

Anqi Zhao

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Google Scholar: https://scholar.google.com/citations?user=R5_5OiwAAAAI

Curriculum Vitae | October 2026

ankky-zhao.github.io

PROFILE

Second-year doctoral candidate in GeoAI at the Technical University of Munich, working on LLM-based multi-agent systems and on explanations of geospatial machine-learning models that are trustworthy and falsifiable. First author of an IJGIS paper that coordinates large and small language models for knowledge extraction from Google Earth Engine scripts, and co-author of published LLM methods for geospatial code generation and knowledge-graph construction. Maintains open-source learning resources on LLM agents and web scraping.

EDUCATION

- Technical University of Munich (TUM), Munich, Germany** 09/2025 – Present
- Doctoral Candidate, Chair of Cartography and Visual Analytics (Prof. Liqiu Meng)
 - Research focus: geospatial multi-agent architectures and explainable GeoAI
- Wuhan University (WHU), State Key Laboratory LIESMARS, Wuhan, China** 09/2022 – 06/2025
- M.Sc. Cartography and Geographic Information Systems, weighted average 90.75/100
 - Thesis: a collaborative framework for large and small language models in knowledge extraction from Google Earth Engine workflow scripts
- Wuhan University (WHU), School of Geodesy and Geomatics, Wuhan, China** 09/2018 – 06/2022
- B.Eng. Geodesy and Geomatics Engineering, GPA 3.87/4.0, top 5%
 - Thesis: intent recognition for user map retrieval incorporating knowledge graphs
- University of Cambridge, Cambridge, UK** 07/2020 – 09/2020
- Summer programme: Modern Algorithms for Machine Learning (A+)

SKILLS

- **LLMs and agents:** LLM prompting and fine-tuning, LLM-based agents and multi-agent collaboration, tool calling and MCP-style tool exposure, retrieval-augmented generation, knowledge extraction from code and text, LLM output evaluation
- **Explainable AI and HCI:** SHAP and uncertainty-based explanation of geospatial models, trustworthy and falsifiable explanation design, interactive visual analytics
- **Knowledge graphs:** Ontology and schema design, knowledge-graph construction from unstructured sources, semantic reasoning, graph-based retrieval
- **Machine learning and software:** Python, PyTorch, Hugging Face Transformers, NumPy, Pandas, scikit-learn, XGBoost, SHAP, C++, Git, GitHub Actions, vibe coding with AI coding assistants
- **GIS and geospatial analysis:** ArcGIS, QGIS, PostgreSQL/PostGIS, spatial database design, WMS/OGC web services, geoprocessing model design
- **Languages:** English (fluent, IELTS 7.0), Mandarin (native), Japanese (JLPT N3)

RESEARCH AND PROJECT EXPERIENCE

- Doctoral research: explaining geospatial AI with LLM agents** 09/2025 – Present
Chair of Cartography and Visual Analytics, TUM
- Designing LLM-based multi-agent methods that turn SHAP attributions and uncertainty estimates of geospatial machine-learning models into explanations for planners, policymakers and the public
 - Studying when such explanations can be trusted, including the reliability of spatial feature attributions under controlled data poisoning and the falsifiability of explanatory claims
 - Supervising Master's theses and contributing to seminar topic design at the Chair
- LLM Agent Roadmap: open-source learning atlas** 09/2026 – Present
Personal project | github.com/Ankky-Zhao/llm-agent-roadmap
- Curated a bilingual roadmap of 26 modules, 277 link-verified resources and 99 key papers on LLM agents
 - Content kept as structured JSON; a Python build script validates it and generates the site, GitHub Actions deploy it and run weekly link checks
- Multimodal map retrieval based on text semantics and visual features (WMS)** 01/2020 – 01/2023
National Natural Science Foundation of China, general project

- Established a formal representation of map-retrieval intent constrained by semantic tags and a knowledge-graph-based user-profile method (two invention patents granted)
- Developed a prototype web-based WMS retrieval system

China GEOSS framework and prototype system

10/2021 – 09/2024

Inter-governmental S&T innovation cooperation project

- Constructed the quality element model and indicator system for digital geographic information objects
- Developed and deployed a new generation of quality-control components for the China GEOSS platform

TEACHING EXPERIENCE

Teaching Assistant, AI Summer School, University of Cambridge (Prof. Pietro Liò)

