Resume (exportversion)

Chinese version：中文版

Hello, I am Zhaoyang Mu, a passionate researcher in robotics and scientific computing.Currently in Hangzhou.

Education

M.Sc. in Artificial Intelligence (0812J1), Dalian Maritime University (Aug 2023 – Present, expected Jun 2026)

Links

- **Project Page** (Sparse→Dense Transformer): https://pitohuie-aiversion.github.io/Sparse_to_Dense_Transformer/
- **Personal Website**: http://www.zhaoyangmu.com
- **GitHub**: https://github.com/Pitohuie
- **LinkedIn**: www.linkedin.com/in/zhaoyang-mu-283497384

Contact

- **Email**: mzymuzhaoyang@gmail
- **Phone**: +86 153 8213 02
- **Google Scholar**: Zhaoya Mu

Introduction

Research Interests: Scientific computing + robotics.

Applying **Transformer / Neural Operator** models to **CFD spatiotemporal fields**, enabling **zero-shot generalization across geometries** and **PDE acceleration**.

Research on **bionic sensing for underwater robots (TENG/artificial lateral line)**.

Skilled in **Star-CCM+ / COMSOL / ANSYS** for engineering simulations and **SolidWorks / Shapr3D** for mechanical design.

Research / Project Experience

DamFormer — Transformer for Dam-Break Generalization (2024–)

Built multi-geometry datasets and achieved cross-geometry zero-shot predictions. Published in *Physics of Fluids*.

Sparse→Dense Transformer — Spatiotemporal Super-Resolution Reconstruction (Ongoing)

Reconstruction of high-resolution CFD/environmental spatiotemporal fields from sparse sensors.

Bionic Undulating-Fin Propulsion Simulation (Westlake University) (Jun 2024 – Present)

Advisor: Prof. **Minyi Xu**, School of Artificial Intelligence

B.Eng. in Materials Science & Engineering (Polymer), Dalian Maritime University (Sep 2019 – Jun 2023)

GPA: **3.2/4.0 (82/100); Rank: 7/100**

Visiting Student / Research Assistant, i⁴-FSI Lab, School of Engineering, Westlake University (PI: Dixia Fan) (Jun 2024 – Present)

Focus: Bionic undulating-fin propulsion simulation (**Star-CCM+ + Java Macro**, with cross-validation in **ANSYS/COMSOL** when needed)

Skills

Programming / ML: Python (PyTorch, NumPy, Pandas, Matplotlib), Java (Star-CCM+ Macro/Workflow); Transformer, Neural Operator

Simulation / Numerical: Star-CCM+ (CFD/FSI), COMSOL, ANSYS; PDEBench

Mechanical / 3D Design: SolidWorks, Shapr3D (3D/2D modeling, BOM, interference checking)

Hardware / Control: STM32 NUCLEO-F439ZI, PWM/TACH feedback, TP-Link L3 managed switch, PowerShell flashing automation

Server / HPC: Linux, SLURM, PyTorch DDP/AMP, CUDA, NCCL, Weights & Biases

Research Tools: LaTeX, Overleaf, Git, data visualization

CFD/FSI simulations in Star-CCM+; automated parameter sweeps with Java Macro.

Fan-Wall Wind Tunnel (21×21 / 10×10 Modular Array) (2023 – Present)

2.5 m × 2.5 m modular array; STM32 multi-board PWM/TACH closed-loop system; VLAN/DHCP network management.

Ocean Observation Buoy — Lead Mechanical Designer (Westlake University) (2022)

Responsible for structure design, sealing, corrosion prevention, buoyancy and stability calculations, BOM drawings, and tank/sea trials.

Server / HPC Training & Deployment (2023 – Present)

PyTorch DDP/AMP, SLURM job arrays, Miniconda environment, CUDA setup, and W&B experiment logging.

Publications

Published in *Physics of Fluids*, *IEEE RA-L*, *Advanced Materials Technologies*, *Nano Energy*, *CAC*, and other journals/conferences (10+ papers in total).

Selected Publications:

Generalizing morphologies in dam break simulations using transformer model — Physics of Fluids **37**(1):016612, 2025

Rs-ModCubes: Self-reconfigurable, scalable, modular cubic robots for underwater operations — IEEE RA-L, 2025

Deep-Learning-Assisted Triboelectric Whisker Sensor Array… — Advanced Materials Technologies, 2025

Deep-learning-assisted triboelectric whisker… — Nano Energy **129**:110011, 2024

Patents

CN119509546A | *Dynamic Environmental Perception and Navigation Device & Method for Underwater Robots* (Published: 2024-11-06)

Applicant: Westlake University

CN119239885A | *Underwater Robot Based on Vector Octa-Thruster Layout* (Published: 2024-11-06)

Applicant: Westlake University

CN119142488A | *Undulating-Fin Propulsion Based Underwater Robot* (Published: 2024-11-06)

Applicant: Westlake University

CN118182783A | *Flexible-Fin Underwater Robot with Embedded Multi-Sensors and Operation Method* (Published: 2024-04-23)

Applicant: Dalian Maritime University

CN118047007A | *Ship with Intelligent Dynamic Sensing System* (Published: 2024-03-14)

Applicant: Dalian Maritime University

CN308069533S (Design Patent) | *Mobile Buoy Robot* (Published: 2023-02-22)

Applicant: Westlake University

CN120217249A | *Intelligent Monitoring System and Method for the Entire Water Network Process of Large Power Plants* (Published: 2025-03-26)

Applicant: Huaneng (Guangdong) Energy Development Co., Ltd. Yutou Power Plant

CN120448721A | *Power Plant Water Network Intelligent Monitoring Method Based on Dynamic Water Balance and ARIMA Model* (Published: 2025-03-25)

Applicant: Huaneng (Guangdong) Energy Development Co., Ltd. Yutou Power Plant

Languages

English (CET-4, CET-6)

Chinese (native)

Interests & Hobbies

Music Production / Arrangement

Music homepage:

Pitoyoung

Additional Information

Full Resume Details (Notion Reference)

Internships & Volunteering

Internship | Dalian Exploration Ocean Technology Co., Ltd. (2022–2023)

Mechanical design and integration; ANSYS/COMSOL verification; participated in sea trials and project delivery.

Volunteer | Society of Engineers Annual Conference (Hangzhou) (2024)

Conference services and A/V support: registration, session organization, presentation switching, timing, and live streaming across multiple sessions.

Honors & Awards

8th China International "Internet+" College Students Innovation & Entrepreneurship Competition · Gold Award (Apr 2023)

Project: *Kunpeng Technology — Leader in Underwater Hull Inspection Robots*; Certificate No.: 202310033

2021 China Robot Conference (RoboCup China) · Underwater Robot "Aquatic Parade" · First Prize (Online, Apr 15–17, 2022)

Team: "Hada Mechanical Engineering Team One", Dalian Maritime University; Certificate No.: Y2109R025A0001

China College Student Mechanical Engineering Innovation & Creativity Competition · "Mingshi Cup" Micro-Nano Sensing Technology and Intelligent Application Track · First Prize (Jul 24, 2024)

Project: *DeepBlue Vision-Fusion Underwater Robot*; Advisor: Yiran Si; Institution: Dalian Maritime University; Certificate No.: MEICC05MNSI2024-CV1-006

Liaoning Province Mechanical Innovation Design Competition · Bronze Award (Apr 2024)

Project: *DeepBlue Sense — TENG-based Underwater Tactile Sensor*; Institution: Dalian Maritime University; Team Members: Junyue Zhou, Zhaoyang Mu, et al.; Advisors: Hao Wang, Minyi Xu, Peng Xu