

Xinyu LI, Ph.D.

Department of Landscape Architecture and Urban Planning
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EDUCATION

- Ph.D. Geomatics, The Hong Kong Polytechnic University, Hong Kong, 2022,
Dissertation: *Deep Learning for Short-term Bike Sharing Demand Forecast: Spatial Temporal Usage Characterization and Feature Fusion Strategies*
- M.S. National Geo-survey and Public Policy, The Chinese University of Hong Kong, Hong Kong, 2017. Full scholarship for MSc Program, South-South Education Foundation, United Nation
- B.S. Geographic Information Science, Tianjin Normal University, Tianjin, China, 2015

RESEARCH INTEREST

GeoAI, Urban Digital Twin, Human Mobility, Traffic Demand Prediction, Shared Mobility, Spatial-Temporal Data Mining, Urban Informatics, Data Visualization ([Demo 1](#), [Demo 2](#))

RESEARCH

Journal Publications ([Google Scholar](#), Citation: 123)

- **Li X.**, Xu Y*, Zhang X, Shi W., Yue Y, Li Q. Improving short-term bike sharing demand forecast through an irregular convolutional neural network. *Transportation Research Part C: Emerging Technologies*, 2023, 147: 103984. ([GitHub](#))
- **Li X.**, Xu Y*, Chen Q, Wang L, Zhang X., Shi W. Short-Term Forecast of Bicycle Usage in Bike Sharing Systems: A Spatial-Temporal Memory Network. *IEEE Transactions on Intelligent Transportation Systems*, vol. 23, no. 8, pp. 10923-10934, Aug. 2022.
- Xu Y.*, **Li X.**, Shaw S L, Lu F, Yin L, Chen B. Effects of data preprocessing

methods on addressing location uncertainty in mobile signaling data. *Annals of the American Association of Geographers*, 2020, 111(2): 515-539.

- Xu Y.*, Zou D, Park S, Li, Q., Zhou, S., **Li X.** Understanding the movement predictability of international travelers using a nationwide mobile phone dataset collected in South Korea. *Computers, Environment and Urban Systems*, 2022, 92: 101753.
- **Li X.**, Wu J.*, Ye X., Sun Q., Unveiling Spatial-Temporal Patterns of Near-Crash Events Through Connected Vehicle Data in San Antonio City, Texas (*Submitted to Analytic Methods in Accident Research*)
- Ye. X, Du J., **Li X.***, Shaw S., Fu Y., Dong X., Zhang Z., Wu L., Human-centered GeoAI Foundation Models: where GeoAI meets human dynamics (*Submitted to Urban Informatic*)

Grants Involved

Highly involved in the ideation, framework design, and proposal drafting of the funded projects below:

- Excellence in Research: Constructing Urban Digital Twins via Responsible Foundation AI for Community Resilience, National Science Foundation, USD\$ 1,000,000, 2024-2027.
- Campus Digital Twin, Texas A&M University, Office of Vice President of Planning, Assessment and Strategy, USD\$ 900,000, 2023-2026.
- Leveraging Probe-Based Data to Enhance Long-Term Planning Models, *Texas Department of Transportation, Research and Technology Implementation Division*, USD\$ 346,904, 2022-2024.
- Utilizing Telematics to Understand Driving Behavior During Missed Exits and Wrong Turns, *Texas Department of Transportation, Research and Technology Implementation Division*, USD\$ 403,695, 2023-2025.
- Big Data and Geospatial Technologies for Smart Tourism, The Hong Kong Polytechnic University, HK\$ 800,000, 2021-2023.
- Coupling Mobile Phone and Socioeconomic Datasets: A New Approach to Quantifying Dynamic Social Segregation in A Hybrid Physical-Virtual Space, *Research Grant Council (RGC) of Hong Kong*, HK\$ 886,800, 2019-2022.

