Weixing Guo

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Project Highlights Website: https://bbqgwx996.github.io/QuSou/

EDUCATION

University of California, Berkeley, USA 08/2024 - 05/2025

Master's Degree in Mechanical Engineering

Core Courses: (Control) ENGIN 236U: Dynamics and Control of Autonomous Flight (Cascaded Control, Lyapunov Stability), (Control) ENGIN 231B: Experiential Advanced Control Design II (Kalman Filter, LQR), (CS) 276DS: Statistics and Data Science for Engineers (Statistics, Neural Network), (CS) 292B: Advanced Special Topics in Controls (Game Theory, Graph Theory)

Huazhong University of Science and Technology(HUST), Wuhan, China 09/2020 - 06/2024

Bachelor's Degree in Mechanical Design, Manufacturing and Automation

GPA: 3.81/4.0 (Top 20%)

Core Courses: (Control) Robot Simulation and Programming Robotics, (Control) Mobile Robotics Technology, (Control) Dynamics of mechanical Systems, (Math) Calculus, (Math) Linear Algebra

PUBICATIONS

Weixing Guo*, Dongqi Zuo*. "RADI: LLMS as World Models for robotic action decomposition and imagination." *NuerIPS,* under review, 2025.

Weixing Guo. "Fully Autonomous Multi-Drone System for Precision Agriculture Data Monitoring." On purpose, 2025

Weixing Guo*, Dongqi Zuo*. "Collision Avoidance Algorithm Based on Buffered Vonoroi Cell." ICRA, under review, 2025.

Guo, Dongliang; Hao, Mingxuan; Zhang, Fan; Lv, Xiaodong; Xu, Zhangyu; Hou, Chao; Ling, Jinghui; Guo, Weixing; Ji, Jingjing; Lai, Wuxing; Yi-Hung Liu . "A Bilateral, Flexible Sensing Skin Integrated In-situ Self-compensation for Multi-modal Measurement of Morphing Wings" IEEE sensors journal, under revision, 2025.

RESEARCH EXPERIENCES

RADI: LLMs as World Models for Robotic Action Decomposition and Imagination 12/2024 - Present

Co-First Author

- Proposed the RADI framework that enables large language models (LLMs) to act as robotic world models by decomposing complex tasks into atomic actions and simulating environmental outcomes.
- Designed a self-correcting imagination loop, where LLMs assess task feasibility and iteratively refine plans using failure-driven reflection.
- Implemented a hierarchical task decomposition and prompt-based action generation system in the VirtualHome simulator using GPT-4.

Data Transmission and Path Planning for UAV in Precise Agriculture, CA, US 09/2024 - Present

Leader

- Developed a trajectory generation system using genetic algorithms and RAPPID local planner in the Ubuntu environment, enabling communication between modules via ROS.
- Conducted information transmission from underground sensors to the UAV using ESP32, enabling the collection of agricultural data.
- Planned to combine global path planning with low-energy strategies and develop a new path planning algorithm using reinforcement learning for local planning.

Collision Avoidance Algorithm Based on Buffered Vonoroi Cell, CA, US 09/2024 - 12/2024

Leader

- Developed a multi-agent collision avoidance system using Buffered Voronoi Cells and geometric greedy algorithms.
- Applying self-designed path optimization, ensuring smooth and efficient navigation.
- Validated the method with high success rates and low computational costs in intersection experiments.

Task-Oriented Grasp Detection Methods for Robots Based on DL, Wuhan, China 09/2024 - 05/2025

Leader

- Optimized deep learning-based robot grasping methods to enable end-to-end grasping with 80% accuracy in complex environments.
- Improved target detection and grasping pose estimation using enhanced YOLOv5 and GR-ConvNet algorithms.
- Validated the method's effectiveness through experiments, demonstrating potential applications in part assembly, logistics, and daily services.

Biomimetic Earwig Robot with Multi-Stable Wings and Stiff-Flexible Tail, Wuhan, China 08/2021 - 08/2022

Leader

- Designed a stiff-flexible tail with a spherical mechanism to balance rigidity and mobility for heavy-object manipulation.
- Optimized leg movement with a translating linkage mechanism, improving terrain adaptability and overall mobility.
- Conducted structural modeling and validation through SolidWorks analysis, 3D printing, and physical prototyping.

SELECTED HONOURS & AWARDS

- Second Prize in the 2024 China University Students' Mechanical Engineering Innovation and Creativity Competition "Jingdiao Cup" Graduation Design Competition, 2024 China University Students' Mechanical Engineering Innovation and Creativity Competition "Jingdiao Cup" Graduation Design Competition Executive Committee 06/2024
- First Prize in the 10th National University Students' Mechanical Innovation Design Competition, National University Students' Mechanical Innovation Design Competition Committee 08/2022
- First Prize in the 2022 "HuaHang Weishi - Sanfeng Intelligent Cup" Hubei Province University Students' Mechanical Innovation Design Competition, National University Students' Mechanical Innovation Design Competition Committee 08/2022