ZONGJIE LIU

Northwestern Polytechnical University
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EDUCATION

Northwestern Polytechnical University Xi'an, China
Supervisor: Prof. Zhongjie Meng
Master in Control Engineering Sep 2021 – Present

Xidian University Xi'an, China
B.E. in Aerospace Science and Technology Sep 2017 – Jul 2021

PUBLICATION

[Aerospace Science and Technology] **Fixed-time attitude control for aircraft with strongly constrained actuators**
Zongjie Liu, Zongjie Meng
Aerospace Science and Technology, **SCI Q1**, **IF: 5.6**, 2023

MANUSCRIPT

Impedance-Based Stable Control for Autonomous Airship with Strong Wind-Gust Disturbance
Jianwei Ma, Zhongjie Meng, **Zongjie Liu** (*Under Review*)

RESEARCH EXPERIENCE

- ***Group of Rigid-Flexible Coupled Aircraft Control, Northwestern Polytechnical University*** ***Xi'an, China***
  Graduate Researcher *Supervisor: Prof. Zhongjie Meng* Sep 2021 – Present
  Research on automatic control of aircraft with constrained actuators.

- ***Group of Aerospace Technology in Electronics, Xidian University*** ***Xi'an, China***
  Undergraduate Researcher *Advisor: Prof. Kai Xie* Feb 2020 – Mar 2021
  Research on hardware design and embedded systems.

SELECTED PROJECTS

- ***Controller Design for Trans-medium Aircraft with Strongly Constrained Actuators*** **Mar 2022 – Present**
  - **Role:** Core Member
  - **Aim:** to conduct a corrective attitude control system by using strongly constrained actuators (the Reaction Control System, RCS) to satisfy the safety of the fuselage of a trans-medium aircraft before transmitting from air to water.
    * Finished simulation modeling of the object aircraft and the strongly constrained actuators;
    * Designed an efficient algorithm on thrust allocation to deal with discrete and restricted output of the RCS;
    * Proposed a control scheme to achieve rapid attitude adjustment and the performance of this scheme was verified by a Monte Carlo simulation experiment;
    * Completed an embedded code implementation of the whole algorithm.
  - **Outcome:**
    ✓ Produced a first author journal paper, Fixed-time attitude control for aircraft with strongly constrained actuators, which was accepted in ***Aerospace Science and Technology***.

- ***Controller Design for Autonomous Airships*** **Sep 2021 – Mar 2022**

  - **Role:** Core Member

  - **Aim:** to design controllers to improve the control performance of a kind of airship which consists of flexible airbags, ropes, and pods in strong winds.

    * Contributed to the design of a control command distribution system for longitudinal and lateral channels of an airship for heterogeneous actuators;

    * Collected information and had a sharp insight into the concept of impedance control;

    * Participated in the design of the controller for airship that can adapt to the strong wind-gust disturbances.

  - **Outcome:**

    ✓ Produced a third-author paper, Impedance-Based Stable Control for Autonomous Airship with Strong Wind-Gust Disturbance, which was Under Review.

- ***Design of Light Carrier Wireless Data Binding Device*** **Jun 2020 – Dec 2020**

  - **Role:** Core Member (*In charge of the design of the receiver part*)

  - **Aim:** to design a device which transmits data and power by light.

    * Finished the hardware circuit design of the receiver part;

    * Competed ultra-low-power programming based on MSP430.

  - **Outcome:**

    ✓ Produced a sixth-author patent, Secondary dumping type micro-power wireless data binding device and method, which was filed in Apr 2022.

    ✓ Produced one set of theoretical prototype and two sets of test prototype, the device has been put into production.

SELECTED AWARDS

- First-class Scholarship for graduate student, Northwestern Polytechnical University 2021 & 2022
- Third-class Scholarship for Academic Excellence, Xidian University 2018 & 2019 & 2020
- 2nd prize (Top 5%, National Level), National Undergraduate Electronics Design Contest 2019
- 2nd prize (Top 8%, Provincial Level), Shaanxi Province Engineering Colleges Intercollege League 2019

PATENTS

- Zhongjie Meng, Jianwei Ma, **Zongjie Liu**, Junjie Lu, and De Chen. A Control System and Method for a Tether Grabber Based on Polar Coordinates and Control Weights, CN202210190443.6, filed May 27, 2023
- Kai Xie, Jiangwen Song, Xiaodan Liu, Lei Quan, Lulu Gu, **Zongjie Liu**, Yunchong Guo, Bichen Wu, Kaihen Gu. Secondary dumping type micro-power wireless data binding device and method, CN202110812159.3, filed Apr 05, 2022

MISC.

- **Extra Experience:** **Jul 2022 – Apr 2023**

  Research-related administrative assistant (Assisting the secretariat in collating research profile)
- **Language:** English (Fluent, IELTS 6.5), Mandarin (Native)
- **Programming:** Python, MATLAB, C
- **Tool:** LaTeX, GIT, Zotero, Altium Designer