Xiyuan (Ryan) Ren

Ph.D., Transportation systems
Department of Civil & Urban Engineering, New York University
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PERSONAL SUMMARY

A highly motivated, productive junior scientist specializing in urban and transportation science. Showcases a robust knowledge of data-driven urban planning and mobility design, from **big data analytics** to **discrete choice modeling** and **equity-aware system design**. Passionate about uncovering the complex interactions between individual behavior and urban environment by integrating agent-based modeling, deep learning, and computational social science to support human-centric policymaking.

EDUCATION

New York University
Ph.D., Transportation Systems   **Dec. 2024**
Advisor: Joseph Y.J. Chow
C2SMARTER University Transportation Center, Built Lab, Laboratory of Urban Design and Urban Science
Dissertation: An Agent-based Mixed Logit Approach for Travel Behavior Modeling with Large Datasets

Tongji University
M.S., Urban Planning   **Jun. 2019**
Urban Big Data and Spatial Analysis Lab
Advisor: De Wang
Thesis: Research on Collective Human Mobility in Shanghai Based on Cell Phone Data

Tongji University
B.S., Urban Planning   **Jun. 2016**
Project: A smart vertical pedestrian network in a joint project of six top design schools

PEER-REVIEWED PUBLICATIONS

1) **Ren, X.**, Chow, J. Y., Bansal P. (2025). Estimating a k-modal nonparametric mixed logit model with market-level data, *Transportation Research Part B: Methodological*, 196, 103220.

2) **Ren, X.**, Chow, J. Y., & Guan, C. (2024). Mobility service design with equity-aware choice-based decision-support tool: New York case study. *Transportation Research Part D: Transport and Environment*, 132, 104255.

3) **Ren, X.**, Chow, J. Y. (2022). A random-utility-consistent machine learning method to estimate agents' joint activity scheduling choice from a ubiquitous data set. *Transportation Research Part B: Methodological*, 166, 396-418.

4) **Ren, X.**, Guan, C. (2022). Evaluating geographic and social inequity of urban parks in Shanghai through mobile phone-derived human activities. *Urban Forestry & Urban Greening*, 76, 127709.

5) **Ren, X.**, Guan, C., Wang, D., Yang, J., Zhang, B., & Keith, M. (2022). Exploring land use functional variance using mobile phone derived human activity data in Shanghai. *Environment and Planning B: Urban Analytics and City Science*, 23998083221103261.

6) Mao, Y., **Ren, X.**, Yin, L., Sun, Q., Song, K., & Wang, D. (2021). Investigating Tourists' Willingness to Walk (WTW) to Attractions within Scenic Areas: A Case Study of Tongli Ancient Town, China. *Sustainability*, 13(23), 12990.

7) **Ren, X.**, & Wang, D. (2020). Research on Collective Human Mobility in Shanghai Based on Cell Phone Data. *International Journal of E-Planning Research*, 9(1), 44-62.

8) **Ren, X.**, Chen, S., Guan, C., You, M., Li, Y., Huang, K., Planning for Rhythmized Urban Parks: Temporal Park Classification and Modes of Action. *Journal of the American Planning Association*, accepted.

9) Guan, C., ***Ren, X.**, Song, J., Keith, M., Akiyama, Y., Shibasaki, R., Mobile phone-derived park visitation dynamics and policy implications: A case study of Tokyo. *Cities*, under revision.

10) **Ren, X.**, Chow, J. Y., A data fusion approach for mobility hub impact assessment and location selection: integrating hub usage data into a large-scale mode choice model. *Transportation Research Part A: Policy and Practice*, under review.

11) **Ren, X.**, Chow, J. Y., Pandey, V., Yuan, L., A nested nonparametric logit model for microtransit revenue management supplemented with citywide synthetic data. *Transportation Research Part B: Methodological*, under review.

12) **Ren, X.**, Guan, C., How dose spatial-temporal context shape park user preferences? A combination of economic and deep learning approaches. In preparation for submission.

13) Wang, S, Guan, C., **Ren, X.**, Li, Y., Huang, K, Keith, M., Gaps in government action and public perception across global and urban scales. In preparation for submission.

CONFERENCE PROCEEDINGS

1) **Ren, X.**, Chow, J. Y., Pandey, V., Yuan, L., 2025. Integrating an agent-based behavioral model in microtransit forecasting and revenue management. 105th Annual Meeting of the Transportation Research Board, Washington, DC.

2) **Ren, X.**, Chow, J. Y., 2025. A data fusion approach for mobility hub impact assessment: integrating actual usage data into a large-scale mode choice model. 105th Annual Meeting of the Transportation Research Board, Washington, DC.

3) Yang, H., Wu, H., Yuan, L., **Ren, X.**, Chow, J.Y., Gao, J., Ozbay, K., 2025. Population synthesis combining statistical and generative models for consistent and diverse household and personal attribute association. 105th Annual Meeting of the Transportation Research Board, Washington, DC.

