Luyu Liu

Auburn University
Department of Geosciences
Haley Center, 2046J, 351 Thach Concourse
Auburn, AL 36849

Email: luyuliu@auburn.edu
Website: https://luyuliu.github.io
GitHub: https://github.com/luyuliu

Education

The Ohio State University	Columbus, OH
• Ph.D. Geography, GIS	2019 – 2023
• M.A. Geography, GIS	2017 – 2019
• Graduate Certificate in College and University Teaching	2020 – 2021

Peking University	Beijing, China
• B.S. Environmental Science	2013 – 2017
• B.S. Mathematics and Applied Mathematics	2014 – 2017

Employment

Auburn University, Department of Geosciences, Assistant Professor	2024 - present
University of Florida, Department of Civil & Coastal Engineering, Postdoc Researcher	2023 - 2024
The Ohio State University, Department of Geography, Graduate Researcher	2017 - 2022

Honors and Awards

Outstanding Dissertation Award by AAG Transportation Geography Specialty Group	2024
Best Paper Award 2023, Journal of Geographical Systems	2023
Presidential Fellowship, The Ohio State University	2022 – 2023
TR Lakshmanan and Lata Chatterjee Award 2020	2020
Collaborative Achievement in Sustainability Award from Mid-Ohio Regional Planning Commission (as group)	2020
Scholarship of Tiehan, Peking University	2013 – 2016
Honorable mentioned by "Mathematical Contest in Modeling" sponsored by COMAP	2016
President of "Outstanding Class" award winner of Peking University	2015

Publications

Published Journal Articles

Liu, L., Zhang, X., Jiang, S., & Zhao, X. (2025). Hurricane evacuation analysis with large-scale mobile device location data during hurricane Ian. Transportation Research Part D: Transport and Environment, 139, 104559.

Qian, Y., **Liu, L.**, & Yan, X. (2025) Big Data, Big Bias? On Factors Influencing Public Transit and Shared Micromobility Integration. *Transportation Research Part D*, 148, 104977.

Lyu, D., **Liu, L.**, Campbell, C., Zhang, Y., & Yan, X. (2025). Potentials and limitations of large-scale, individual-level mobile location data for food acquisition analysis. *Health & Place*, 95, 103526. https://doi.org/10.1016/j.healthplace.2025.103526

Liu, L., Li, X., Pereira, R. H., & Yan, X. (2025). Measuring exposure to extreme heat in public transit systems. *Journal of Transport Geography*, 128, 104383.

Javanmard, R., **Liu, L.**, Long, J. A., & Lee, J. (2025). Using Realtime GTFS to generate easy-to-use transit accessibility measures under travel time uncertainty. *Travel Behaviour and Society*, 41, 101054.

Tokey, A. I., **Liu, L.**, & Miller, H. J. (2025). Measuring the impacts of sidewalks on public transit first mile/last mile accessibility and their association with social and demographic factors. *Transportation Research Interdisciplinary Perspectives*, 33, 101576.

Dai, Y., **Liu, L.**, Wang, K., Li, M., & Yan, X. (2025). Using computer vision and street view images to assess bus stop amenities. *Computers, Environment and Urban Systems*, 117, 102254.

Liu, L., & Miller, H. J. (2025). Accessibility derivative: measuring the accessibility contribution of public transit routes. *Environment and Planning B: Urban Analytics and City Science*, 23998083241272098.

Liu, L., Lee, J., & Miller, H. J. (2024). Evaluating accessibility benefits and ridership of bike-transit integration through a social equity lens. *Computers, Environment, and Urban Systems*, 112, 102150.

Ahmed, N., Lee, J., **Liu, L.**, Kim, J., Jang, K. M., & Wang, J. (2024). The cost of climate change: A generalized cost function approach for incorporating extreme weather exposure into public transit accessibility. *Computers, Environment and Urban Systems*, 112, 102145.

Liu, L., Porr, A., & Miller, H. J. (2024). Measuring the impacts of disruptions on public transit accessibility and reliability. *Journal of Transport Geography*, 114, 103769.

