Jinjie LI

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EDUCATION

Beihang University (BUAA) – Beijing, China **09/2020 – (Expected) 06/2023**
M. Sc. Eng. in Control Science and Engineering *Advisors: Prof. Zhang REN, Assoc. Prof. Liang HAN*
GPA: 3.78/4.00 (89.80/100.00) School of Automation Science and Electrical Engineering

Beihang University (BUAA) – Beijing, China **09/2016 – 06/2020**
B. Eng. in Automation *Advisor: Prof. Lei GUO*
GPA: 3.78/4.00 (89.70/100.00) | "Outstanding Graduates" ShenYuan Honors College

PUBLICATION & PATENT

[1] **Jinjie Li**, Liang Han*, Zhang Ren, "Indoor Localization for Quadrotors using Invisible Projected Tags", in *IEEE International Conference on Robotics and Automation (ICRA)*, May 2022. [pdf] [video] *Accepted*

[2] Liang Han, **Jinjie Li**, Zhang Ren, "An Indoor Localization Method based on Invisible Projected Tags", *Chinese Patent*, 202111154577.4. *Substantive Examination Stage*

RESEARCH EXPERIENCE

National Key Laboratory of Science and Technology on Aircraft Control, BUAA **09/2020 – Present**
Master's Thesis, Master Student Researcher *Advisors: Prof. Zhang REN, Assoc. Prof. Liang HAN*

- Design a neural network disturbance observer to model the aerodynamic disturbances among quadrotors efficiently. Add this disturbance model to the standard control scheme to promote the control effect. [*Ongoing*]
- Design a nonlinear model predictive control (NMPC) controller for formation control and trajectory tracking based on the model above. Achieve fast trajectory tracking of three quadrotors in dense formation. [*Ongoing*]
- Propose a low-cost indoor localization method based on invisible projected tags (IPT), providing real-time centimeter-level pose data for quadrotors. *The paper has been accepted by ICRA 2022*.

Human-Machine Interaction (HMI) Lab, Huawei Technologies **08/2020 – 09/2020**
Technology Intern *Advisor: Dr. Xuan ZHOU*

- Design a force feedback prototype based on piezoelectric sensors, combining different vibration waveforms to provide a natural touch feeling for virtual keyboards.

Sino-French UAV Lab, BUAA **12/2019 – 06/2020**
Bachelor's Thesis, Undergraduate Student Researcher *Advisor: Assoc. Prof. Liang HAN*

- Implement a multi-quadrotor formation control system in the Gazebo-ROS simulator. Use fiducial tags on the ground for visual localization; combine the results with IMU to improve reliability and accuracy. Employ the Dyna-Q reinforcement learning algorithm to train the aerial robots to maintain a formation.
- Ranked **No.1** in the department (1/33), chosen as *Outstanding Bachelor's Thesis*.

SELECTED PROJECTS

A Simulation Platform for Large-Scale Heterogeneous Swarm Agents **09/2020 – Present**
Supported by the Science and Technology Innovation 2030-Key Project, Student Leader *Assoc. Prof. Liang HAN*

- Develop a large-scale swarm simulation platform for regional anti-terrorism confrontation scenarios. The number of nodes must be ≥ 2000; at least five types of agents are supported, including fixed-wing, quadrotor, tilt-rotor, interceptor, and autonomous vehicle.

Development of a Settable Constant Temperature Controller **02/2018 – 06/2018**

Course: Fundamentals of Analog Electronics, Team Leader *Advisor: Assoc. Prof. Yao TANG*

- Develop a temperature control system for a water tank from scratch, which can be controlled via Bluetooth, powered by 220V, and warmed up or cooled down to a specified temperature in 5 minutes [details].
- Be invited by the Lunar Palace 1 Team to design a temperature control system for plant cultivation devices.

Development of Heavy Load and High Maneuverability Aircrafts **07/2017 – 10/2018**

Beihang Aeromodelling Team, Leader of the Composite Material Team, Pilot *Advisor: Prof. Zhiqiang WAN*

- Develop the composite part of a heavy-load aircraft. Employ carbon and glass fiber reinforced polymer (CGFRP) to make D-box structures, increasing the torsional rigidity by 161.07% [details]. Serve as a pilot as well [details].
- Win the **Top 3** places in the 2018 China Aeromodelling Design Challenge (Time-limited Airdrop Project), the **BEST** record in the history of the event. BMFA News Magazine report: [link].

HONORS & AWARDS

- Beihang Scholarship, Freshman Scholarship (2021)
- Beihang Outstanding Graduates (2020), Merit Student Scholarship (2016-2018)
- The Champion of "Simulated Search and Rescue Project" in China Aeromodelling Design Challenge (2017)

SKILLS

- **TOEFL:** 106 (R 30, L 28, S 24, W 24)
- **Skills:** Coding **(**Python, MATLAB, C/C++, Mathematica); Robotics software development (ROS1, ROS2); Microcontroller programming (STM32 series); Circuit design (Altium Designer and Multisim); UAV design and flight (Fixed-wing, Quadrotor, Glider)
- **Interests:** Tennis, Skiing, Photography [link], Travelling, Model Airplane