JIAXI ZHENG

5000 Forbes Ave, PA, Pittsburgh 15213

jiaxizheng.com | jiaxiz@andrew.cmu.edu | Google Scholar

Education

Dalian Maritime University September 2019 – June 2023

Bachelor of Engineering in Civil Engineering *DaLian, China*

GPA : 76/100

Advisor : Minyi Xu

Research & Work Experience

Carnegie Mellon University August 2023 – Present

Research Assistant *Pittsburgh, U.S.*

Advisor: Howie Choset

- Utilizing a combination of LiDAR and IMU sensors to achieve precise global state estimation, enabling the (snake robot) to excel in exploring uncharted environments.
- Maintaining the complete maintenance of the Hardened Underwater Modular Robot Snake (HUMRS) system, ensuring its stability during underwater pipe inspection tasks while utilizing an MPC controller.

Westlake University May 2022 – July 2023

Undergraduate Research Assistant *HangZhou, China*

Advisor: Dixia Fan

- Developed intelligent swarms tailored for water analysis and resilience management systems. It's been an exciting endeavor in harnessing collective intelligence.

The Chinese University of Hong Kong June 2022 – August 2022

Undergraduate Research Assistant *Hong Kong SAR, China*

Advisor: Au, Kwok Wai Samuel

- Developed a a teleoperated legged-manipulator robot system, with applications spanning healthcare and logistics. This project underscores the potential of robotics in diverse real-world scenarios.

Dalian Maritime University November 2019 – May 2022

Undergraduate Research Assistant *DaLian, China*

Advisors: Minyi Xu, Guangming Xie

- Developed a comprehensive robotics system encompassing both hardware and software components, for autonomous exploration and manipulation in underwater environments.
- Designed efficient piezoelectric sensors for autonomous underwater tactile perception tasks. This project underscores the importance of sensory innovation in underwater robotics.

Selected Publications

*** - equal contribution**

- **Jiaxi Z**, Peng X, Zhaochen M, Jianhua L, Siyuan W, Xinyu W, Guangming X, Jin T, and Minyi X. *"Design, Fabrication, and Characterization of a Hybrid Bionic Spherical Robotics With Multilegged Feedback Mechanism."* 2022 IEEE Robotics and Automation Letters with IROS
- Peng X*, **Jiaxi Z***, Xinyu W, Siyuan W, Jianhua L, Xiangyu L, Guangming X, Jin T, and Minyi X. *"Design and Implementation of Lightweight AUV With Multisensor Aided for Underwater Intervention Tasks."* 2022 IEEE Transactions on Circuits and Systems II: Express Briefs
- Peng Xu*, **Jiaxi Z***, Jianhua L*, Xiangyu L, Xinyu W, Siyuan W, Tangzhen G et al. *"Deep-Learning-Assisted Underwater 3D Tactile Tensegrity."* 2023 Research
- Jianhua L, **Jiaxi Z**, Peng X, Tingyu W, Jin T, Guangming X, and Minyi X. *"Development of AUV Mechatronics Integration for Underwater Intervention Tasks."* 2021 IEEE International Conference on Automation, Control and Robotics Engineering (CACRE)
- Jianhua L*, Peng X*, **Jiaxi Z***, Xiangyu L, Xinyu W, Siyuan W, Tangzhen G, Guangming X, and Minyi X. *"Whisker-inspired and self-powered triboelectric sensor for underwater obstacle detection and collision avoidance."* 2022 Nano Energy
- Xiangyu C, Shengzhi W, Minjian F, **Jiaxi Z**, Yuxuan Z, Jing H, and K. W. Au. *"Model-Free Large-Scale Cloth Spreading With Mobile Manipulation: Initial Feasibility Study."* 2023 IEEE International Conference on Automation Science and Engineering (CASE)

Projects

MARCS: Modular Aquatic Robotics for Complex Swarms | *CMU / Westlake University* **February 2023 – Present**

- Developing an innovative underwater robotic swarm system. This system is tailored for executing function-specific tasks in challenging environments, employing a modular approach for enhanced adaptability.
- More at https://jiaxizheng.com/research/underwater-robotics/

iSWARMs: Intelligent Swarms for Water Analysis Systems | *Westlake University* **May 2022 – February 2023**

- Developed intelligent swarms tailored for water analysis and resilience management systems. It's been an exciting endeavor in harnessing collective intelligence.
- More at https://jiaxizheng.com/research/iswarms/

TumbleBot | *Dalian Maritime University / Peking University* **March 2021 – May 2022**

- Designed and developed a hybrid spherical robot inspired by sea urchins and tumbleweeds. It excels in unstructured terrain using telescopic units, controlled by a central pattern generator.
- Github : https://github.com/jiaxi-zheng/TumbleBot
- More at https://jiaxizheng.com/research/tumblebot/

Underwater Vessel Inspection | *Dalian Maritime University / Peking University* **October 2019 – May 2022**

- Developed a comprehensive robotics system encompassing both hardware and software components, for autonomous exploration and manipulation in underwater environments.

Patents

- **Jiaxi Z** et al. *"Autonomous mobile surface buoy robot."* 2023, CN307848321S
- Dixia F, **Jiaxi Z** et al. *"Mobile buoy robot."* 2023, CN308069533S
- LiuYan R, **Jiaxi Z** et al. *"Vision-based Robot with Gripping Apparatus."* 2023, CN, No. 202221952040.2
- Minyi X, **Jiaxi Z** et al. *"New type of energy-efficient multi-purpose underwater AUV."* 2023, CN, No. 202310600506.5
- Minyi X, **Jiaxi Z** et al. *"A versatile underwater vehicle based on modular design."* 2023, CN, No. 202310600508.4
- Minyi X, **Jiaxi Z** et al. *"Novel small-size glider under water of multipurpose."* 2023, CN116654221A
- **Jiaxi Z** et al. *"Design and implementation of lightweight AUV."* 2022, CN, No. 202220689117.5
- Minyi X, **Jiaxi Z** et al. *"An underwater hull cleaning robot with dual cleaning functions."* 2020, CH, No.2020 2 2135954.7
- Minyi X, **Jiaxi Z** et al. *"An adsorption and driving device of underwater hull cleaning robot and its working method."* 2020, CH, No.ZL 2020 1 1027003.6

Robotics & Venture Challenges

China Robotic Competition(RCCCAA) | *ROS, Python, C++, Solidworks, GAZEBO* **August 2020 – July 2022**

- Developed a comprehensive robotics system encompassing both hardware and software components, for autonomous exploration and manipulation in underwater environments.
- I act as team leader won the national 1st and 2nd place in the Underwater Circuit Event(AUV) on 2022 and 2020, 1st place in the Underwater Manipulation Event(ROV) on 2022.

"Internet +" Innovation & Entrepreneurship Competition | *Underwater Vessel Inspection* **2022**

- Commercialized the underwater vessel inspection project and secured contracts with vessel companies to implement our programs.
- I act as team leader won the national gold award in the Undergraduate Event on 2022.

Awards & Honours

Outstanding May Fourth Youth Award(Top 1%), from Dalian Maritime University 2022
Technology Activities Scholarship(Top 5%), from Dalian Maritime University 2021
Undergraduate Research Fellowship(Top 7%), from Dalian Maritime University 2020, 2021, 2022

Academic Service

Reviewer:
IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS), 2023
IEEE Intl. Conf. on Robotics and Automation (ICRA), 2022

Academic Presentations

Conferences:
IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)
Workshop : Enabling Robot Swarms Across Scales, Detroit, US, 2023
IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS), Kyoto, JP, 2022