

Shanshan Liu, Ph.D.

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University of Michigan

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RESEARCH INTERESTS

- Sustainable transportation planning and policy
- ML/AI applications in transportation engineering
- Integration of transportation and energy systems
- Mobility and energy equity
- Autonomous, electric, and shared vehicles operations

EDUCATION

- **University of Illinois Urbana-Champaign** Advisor: Eleftheria Kontou
Ph.D. in Civil Engineering (Transportation)
Concentration: Computational Science and Engineering Aug 2020 – Aug 2024
Diss.: *Electrified Transportation and Urban Energy Systems for Economic, Efficiency, and Resilience Benefits*
- **Southeast University** Advisor: Xiucheng Guo
M.Sc in Transportation Engineering Sep 2017 – Jun 2020
Thesis: *Optimization Method of Community Bus Routes Connected by Railway*
- **Southeast University** Advisor: Xiucheng Guo
B.Sc in Traffic Engineering Sep 2013 – Jun 2017
Thesis: *Optimization Method of Pedestrian Organization in Passenger Railway Transport Hub*

POSTDOCTORAL EXPERIENCE

- **Schmidt AI in Science Postdoctoral Research Fellow** Mentor: Gábor Orosz & Neda Masoud
Michigan Institute for Data and AI in Society, **University of Michigan** Aug 2025 – present
- **Postdoctoral Researcher** Mentor: Parth Vaishnav
School for Environment & Sustainability, **University of Michigan** Sep 2024 – Jul 2025

RESEARCH EXPERIENCE

- **Research Assistant**
University of Illinois Urbana-Champaign Aug 2020 – Aug 2024
 - **Electrified transportation system planning, mobility modeling, and energy equity:** Led research on managed EV charging, COVID-19 mobility modeling, and U.S. transportation energy vulnerability quantification; outcomes include peer-reviewed publications and reproducible analysis materials; mentored undergraduate researchers.
- **Graduate Intern**
National Renewable Energy Laboratory (NREL) Jun 2023 – Aug 2023
 - **Long-distance Freight Simulation:** Designed algorithm for freight flows and implemented route-choice model; delivered code and documentation.
- **Research Assistant**
Southeast University, Nanjing China Oct 2016 – Jun 2020
 - **Provincial Transportation Strategy** (Jiangsu Province): Analyzed multimodal networks, identified bottlenecks, and proposed prioritized measures adopted in planning recommendations.
 - **Municipal Transit Planning** (Ganzhou City; Gaoping City): Designed rural and integrated urban-rural bus networks; produced GIS layers, a short-term road-network plan, and a planning atlas.
 - **Administrative Power Evaluation** (Jiangsu Province): Evaluated 700+ regulatory items; developed multi-criteria models and provided recommendations to regional governments.
 - **Feeder Demand from Multi-source Data** (Suzhou City): Developed a methodology to locate feeder demand and proposed demand-driven route/stop optimization.

TEACHING & MENTORING

- **Undergraduate Mentor**

University of Illinois Urbana–Champaign

Jan 2021 – May 2022

- **Residential V2G for Peak Shaving & Valley Filling (URAP)**

Mentored Si Chen (now a Master student at UCSD) on data processing, and modeling; delivered a full analysis package and a final technical presentation.

- **Managed EV Charging for Cost Minimization**

Mentored Tinghan Ye (now a Ph.D. candidate at Georgia Tech) on data processing, method development, and scholarly writing; project culminated in a peer-reviewed article in *Transport Policy* (2024).

- **Teaching Assistant**

Southeast University

Mar 2018 – Jun 2018

- **Basic Theories of Modern Transport Management**

Prepared lectures and in-class activities; designed and graded assessments for first-year graduate students.

- **Guest Lectures**

- **Energy–Water–Environmental Sustainability Seminar**

Civil and Environment Engineering, University of Illinois Urbana-Champaign

Feb 2023

- **Sustainable Transportation**

School for Environment and Sustainability, University of Michigan

Feb 2025

PUBLICATIONS

***Bold** indicates my name; * indicates corresponding author.*

Journal Articles

1. **Shanshan Liu**, Alex Vlachokostas, Eleftheria Kontou*. Leveraging electric vehicles as a resiliency solution for residential backup power during outages. *Energy* (2025): 134613. [Link](#)
2. **Shanshan Liu**, Alex Vlachokostas, Eleftheria Kontou*. Resilience and environmental benefits of electric school buses as backup power for educational functions continuation during outages. *Building and Environment* 269 (2025): 112329. [Link](#)
3. **Shanshan Liu**, Alex Vlachokostas, Si Chen, Eleftheria Kontou*. Coupled management of electric vehicle workplace charging and office building loads. *Transportation Research Part D: Transport and Environment* 134 (2024): 104317. [Link](#)
4. **Shanshan Liu**, Eleftheria Kontou*. Quantifying transportation energy vulnerability and its spatial patterns in the United States. *Sustainable Cities and Society* 82 (2022): 103805. [Link](#)
5. Tinghan Ye, **Shanshan Liu**, Eleftheria Kontou*. Managed residential electric vehicle charging minimizes electricity bills while meeting driver and community preferences. *Transport Policy* 149 (2024): 122–138. [Link](#)
6. Zoi Rapti*, Jesús Cuevas Maraver, Eleftheria Kontou, **Shanshan Liu**, et al. The role of mobility in the dynamics of the COVID-19 epidemic in Andalusia. *Bulletin of Mathematical Biology* 85(6) (2023): 54. [Link](#)
7. Meina Zheng, Runxuan Zhou, **Shanshan Liu**, et al. Route design model of multiple feeder bus service based on existing bus lines. *Journal of Advanced Transportation* (2020): 8853872. [Link](#)

