

Luyu Liu

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Education

2019 – 2023 The Ohio State University, Ph.D. Geography (GIS), Columbus, OH.
2017 – 2019 The Ohio State University, M.A. Geography (GIS), Columbus, OH.
2013 – 2017 Peking University, B.S. Environmental Science, Beijing, China.
2014 – 2017 Peking University, B.S. Mathematics and Applied Mathematics, Beijing, China.
2020 – 2021 The Ohio State University, Graduate Certificate in College Teaching, Columbus, OH.

Employment

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

Honors and Awards

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

Publications

Published Journal Articles

2026 Ahmed, N., Long, J. A., Kim, J., **Liu, L.**, Diab, E., Voogt, J. A., Wang, J., & Lee, J. (2026). Measuring heat stress and mitigation capacity around transit stops during Vancouver’s 2021 heat dome using hyperlocal microclimate simulations. *International Journal of Disaster Risk Reduction*, 106404.
2026 Shaver, H., **Liu, L.**, Ahmed, N., Long, J. A., Voogt, J. A., Diab, E., Wang, J., & Lee, J. (2026). Measuring transit riders’ heat exposure and mitigation during the 2021 Vancouver heatwave. *Transportation Research Part D: Transport and Environment*, 157, 105398.
2026 Recalde, A., **Liu, L.**, Zhang, X., Park, S., Jiang, S., & Zhao, X. (2026). Evacuation destination choices during Hurricane Ian: A direct demand modeling approach. *Transportation Research Part D: Transport and Environment*, 156, 105384.

- 2025 **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.
- 2025 Qian, Y., **Liu, L.**, & Yan, X. (2025). Big data, big bias? On factors shaping transit and shared micromobility integration. *Transportation Research Part D*, 148, 104977.
- 2025 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>
- 2025 **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.
- 2025 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.
- 2025 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.
- 2025 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.
- 2025 **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.
- 2024 **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.
- 2024 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.
- 2024 **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.
- 2023 Javanmard, R., Lee, J., Kim, J., **Liu, L.**, & 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.
- 2023 **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.
- 2023 **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.
- 2022 **Liu, L.**, & Miller, H. J. (2022). Measuring the impacts of dockless micro-mobility ser-

- vices on public transit accessibility. *Computers, Environment, and Urban Systems*, 98, 101885.
- 2021 **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.
- 2020 **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.
- 2020 **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.
- 2019 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

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

In-progress Publications

- Submitted **Liu, L.**, & Miller, H. J. Measuring Ridership Changes During a Fare-Free Policy Using Large-Scale Mobile App Data and Explainable Artificial Intelligence.
- 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 Ahmed, N., **Liu, L.**, Kar, A., Voogt, J. A., Wang, J., & Lee, J. Thermal Comfort Accessibility: Measuring the Impacts of Extreme Heat on Space-Time Accessibility under Climate Change.
- Submitted Shaver, H., **Liu, L.**, Voogt, J. A., & Lee, J. Examining the Impacts of Transit Service Unreliability on Heat Exposure at Bus Stops.

Conference Presentations

- 2026 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.
- 2026 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.
- 2026 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.
- 2026 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.
- 2026 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.
- 2026 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.
- 2026 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.
- 2025 **Liu, L.**, & Miller, H. J. (2025). Impacts of Free Fare Policy on Public Transit Ridership: Case of Columbus, Ohio during COVID-19. *Association of Collegiate Schools of Planning Annual Meeting 2025*, Minneapolis, MN.
- 2025 Guan, X., Kar, A., Lee, J., & **Liu, L.** (2025). Assessing Potential and Bias of Generative Artificial Intelligence in Inferring Pedestrian Safety Perception. *Association of Collegiate Schools of Planning Annual Meeting 2025*, Minneapolis, MN.
- 2025 Guan, X., Kar, A., Lee, J., & **Liu, L.** (2025). Assessing Potential and Bias of Generative Artificial Intelligence in Inferring Pedestrian Safety Perception. *AI and Cities: An International Forum for Innovation and Collaboration*, University of Florida.
- 2025 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.
- 2025 **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.
- 2025 **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.
- 2025 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.

