Ruopeng Huang

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EDUCATION

- University of Southern California (***GPA***:3.8/4.0) Los Angeles, United States

- *Major:* Master of Computer Science (Intelligent Robotics) Jan. 2024-Dec.2025(Expected)

- Northeastern University (***GPA***:4.0/4.0) ***Transfer out*** Boston, United States

- *Major:* Master of Engineering in Robotics Aug. 2023-Dec.2023

- Beijing University of Posts and Telecommunications (WAS*:* 88.05/100, ***Ranking:*** Top 10%) Beijing, China

- *Major:* Bachelor of Engineering in Computer Science and Technology Sept. 2016-Jun.2020

Relevant Courses: Introduction to Robotics, Robotics, Robotics Manipulation, Mobile Robotics, Robotics Dynamic and Control

RESEARCH INTERETS

My research focuses on building reliable robotic systems for real-world manipulation under uncertainty. I study **Robotic Manipulation**, aiming to develop long-horizon manipulation policies that remain robust to geometric, contact, and task uncertainty. In **Robot Perception**, I work on robust 3D reconstruction, tracking, and pose estimation to provide stable, uncertainty-aware state representations under partial observability and dynamic environments. In **Robot Learning**, I am interested in combining large visuomotor models with reinforcement learning to improve generalization, enable efficient sim-to-real transfer, and support online adaptation on real robots. Ultimately, I aim to integrate manipulation, perception, and learning into cohesive systems where these components jointly enable robust and safe real-world deployment.

HONORS & AWARDS

- School Scholarship, Beijing University of Post and Telecommunication Oct. 2017, Oct. 2018, & Oct. 2019
- First Prize, Contemporary Undergraduate Mathematical Modeling Contest in Beijing, Multilayer Fire-Resistant Cloth Oct. 2018
- Honorable Prize, The International Contest in Mathematical Modeling, Oceanic HF Communication Model Apr. 2018
- The 12th National Robotics Competition Gold Award - FLL Engineering, LEGO Robotics High School

PROFESSIONAL EXPERIENCE

- USC Learning and Interactive Robot Autonomy Lab (LiraLab). Los Angeles, United States

Robotics Research Assistant, Professor Erdem Bıyık Jun. 2025-Present

- Led SyncTwin project, a joint research effort developing real-time digital-twin synchronization for robotic manipulation.
- Participated a project based on Learning to Ground Instruction on the ARIA Glasses, building a data-collection tool that segments manipulated objects during demonstrations to support attention-focused visual-motor learning.

- UC Riverside, Trustworthy Autonomous Systems Laboratory (TASL). Riverside, United States

Visiting Student Researcher, Professor Jiachen Li Jun. 2025–Present

- Led the SyncTwin project, that tracks 3D objects in real time from point clouds and updates their poses and geometries in a synchronized simulation, enabling collision-aware planning and a closed real-to-sim-to-real loop for partially observed scenes.
- Co-led RegraspGen: a system for learning general pick-and-place skills via synthetic regrasp demonstration generation, enabling robots to discover intermediate stable placements and perform robust multi-step object reorientation.

- USC Realization of Robotic Systems Lab (RRoS). Los Angeles, United States

Robotics Research Assistant, Professor S.K. Gupta May. 2024-May.2025

- Use NVIDIA Isaac Sim to get valid grasp pose simulations for arbitrary objects without relying on the ACRONYM dataset
- Participated in research using a KUKA robot to develop a diffusion-policy guided by combined force and vision observations.
- Participated in the Energy-Aware Planning for Legged Robots Performing Tasks in Agricultural Applications project.

- Department of Mathematics, Peking University. Intern Beijing, China

Research Assistant, Internship, Advisor: Yang Chao Jul. 2018-Sept. 2018

- Used Python to implement web crawlers and obtain data. Researched the application of distributed machine learning.

