Zhihai Bi

https://zhihaibi.github.io/

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Education

- **Southeast University** — Nanjing, China
  Bachelor in Robot Engineering, SEU — *Sept 2017 – Jun 2021*
  GPA: 3.81/4.00, Ranking:5/34
- **Fudan University** — Shanghai, China
  Master in Computer Applied Technology, FDU — *Sept 2021 – Jun 2024*
  Supervisor: Prof. Hongbin Fang, Institute of AI and Robotics
  GPA: 3.57/4.00, Ranking:5/16

Publications

1. **A Worm-Snake-Inspired Metameric Robot for Multi-Modal Locomotion: Design, Modeling, and Unified Gait Control**
   Zhihai Bi, Qinyan Zhou, Hongbin Fang
   International Journal of Mechanical Sciences **(Q1,Top)**, 2023.
2. **Design and path planning for a Worm-Snake-Inspired Metameric(WSIM) Robot**
   Zhihai Bi, Jian Xu, Hongbin Fang
   *IEEE International Conference on Robotics and Biomimetics(**ROBIO**)*, 2022

Preprints or In progress

1. **Dynamic models for Planar Peristalic Locomotion of a Metameric Earthworm-like Robot**
   Qinyan Zhou, Hongbin Fang, **Zhihai Bi**, Jian Xu
   arXiv preprint 2303.11846, 2023.
2. **Multi-modal motion planning framework for the Worm-Snake-Inspired robot**
   Zhihai Bi, Hongbin Fang
   *In progress, target journal: IEEE Robotics and Automation Letters(**RA-L**)*, 2023.

Selected Projects

- **Design, modeling and control for a worm-snake-inspired robot** — *Aug 2021 – Oct 2022*
  - A worm-snake-inspired robot with multi-modal locomotion capability is designed.
  - Dynamic models for worm-like and snake-like locomotion modes are established.
  - A unified gait control framework for the multi-modal robot is proposed.
- **Multi-modal planning for the worm-snake-inspired robot** — *Oct 2022 – present*
  - Topology planning utilizing the voronoi diagram.
  - Front-end: Planning based on Hybrid A* considering the mode selection.
  - Back-end: Mode and trajectory optimization based on quadratic programming.

Teaching Experience

Teaching Assistant: Introduction to Robotics INFO130371.01, FDU — *Spring 2022*

- Responsible for robot arm kinematics, dynamics modeling, and trajectory planning.

Honors and Awards

- Outstanding Graduate Student Award of Southeast University (**Top 3%**) *2021*
- Principal's scholarship of Southeast University (**Top 1%**) *2017 – 2018*
- The 10th University Robotics Competition, Jiangsu Province (**1st place**) *2019*
- China ICV Algorithms Challenge: LKA lateral control (**1st place**) *2022*
- The 15th National Student Intelligent Vehicle Competition (**2nd prize**) *2020*
- School Prize of Fudan University *2021 – 2022*
- Tang Zhongying Moral Education Scholarship (**four consecutive years**) *2017 – 2021*

Skills

- Robot design: Solidworks, STM32, Altium Designer
- Robot modeling: Kinematics and dynamics modeling, Newton Euler and Lagrange
- Robot simulation: Webot, Gazebo, RViz
- Robot Programming: ROS, C/C++, Python, Matlab, Eigen, OOQP, OSQP...
- Language: Cantonese, Mandarin, English

Self-learning courses/books

- EE364a: Convex Optimization I - Stanford University — Prof. Stephen Boyd — *2021*
- Machine Learning in Coursera - Stanford University — Prof. Andrew Ng — *2020*
- Motion Planning for Mobile Robots - Zhejiang University — Prof. Fei Gao — *2021*
- CMU16-745: Optimal Control 2022 - CMU — Prof. Zachary — *2022*
- Reinforcement Learning - UCL — Prof. David Silver — *2022*