- 2024 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.
- 2024 **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.
- 2024 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.
- 2024 **Liu, L.**, & Miller, H. J. (2024). Accessibility derivative: measuring the accessibility contribution of public transit routes. *Transportation Research Board Annual Meeting 2024*, Washington, DC.
- 2023 **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.
- 2023 **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.
- 2022 **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.
- 2021 **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*.
- 2019 **Liu, L.**, Miller, H. J. (2019). Measuring public transit transfer risk using high-resolution schedule and real-time location data. *American Association of Geographers Annual Meeting 2019*, Washington, DC.
- 2019 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

- 2026 **Liu, L.**, Lee, J., & Jin, S. (2026). GISER Symposium: Multimodal Human Mobility. *American Association of Geographers Annual Meeting 2026*, San Francisco, CA.
- 2025 Lee, J., **Liu, L.**, Kar, A., & Le, H. (2025). Transportation & Environmental Exposure. *American Association of Geographers Annual Meeting 2025*, Detroit, MI.
- 2023 **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.

Awarded Research Grants

- 2026 **Liu, L. (PI)**, Wang, Z. (University of Maine), and Hahmann, T. (University of Maine)

- “Physics-Informed AI for Hyperlocal PFAS Exposure and Agricultural Vulnerability Assessment,” PFAS Center of Excellence, U.S. Department of Agriculture, \$60,000 (Auburn award).
- 2026 Hawthorne, T. (PI), Braden, D., Savrda, A., McNeal, K., Mitra, C., **Liu, L.**, & Veitch, M. “Going Places with Geo Explorer Auburn: Preparing Science’s Next Generation with a Mobile Science Lab,” U.S. Department of Education, GEAR UP Achieve Program, \$108,000 (total includes cost share).
- 2024 **Liu, L.** (PI), Xiang, Y., Marshall, W., Misra, A., & Shirgaokar, M. “High-resolution Transit Riders Extreme Heat Exposure across U.S. Cities,” Center for Transit-Oriented Communities (CETOC), USDOT Tier 1 University Transportation Center, \$225,000.
- 2024 Xiang, Y., **Liu, L.** (Co-PI), Tian, G., Ewing, R., & Kaniewska, J. “Assessing Bus Stop Amenities Using Google Street View Images and Computer Vision,” Center for Transit-Oriented Communities (CETOC), USDOT Tier 1 University Transportation Center, \$150,000.
- 2024–2026 Lee, J., Diab, E., Long, J., Voogt, J., Wang, J., & **Liu, L.** (International Collaborator). “Understanding Heat Exposure-Aware Accessibility by Transit in the Era of Climate Change,” Social Sciences and Humanities Research Council, \$50,000.
- 2020–2023 Leasor, Z., Zhao, C., & **Liu, L.** (Awardee). “Downscaling Soil Moisture for Drought Monitoring with Machine Learning Methods,” Sharpe Innovation Commons Seed Grant, The Ohio State University, \$5,000.

Pending Research Grants

Non-awarded Research Grants

- 2025 Jin, M. S. (PI), Homan, K., **Liu, L.** (Co-PI), & Mitra, C. “NSF R2I2 Phase 1: Climate Resilience Solutions for Southeast Transportation Sector on Road Safety and Climate Equity Enhancement,” National Science Foundation, \$500,000 (Auburn share: \$147,648)
- 2025 **Liu, L.** (PI), & Hawthorne, T. L. “Greener Alabama Initiative: Growing Access to Outdoor Green Infrastructure via Artificial Intelligence (AI) and Community Engagement,” Innovate Alabama, \$249,570
- 2025 **Liu, L.** (PI). “SMARTS: AI-driven Transit Optimization via Multi-agent Reinforcement Learning,” USDOT ARPA-I (Ideas and Innovation Challenge Concept Paper), \$316,861

Research Experience

- 2023–2024 Xiang, Y. J., & Zhao, X. “Analyzing Transit-Based Evacuation Demand in Hurricanes,” USDOT Tier 1 University Transportation Center, lead researcher, \$150,000.
- 2023–2024 Xiang, Y. J., & Zhao, X. “Shared Micromobility as a Last-Mile Complement to Public Transit,” USDOT Tier 1 University Transportation Center, lead researcher, \$225,000.
- 2019–2020 Miller, H. J., & Xiao, N. “MORPC Sustainability Dashboard,” Mid-Ohio Regional Planning Commission, lead programmer.
- 2017–2018 Miller, H. J., & Xiao, N. “Columbus Urban & Regional Information Observatory (CU-RIO),” Center for Urban and Regional Analysis, The Ohio State University, lead programmer.

2018–2019	Root, E. “Infant Mortality Research Partnership (IMRP) Online GIS Platform,” programmer.
2017–2018	Browning, C., & Calder, C. “Neighborhood Polygon Algorithm Based on Network Analysis,” Institute for Population Research, The Ohio State University, programmer.