Javanmard, R., Lee, J., Kim, J, **Liu, L.**, and Diab, E. (2023). The impacts of the modifiable areal unit problem (MAUP) on social equity analysis of public transit reliability. *Journal of Transport Geography*, 106, 103500.

Liu, L., Kar, A., Tokey, A. I., Le, H. T., & Miller, H. J. (2023). Disparities in public transit accessibility and usage by people with mobility disabilities: An evaluation using high-resolution transit data. *Journal of Transport Geography*, 109, 103589.

Liu, L., Porr, A., & Miller, H. J. (2023). Realizable accessibility: evaluating the reliability of public transit accessibility using high-resolution real-time data. *Journal of Geographical Systems*, 25(3), 429-451.

Liu, L., & Miller, H. J. (2022). Measuring the impacts of dockless micro-mobility services on public transit accessibility. *Computers, Environment, and Urban Systems*, 98, 101885.

Liu, L., & Miller, H. J. (2021). Measuring risk of missing transfers in public transit systems using high-resolution schedule and real-time bus location data. *Urban Studies*, 58(15), 3140-3156..

Liu, L., & Miller, H. J. (2020). Does real-time transit information reduce waiting time? An empirical analysis. *Transportation Research Part A: Policy and Practice*, 141, 167-179.

Liu, L., Miller, H. J., & Scheff, J. (2020). The impacts of COVID-19 pandemic on public transit demand in the United States. *Plos one*, 15(11), e0242476.

Park, Y., Mount, J., **Liu, L.**, Xiao, N., & Miller, H. J. (2019). Assessing public transit performance using real-time data: spatiotemporal patterns of bus operation delays in Columbus, Ohio, USA. *International Journal of Geographical Information Science*, , 34(2), 367-392.

Book Chapters

Liu, L., & Miller, H. J. (2025). Measuring Resilience with Public High-Transit Resolution Real-Time Geospatial Data. *Urban Human Mobility: Practices, Analytics, and Strategies for Smart Cities*, 283.

Liu, L. (2025). Impacts of COVID-19 on Passenger Transportation. *International Encyclopedia of Geography*.

Liu, L. (2025). General Transit Feed Specification. *International Encyclopedia of Geography*.

In-progress Publications

Liu, L., & Miller, H. J. Impacts of Free Fare Policy on Public Transit Ridership: Case of Columbus, Ohio during COVID-19. (Submitted)

Khattak, M. M., & **Liu, L.** SMARTS: A Synchronous Multi-Agent Reinforcement Learning-driven Transit Scheduler. (Submitted)

Guan, X., Kar, A., Lee, J., & **Liu, L.** Assessing Potential and Bias of Generative Artificial Intelligence in Inferring Pedestrian Safety Perception. (Submitted)

Recalde, A., **Liu, L.**, Zhang, X., & Zhao, X. Assessing Evacuation Destination Preference during Hurricane Ian: A Gravity Model Approach with Large-scale Mobile Device Location Data. (Submitted)

Liu, L., & Smith, M. Compare disparities in public transit accessibility of Black communities in 1910 and 2019 with historical transit data (In preparation).

Conference Presentations

Wang, Y., **Liu, L.**, Lee, J., & Kar, A. (2026). Interrelationship between Pedestrian Streetscape, Walking Perceptions, and Willingness: An Analysis Using Structural Equation Modeling and Explainable Artificial Intelligence. *American Association of Geographers Annual Meeting 2026*, San Francisco, CA.

Shaver, H., **Liu, L.**, Ahmed, N., Long, J. A., Voogt, J. A., Diab, E., Wang, J., & Lee, J. (2026). Measuring Transit Riders' Extreme Heat Exposure and Mitigation Availability during the 2021 Heatwave in Vancouver, British Columbia, Canada. *American Association of Geographers Annual Meeting 2026*, San Francisco, CA.

Zhao, T., Lee, J., Li, Y., **Liu, L.** (2026). Modeling Urban Tree Cooling Effect through Microclimate Simulation and Mobility Data. *American Association of Geographers Annual Meeting 2026*, San Francisco, CA.

