

Mobile: 86-19026502049; Email: [bbbbigrui@gmail.com](mailto:bbbbigrui@gmail.com);

Homepage: [bbbbigrui.github.io](https://bbbbigrui.github.io)

# Rui JIN

## EDUCATION BACKGROUND

### **Zhejiang University, Hangzhou**

*Sep 2021-Mar 2024*

- FAST Lab, College of Control Science and Engineering.
- MEng of Control Science and Engineering.
- GPA: 3.68/4, Postgraduate Recommendation (Ranking: 1/81).

### **Northwestern Polytechnical University, Xi'an**

*Sep 2017-Jun 2021*

- School of Mechanical Engineering.
- BEng of Mechanical Design & Manufacturing and Their Automation.
- Comprehensive Ranking: 1/94 (1.1%), Average Score: 86.37 (13.4%).

## PUBLICATIONS

### **Unmanned Aerial Vehicle Mediated Drug Delivery for First Aid ∞**

*Advanced Materials 2023*

Sheng Tao\*, **Rui Jin\*** (co-first author), et al, Fei Gao, Haojian Lu, Jichen Yu, Zhen Gu. (Frontispiece, IF: 29.4)

- Proposed an UAV-mediated first-aid system achieving autonomous administration of emergency medication without the involvement of bystander or the conscious patient.
- Designed a contact-triggered microneedle applicator capable of providing adequate force to insert microneedles upon contact with the skin, enabling fully autonomous first aid administration.

### **GS-Planner: A Gaussian-Splatting-based Planning Framework for Active High-Fidelity Reconstruction**

**Rui Jin\***, Yuman Gao\*, Haojian Lu, Fei Gao.

∞ Submitted to **IROS 2024**

- Proposed the first active 3D reconstruction system using 3DGS with online evaluation.
- Designed a feedback strategy of online model-consistent completeness and quality evaluation.
- Devised a planning framework for active reconstruction and safe navigation in the 3DGS map.

### **Canfly: A Can-sized Autonomous Mini Coaxial Helicopter ∞**

**IROS 2023**

Neng Pan, **Rui Jin**, Chao Xu, Fei Gao.

- Presented hardware design and control strategy for a mini coaxial helicopter, which occupies 62% less collision area compared to the state-of-the-art autonomous mini quadrotor.

### **Adaptive Tracking and Perching for Quadrotor in Dynamic Scenarios ∞**

**T-RO 2024**

Yuman Gao, Jialin Ji, Qianhao Wang, **Rui Jin**, Chao Xu, Fei Gao.

- UAV dynamic tracking and perching on 30 km/h high-speed SUV.
- UAV dynamic perching on high-speed 60-degree tilt plain.
- T-RO popular articles highest **Ranking No.5**, video with 35,000 views.

### **Other Publications**

- Modeling and Force Control of a Variable-Length Continuum Robot with Variable Stiffness for Minimally Invasive Surgery, T-ASE (4th author, accepted)
- Soft Lightweight Small-Scale Parallel Robot With High-Precision Positioning, T-MECH 2023 (5th author)

## **INTERNSHIP EXPERIENCE**

### **Skysys Intelligent Technology (SKYSYS)**

- Research and Development Department

- **Photovoltaic Cleaning Robot (Project Leader)**

**Aug 2023-Jan 2024**

Proposed an UAV-based autonomous delivery system for deploying and retrieving cleaning robots on photovoltaic panels.

## **RESEARCH EXPERIENCES**

### **Design, Modeling and Control of Miniature Coaxial Helicopter**

**Dec 2020-Nov 2023**

- Proposed the hardware design and flight control algorithm for an autonomous coaxial dual-rotor UAV weighing 1.5 kg with a 33-minute endurance.
- Developed the flight control algorithm with a differential-flatness-based cascading controller and an actuator allocation algorithm based on quadratic programming to prevent actuator saturation.

### **Neural Collision Field for Efficient Trajectory Optimization for Mobile Robots**

**Jan 2023-Present**

- Compressed a swept-volume-based continuous-time SDF into the neural network to enable efficient and accurate representation, and applied it to optimize quadrotor trajectories.
- Designed a progressive guidance training strategy, and a Level-of-Details sampling strategy to enhance network performance and training efficiency.

### **Nuclear Power Plant Autonomous Inspection Tracked Robot**

**Aug 2023-Dec 2023**

- Engineered software algorithms enabling autonomous inspection, obstacle avoidance, and cross-platform capability for a nuclear power plant inspection tracked vehicle.

## **COMPETITION EXPERIENCES**

### **China Robot Competition, Championship Prize (Top 1%)**

**2019**

- Designed and built a transformer robot capable of transforming between vehicular and humanoid forms.

### **National 3D innovative Design Competition, Top-tier Award of Shanxi Province (Top 3%)**

**2019**

## **HONORS AND AWARDS**

### **Outstanding Graduate of Northwestern Polytechnical University**

**2021**

### **Interdisciplinary Contest In Modeling, Honorable Mention**

**2020**

### **Fastgear Scholarship, Top-tier Prize (Top 1%)**

**2019**

### **National Training Program of Innovation for Undergraduates, Outstanding Conclusion Award**

**2018&2019**

### **Huawei Scholarship, First Prize (Top 1%)**

**2018**

### **Northwestern Polytechnical University Scholarship, First Prize (Top 10%)**

**2017&2018&2019**

## **SKILLS**

### **Programming Skills**

- C++, Python, MATLAB, ROS

### **Design Skills**

- Solidworks, Altium Designer, Keyshot, Premiere

### **English proficiency**

- IELTS: 7.0, CET 6: 581

### **FAST Lab Video Account Management**

- Produced video edits with over a million views