07/2021 – 09/2021

- Compiled and analysed assignment data and addressed students' questions on lecture concepts

Teaching Assistant, International Geoinformatics Summer School, Wuhan University

07/2022 – 09/2022

- Supported classroom instruction and supervised coursework completion for an international cohort

Teaching Assistant, Data Structure and Programming B (C++), Wuhan University

09/2024 – 06/2025

- Marked assignments and examinations, supervised computer practice sessions and helped students debug code

SELECTED PUBLICATIONS (15 PEER-REVIEWED IN TOTAL)

- **Zhao A.**, Gui Z., Liang J., Liu Y., Peng D., Wei W., Hou S., Wu H. (2026). Extraction of geoprocessing modeling knowledge from crowdsourced Google Earth Engine scripts by coordinating large and small language models. *International Journal of Geographical Information Science*, 40(3), 808–841. First author.
- Hou S., **Zhao A.**, Liang J., Shen Z., Wu H. (2025). Geo-FuB: constructing an operator-function knowledge base for geospatial code generation with large language models. *Knowledge-Based Systems*, 319, 113624.
- Hou S., Shen Z., **Zhao A.**, Liang J., Gui Z., Guan X., Li R., Wu H. (2025). GeoCode-GPT: a large language model for geospatial code generation. *International Journal of Applied Earth Observation and Geoinformation*, 104456.
- Hou S., Jiao H., Liang J., Shen Z., **Zhao A.**, Wu H. (2025). GeoCogent: an LLM-based agent for geospatial code generation. *International Journal of Geographical Information Science*.
- Wu H., Jiao H., Hou S., Liang J., Shen Z., **Zhao A.**, et al. (2025). GeoColab: an LLM-based multi-agent collaborative framework for geospatial code generation. *International Journal of Digital Earth*, 18(2).
- Liang J., **Zhao A.**, Hou S., Wu H., Jin F. (2024). A GPT-enhanced framework on knowledge extraction and reuse for geographic analysis models in Google Earth Engine. *International Journal of Digital Earth*, 17(1).
- Liang J., Hou S., **Zhao A.**, Xu Q., Xiang L., Li R., Wu H. (2025). Design and application of a semantic-driven geospatial modeling knowledge graph based on large language models. *Geo-spatial Information Science*.
- Hou S., Liang J., **Zhao A.**, Wu H. (2025). GEE-OPs: an operator knowledge base for geospatial code generation on Google Earth Engine powered by large language models. *Geo-spatial Information Science*.
- Gui Z., Liu X., **Zhao A.**, et al. (2024). Map retrieval intention recognition based on relevance feedback and geographic semantic guidance. *Information Processing & Management*, 61(4), 103767.
- Wei W., Gui Z., Wu C., **Zhao A.**, Peng D., Wu H. (2025). Dynamic visual semantic sub-embeddings and fast re-ranking for image-text retrieval. *IEEE Transactions on Multimedia*, 27, 3781–3796.

HONOURS AND PATENTS

- Outstanding Postgraduate of LIESMARS, Wuhan University (2024)
- First Prize, National Surveying Science and Technology Thesis Competition for College Students (2021)
- National Inspirational Scholarship (2019–2021); Second Prize Scholarship of Wuhan University (2019–2024)
- Two granted Chinese invention patents on knowledge-graph-based map retrieval (2023, 2024)
- Outstanding Graduate of Wuhan University (2022); Outstanding Student Leader (2020, 2021); Social Activist of Wuhan University (2020, 2023)

CONFERENCES AND ACADEMIC SERVICE

- Seminar on Spatial Perception and Computing Technology, Chibi, July 2024
- 5th China Spatial Data Intelligence Academic Conference, Nanjing, April 2024
- China Academic Conference on Geographic Information Science Theory and Methods, Guilin, May 2023

LEADERSHIP

Director, Secretariat Department, English GeoScience Café Club, WHU

09/2023 – 06/2024

Director, Social Activities Department, English GeoScience Café Club, WHU

09/2022 – 06/2023

Vice Director, Operations Center, GeoScience Café Club, WHU

09/2021 – 06/2022

Class Monitor, Geomatics Engineering Class 8 (2018), WHU

09/2018 – 06/2022