4) Namdarpour F., **Ren, X.**, Davis, H., Yang, H., Landes, H., He, Y., Chow, J.Y., Ozbay, K., 2025. An equity-aware, passenger- and freight-integrated multi-agent activity-based transport simulation of New York City. 105th Annual Meeting of the Transportation Research Board, Washington, DC, upcoming.

5) **Ren, X.**, Chow, J. Y., 2024. Integrating an agent-based behavioral model in revenue management for microtransit: A case study in Arlington, TX. INFORMS Annual meeting, Seattle, WA.

6) **Ren, X.**, Chow, J. Y., 2024. An agent-based mixed logit (AMXL) approach for activity pattern modeling with a ubiquitous data set. 17th International Conference on Travel Behavioral Research, Vienna, Austria.

7) **Ren, X.**, Chow, J. Y., 2024. Group level agent-based mixed logit for nonparametric estimation of taste heterogeneity with a ubiquitous data set. 104th Annual Meeting of the Transportation Research Board, Washington, DC.

8) **Ren, X.**, Chow, J. Y., 2024. Choice-based Service Region Assortment Problem with Statewide Synthetic Data: Towards Equitable Transportation Design. 104th Annual Meeting of the Transportation Research Board, Washington, DC.

9) **Ren, X.**, Chow, J. Y., 2023. Choice-based service region assortment problem: equitable design with statewide synthetic data. 26th IEEE International Conference on Intelligent Transportation Systems, Bilbao, Spain

10) **Ren, X.**, Chow, J. Y., 2023. A random-utility-consistent machine learning method to estimate agents' joint activity scheduling behavior from ubiquitous data. 103rd Annual Meeting of the Transportation Research Board, Washington, DC.

11) Guan, C., **Ren, X.**, 2023. Exploring the user preference and recreational value of urban parks: A case study using mobile phone revealed preference (RP) in Tokyo. 63rd Association of Collegiate Schools of Planning Annual Meeting, Chicago, IL.

12) **Ren, X.**, Chow, J. Y., 2022. A random-utility-consistent machine learning method to estimate agents' joint activity scheduling behavior from ubiquitous data. The 11th Triennial Symposium on Transportation Analysis, Mauritius Island.

13) **Ren, X.**, Guan, C., 2022. Mobile phone-derived park visitation dynamics and policy implications: A case study of ten comprehensive parks in Tokyo. 16th International Association for China Planning, Nanjing, China.

14) **Ren, X.**, Guan, C., 2021. Accessing the spatial distribution of urban park in Shanghai through mobile phone-derived

human activities: Accessibility and inequity. 61st Association of Collegiate Schools of Planning Annual Meeting, online.

GRANTS/HONORS /AWARDS/FELLOWSHIPS

2024   National Science Foundation (NSF) Award #2425021
SAI: Planning for Electric Vehicle Charging Infrastructure
Role: Contributed to proposal writing and research design
Total amount: $44,943, PI: Takahiro Yabe, Co-PI: Joseph Y.J. Chow

2024   USDOT Award #69A3551747124-2024
Multi-Modal Tripchain Planner for Disadvantaged Travelers to Incentivize Transit Usage
Role: Contributed to proposal writing and research design
Total amount: $195,000, PI: Venktesh Pandey, Co-PI: Joseph Y.J. Chow, Hyoshin Park

2023   USDOT Award #69A3551747124-2023
NY Statewide Behavioral Equity Impact Decision Support Tool with Replica
Role: Contributed to proposal writing and research design
Total amount: $154,625, PI: Joseph Y.J. Chow

2023   Chinese technical patent: An auxiliary system for facility planning based on actual population indicators

2022   Tandon SOE Fellowship (one-year funding for selected Ph.D. students)

2022   Shanghai Key Laboratory of Urban Design and Urban Science (LOUD) Open Grant (¥20,000 CNY)

2021   Second Prize in Shenzhen Open Data Innovative Competition (¥20,000 CNY)

2018   Outstanding Value Excavation Award in Chongqing Open Data Application (¥10,000 CNY)

2017   Excellent Master Scholarship of Tongji University (¥6,000 CNY)

RESEARCH LEADERSHIP EXPERIENCE

C2SMARTER University Transportation Center, New York University
Postdoc Research Associate   **Jan. 2025 – Present**

- Leading the behavior modeling part of an NFS-SAI project, focusing on understanding and predicting EV charging patterns to inform infrastructure planning and policy development.
- Leading the C2SMART project on evaluating the impacts of NYC Congestion Pricing Program.

C2SMARTER University Transportation Center, New York University
Ph.D. Researcher   **Sept. 2021 – Dec. 2024**
Advisor: Joseph Y.J. Chow

- Led development of AMXL, an innovative agent-based mixed logit approach for choice modeling with big datasets. Ran a team of 3 graduate students and 2 undergraduate students. AMXL has outperformed conventional discrete choice models and served as a core methodological approach in numerous projects funded by USDOT and NSF.
- Developed an equity-aware decision support tool for statewide mobility service design in New York, addressing large-scale assortment problems. The tool optimizes solutions within minutes, leveraging one of four key metrics focused on transportation efficiency and equity.

