Pengli Zhu

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Personal Summary

I am currently a Research Staff with the AIM Group, Department of Electronic Engineering, The Chinese University of Hong Kong, Hong Kong. From 2024 to 2026, I was a Postdoctoral Research Fellow with the Department of Health Technology and Informatics at The Hong Kong Polytechnic University. I received the B.Eng., M.Eng., and Ph.D. degrees from Dalian Maritime University under the supervision of **Prof. Yancheng Liu** and **Prof. Siyuan Liu**. From 2023 to 2024, I was a Joint-Training Ph.D. Student with the Department of Biomedical Engineering at the National University of Singapore, supported by the China Scholarship Council and supervised by Prof. **Prof. Anqi Qiu**.

My current research focuses on medical image analysis, particularly in developing AI-driven computational frameworks for brain-gut disease diagnosis, medical image synthesis, noise correction, and quality assessment. I explore generative frameworks such as conditional diffusion models and attention-based networks to address challenges in unpaired data settings and complex image representations. Previously, I worked extensively on underwater vision, including unsupervised image enhancement and perception-driven control of autonomous vehicles. I have published 20+ peer-reviewed papers in international journals and conferences and have been granted several patents in these areas.

Employment

- **The Chinese University of Hong Kong** *04.2026 - Present*
  Postdoctoral Fellow Hong Kong
  - Advised by **Prof. Yixuan Yuan**
  - Gut-Axis Biomarkers for Rapid Alzheimer's Diagnosis
- **The Hong Kong Polytechnic University** *04.2024 - 02.2026*
  Research Associate and Postdoctoral Fellow Hong Kong
  - Advised by **Prof. Anqi Qiu**
  - Research on Q-space Guided DWI Synthesis and MRI Harmonization/Enhancement

Education

- **National University of Singapore** *02.2023 - 02.2024*
  Joint-Training Ph.D. – Medical Image Analysis Singapore
  - Ranked 20th in STEM-related Fields (ARWU 2025).
  - Cycle-Conditional Diffusion Model for DWIs Noise Correction
- **Dalian Maritime University** *09.2013 - 04.2024*
  B.Eng., M.Eng., and Ph.D. – Underwater Robot Visual Perception and Decision-Making Dalian, China
  - Ranked 8th in STEM-related Fields (ARWU 2025).
  - Image Intelligent Assessment and Enhancement
  - Robot Visual-Perception and Decision-Making

Selected Journals and Conferences

[1] **Pengli Zhu**, Chaoqiang Liu, Yingji Fu, Nanguang Chen, and Anqi Qiu*. **Cycle-Conditional Diffusion Model for Noise Correction of Diffusion-Weighted Images using Unpaired Data**. ***Medical image analysis***, *2025: 103579.* (Impact Factor: 11.8, Ranking: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING 4/213, First author)

[2] **Pengli Zhu**, Yingji Fu, Nanguang Chen, and Anqi Qiu*. **Q-space Guided Multi-Modal Translation Network for Diffusion-Weighted Image Synthesis**. ***IEEE Transactions on Medical Imaging***, *2025.* (Impact Factor: 9.8, Ranking: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING 5/213, First author)

[3] **Pengli Zhu**, Yingji Fu, Nanguang Chen, and Anqi Qiu*. **Q-space Guided Collaborative Attention Translation Network for Flexible Diffusion-Weighted Images Synthesis**. ***International Conference on Medical Image Computing and Computer-Assisted Intervention***. *Cham: Springer Nature Switzerland, 2025: 501–511* (Top Conference, Early Accepted in top 9%, Poster Highlights, First author)

[4] Jinghan Huang†, Qiufeng Chen†, **Pengli Zhu**, Yijun Bian, Nanguang Chen, Moo K. Chung, and Anqi Qiu*. **HL-HGAT: Heterogeneous Graph Attention Network via Hodge-Laplacian Operator**. ***IEEE Transactions on Pattern Analysis and Machine Intelligence***, *2025.* (Impact Factor: 18.6, Ranking: COMPUTER SCIENCE, ARTIFICIAL INTELLIGENCE 5/213, Second author)

