Xihan Yao 姚希翰

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RESEARCH INTERESTS

My research interests center on integrating remote sensing, GIS and AI technologies for high-resolution, multidimensional environmental monitoring and modeling, with a focus on heterogeneous, human-nature coupled landscapes. I am interested in analyzing ecosystem services and exploring how diverse landscape features interact and contribute to climate change and social resilience. My work also involves investigating low-impact development strategies across varied ecosystem contexts.

EDUCATION

UNIVERSITY OF TEXAS, AUSTIN

PhD student, Geography and the Environment, 2025 - present

Supervisors: Professor Yuhao Kang

UNIVERSITY OF CALIFORNIA, BERKELEY

MLA, Environmental Planning, 2021 - 2023

Thesis: Towards more effective urban vegetation monitoring and management: Studying of urban tree characteristics and their relationship to the urban heat island effect with high-resolution remote sensing products, a case study in Portland, Oregon, USA (Link: Thesis; Publication Draft)

HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY (HKUST)

BSc, Environmental Management and Technology, 2017 - 2021

Thesis: "Light pollution impact assessment in Hong Kong: Multi-dimensional measurement and spatial numerical modelling on integrated light sources in the neighborhood level" (Link: Publication)

Exchange Student, University of Washington, Seattle, 2019

EXPERIENCE

EARTHDEFINE, LLC

GIS Analyst, 2024 – 2025

- Designing and implementing deep learning classification workflows for city-scale, sub-meter resolution land cover mapping and change detection, leveraging high-resolution aerial imagery and efficient batch scripting processes.
- Leading a team of GIS specialists to develop and deliver spatial data products across the US, including community canopy coverage statistics and multiyear land-use change detection datasets. These products supported clients such as the Arbor Day Foundation and municipal governments in their land resource monitoring and analysis efforts.

UNIVERSITY OF CALIFORNIA, BERKELEY

Lecturer in GIS (GEOG/LDARCH C188), 2023

- Managed UC Berkeley's largest GIS course with 200 students from diverse academic backgrounds. Delivered lectures and supervised TAs in conducting laboratory sessions.
- Revamped the curriculum to incorporate cutting-edge GIS concepts and tools in collaboration with ESRI, enhancing GIS data management and sharing for instructional purposes.

Research Assistant, 2022

*Korean Tidal Flats, Hwaseong Wetland World Heritage Inscription Study (*Link: Project Report*)*

- Conducted spatial analysis of the environmental and social factors within Hwaseong, South Korea's designated wetland conservation area. This analysis illuminated the significance and challenges associated with the inclusion of this wetland as a World Heritage site.

Graduate Student Instructor in Applied Remote Sensing (ESPM/LDARCH C289) & GIS (GEOG/LDARCH C188), 2022-2023

- Instructed two advanced GIS/Remote Sensing courses as a Graduate Student Instructor.
- For Applied Remote Sensing, taught JavaScript programming in Google Earth Engine, covering object-based and pixel-based image analysis, land use classification with machine learning, and utilizing diverse data sources such as Landsat, MODIS, NAIP, and LiDAR.
- For GIS, conducted lab sessions using ArcGIS Pro, updated course materials, and recorded new instructional videos to

facilitate the transition from ArcGIS Desktop to ArcGIS Pro.

BEIJING SMART GREEN TRANSPORT TECHNOLOGY

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

- 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. https://doi.org/10.1016/j.landurbplan.2025.105420

- 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. (2023). 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. https://doi.org/10.1177/0958305X221146942

- 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. https://doi.org/10.1016/j.jher.2022.08.003

CONFERENCE PROCEEDINGS & PRESENTATIONS

- Main, K. L., Yao, X., Raine, H., Farley, M., Malone, H., Serra-Llobet, A., Kondolf, G. M., & Radke, J. (2024). The Levee Effect and Residual Risk in Sacramento, California: Have we been good or lucky? *ASFPM Foundation 14th Annual Student Paper Competition.* Salt Lake City, Utah, US., Jun 23-27, 2024

- Yao, X., & Kim, M. (2024). Object-based Ecosystem Services Evaluation with Higher Spatial Resolution, Multidimensional Remote Sensing. *2024 Natural Capital Symposium*. Stanford, California, US., Jun 3-7, 2024

- Yao, X., & Kim, M. (2023). A Lidar-based Method for 3D Urban Forest Evaluation and Microclimate Assessment, a Case Study in Portland, Oregon, USA. *American Geophysical Union (AGU) Annual Meeting 2023.* https://doi.org/10.22541/essoar.170914530.09781933/v1. San Francisco, California, US., Dec 11-15, 2023.

- Yao, X., & Kim, M. (2023). From Local to Micro: Exploratory Data Analysis on Urban Forests and Microclimates in Portland, Oregon, USA. *IGARSS 2023 - 2023 IEEE International Geoscience and Remote Sensing Symposium*, 2095–2098. https://doi.org/10.1109/IGARSS52108.2023.10282088. Pasadena, California, US., July 16-21, 2023.

- Hester, R., McNally, M., Stern, M., Yao, X., Malone, H. (2022). The factor of time, Hwaseong Wetland. *Association of Pacific Rim Universities Sustainable Cities and Landscapes (APRU-SCL)*. Honolulu, HI, US., (Remote), Sep 8, 2022.

PEER REVIEW EXPERIENCE

- *Urban Forestry & Urban Greening* (Impact Factor: 6.7)
- *Journal of Applied Remote Sensing* (Impact Factor: 1.4)
- *Computational Urban Science* (Impact Factor: 3.2)

MENTORED STUDENTS

- **NASA DEVELOP Student Team:** National Program 2024 Fall Project, *Quantifying Canopy Cover and Land Surface Temperature in San Jose to Identify Future Tree Planting Sites*. Sept 2024 – Nov 2024

- **Sarah Song (UC Berkeley Statistics & Data Science):** Undergraduate Thesis, *Urban Greenery in San Francisco*. Sept 2023 – May 2024

AWARDS & CERTIFICATES

Second Place Award, Jackson School of Geosciences – The University of Texas as Austin, Geoscience Hackathon 2025, *"Tracking Earth's Changes with AlphaEarth Foundations"*, 2025

First Place Award, Department of Geography - Texas A&M University, 2025 CyberTraining Summer School, *"Assessing Instance-based Disaster Impact Through Multimodal Geospatial Data with Damage Prediction and Demographic Attributes"*, 2025

Third Place Award, The Association of State Floodplain Manager (ASFPM), 14th Annual Collegiate Student Paper Competition, *"The Levee Effect and Residual Risk in Sacramento, California"*, 2024

Third Place Award, IEEE Geoscience and Remote Sensing Society, GeoPitch Award: Innovating for a Sustainable Future with Geoscience and Remote Sensing, *"Object-Based Urban Trees Characterization with Airborne Lidar for Microclimate Simulation"*, 2023

Certificate in Geographic Information Science and Technology (GIST), from UC Berkeley, 2023

Certificate of Teaching and Learning in Higher Education, from UC Berkeley, 2023

SKILLS

Programming & Data Science: Python (TensorFlow, PyTorch, Scikit-learn, GeoPandas, Rasterio), R, JavaScript (Google Earth Engine), Java (basic)

GIS & Remote Sensing: ESRI products (ArcGIS Pro, ArcGIS Online), QGIS, Google Earth Engine, LiDAR, GDAL/OGR

Computing & Systems: Linux Shell, High performance computing, GPU server management, batch processing, Git/GitHub