

Ruiqiang Xiao

Personal Webpage

MSc of Data-driven Modeling, School of Science

Hong Kong University of Science and Technology, Hong Kong SAR

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🌐 GitHub Profile

🌐 LinkedIn Profile

EDUCATION

- **The Hong Kong University of Science and Technology (HKUST), Hong Kong** Sept. 2022-Nov. 2023
MSc in Data Science, School of Science CGPA: 4.02/4.3 Percentage: 10%
- **Main Courses:** Statistical Machine Learning(A+), Stochastic Processes and Applications(A), Deep Learning for Modeling: Concepts, Tools, and Techniques(A+)
- **Southeast University, Nanjing, China** Sept. 2018-June. 2022
B.E. in Highway and Bridge Engineering, School of Transportation GPA: 90/100
- **National University of Singapore, Singapore** Sept. 2021-May. 2022
A one-year joint training program between National University of Singapore and Southeast University

PUBLICATION AND PREPRINTS

- Xiao, R., & Wan, Z. (2023). *Gaei-unet: Global attention and elastic interaction u-net for vessel image segmentation.* ([link](#))

RESEARCH INTEREST

- Prompt-based multimodal understanding
- Large-scale multi-modality biomedical image data integration for more precise medical analysis

RESEARCH EXPERIENCE

- **Multi-Task, Multi-Prompt Medical Image Inpainting with Transformer-Based Model** Remote intern
Project Leader – Supervised by Prof. Yuankai Huo from Vanderbilt University Sept. 2023-Present
 - Developed a cutting-edge transformer-based model for multi-task medical image analysis by image inpainting.
 - Introduced a unique input paradigm – combining a query image with multiple support sets(multi-prompt) unlike traditional approaches that use a single input image and train a specific task model.
 - Leveraged the patterns learned from the support set through in-context learning to inpaint the query image and generate the desired result.
- **Medical Image Segmentation using Active Contour and Deep Learning Methods** Hong Kong SAR
Project Leader – Supervised by Prof. Yang Xiang from HKUST Sept. 2022-June. 2023
 - Designed and implemented a novel image segmentation approach by integrating unique active contour methods – elastic interaction-based method with the U-shape deep learning framework.
 - Proposed an attention module to leverage spatial and channel context information to enhance high-level semantic understanding, prompting thin structure segmentation accuracy and efficiency.
 - Focused on applications in medical imaging, contributing to improved diagnosis and treatment planning.
 - The article **GAEI-UNet: Global Attention and Elastic Interaction U-Net for Vessel Image Segmentation** is submitted to Arxiv.
- **The Detection of Apparent Cracks in Bridges Using Computer Vision** Nanjing, China
Project Leader – Supervised by Prof. Yanjie Zhu from Southeast University Aug. 2021-Jun. 2022
 - Developed a deep learning model using YOLOv5's image recognition algorithm to detect and analyze cracks in bridge structures.
 - Implemented lens distortion correction and orthogonal projection methods to quantify the identified cracks accurately.
 - An article in process of modifying: **YOLOv5s-GTB: light-weighted and improved YOLOv5s for crack detection.**
- **Automated Road Information Extraction Based on Laser Scanning Point Cloud** Nanjing, China
Project Leader – Supervised by Prof. Bin Yu from Southeast University Aug. 2020-Aug. 2021
 - Utilized machine learning techniques to extract road level data sets, contributing to urban planning and development.
 - Innovated a linear index-based segmentation strategy for efficient point cloud data processing.
 - Addressed noise issues through data refinement, enhancing the accuracy of surface segmentation.
- **Vehicle Dispatching Considering User Preference Based on Reinforcement Learning** Singapore
Project Leader – Supervised by Prof. Yang Liu from National University of Singapore Aug. 2021- May. 2022
 - Led a team to analyze NYC taxi data, studying user behavior preferences for carpooling platforms.
 - Developed and tested incentive strategies using multi-agent reinforcement learning, maximizing platform efficiency and user satisfaction.
 - Implemented a deep Q-network-based ordered allocation system, contributing to the field of intelligent transportation systems.

HONOURS AND AWARDS

- Honours: Subot Scholarships (2021-2022) (top 1 out of 95), Outstanding Graduate of Southeast University(2022)
- Awards: First Prize of Jiangsu Student Transportation Technology Competition (2021) (top 6 out of 122), The Second Prize Contemporary Undergraduate Mathematical Contest in Modeling (2020)

WORKING EXPERIENCE

•Hong Kong Center for Construction Robotics (HKCRC)

Hong Kong

Research Intern

Sep. 2022-Jan. 2023

- Conducted comprehensive data collection and organization, tracking the latest trends and technologies in the Hong Kong construction industry.
- Developed strategic plans for implementing robotics, focusing on the digitalization of construction sites, with potential applications in medical and structural imaging.

TECHNICAL SKILLS AND INTERESTS

Languages: C/C++, Python, LaTeX

Technical: Pytorch, Git, Linux, Tensorflow, Matlab

Specialized Skills: Medical Image Analysis, Deep Learning, Computer Vision, Active Contour Methods

Libraries : C++ STL, Python Libraries, CUDA Libraries

Soft Skills: Problem Solving, Self-learning, Presentation, Adaptability