Teaching and Public Speaking

Primary Instructor

2025	GEOG 5880 / 6880: Advanced GIS (3 credit hours), Auburn University. 100% instructor of record. Enrollment: 20. Combined average rating: 5.4 / 6.0.
2025	GEOG 5700 / 6700: Quantitative Methods & Spatial Analysis (3 credit hours), Auburn University. 100% instructor of record. Enrollment: 17. Combined average rating: 5.38 / 6.0.
2021	GEOG 5210: Fundamental GIS (3 credit hours), The Ohio State University. 100% instructor of record. Enrollment: 34. Student evaluation: 4.71 / 5.0 (University average: 4.48).
2021	University Consortium for Geographic Information Science (UCGIS) Workshop: “Full-stack Geo-visualization 101: How to Make Productive Webmaps.” Participant rating: 4.44/5, 19 enrollments.
2021	Harvard University Vizathon: “Learn to Make Your First Web Map.” Workshop organizer and instructor.

Invited Panels

2026	AAG Annual Meeting 2026, Panel session, “Challenges and Opportunities of Mobility and Spatial Accessibility”.
2024	C40 webinar, “Extreme heat exposure and active transportation”.

Invited Talks/Lectures

2026	Auburn University, GEOG 1010. <i>Guest lecture.</i>
2026	Auburn University, College of Forestry, Wildlife and Environment Colloquium. <i>Transit in a Warming World: Governing Heat Exposure in Urban Transit Systems.</i>
2024	Auburn University, Geometric Design. Guest lecture on GIS applications.
2023	University of Florida, Sustainable Transportation and Public Transit. Guest lecture on GTFS data.
2023	University of Florida, Applied Data Science in Civil and Environmental Engineering. Guest lecture on database systems.
2022	The Ohio State University, GEOG 5201: GeoVisualization. Guest lecture on web-based geovisualization.
2021	West Washington University, ENVS 412: Environmental Journalism. Invited speaker on COVID impacts on public transit.
2020	The Ohio State University, GEOG 2200: Mapping Our World. Guest lecture on geovisualization.

Media

- 2023 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.”](#) 14.7k upvotes (as of Oct 2023).
- 2020 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.”](#)

Service

Department / University Service

- 2025– Colloquium Committee, Department of Geosciences, Auburn University.
- 2021–2022 Graduate Geography Organization, Social Chair.

Journal/Conference

- 2025– Urban Informatics, Young Editorial Board Members.

Student Supervision

- 2025– Zam Khattak, Ph.D. Geosciences, Auburn University.
- 2026– Yonghan An, Ph.D. Geosciences, Auburn University.
- 2024– Taiyu Zhao, M.Phil. Holocene Climates, University of Cambridge.
- 2025– Mei Yang, M.A. Architectural Conservation, The University of Hong Kong.
- 2022–2024 Michael Smith, MCRP, Urban Planning, The Ohio State University.
- 2023–2024 Xiaojian Zhang, Ph.D. Civil Engineering, University of Florida.
- 2023 Duanya Lyu, Ph.D. Civil Engineering, University of Florida.
- 2023–2024 Yiheng Qian, Ph.D. Civil Engineering, University of Florida.
- 2024–2025 Xi Guan, M.R.P. Regional Planning, Cornell University.
- 2023 Anran Zheng, M.E. Civil Engineering, University of Florida (currently at AECOM).

Student Committee

- 2026– Ariadna del Carmen Lucho Gonzalez , Ph.D. Geography, Auburn University.
- 2026– Avry Prewitt, Master’s Civil Engineering, Auburn University.
- 2026– Maddlyn Boone, Master’s Geology, Auburn University.
- 2024– Michael Agbozo, Ph.D. Geography, Auburn University.
- 2025– Jan Joseph Dida, Ph.D. Geography, Auburn University.
- 2025– Sylvia Noralez, Ph.D. Geography, Auburn University.
- 2025– Tony Hall, Ph.D. Geography, Auburn University.

2025–2026 Tonghui Li, Ph.D. Civil Engineering, Auburn University.
2025–2026 Lander Stone, M.S. Geography, Auburn University.
2024–2025 Gifty Gavor, M.S. Geography, Auburn University.
2024–2025 Katie Bendall, M.S. Geography, Auburn University.
2024 Md Mahmud Hossain, Ph.D. Civil Engineering, Auburn University.

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
Urban Informatics
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