Xinyu LI, Ph.D.

Department of Landscape Architecture and Urban Planning
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EDUCATION

Ph.D. Geoinfomatics, 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, Spatial-Temporal Data Mining, Urban Digital Twin, Human Mobility, Traffic Demand Prediction, Shared Mobility, Urban Informatics, Geospatial Data Visualization (Demo1, Demo2)

RESEARCH

Journal Publications (Google Scholar, Citation: 158)

1. **Li, X.,** Wu D.*, Ye, X., & Sun, Q. (2024). Leveraging Connected Vehicle Data for Near-Crash Detection and Analysis in Urban Environments. arXiv preprint arXiv:2409.11341.
2. Ye, X., Du, J., **Li X**.*, Shaw, S. L., Fu, Y., Dong, X., ... & Wu, L. (2025). Human-centered GeoAI foundation models: where GeoAI meets human dynamics. Urban Informatics, 4(1), 2.
3. **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)*

4. **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.
5. 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.
6. 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.
7. Ye. X., Li S., Li X., **Li X.,** Dadashova B., Li W., Du J., Wu D., (2024), Street view imagery in traffic crash and road safety analysis: A review *(Submitted)*

Conference Report & Papers

1. 01/2025, TRB Annual Meeting 2025, Washinton DC, USA, *Assessing volume delay function accuracy through multi-source traffic data: Insights from connected vehicle data and traffic simulation data*
2. 07/2023, The 30th International Conference on Geoinformatics, London, UK, *Short-term bike sharing demand prediction through feature fusion in spatial and topological domains*
3. 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*
4. 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*

Grants

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

1. Optimizing Urban Vehicle Fleet Through Multi-Agent Reinforcement Learning: Integrating Built Environment Factors and Real-Time Road States, *2024 Seed Program for AI, Computing, and Data Science, Texas A&M Institute of Data Science (TAMIDS),* USD$ 20,000, 2025-2027 **(PI)**.
2. Excellence in Research: Constructing Urban Digital Twins via Responsible Foundation AI for Community Resilience, *National Science Foundation,* USD$ 1,000,000, 2024-2027.
3. Campus Digital Twin, *Texas A&M University*, Office of Vice President of Planning,

Assessment and Strategy, USD$ 900,000, 2023-2026.

4. Leveraging Probe-Based Data to Enhance Long-Term Planning Models, *Texas Department of Transportation, Research and Technology Implementation Division,* USD$ 346,904, 2022-2024.
5. 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.
6. Big Data and Geospatial Technologies for Smart Tourism, The Hong Kong Polytechnic University, HK$ 800,000, 2021-2023.
7. 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.
8. Feature Representation in A Coupled Continuous and Network Space: A New Approach for Travel Demand Forecast for Urban Bike-Sharing Systems, *National Natural Science Foundation of China,* RMB 560,000, 2022-2025
9. Integrating Spatiotemporal Features for Travel Demand Analysis and Forecast of Dockless Bike Sharing in Urban Areas, *National Natural Science Foundation of China,* RMB 251,000, 2019-2021

Review Service for the Following Journals

IEEE Transactions on Intelligent Transportation Systems

IEEE Internet of Things Journal

IEEE Access

Scientific Reports

Transportation Research Record

The Journal of Supercomputing

Transportation Research Part D: Transport and Environment

Urban Informatics

International Journal of Data Science and Analytics

Cluster Computing

WORKING AND TEACHING EXPERIENCE

Postdoctoral Research Associate **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

- Participated in the research, design, and development of big data mining and deep learning architecture.
- Development of urban digital twin platform with multisource data and relevant analysis

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
- Object detection using deep learning approaches
- 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	UNITY Development, and Virtual Reality (VR) Development
Programming	Python, C/C++/C#, Django, SQL, JavaScript
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

1. 2018, Full scholarship for Postgraduate (PhD) Program, HKPolyU

2. 2016, Full scholarship for MSc Program, South-South Education Foundation, United Nation
3. 2014, First -class Undergraduate Scholarship, Tianjin Normal University, China
4. 2013, First -class Undergraduate Scholarship, Tianjin Normal University, China