[5] **Pengli Zhu**, Yancheng Liu, Yuanquan Wen, Minyi Xu, Xianping Fu, and Siyuan Liu*. **Unsupervised Underwater Image Enhancement via Content-Style Representation Disentanglement**. ***Engineering Applications of Artificial Intelligence***, *2023, 126: 106866.* (Impact Factor: 8.0, Ranking: ENGINEERING, MULTIDISCIPLINARY 5/179, First author)

[6] **Pengli Zhu**, Siyuan Liu, Tao Jiang, et al. **Autonomous reinforcement control of visual underwater vehicles: Real-time experiments using computer vision**. ***IEEE Transactions on Vehicular Technology***, *2022, 71(8): 8237-8250.* (Impact Factor: 7.1, Ranking: ENGINEERING, ELECTRICAL & ELECTRONIC 41/368, First author)

[7] **Pengli Zhu**, Yancheng Liu, Minyi Xu, Xianping Fu, Ning Wang, and Siyuan Liu*. **Unsupervised Multiple Representation Disentanglement Framework for Improved Underwater Visual Perception**. ***IEEE Journal of Oceanic Engineering***, *2023, 49(1): 48-65.* (Impact Factor: 5.3, Ranking: OCEANOGRAPHY 4/65, First author)

[8] **Pengli Zhu**†, Siyuan Liu†, Yancheng Liu, and Pew-Thian Yap*. **METER: Multi-task efficient transformer for no-reference image quality assessment**. ***Applied Intelligence***, *2023, 53(24): 29974-29990.* (Impact Factor: 5.3, Ranking: COMPUTER SCIENCE, ARTIFICIAL INTELLIGENCE 84/204, First author)

[9] **Pengli Zhu**, Huan Ma, Kuangqi Ma, Yancheng Liu, and Siyuan Liu*. **Content-Adaptive Efficient Transformer for No-Reference Underwater Image Quality Assessment**. ***OCEANS 2024-Singapore***. *IEEE, 2024: 1-9.* (Top Conference, Oral, First author)

[10] **Pengli Zhu**, Shuhan Yao, Yancheng Liu*, Siyuan Liu, and Xiaoling Liang. **Autonomous Reinforcement Control of Underwater Vehicles based on Monocular Depth Vision**. ***IFAC-PapersOnLine***, *2020, 53(2): 9201-9206.* (Top Conference, Oral, First author)

[11] **Pengli Zhu**, Yancheng Liu*, Youtao Zhao, and Jian Zhou. **Finite-time Robust Trajectory Tracking Control of Unmanned Underwater Vehicles**. *IOP Conference Series: Materials Science and Engineering, 2019, 569(4): 042010.*

[12] Fei Huang†, **Pengli Zhu**†, Nanguang Chen, and Anqi Qiu*. **Patch Residual Transformer: A Token-Efficient Vision Framework for Alzheimer's Disease Diagnosis**. *Scientific Reports, 2026*. (Co-first author)

[13] Haowen Pang†, **Pengli Zhu**†, Shannan Chen, Xiaoming Hong and Chuyang Ye*.**nnDiffusion: A Standardized 3D Diffusion Framework for Medical Image Synthesis**. *MICCAI 2026 Workshop on Simulation and Synthesis in Medical Imaging, 2026*. (Co-first author)

[14] Yancheng Liu, Zhangwei Dong, **Pengli Zhu*** **(Corresponding author)**, and Siyuan Liu. **Unsupervised Underwater Image Enhancement based on Feature Disentanglement**. ***Journal of Electronics & Information Technology***, *2022, 44(10): 3389-3398.* (Corresponding author)

[15] Haowen Pang, Yingqi Hao and **Pengli Zhu***. **Task-Adaptive 3D Cross-Field MRI Translation via Field-Conditioned Content-Style Pretraining**. *MICCAI 2026 Workshop on MRIxFields, 2026*. (Corresponding author)

[16] Han Chen, **Pengli Zhu**, Yancheng Liu, Xuanhe Chu, and Siyuan Liu*. **Multi-View 3D Reconstruction of Vessel Hull with Spatial Density Weighted NeRF**. ***OCEANS 2024-Singapore***. *IEEE, 2024: 1-7.* (Top Conference, Oral, Second author)

[17] Shijian Zhou, **Pengli Zhu**, Siyuan Liu*, and Han Chen. **Unsupervised Controllable Enhancement of Underwater Images Based on Multi-Domain Attribute Representation Disentanglement**. *Journal of Unmanned Undersea Systems, 2024, 32(5): 808-817.* (Second author)

Selected Patents

[1] Anqi Qiu (Supervisor), **Pengli Zhu**. **Q-Space Guided Diffusion-Weighted Image Synthesis Method**. China Patent: **202510961496.7A[P]**. Registration Date: 11-07-2025.

