Xihan Yao 姚希翰

Austin, TX | xyaoaf@utexas.edu | LinkedIn | GitHub | Website

Research Interests

My research examines how urban and natural environments relate to the people who live in them, using geospatial data and spatial analysis. I am particularly interested in ecosystem services, urban greenery, and how landscape features shape environmental and social well-being.

Education

The University of Texas at Austin — PhD student, Geography and the Environment 2025 – present

Supervisor: Professor Yuhao Kang

Link: GISense Lab

University of California, Berkeley — MLA, Environmental Planning 2021 – 2023

Thesis: Towards Effective Urban Forestry Monitoring and Evaluation: Studying Urban Tree Characteristics and Their Relationship to the Urban Microclimate, A Case Study in Portland, Oregon, USA.

Link: Publication

Hong Kong University of Science and Technology (HKUST) — BSc, Environmental Management and Technology 2017 – 2021

Capstone Project: Light pollution impact assessment in Hong Kong: Multi-dimensional measurement and spatial numerical modelling on integrated light sources in the neighbourhood level.

Link: Publication

University of Washington, Seattle — Exchange Student 2019

Experience

The University of Texas at Austin Austin, TX, 2025 – present

Research Assistant 2025 – present

- Leading a first-author study, now nearing submission, that uses AlphaEarth satellite data to examine how the fit between people's personalities and their environments varies across U.S. urban areas.
- Managing the lab's research server and large geospatial data collection: organizing public, statistical and government datasets and coordinating data exchange with collaborators.

Teaching Assistant, Spatial Data Science and Maps (GRG 356T) 2026

- Rebuilt three of the course's Python labs, on how well AI language models know geography, on street-level greenery, and on access to maternal health care; revised the other labs.

Ready.net — Data Intern Remote, 2026

- Analyzed how resilient communities' internet connectivity is to natural hazards, and where repairs and detours would be needed after a disaster; presented a statewide case study.
- Built suitability scores to help decide where to place the company's public-access equipment at rural health clinics and public libraries.
- Built data pipelines and data-quality checks with Airflow, dbt and AWS for the grant data state broadband offices report, and a directory that helps federal broadband grant applicants find qualified contractors by combining public and commercial sources of uneven quality.

EarthDefine, LLC — GIS Analyst Redmond, WA, 2024 – 2025

- Produced tree canopy and land cover maps for U.S. cities, delivered to municipal governments and the Arbor Day Foundation.
- Led a team of GIS specialists delivering community canopy metrics and multi-year land use change datasets across the U.S., with consistent quality control.

University of California, Berkeley Berkeley, CA, 2022 – 2023

Lecturer, GIS 2023

- Served as instructor of record for UC Berkeley's largest GIS course (GEOG/LDARCH C188; 200 students), delivering lectures, designing assessments, and supervising a multi-TA instructional team.
- Redesigned and modernized the curriculum to incorporate contemporary GIS concepts and tools, working with Esri to improve data workflows, reproducibility, and instructional data management.

Graduate Student Instructor, Applied Remote Sensing & GIS 2022 – 2023

- Led labs for Applied Remote Sensing (ESPM/LDARCH C289) in Google Earth Engine, where students applied remote sensing to environmental questions such as vegetation monitoring and land cover change.
- Taught hands-on GIS and spatial data labs (GEOG/LDARCH C188) in ArcGIS Pro, updated course materials, and produced instructional videos to support the move from ArcGIS Desktop to ArcGIS Pro.

Research Assistant 2022

- *Korean Tidal Flats, Hwaseong Wetland World Heritage Inscription Study* (Project Report): Conducted spatial analysis of environmental and social factors to illuminate the significance and challenges of its World Heritage site designation.

Beijing Smart & Green Transport Research Center — Data Research and Analysis Intern 2020

- Analyzed carbon abatement potential in China's transportation sectors under various green technology incentive policy scenarios; utilized a multi-parameter model to assess effectiveness under the supervision of Dr. Dongquan He.

Publications

4. Ito, K., Kang, Y., Gosling, S. D., **Yao, X.**, Potter, J., & Biljecki, F. (2026). Uncovering the associations between human Big Five personality traits and built environment characteristics from street view imagery. *Annals of the American Association of Geographers*. Advance online publication. DOI: 10.1080/24694452.2026.2704575
3. **Yao, X.**, Kim, M., Dronova, I., McBride, J. R., Kondolf, G. M., & Radke, J. D. (2025). Community-scale microclimate simulation using Airborne Laser Scanning and object-based urban tree classification. *Landscape and Urban Planning, 263*, 105420. DOI: 10.1016/j.landurbplan.2025.105420
2. Tong, J. C. K., **Yao, X. H.**, Lau, E. S. L., Cheung, W. K. S., Ho, K. K. S., Ng, V. Y. Y., & Lau, A. P. S. (2024). Light pollution impact assessment in Hong Kong: Multi-dimensional measurement and spatial numerical modelling on integrated light sources in the neighbourhood level. *Energy & Environment, 35*(5), 2497–2516. DOI: 10.1177/0958305X221146942
1. Chan, S. N., Fan, Y. W., & **Yao, X. H.** (2022). Mapping of coastal surface chlorophyll-a concentration by multispectral reflectance measurement from unmanned aerial vehicles. *Journal of Hydro-environment Research, 44*, 88–101. DOI: 10.1016/j.jher.2022.08.003

Conference Presentations & Proceedings

10. **Yao, X.**, Wu, K., Bhatt, R., Kim, M., & Kang, Y. (2026, September 8–11). *Cartographer in the loop: Interactive land cover change screening using geospatial foundation model embeddings* [Paper presentation]. CaGIS 2026 Conference, Cartography and Geographic Information Society, St. Louis, MO, United States.