Ahmed, N., **Liu, L.**, Kar, A., Voogt, J. A., Wang, J., & Lee, J. (2026). Thermal Comfort Accessibility: Integrating the Impacts of Urban Heat into Space-Time Prisms under Climate Change. *American Association of Geographers Annual Meeting 2026*, San Francisco, CA.

Yao, Q., Liu, K.-b., Leighton, F., Smith, C., **Liu, L.**, Rodrigues, E., & Sievers, D. (2026). Reconstructing 2,500 Years of Hurricanes and Floods at McFaddin National Wildlife Refuge, Texas Using Multi-Proxy and Machine-Learning Methods. *American Association of Geographers Annual Meeting 2026*, San Francisco, CA.

Khattak, M. M. H., & **Liu, L.** (2026). SMARTS: A Synchronous Multi-Agent Reinforcement Learning-driven Transit Scheduler. *American Association of Geographers Annual Meeting 2026*, San Francisco, CA.

Khattak, M. M. H., & **Liu, L.** (2026). SMARTS: A Synchronous Multi-Agent Reinforcement Learning-driven Transit Scheduler. *Transportation Research Board Annual Meeting 2026*, Washington, DC.

Recalde, A., **Liu, L.**, Zhang, X., & Zhao, X. (2025). Assessing Evacuation Destination Preference during Hurricane Ian: A Gravity Model Approach with Large-scale Mobile Device Location Data. *Transportation Research Board Annual Meeting 2025*, Washington, DC.

Liu, L., Zhang, X., Jiang, S., & Zhao, X. (2025) Measuring evacuees' behavior during Hurricane Ian using large-scale mobile phone GPS data. *Transportation Research Board Annual Meeting 2025*, Washington, DC.

Liu, L., Li, X., Pereira, R. H., & Yan, X. (2025) Measuring extreme heat exposure in public transit systems in Florida, US. *Transportation Research Board Annual Meeting 2025*, Washington, DC.

Qian, Y., **Liu, L.**, & Yan, X. (2025) Big data, big bias? On Factors Influencing Public Transit and Shared Micromobility Integration. *Transportation Research Board Annual Meeting 2025*, Washington, DC.

Tokey, A. T., **Liu, L.**, & Miller, H. J. (2024). Measuring the Impacts of Sidewalks on Public Transit First Mile/Last Mile Accessibility and their Association with Social and Demographic Factors. *CAGIS – University Consortium for Geographic Information Science Symposium 2024*, Columbus, Ohio.

Liu, L., Yan, X., & Pereira, R. H. M. (2024). Measuring Extreme Heat Exposure in Public Transit Systems in Florida, US. *Gulf of Mexico Conference 2024*, Tampa, FL.

Zhao, X., Sun, Y., Huang, S., Lindell, M. K., Zhang, X., & **Liu, L.** (2024). Fusing Small and Big Data to Advance Understanding of Hurricane Evacuation. *Gulf of Mexico Conference 2024*, Tampa, FL.

Liu, L., & Miller, H. J. (2024). Accessibility derivative: measuring the accessibility contribution of public transit routes. *Transportation Research Board Annual Meeting 2024*, Washington, DC.

Liu, L., Kar, A., Tokey, A. I., Le, H. T., & Miller, H. J. (2023). Disparities in public transit accessibility and usage by people with mobility disabilities: An evaluation using high-resolution transit data. *Transportation Research Board Annual Meeting 2023*, Washington, DC.

Liu, L., Porr, A., & Miller, H. J. (2023). Realizable accessibility: evaluating the reliability of public transit accessibility using high-resolution real-time data. *Transportation Research Board Annual Meeting 2023*, Washington, DC.

Liu, L., Miller, H. J., Schenk, J., Puranik, D. (2022). New data for understanding and planning public transit. *Ohio Public Transit Association Annual Meeting 2022*, Columbus, Ohio.

Liu, L., Zhang, X., Zhao, X. (2024). Assessing evacuation behavior during Hurricane Ian with large-scale GPS data. *American Association of Geographers Annual Meeting 2024*.

Liu, L., Miller, H. J. (2023). Accessibility derivative: measuring the accessibility contribution of public transit routes. *American Association of Geographers Annual Meeting 2023*.