[2] Yancheng Liu (Supervisor), **Pengli Zhu**, et al. **An Underwater Object Visual Recognition and Classification Method based on Support Vector Machine**. China Patent: **202011635352.6[P]**. Registration Date: 31-12-2020, Grant Date: 22-03-2024.

[3] Yancheng Liu (Supervisor), **Pengli Zhu**, et al. **Autonomous Decision Control Method for Underwater Vehicles based Visual Depth Estimation**. China Patent: **202010121857.4[P]**. Registration Date: 26-02-2020, Grant Date: 02-06-2023.

[4] Yancheng Liu (Supervisor), **Pengli Zhu**, et al. **A Composite Trajectory Tracking Control Method for Unmanned Underwater Vehicles**. China Patent: **201910037203.0[P]**. Registration Date: 15-01-2019, Grant Date: 03-08-2021.

[5] Yancheng Liu (Supervisor), **Pengli Zhu**, et al. **An Autonomous Tracking Method for Unmanned Underwater Vehicles based on Visual Perception**. China Patent: **202011635410.5[P]**. Registration Date: 31-12-2020.

[6] Minyi Xu (Supervisor), **Pengli Zhu**, et al. **A Kind of Unmanned Ship towards Ocean Early Warning**. China Patent: **201621343342.4[P]**. Registration Date: 08-12-2016, Grant Date: 11-07-2017.

Awards and Honors

- **Award A: 1st Prize in MICCAI 2025 Challenge** *01.09.2025*
  - Brain Region Segmentation Task of the Parkinson's Disease Auto Diagnosis Challenge
- **Award B: China Scholarship Council (CSC)** *01.2023-06.2024*
  - Award Number: 202206570013
  - Study on Medical Image Quality Assessment and Enhancement
- **Award C: Excellence Award - 2nd National Postdoctoral Innovation and Entrepreneurship Competition (Innovation Track)** *10.2023*
  - Award Number: 2023100069
  - Research on Vision Perception and Autonomous Operation Technologies for Underwater Robots in Complex Marine Environments
- **Award D: Outstanding Paper of 2022 - Journal of Electronics & Information Technology** *26.01.2023*
  - Unsupervised Underwater Image Enhancement based on Feature Disentanglement
- **Honor A: Session Chair of Top Conference (OCEANS 2024-Singapore).** *14.04.2024-18.04.2024*
  - Session name: Imaging and Vision

Projects

- **Grant A: Intelligent controllable enhancement algorithm of image quality via representation disentanglement** *01.2024-12.2026*
  - Grant Number: 62301107.
  - Funding Agency: National Natural Science Foundation (NSF) of China
  - Relationship: Principal Participant
- **Grant B: Underwater multi-dimensional information intelligent perception method** *01.2023-12.2025*
  - Grant Number: 83123003.
  - Funding Agency: National Natural Science Foundation (NSF) of China
  - Relationship: Principal Participant

Professional Memberships

- **Institute of Electrical and Electronics Engineers (IEEE)**, ID: 96703152 *06.2019 - Present*
- **Medical Image Computing and Computer Assisted Intervention (MICCAI)**, ID: 4159 *06.2025 - Present*
- **Organization for Human Brain Mapping (OHBM)**, ID: 53373 *03.2025 - Present*
- **China Computer Federation (CCF)**, ID: L8121G *01.2023 - Present*

Editor

- Computers, Materials & Continua (Q1) Guest Editor

Regular Reviewer

- MICCAI, Neural Networks, PR, MIA, ESWA
- IEEE TPAMI, TMI, TMM, TVT, JBHI

Computer Skills

- **Programming Languages:** Python, C#, MATLAB
- **Frameworks:** PyTorch, TensorFlow, OpenCV, Scikit-Learn
- **Tools:** Git, Docker, LaTeX, Jupyter Notebook
- **Platforms:** Linux, Windows

Additional Information

Languages: Mandarin (native), English (fluent)
Interests: Basketball, Running
Hobbies: Cooking, Traveling, NBA