9. **Yao, X.**, Kang, Y., Ito, K., Tan, H., & Gosling, S. D. (2026, June 3). *From embeddings to explanation: A geospatially explicit framework for human–environment research with geo-foundation models* [Lightning talk]. 4th Smart Cities and AI Innovations Symposium, Good Systems, The University of Texas at Austin, Austin, TX, United States.
8. **Yao, X.**, Kang, Y., Gosling, S. D., Ito, K., Tan, H., Bhatnagar, A., & Kim, S. (2026, March 20). *Uncovering the geography of personality: Linking the Big Five traits to built environment features across U.S. urban areas* [Paper presentation]. American Association of Geographers (AAG) Annual Meeting 2026, San Francisco, CA, United States.
7. Liu, J., **Yao, X.**, Rajput, A. A., & Bugada, A. (2026, March 18). *Instance-level disaster impact assessment from remote sensing: An uncertainty-aware GeoAI framework integrating exposure modeling* [Paper presentation]. American Association of Geographers (AAG) Annual Meeting 2026, San Francisco, CA, United States.
6. **Yao, X.**, Kim, M., Dronova, I., McBride, J. R., Kondolf, G. M., & Radke, J. D. (2025, October 23–25). *Community-scale microclimate simulation using Airborne Laser Scanning and object-based urban tree classification* [Paper presentation]. ACSP 2025 Minneapolis 65th Annual Conference, Minneapolis, MN, United States.
5. Main, K. L., **Yao, X.**, Raine, H., Farley, M., Malone, H., Serra-Llobet, A., Kondolf, G. M., & Radke, J. (2024, June 23–27). *The levee effect and residual risk in Sacramento, California: Have we been good or lucky?* [Paper presentation]. ASFPM Foundation 14th Annual Student Paper Competition, Salt Lake City, UT, United States.
4. **Yao, X.**, & Kim, M. (2024, June 3–7). *Object-based ecosystem services evaluation with higher spatial resolution, multidimensional remote sensing* [Poster presentation]. 2024 Natural Capital Symposium, Stanford, CA, United States.
3. **Yao, X.**, & Kim, M. (2023, December 11–15). *A Lidar-based method for 3D urban forest evaluation and microclimate assessment, a case study in Portland, Oregon, USA* [Poster presentation]. American Geophysical Union (AGU) Annual Meeting 2023, San Francisco, CA, United States. DOI: 10.22541/essoar.170914530.09781933/v1
2. **Yao, X.**, & Kim, M. (2023, July 16–21). *From local to micro: Exploratory data analysis on urban forests and microclimates in Portland, Oregon, USA* [Conference session]. IGARSS 2023 - 2023 IEEE International Geoscience and Remote Sensing Symposium, Pasadena, CA, United States. DOI: 10.1109/IGARSS52108.2023.10282088
1. Hester, R., McNally, M., Stern, M., **Yao, X.**, & Malone, H. (2022, September 8). *The factor of time, Hwaseong Wetland* [Conference session]. Association of Pacific Rim Universities Sustainable Cities and Landscapes (APRU-SCL), Honolulu, HI, United States (Remote).

Awards & Certificates

Honors and Awards

- **Energy AI Hackathon (6th Annual)**, UT Austin. Awarded **Fourth Place** among 46 teams. 2026
- **Geoscience Hackathon**, UT Austin — Jackson School of Geosciences. Awarded **Second Place**. 2025
- **CyberTraining Summer School**, Texas A&M University — Department of Geography. Awarded **First Place**. 2025
- **Collegiate Student Paper Competition (14th Annual)**, Association of State Floodplain Managers (ASFPM). Awarded **Third Place**. Paper: "The Levee Effect and Residual Risk in Sacramento, California" 2024
- **IEEE GRSS GeoPitch Award**. Awarded **Third Place**. 2023

Professional Certificates

- Certificate in Geographic Information Science and Technology (GIST), UC Berkeley. 2023
- Certificate of Teaching and Learning in Higher Education, UC Berkeley 2023

Peer Review Service

- *BMC Public Health*
- *Computational Urban Science*
- *Journal of Applied Remote Sensing*
- *Urban Forestry & Urban Greening*

Mentorship & Leadership

- **GISense Lab, The University of Texas at Austin** 2026 – present
  Undergraduate Research Mentor for Samiksha Boinpalli (street view imagery processing for a national study of personality and the built environment) and Oscar Friend (U.S. Census boundary and city-level census data processing; land cover change labeling for a change detection tool).
- **NASA DEVELOP National Program** Fall 2024
  Technical Mentor for Student Internship Project: "Quantifying Canopy Cover and Land Surface Temperature in San Jose to Identify Future Tree Planting Sites".
- **Undergraduate Honors Thesis Mentor** 2023 – 2024
  Thesis Mentor for Sarah Song (UC Berkeley, Statistics & Data Science). Project: "Urban Greenery in San Francisco."

Skills

Programming & Data	Python (GeoPandas, PySAL, Scikit-learn), SQL, R, Git/GitHub
Data Engineering	Airflow, dbt, AWS (Athena, Redshift), GeoParquet, Superset
GIS & Spatial Analysis	Esri products, PostGIS, GDAL, spatial statistics