Zhihang Liu

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Research Interests

Complex Systems Dynamics, General Swarm Intelligence, Swarm Robotics, Physics-Informed Spatial Intelligence.

Education

- PhD student, Institute of Space and Earth Information Science (ISEIS), The Chinese University of Hong Kong, 2024–2027. Supervisor: Mei-Po Kwan
- MSc, Peking University, 2021–2024
- Bachelor, Sun Yat-Sen University, 2017–2021

Visiting / exchange:
- Guest Researcher, Department of Aerospace and Geodesy, Technical University of Munich, 2022–2023
- UK Study Abroad Programme (Full Scholarship), LSE, Cambridge, Oxford, UoM, 2019
- China Scholarship Council (CSC) Excellent Undergraduate International Exchange Program, The University of Seoul, 2019–2020

Work Experience

Full-time Research Assistant · The Chinese University of Hong Kong
Institute of Space and Earth Information Science (ISEIS) · 2023.9 – 2024.3 · Hong Kong
- Project: "Vehicle Detection and Vehicle-kilometrage Estimation Based on Remote Sensing Technologies", Smart Traffic Fund, HKSAR (PI: Prof. Mei-Po Kwan)
- Supervisor: Prof. Mei-Po Kwan

Summer Intern · The JTL Urban Mobility Lab, MIT · 2023.6 – 2023.9
- Research: Mobility AI with urban imagery, networks, and natural language
- Project: Holistic urban sensing based on remote sensing and street view images using Vision Transformers

Full-time Research Assistant · Technical University of Munich
Department of Aerospace and Geodesy, Professorship for Big Geospatial Data Management · 2022.9 – 2023.9
- Project: "Towards a NAS Benchmark for Classification in Earth Observation" (TUM & DLR)
- Research: Complexity & complex networks, Auto ML
- Supervisor: Prof. Dr. Martin Werner

Part-time Research Assistant · Chinese Academy of Sciences
Institute of Geographic Sciences and Natural Resources Research (IGSNRR) · 2020.9 – 2024

- Project: "Cooperative Observation, Transformation Mechanism and Scenario Simulation of Rural Areal System", Major Program of NSFC (PI: Prof. Liu Yansui)
- Research: Regional complex systems simulation & multi-agent reinforcement learning
- Supervisor: Prof. Yurui Li

Publications

- Z Liu, C Fang, H Li, J Wu, L Zhou, M Werner. **Efficiency and equality of the multimodal travel between public transit and bike-sharing accounting for multiscale.** *Sustainable Cities and Society* 101, 105096, 2024.
- L Zhou, Y Zhou, WT de Vries, Z Liu, H Sun. **Collective action dilemmas of sustainable natural resource management: A case study on land marketization in rural China.** *Journal of Cleaner Production* 439, 140872, 2024.
- Y Yao, S Lei, Z Guo, Y Li, S Ren, Z Liu, Q Guan, P Luo. **Fast optimization for large scale logistics in complex urban systems using the hybrid sparrow search algorithm.** *International Journal of Geographical Information Science* 37(6), 1420–1448, 2023.
- Z Liu, J Wu, CYH Wu, X Xia. **Shifting sentiments: analyzing public reaction to COVID-19 containment policies in Wuhan and Shanghai through Weibo data.** *Humanities and Social Sciences Communications* 11(1), 1–13, 2024.
- Z Liu, J Wu, H Li, M Werner. **Spatio-Temporal Analysis of Urban Economic Resilience during COVID-19 with Multilayer Complex Networks.** *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 2023.
- Z Liu, MP Kwan, J Wu. **Optimal Location of Electric Vehicle Charging Stations Using Geospatial Big Data.** *Proceedings of the 32nd ACM International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL)*, 2024.

Awards & Scholarship

Awards
- **GISCup 2024 Award**, 32nd ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL 2024), Oct 29 – Nov 1, 2024, Atlanta, GA, USA.
- Travel Grants by the ISPRS Foundation for GSW'2023, 2–7 September 2023.
- Global Perspectives – Peking University Graduate Student Scholarly Exchange Fund, 2023.
- Excellent Paper Award, First National Student Land Survey Competition of China Land Science Society, 2021.
- Second Prize (Provincial), 16th Challenge Cup Guangdong University Student's Extra-curricular Academic Science and Technology Works Competition, 2021.
- Outstanding Talents Training Program for Law and Political Science (excellence), 2017–2020.

- Tsinghua University First Young Computational Social Scientist Award, 2020.
- National Top 100, All-China Youth Federation's "Youth in China" Eighth Summer Social Research and Practice Activities for College Students, 2020.

Scholarship
- Peking University Education Abroad Program Scholarship, 2023.
- Li Xuerou Foundation Scholarship of Sun Yat-sen University (top 1%), 2021.
- Professor Xia Shuzhang Scholarship of Sun Yat-sen University (top 1%), 2021.
- National Encouragement Scholarship (National), 2020.
- Sun Yat-sen University Academic Innovation Scholarship (School), 2020.
- China Scholarship Council (CSC) Excellent Undergraduate International Exchange Scholarship, 2019.
- Sun Yat-sen University UK Overseas Study Scholarship, 2019.
- National Encouragement Scholarship (National), 2019.
- Sun Yat-sen University Academic Scholarship, 2019.
- Sun Yat-sen University First Class Scholarship, 2018.