INDUSTRY EXPERIENCE

- Dorna Robotics Co. Ltd. Internship Los Angeles, United States

Robotics Software Engineer, Algorithm Development Department Apr. 2025-July.2025

- Design and implement an automatic calibration algorithm for a robotic arm without camera setting.
- Developed a user-friendly interface for configuring environmental obstacles, enabling easier setup and safer motion planning.

- ByteDance Technology Co. Ltd. Full-time Beijing, China

Software Development Engineer, DouYin (TikTok) Content Security Platform Department Aug. 2021-Aug. 2022

- Participated in the development of the Hawk platform Go language refactoring project, solving the efficiency problems of the previous version of the Python language, focusing on architectural transformation and multiple concurrency design.

- Baidu Technology Co. Ltd. Full-time Beijing, China

Development and Test Engineer, Vision Technology Center Platform Quality Department Oct. 2020-Aug. 2021

- Write the algorithm effect evaluation code by using Python. Use Golang language to maintain backend platform

PUBLICATIONS

- **Ruopeng Huang**, Boyu Yang, Wenlong Gui, Jeremy Morgan, Erdem Biyik, Jiachen Li, *"SyncTwin: Fast Digital Twin Construction and Synchronization for Safe Robotic Grasping", (CVPR 2026).* ***Under Review***
- **Ruopeng Huang**∗, Mingxuan Yan∗, Litian Gong, Zechun Liu, Jiachen Li, *"RegraspGen: Learning General Pick and Place via Synthetic Regrasp Demonstration Generation", Target conference (RSS 2026),* ***In preparation***
- Jeon Ho Kang, Sagar Joshi, **Ruopeng Huang**, Satyandra K. Gupta, *"Robotic Compliant Object Prying Using Diffusion Policy Guided by Vision and Force Observations"*, *IEEE Robotics and Automation Letters (RA-L 2025).* ***Accepted***
- Shengqiang Chen, **Ruopeng Huang**, Yiyu Chen, Zishen Wei, Quan Nguyen, Satyandra K. Gupta, *"Energy-Aware Planning for Legged Robot Performing Logistics Tasks in Agriculture Applications" (T-ASE), 2025.* ***Under Review***
- Haoyan Xu∗, Ruizhi Qian∗, Jiate Li∗, **Ruopeng Huang**, Yushun Dong, Minghao Lin, Hanson Yan, Zhengtao Yao, Qinghua Liu, Junhao Dong, Yue Zhao, Mengyuan Li *"A Systematic Study of Model Extraction Attacks on Graph Foundation Models", (S&P 2026).* ***Under Review***

ACADEMIC PROJECTS

- Class Project: Multimodal Model-Based Robotic Arm Control in Household Scenarios Jan. 2025-May.2025

Name of the Class: *Deep Learning and Application*, Instructor: *Zhao Yue*

- Implemented a VLA based on OpenVLA to enable natural language control of a robotic arm for manipulation tasks in household. Evaluated performance using the LIBERO benchmark suite.

- Class Project: The Application of AI Algorithms in Robotic Arms Aug. 2023-Dec. 2023

Name of the Class: *Foundation of Artificial Intelligence*, Instructor: *Raj Venkat*

- Implement motion planning for a three-axis robotic arm in a two-dimensional plane using reinforcement learning techniques such as search algorithms, MDP, Q-learning, DDPG, etc.

- Class Project: The Application of multi-sensor fusion in Mobile Robotics Aug. 2023-Dec.2023

Name of the Class: *Mobile Robotics,* Instructor: *David Rosen*

- Enhance an existing Lidar SLAM system by introducing GNSS observations as additional factors in a multi-sensor fusion approach. This will improve the localization accuracy and mapping quality of Lidar SLAM.

SERVICES & SKILLS

- **Services:** IROS 2025 Reviewer. **Skills:** Python, C/C++, ROS2, Isaac Sim, ManiSkill, MuJoCo, MATLAB, JAVA, VHDL

HARDWARE EXPERIENCE

- KUKA iiwa, Franka Panda, Aloha Dual Arm Robot, LeRobot, LEGO Robot