Conference Proceedings

1. **Shanshan Liu**, Yongtao Zheng, Shujie Zheng, et al. Research on priority organization mode of modern tram. In: *Proceedings of the 17th COTA International Conference of Transportation Professionals (CICTP 2017)*, July 2017, Shanghai, China. [Link](#)
2. Xinyue Lei, Xiucheng Guo*, **Shanshan Liu**, et al. Analysis of transit accessibility to transportation hubs at multi-scale based on open data and ArcGIS: The case of Nanjing. In: *Proceedings of the 19th COTA International Conference of Transportation Professionals (CICTP 2019)*, July 2019, Nanjing, China. [Link](#)
3. Junlan Chen, Xiucheng Guo*, **Shanshan Liu**, et al. Research on the setting of guide signs in the public transfer zone of large-scale railway integrated passenger transportation hubs. In: *Proceedings of the 19th COTA International Conference of Transportation Professionals (CICTP 2019)*, July 2019, Nanjing, China. [Link](#)

Book Compilation

1. Planning and Operation Organization Method of Modern Tram Network. *Ch. 3 Analysis of Traffic Operation Characteristics of Modern Trams*. Southeast University Press. (2022)
2. Research and Practice on the Training Mode of Transportation Planning Graduates. *Ch. 5 in Personnel Training Quality Management and Process Monitoring*. Southeast University Press. (2022)
3. Urban Road Network Planning & Urban and Rural Public Passenger Transport Planning. *Ch. 2 & Ch. 3 in Case Study on Traffic Engineering*. China Railway Press (2018)
4. Planning and Design of Passenger Railway Transport Hub. *Ch. 7 in Planning and Design of Urban Passenger Transport Hub*. People's Transportation Press Co., Ltd. (2018)

Manuscripts in Preparation

1. **Shanshan Liu**, Parth Vaishnav*. Heat-Related Health Risks and Backup Power Benefits Under Extreme Weather and Power Outages. (Manuscript in preparation for submission to *Building and Environment*).

PRESENTATIONS & TALKS

Invited Talks

- INFORMS Annual Meeting (Invited), Atlanta, GA, Oct 2025.
- INFORMS Annual Meeting (Invited), Seattle, WA, Oct 2024.

Selected Conference Presentations

- TRB Annual Meeting, Washington, DC (2020–2025, **6 presentations**).
Recent presentations:
“Leveraging electric vehicles as a resiliency solution for residential backup power during outages” (2024);
“Resilience and environmental benefits of electric school buses as backup power for educational functions continuation during outages” (2025).
- AAAS Annual Meeting, Denver, CO, Feb 2024.
- Bridging Transportation Researchers (BTR), (2022–2024, **3 presentations**).
- NAE Regional Meeting and Symposium, Urbana, IL, Apr 2023.

AWARDS AND HONORS

- **Lee Schipper Memorial Scholarship**, *one of only three awardees worldwide, for Sustainable Transport and Energy Efficiency for transformative research proposals that challenge conventional wisdom* 2023
- **ARTBA Women Leaders Future Industry Spotlight Award** 2023
- **Young Researcher of the Year Award Finalist**, International Transport Forum 2023
- **Leadership Legacy Scholarship for Graduates**, WTS Greater Chicago 2022
- **Midwest Big Data Hub Learning Innovation Fellowship** 2021
- **Accepted to the ARPA-E Energy Innovation Summit Student Program** 2021
- **Winner, Vehicle-to-Grid University Challenge**, Pecan Street Inc. 2021
- **Earlier honors (selected)**: Outstanding Graduate (2020); Runner-up, National Transport S&T Competition (2017); SRTP Excellent Prize (2016); multiple university scholarships (2015–2018).

SERVICE

- **Journal Review**: Transportation Research Part D: Transport and Environment; Energy; Public Transport; Sustainable Cities and Society.
- **Poster Session Judge**, Electric Vehicle Center Symposium 2025
- **Vice President** : ASCE T&DI UIUC Chapter at the University of Illinois Urbana-Champaign 2022 – 2023
- **President** of the Bluesky Studio of Professor Xiucheng Guo at Southeast University 2019 – 2020