

Zhihang Liu

Professorship for Big Geospatial Data Management
Technical University of Munich

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Research Interests

Big Geospatial Data, Urban Computing, Diffusion Models, Graph Neural Networks,
Complex Networks, Computational Social Science

Education

Guest Researcher / Technical University of Munich 2022.9-2023.11

- Department of Aerospace and Geodesy, Professorship for Big Geospatial Data Management (<https://www.bgd.ed.tum.de/en/>)
- Research Direction: Complexity & Complex Networks, Auto ML
- Supervisor: Prof. Dr. Martin Werner

Research Assistant/IGSNRR, CAS 2020.9- present

- Research Direction: Regional complex systems simulation & Reinforcement Learning
- Project: Simulation of space system based on multi-agent deep reinforcement learning

MSc in Urban Planning/Peking University 2021.9-2024.6

- Research Direction: Urban Computing
- Supervisor: Prof. Dr. Jiawen Yang

BA in Administration /Sun Yat-Sen University 2017.9-2021.7

- Research Direction: Computational Social Science

Study Abroad Experiences 2019

- Guest Researcher, Department of Aerospace and Geodesy, Technical University of Munich;
- UK Study Abroad Programme (Full Scholarship), LSE, Cambridge, Oxford, UoM;
- CSC Excellent Undergraduate International Exchange Program, The University of Seoul;

Skills

Computer

- Data Analysis, Graphics, Modelling and Simulation, Python (TensorFlow, PyTorch), R, JavaScript, HTML, Julia, ArcGIS, NetLogo, GEE

Research Methods

- Machine Learning (Interpretable ML, Graph ML)
- Deep learning (MDRL, CV, NLP)
- Complex networks (Topology, Dynamics, Multilayer)
- Spatial algorithms
- Web spider & Geospatial web data visualization
- Advanced Statistics

Academic Experience

Publications

- Yao, Y., Lei, S., Guo, Z., Li, Y., Ren, S., **Liu, Z.**, ... & Luo, P. (2023). Fast optimization for large scale logistics in complex urban systems using the hybrid sparrow search algorithm. *International Journal of Geographical Information Science*, 1-29.

Projects

- Towards a NAS Benchmark for Classification in Earth Observation, Sponsored by: [TUM Data Science in Earth Observation](#) cooperating with the [German Aerospace Center \(DLR\)](#), 2022-2023

Working Papers

- Efficiency and equity of the multimodal travel between public transit and bike-sharing accounting for multiscale (accepted by IACP2022, Submit to *Sustainable Cities and Societies*)
- From positive support to negative reaction: The evolution of China's containment policy and its impact on public sentiment during the COVID-19 pandemic (accepted by IACP2022, Submit to *Journal of the American Medical Informatics Association*)
- Finding the pattern of rural development through AI-driven simulation (On going)
- Spatio-temporal analysis of urban economic resilience during COVID-19 with multilayer complex networks (accepted by IACP2022, Submissions in progress)
- How do the spatial mobility and economic model shape shop sign landscape? Based on street view images and deep learning (On going)
- Sensing Cities with large language model (On going)

Awards & Scholarship

Awards

- Excellent Paper Award in First National Student Land Survey Competition of China Land Science Society 2021
- Second Prize of the 16th Challenge Cup Guangdong University Student's Extra-curricular Academic Science and Technology Works Competition (Provincial). 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 in 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 (top1%) 2021
- Professor Xia Shuzhang Scholarship of Sun Yat-sen University (top1%) 2021
- National Encouragement Scholarship (National) 2020
- Sun Yat-sen University Academic Innovation Scholarship (School) 2020
- China scholarship council Excellent Undergraduate International Exchange Scholarship (CSC) 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