Conference Report & Papers

- 07/2024, TRB Annual Meeting 2025, *Assessing volume delay function accuracy through multi-source traffic data: Insights from connected vehicle data and traffic simulation data (submitted)*

- 07/2023, The 30th International Conference on Geoinformatics, *Short-term bike sharing demand prediction through feature fusion in spatial and topological domains*
- 10/2021, The 2021 City+ Milan Conference, Theme: Smart City Beyond, Webinar, *Short-Term Forecast of Bicycle Usage in Bike Sharing Systems: A Spatial-Temporal Memory Network*
- 12/2021, The 4th International Symposium on Multimodal Transportation, Webinar, *Short-Term Forecast of Bicycle Usage in Bike Sharing Systems: A Spatial-Temporal Memory Network*

WORKING AND TEACHING EXPERIENCE

Postdoctoral Researcher

01.2024 – to date

Department of Landscape Architecture and Urban Planning, Texas A&M University
Texas A&M Transportation Institute

Project: Excellence in Research: Constructing Urban Digital Twins via Responsible Foundation AI for Community Resilience/Utilizing telematics to understand driving behavior during missing exits.

- Design the research framework to study the correlation between near-missing points and environmental variables.
- Participated in the research, design, and development of big data mining and deep learning architecture.

Project: 0-7166 Leveraging Probe-Based Data to Enhance Long-Term Planning Models

Project: 0-7200 Utilizing Telematics to Understand Driving Behavior During Missed Exits and Wrong Turns (*funding source: Texas Department of Transportation, Research and Technology Implementation Division*)

- Design the framework to identify near-crash events, unsafe, and inefficient locations of Texas state highways using connected vehicle data.
- Leverage the multi-source transportation data to validate the Bureau of Public Roads (BPR) function in travel demand model.

Research Assistant

09.2021 – 08.2023

Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University

Project: Feature Representation in A Coupled Continuous and Network Space: A New Approach for Travel Demand Forecast for Urban Bike-Sharing Systems

- Designed and formulated a deep learning model to forecast the bicycle usage demand
- Participated in the research, design, and development of deep learning architecture.

Research Assistant

09.2018 – 09.2021

Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University

Project: Integrating Spatiotemporal Features for Travel Demand Analysis and Forecast of Dockless Bike-Sharing in Urban Areas

- Designed and formulated a hybrid deep learning model to predict bike-sharing usage demand for two types of bike-sharing systems.
- Participated in the research, design, and development of deep learning architecture and was responsible for data collection and quality control.

Research Assistant

09.2017 – 09.2018

Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University

Project: Development of Web GIS for Disaster Analysis and Prediction

- Wildfire simulation using environmental and geographic data
- Risk analysis and mapping
- Progress report and evaluation meeting
- Contact person for industry partner

Teaching Experience

2018 Spring Semester	LSGI3431A: System Customization and Development
2019 Spring Semester	LSGI3431A: System Customization and Development
2019 Autumn Semester	LSGI3292A: Internet GIS and Web Services
2020 Autumn Semester	LSGI3245: Geospatial Database Management and Design
2021 Autumn Semester	LSGI3245: Geospatial Database Management and Design

2022 Autumn Semester Supervised BSc Final Year Project
Title: A Study of Road Crossing Safety in Hong Kong through User Control Simulation, NG Ka Ho
Title: Bikeability Assessment and Analysis through Residential Questionnaire and GIS Technology, LEUNG Marcella Yin

CORE SKILLS

Deep Learning	PyTorch, TensorFlow, CUDA coding
Engine Development Programming	UNITY Development, and Virtual Reality (VR) Development
Geospatial Analysis	ArcGIS, QGIS, GeoPandas
Remote Sensing	ENVI with IDL Development
Data Collection	Scrapy, Requests
Big Data Analysis	SQL, Hadoop, line-by-line & parallel processing
Visualization	deck.gl, kelper.gl, Adobe Illustrate, Adobe Premiere
Language	English (Fluent), Mandarin (Native)

HONORS & AWARDS

- 2018, Full scholarship for Postgraduate (PhD) Program, HKPolyU
- 2016, Full scholarship for MSc Program, South-South Education Foundation, United Nation
- 2014, First -class Undergraduate Scholarship, Tianjin Normal University, China
- 2013, First -class Undergraduate Scholarship, Tianjin Normal University, China