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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

- CET 6: 581

FAST Lab Video Account Management

- Produced video edits with over a million views