Zicen Xiong

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Interests: Robotics, Dynamics and Control, Reinforcement Learning

Education

- **Beihang University**
  M.Sc in Dynamics and Control, GPA:3.88/4 (3%), **National Scholarship** (1%)   Sept. 2022 - Now

- **Beihang University**
  B.Eng. in Flight Vehicle Design, GPA:3.8/4 (5%), **National Scholarship** (1%)   Sept. 2018 - Jun. 2022

Publications

Journals

- Zicen Xiong, Yue Wang, "Constant-Thrust Orbital Transfer about Binary Asteroids Using BLT Guidance", *IEEE TRANS on AERO ELEC SYS*.[paper]

Researches

- **In-cabin Robot *LINGSUO***   Apr. 2024 - Present
  World Robot Contest 2024
  - **Aim:** Assisting astronauts in their work - finding and delivering cargo; Lunar surface movement - lunar surface obstacle movement and opening tasks.
  - 1st Prize in World Robot Contest 2024 [report]

- **In-cabin Teleoperation Assistant Robotic Arm**   Jan. 2024 - Present
  Research Project
  - **Problem:** Human-machine synergy can strongly affect the efficiency in the space. Teleoperation robots provide a feasible solution.
  - **Hardware:** 7 DoF ARM: OMEGA Haptic-FRANKA Panda; Agile Hand: SENSEGlove-Libertec

- **Free-Flying Cubic Robot for Space Station**
  Conceptual Design for IAF-Space Universities CubeSat Challenge, SUCC   Jun. 2023 - Present
  - **Aim:** Self-propelled in-cabin assistant robot for astronauts in space stations with 6-DoF arm
  - **Method:** Double-gimbal fans enables the robot to have 6 DoF. SLAM mapping is used for in-cabin navigation. The deep neural network is applied to monitoring astronauts's emotion.
  - The prototype is still under development and the conceptual design won 2nd Prize in China Grand Finale.[pdf][report][code]

- **Constant-Thrust Orbital Transfer about Binary Asteroids Using BLT Control**
  Bachelor Thesis   Dec. 2021 - May 2023
  - **Aim:** Current control algorithms near asteroids are computationally expensive for autonomous orbital tracking. This research tries to achieve efficient guidance for autonomous constant low-thrust guidance about binary asteroid systems.
  - **Method:** A bilinear tangent control is derived by Pontryagin's maximum principle and manifold theory. Acquire near-optimal control profiles and 200 times faster than IPOPT results.

- **Multi-functional Electronic Scale with Quotation**
  Course Project of Electrical and Electronic Experiment 2   Sept. 2020 - Dec. 2020
  - Proteus design, prototype made with 74 series and NE555. Support functions: tare module, unit price-total price display. Score:95/100.[slide]

Competitions

- **1st Prize, World Robot Contest 2024, WRC**   Sep. 2024
  by Chinese Association of Automation   [report]
- **2nd Prize, 2nd Space Universities CubeSat Challenge, SUCC**   Aug. 2023
  by International Astronautical Federation
- **2nd Prize, 13th National Mechanics Competition for College Students**   May. 2021
  by Chinese Society of Theoretical and Applied Mechanics   Ranked 130th[rankinglist]

- **1st Prize in 12th National Mathematics Competition for College Students** Dec. 2020
  by Chinese Society of Theoretical and Applied Mechanics
- **2nd Prize in China Undergraduate Mathematical Contest in Modeling 2020** Oct. 2020
  by China Society for Industrial and Applied Mathematics
- **Champion in China Aeromodelling Design Challenge 2019** Oct. 2019
  by Aero Sports Federation of China Champion Team[rankinglist]

Honors and Awards

Items by Ministry of Education
- **National Scholarship for Graduates, Top 1%** Student [announcement] 2024
- **National Scholarship, Top 1%** Student [announcement][report] 2021

Items by Beihang University
- **Academic Excellence Scholarship for Graduates** 2022, 2023
- **Freshman Scholarship** 2022
- **Outstanding Graduate** 2022
- **Academic Excellence Scholarship for Undergraduates** 2019 - 2021

Skills

- **Language**: English(IELTS 8.0, TOEFL 104), Chinese(Native)
- **Coding**: Python, MATLAB, C/C++, C#, Git, bash, LaTeX
- **Hardware**: Arduino, STM32
- **Software**: ROS, CAD (SolidWorks), ADAMS, ANSYS, Multisim, Proteus
- **Misc.**:HAM(Amateur Radio)[**BI1RKD's QRZ**], PADI Diver