)
2022-2023	Second-class Academic Graduate Scholarship (top 20% of 200 students)
2021-2022	First-class Academic Graduate Scholarship (top 10% of 200 students)
2021-2022	Merit Student of Southeast University
2020	Excellent National University Student Innovation & Entrepreneurship Development Program
2019-2020	Excellent League Member of Southeast University
2018-2019	National Endeavor Scholarship (top 3% of 600 students)

TEACHING & ACTIVITIES

2024 IEEE International Conference on Robotics and Automation *Reviewer*

October, 2023

- Review two papers related to tactile perception.

ICRA 2023 ViTac Workshop *Poster*

June, 2023

- Propose an Adaptively Correlation-attentive and Task-related Network (ACTNet) for tactile image transfer.
- Construct a task-related constraint loss based on the robotic insert-and-pullout tactile manipulation task.
- As a main personnel, complete the simulated and real-world insert and pullout experiments.

Intelligent Robot System Synthesis Design *Teaching Assistant*

Fall, 2022

- Combine robotic arms and mobile robots for object manipulation.
- Utilize radar and odometer for motion planning, and use camera to locate manipulated objects
- **My Duties:** 1. Assembly and debug robots used in the course, including a robotic arm and a mobile robot; 2. Solve software and hardware issues encountered in the course; 3. Real-world experiments acceptance.

SKILLS

Programming	Python, C, Matlab, ROS
Professional Softwares	MuJoCo, Pybullet, Gazebo, Meshlab
Clipping & Typesetting	Markdown, Office, LaTeX, Premiere
Languages	Chinese (Native), English (IELTS 7.0: L7.0, R7.5, W7.0, S6.0)