Laboratory of Urban Design and Urban Science (LOUD), NYU Shanghai
Research Assistant   **Sept. 2020 – Sept. 2021**
Advisor: ChengHe Guan

- Joined a team of 8 graduate students at LOUD lab, specializing in green-blue space planning using AI and urban sensing techniques. Set the research agenda, coordinated individual researchers, and ensured the research database was appropriately designed.
- Extracted urban park activity data from mobile phone records in Shanghai and Tokyo. Developed an activity-based park usage indicator framework using advanced data mining techniques. Led several studies on park access equity, visitation dynamics, classification system, and recreation value perception.

Urban Big Data and Spatial Analysis Lab, Tongji University
Research Assistant   **Sept. 2019 – Sept. 2020**

Advisor: De Wang
- Ran a team of 3 graduates on activity-based modeling for temporal urban planning. Developed the 'Time–Space–Decision–Activity' theoretical framework and established a comprehensive data pipeline covering all stages from data collection, choice modeling, and preference analysis to policy making and behavior simulation.
- Extracted individual activity chain data from 150 million mobile phone records to develop a comprehensive mobility indicator system. Applied this system to support community planning initiatives and secured a technical patent for the innovative methodology.

TEACHING EXPERIENCE

Teaching Assistant
TR-GY 7073/CUSP-GX 9113A, NYU Tandon School of Engineering
- Held 4 TA Sessions: Introduction to R; Statistics and regression models in R; Discrete choice models in R; Agent-based mixed logit model in Python.
- Held a review session each week for lectures and assignments.

Student Instructor
C2SMART University Transportation Center, NYU
- An agent-based mixed logit approach for choice modeling with large datasets
Urban Big Data and Spatial Analysis Lab, Tongji University
- Introduction to the Commercial Complex Simulation (CCSim) tool

Mentorship of students
Linfei Yuan, NYU Tandon School of Engineering Computer Science B.S. student, 2024
Prinsa Chauhan, NYU Abu Dhabi Economics B.S. student, 2024
Xiaoling Wu, NYU Shanghai NET Program M.S. student, 2023
Yu Zhang, Tongji University CAUP Urban Planning M.S. student, 2023
Ngoc Hoang, NYU Abu Dhabi Big Data Management and Analytics M.S. student, 2022
Xinbei Wang, NYU Shanghai NET Program M.S. student, 2022
Ruohao Li, Tongji University CAUP Urban Planning M.S. student, 2021
Binli Han, Tongji University CAUP Urban Planning M.S. student, 2020

INDUSTRY EXPERIENCE

Replica Inc. R&D Team, New York   **May 2022 – Nov. 2022**
Refined the workplace generation model and traffic assignment model for the US nationwide synthetic population, enhancing the granularity of the simulation framework. Developed a data pipeline for electric vehicle (EV) ownership forecasting in California State. Utilized GitHub for version control and collaborative development.

Shanghai Tongji Urban Planning & Design Institute, Shanghai   **May 2019 – Jun. 2020**
Conducted a sequential analysis of population data from 2013 to 2018, forecasting trends in population structure under various policy scenarios. Prepared the report "Mid-Term Development Trends and Key Measures of Residential Population in Shanghai," which was presented to the Shanghai Municipal Development & Reform Commission.

Gerkan, Marg & Partners (GMP) Urban Design Team, Shanghai   **Feb. 2016 – Mar. 2016**
Conducted data collection and site analysis for urban design projects in the core area of Long Yang transportation hub.

SERVICE AND AFFILIATIONS

Reviewer
Transportation Research Part B, 2025
Transportation Research Part D, 2024-2025

Transportation, 2025
Transportation Engineering, 2025
Journal of Planning Education and Research, 2024-2025
Transportation Research Record, 2022-2024
Transportation Research Board Annual Conference, 2022-2024
Urban Forestry & Urban Greening, 2023
Scientific Report, 2022
Cities, 2021

Membership
INFORMS, student member (2024-present)
Association of Collegiate Schools of Planning (ACSP), student member (2022-present)
Transportation Research Board (Affiliate):

- AME10 Equity in Transportation, friend (2022-present)
- AED20 Transportation Data and Information Systems, friend (2022-present)
- AEP30 Traveler Behavior & Values, friend (2022-present)
- AEP40 Transportation Network Modeling, friend (2022-present)

Invited talks
Harvard-MIT Economics and Policy of Electric Vehicle Transportation Infrastructure Workshop, 2024
Peking University International Urban Planning Workshop, 2024
C2SMARTER Planning for Transportation Equity Seminar, 2023
Tongji University Urban Big Data and Spatial Analysis Lab Seminar, 2023
Tongji University Urban Big Data and Spatial Analysis Lab Seminar, 2022
Replica Inc. Company R&D Workshop, 2022

RELEVANT SKILLS

Programming: Python, R, Stata, Big Query (SQL), Javascript
Spatial analysis: ArcGIS, QGIS, Mapbox
Agent-based simulation: MATSim, SUMO, NetLogo
Language: English, Mandarin Chinese (native)