Luyu Liu

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Research interests

Sustainable transportation, geospatial data science, mobility equity, mobility resiliency

Education

The Ohio State University, Department of Geography — Columbus, OH
Ph.D. Geography, GIS — 2019 – 2023

The Ohio State University, Department of Educational Studies — Columbus, OH
Graduate Certificate in College and University Teaching — 2020 – 2021

The Ohio State University, Department of Geography — Columbus, OH
M.A. Geography, GIS — 2017 – 2019

Peking University, College of Urban and Environmental Sciences — Beijing, China
B.S. Environmental Science — 2013 – 2017

Peking University, School of Mathematical Sciences — Beijing, China
B.S. Mathematics and Applied Mathematics — 2014 – 2017

Employment

Auburn University, Department of Geosciences — Auburn, AL
Assistant Professor — 2024 - present

University of Florida, Engineering School of Sustainable Infrastructure & Environment — Gainesville, FL
Postdoctoral Researcher — 2023 - 2024

The Ohio State University, Center for Urban and Regional Analysis — Columbus, OH
Graduate Research Associate — 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., Lee, J., & Miller, H. J. 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.

In-progress Publications

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. (In preparation)
Lyu, D., **Liu, L.**, Campbell, C., Zhang, Y., & Yan, X. Potentials and limitations of large-scale mobile phone GPS data for food access analysis (Submitted).

Liu, L., Zhang, X., & Zhao, X. Measuring evacuees' behavior during Hurricane Ian using large-scale mobile phone GPS data (Submitted).

Liu, L., Li, X., Pereira, R. H., & Yan, X. Measuring extreme heat exposure in public transit systems in Florida, US (Submitted).

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

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 (In preparation).

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

Dai, Y., **Liu, L.**, Wang, K., Li, M., & Yan, X. A Deep Learning-based Bus Stop Amenities Assessment System with Low-cost Google Street View Images. (In preparation).

Qian, Y., **Liu, L.**, & Yan, X. Big data, big bias? On Factors Influencing Public Transit and Shared Micromobility Integration. (In preparation).

<u>Conference Presentations</u>
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 Session

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 Measurement of Transit Riders' Extreme Heat Exposure across U.S. Cities 2023 - 2024

- Funder: USDOT, Tier 1 University Transportation Center
- Collaborators: Drs. Yan Xiang, Wesley Marshall, Aditi Misra, Manish Shirgaokar
- Amount: $225,000
- Role: PI

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

Primary Instructor

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: 2021
Full-stack Geo-visualization 101: How to Make Productive Webmaps
Participants rating: 4.44/5, 19 enrollments

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

Guest Lecturer

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" — 2023
With 14.7k upvote as of Oct 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

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

Xiaojian Zhang, Ph.D Civil Engineering, University of Florida 2023 - present

- Supervising PhD dissertation projects on AI fairness

Michael Smith, MCRP. Urban Planning, The Ohio State University 2022 - present

- Supervising Master's thesis project on historical accessibility

Duanya Lyu, Ph.D Civil Engineering, University of Florida 2023 - present

- Supervising PhD dissertation project on food access

Yiheng Qian, Ph.D Civil Engineering, University of Florida 2023 - present

- Supervising PhD dissertation project on dockless scooters

Anran Zheng, M.E. Civil Engineering, University of Florida 2023

- Supervising Master's thesis on real-time public transit performance surveillance
- Employed in AECOM