

Junjie Zhang

Robotics Research | Manipulation Localization | Multi-Sensor Fusion

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Research Interests

Active vision for robotic manipulation; bio-inspired robotics; UMI and whole-body UMI; multi-sensor localization, robot data collection, and sensor simulation.

Seeking robotics research and engineering roles, PhD opportunities, and like-minded robotics co-founders.

Education

Chongqing University

2024–2027 (expected)

Master's student in Mechanical Engineering

China University of Petroleum (Beijing)

2020–2024

Bachelor's degree in Mechanical Design, Manufacturing and Automation

Research and Industry Internships

Shanghai AI Laboratory

Jan.–Apr. 2025

UMI localization and sensor calibration

Calibrated a camera–IMU module and evaluated visual–inertial and visual SLAM methods for UMI gripper end-effector localization.

PokeBot

15 Apr. 2026–13 Jul. 2026

UMI and whole-body UMI internship

Worked on UMI (Universal Manipulation Interface) and whole-body UMI systems.

ENGINEAI

15 Jul. 2026–Present

UMI and whole-body UMI internship; expected end: 15 Nov. 2026

Worked on UMI and whole-body UMI systems for robot demonstration workflows.

Selected Research and Engineering Projects

MILD and AprilVINS

2026

Manipulation localization dataset and AprilTag-assisted visual–inertial estimation

Developed a dataset and evaluation workflow for manipulation-interface localization, and an AprilTag-assisted end-effector localization system using sequence-local tag geometry. Combined real-world acquisition, baseline evaluation, and simulation-based replay studies.

NIDAR

IROS 2026

NIR-guided LiDAR intensity reconstruction

Developed an intrinsic-decomposition framework for scene-agnostic LiDAR intensity reconstruction and integrated intensity simulation into downstream localization evaluation.

Ground-Fusion++ and M3DGR

IROS 2025

Resilient ground-robot SLAM and multi-sensor benchmarking

Contributed to SLAM implementation, baseline adaptation, and evaluation for a multi-sensor dataset and a resilient sensor-fusion framework. Co-first author and code contributor.

Mobile-Manipulation Simulation Data Collection

2025–2026

Isaac Sim and SAPIEN workflows

Built automated scene and trajectory-generation workflows for mobile manipulation, including navigation, collision models, and robot motion planning.

Publications

Towards Accurate End-Effector Localization for UMI-Style Robotic Manipulation Teaching

Junjie Zhang, Deteng Zhang, Zhisong Xu, Bo Sun, Liuyang Li, Yihong Tian, Jie Yin.

arXiv preprint, 2026. [\[Preprint\]](#) [\[Project\]](#)

NIDAR: NIR-Guided Intrinsic Decomposition for Scalable Scene-Agnostic LiDAR Intensity Reconstruction

Junjie Zhang, Jie Yin, Kefei Qian, Jie Li, Mengpei Jia, Yajuan Dun, Wenbo Chu, Guofa Li.

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2026. [\[Preprint\]](#) [\[Project\]](#)

Ultra-Fusion: A Resilient Tightly-Coupled Multi-Sensor Fusion SLAM Framework under Sensor Degradation and Spatiotemporal Perturbation for Intelligent Transportation Systems

Yihong Tian, Junjie Zhang, Liuyang Li, Deteng Zhang, Yunfei Zuo, Jie Yin.

arXiv preprint, 2026. [\[Preprint\]](#) [\[Code\]](#)

APGC-LVIW: LiDAR-visual-inertial-wheel SLAM with adaptive planar geometric constraints

Yan Sun, Lu Zhou, Wanbiao Lin, Junjie Zhang, Liangbo Hu, Bowen Peng, Jinlin Xiong, Lei Sun.

Measurement and Control, 2025. [\[Paper\]](#)

Towards Robust Sensor-Fusion Ground SLAM: A Comprehensive Benchmark and A Resilient Framework

Deteng Zhang[†], Junjie Zhang[†], Yan Sun, Tao Li, Hao Yin, Hongzhao Xie, Jie Yin.

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2025. [\[Preprint\]](#) [\[Code\]](#) [\[Dataset\]](#)

[†] Equal contribution.

Structure and Gait Design of an Eight-legged Bionic Robot

Junjie Zhang, Jianping Tan, Ling Tang.

International Symposium on Robotics & Intelligent Manufacturing Technology (ISRIMT), 2023. [\[Paper\]](#) [\[Video\]](#)

Additional Engineering and Open-Source Work

Open-source impact: Approximately 1.7k aggregate GitHub stars across owned and collaborating public repositories (as of 13 October 2026).

M2DGR / M2DGR-plus Benchmark. Adapted and released LiDAR and visual-inertial SLAM baselines for these datasets. [\[Code\]](#)

SC-FAS-POINT (Undergraduate Project, 2023–2024). Built a Point-LIO-based LiDAR-inertial pipeline with incremental-voxel mapping, dynamic-point filtering, and Scan Context loop closure; assembled a MID360 acquisition rig.

Eight-legged Bionic Robot. Led an undergraduate innovation project involving mechanism design, gait analysis, prototype fabrication, and remote operation.

Technical Skills

Programming and tools: C++, Python, MATLAB; ROS/ROS2, Linux, Git, Docker.

Robotics: SLAM, VIO/LIO, camera-IMU calibration, synchronization, and robot data pipelines.

Simulation and design: Isaac Sim, SAPIEN, Unreal Engine; SolidWorks, ANSYS, prototype fabrication.

Honors

National Second Prize, National College Student Mechanical Innovation Design Competition (2022).

First- and Second-Class Graduate Scholarships, Chongqing University.