Liu, L., Miller, H. J. (2022). Measuring the impacts of dockless micro-mobility services on public transit accessibility *American Association of Geographers Annual Meeting 2022*.

Liu, L., Miller, H. J. (2021). Revisiting the impacts of transit real-time information on waiting time reduction: an empirical analysis in Columbus, Ohio. *American Association of Geographers Annual Meeting 2021*.

Liu, L., Miller, H. J. (2019). Measuring public transit transfer risk using highresolution schedule and real-time location data. *American Association of Geographers Annual Meeting 2019*, Washington, DC.

Root, E. D., **Liu, L.**, Porr, A. (2019). Addressing birth outcomes with data analytics and spatial analysis. *18th International Medical Geography Symposium 2019*, Queenstown, New Zealand.

Conference Sessions & Panels
Liu, L., Lee, J., & Jin, S. (2023).GISER Symposium: Multimodal Human Mobility. *American Association of Geographers Annual Meeting 2026*, San Francisco, CA.

Lee, J., **Liu, L.**, Kar, A., & Le, H. (2023). Transportation & Environmental Exposure. *American Association of Geographers Annual Meeting 2025*, Detroit, MI.

Liu, L., Lee, J., Jed, L., Miller, H. J., Xiao, N. (2023). Data-driven movement analytics. *American Association of Geographers Annual Meeting 2023*, Denver, CO.

Research Funding & Experiences

High-resolution Transit Riders Extreme Heat Exposure across U.S. Cities   2024
- Funder: USDOT, Tier 1 University Transportation Center
- Collaborators: Drs. Yan Xiang, Wesley Marshall, Aditi Misra, Manish Shirgaokar
- Amount: $225,000
- Role: PI

Assessing Bus Stop Amenities Using Google Street View Images and Computer Vision   2024
- Funder: USDOT, Tier 1 University Transportation Center
- Collaborators: Drs. Yan Xiang, Guang Tian, Reid Ewing, and Justyna Kaniewska
- Amount: $150,000
- Role: co-PI

Understanding heat exposure-aware accessibility by transit in the era of climate change   2024 - present
- Funder: Social Sciences and Humanities Research Council
- Collaborators: Drs. Jinhyung Lee, Ehab Diab, Jed Long, James Voogt, Jinfei Wang
- Amount: $50,000
- Role: collaborator

Analyzing transit-based evacuation demand in hurricanes   2023 - 2024
- Funder: USDOT, Tier 1 University Transportation Center
- Collaborators: Dr. Yan Jacob Xiang and Dr. Xilei Zhao
- Amount: $150,000
- Role: Lead researcher

Shared micromobility as a last-mile complement to public transit   2023 - 2024
- Funder: USDOT, Tier 1 University Transportation Center
- Collaborators: Dr. Yan Jacob Xiang and Dr. Xilei Zhao
- Amount: $225,000
- Role: Lead researcher

Downscaling Soil Moisture for Drought Monitoring with Machine Learning Methods   2020 - 2023
- Funder: Sharpe Innovation Commons Seed Grant Award, the Ohio State University
- Collaborators: Dr. Zack Leasor and Dr. Chen Zhao
- Role: Awardee and coauthor

MORPC sustainability dashboard   2019 – 2020
- Funder: Mid-Ohio Regional Planning Commission
- Collaborators: Dr. Harvey Miller and Dr. Ningchuan Xiao
- Role: Lead programmer and first author

Columbus Urban & Regional Information Observatory (CURIO)   2017 – 2018
- Funder: Center for Urban and Regional Analysis, the Ohio State University
- Collaborators: Dr. Harvey Miller and Dr. Ningchuan Xiao
- Role: Lead programmer

Infant Mortality Research Partnership (IMRP) online GIS platform   2018 – 2019
- Funder: Dr. Elisabeth Root
- Collaborators: Dr. Elisabeth Root
- Role: Lead programmer and coauthor

Neighborhood polygon algorithm based on network analysis   2017 – 2018
- Funder: Institute for Population Research, The Ohio State University
- Collaborators: Dr. Christopher Browning and Dr. Catherine Calder
- Role: Lead programmer

Teaching and Public Speaking

<u>Primary Instructor</u>

Auburn University GEOG 5880: Advanced GIS, 3 credits   2025

The Ohio State University GEOG 5210: Fundamental GIS, 3 credits   2021
Student rating: 4.71/5 (University average: 4.48), 34 enrollments

University Consortium for Geographic Information Science (UCGIS) Workshop: Full-
stack Geo-visualization 101: How to Make Productive Webmaps   2021
Participants rating: 4.44/5, 19 enrollments

Harvard University Vizathon: Learn to Make Your First Web Map   2021
Workshop organizer and instructor

<u>Guest Lecturer</u>

Auburn University: Geometric design   2024
Guest lecture on GIS application

University of Florida: Sustainable Transportation and Public Transit   2023
Guest lecture on GTFS data

University of Florida: Applied Data Science in Civil and Environmental Engineering 2023
Guest lecture on database

The Ohio State University GEOG 5201: GeoVisualization   2022
Guest lecture on web-based geo-visualization

The Ohio State University GEOG 2200: Mapping Our World   2020
Guest lecture on geo-visualization

West Washington University ENVS 412: Environmental Journalism   2021
Speaker on COVID impact on public transit

Media

KCBS Radio: "Using new technology to observe real-time impacts on public transportation"	2023
Tech Times: "New Tech Shows How Public Transit Can Be Disrupted by a Major Sporting Event"	2023
Ohio State News: "Why buses can't get wheelchair users to most areas of cities"	2023
Reddit r/science: "Why buses can't get wheelchair users to most areas of cities" With 14.7k upvote as of Oct 2023.	2023
ZME Science: "Wealth and race influenced public transportation in the pandemic"	2020
Study Finds: "Study: Transit apps are MORE likely to make you miss the bus than save you time!"	2020

Service

Peer Review for Journals (Stopped counting after Sep 2023)

Sustainable Cities and Society
Transportation Research Part C: Emerging Technologies
Transportation Research Part D: Transport and Environment
Journal of Transport Geography
Journal of Geographical Systems
Public Transport
Transportation
International Journal of Geo-Information
Case Studies on Transport Policy
Travel Behavior and Society
Transactions in Urban Data, Science, and Technology
BioMedical Engineering OnLine
Transport Policy
Transaction in GIS
Journal of Public Transportation
Transportation Research Record
Data Science For Transportation
American Journal of Infection Control

Department/University Service

Graduate Geography Organization, Social Chair   2021 – 2022

Student Supervision

Muhammad Muzzamil H Khattak, PhD Geosciences, Auburn University	2025 - present
Taiyu Zhao, Master of Holocene Climates, Cambridge University	2024 - present
Mei Yang, Master of Architectural Conservation, The University of Hong Kong	2025 - present
Michael Smith, MCRP. Urban Planning, The Ohio State University	2022 - 2024
Xiaojian Zhang, Ph.D. Civil Engineering, University of Florida	2023 - 2024
Duanya Lyu, Ph.D. Civil Engineering, University of Florida	2023
Yiheng Qian, Ph.D. Civil Engineering, University of Florida	2023 - 2024
Xi Guan, Master of Regional Planning, Cornell University	2024 - 2025
Anran Zheng, M.E. Civil Engineering, University of Florida, employed at AECOM	2023

Student Committee

Michael Agbozo, Ph.D. in Geography, Auburn University	2024 - present
Jan Joseph Dida, Ph.D. in Geography, Auburn University	2025 - present
Tonghui Li, Ph.D. in Civil Engineering, Auburn University	2025 - present
Robert Hernandez, Ph.D. in Geography, Auburn University	2025 - present
Tony Hall, Ph.D. in Geography, Auburn University	2025 - present
Lander Stone, M.S. in Geography, Auburn University	2025 - present
Gifty Gavor, M.S. in Geography, Auburn University	2024 - 2025
Katie Bendall, M.S. in Geography, Auburn University	2024 - 2025
Md Mahmud Hossain, Ph.D. in Civil Engineering, Auburn University	2024