Shengao Yi

Department of City and Regional Planning, University of Pennsylvania, PA 19104, US

Email: yishengao@alumni.upenn.edu | Tel: +1 2673241376 Website Google Scholar LinkedIn

EDUCATION

University of Pennsylvania Philadelphia, US
Doctor of Philosophy in City and Regional Planning Aug 2024 – Jun 2028 (Expected)
Courses: Introduction to City & Regional Planning: History, Theory, and Practice; Geospatial Data Science in Python; Advanced Statistical Inference I
Advisor: Prof. Xiaojiang Li

University of Pennsylvania Philadelphia, US
Master of Science in Urban Spatial Analytics Aug 2022 – May 2023
GPA: **3.81**/4.0
Courses: Spatial Statistics and Data Analysis; Java Script Programming for Planners and Designers; Modeling Geographic Space; Database and Information Systems

Shenzhen University Shenzhen, China
Bachelor of Engineering in Geospatial Information Engineering Aug 2018 – Jun 2022
GPA: **85**/100
Advisor: Prof. Wei Tu

RESEARCH INTERESTS

- **AI for Environmental/Landscape Planning, Optimization and Design**
- **Micro-scale Urban Analytics**
- **Geospatial Artificial Intelligence (GeoAI)**

RESEARCH EXPERIENCE

Graduate Researcher June 2023 –
Advisor: Prof. Xiaojiang Li, Urban Spatial Informatics Lab, University of Pennsylvania

- Mapping and Modeling Heat Exposure at Hyperlocal Level (NSF #2314709).
- Aiming to combine Science, Data, and Design together to tackle the pressing urban challenges through collaboration with communities.

Advisor: Prof. Hamil Pearsall, Temple University Jan 2024 –

- Interactions of Sustainable Urban Design with Gentrification Processes (NSF #2312048, Co-PI).
- Collected millions geolocated Google Street View images to create before-and-after pairs for the same buildings.
- Developed a deep learning method to detect changes between the paired images and predict their categorization of gentrification.

Research Intern
Advisor: Prof. Jinhua Zhao & Prof. Shenhao Wang, MIT JTL Urban Mobility Lab June 2023 – Sep 2023

- Conducted research projects focusing on investigating the impacts of misallocation of bus drivers by looking at socioeconomic characteristics associated with bus routes.
- Measured and investigated relationship between service quality and service area socioeconomic indicators and characteristics.

WORKING EXPERIENCE

Data Scientist Intern May 2023 – Aug 2023
CityDNA Holdings Ltd Beijing, China

- Developed a universal simplification method for disorganized OSM road networks, producing a streamlined main road network suitable for non-precision applications like land division.
- Conducted network analysis using NetworkX library for urban infrastructure evaluation.
- Participated in an urban diagnostics project, utilizing Python to calculate various city indicators.

Machine Learning Researcher Intern Sept 2021 – Jun 2022
Advisor: Dr. Jixuan Cai, Tencent Holdings Ltd Shenzhen, China

- Integrated and analyzed multi-source spatio-temporal data through PySpark, including satellite images, open street maps, points of interest, and WeChat user trajectories.
- Helped to develop a multi-view neural network to detect fraudulent user behavior.

PROFESSIONAL WORKS

2022 Smart Cities Innovation Competition Aug 2022 – Dec 2022
Advisor: Prof. Wei Tu

- Built an intelligent management platform and multi-dimensional analysis framework for taxi and ride-hailing data through React.js and Mapbox.
- Conducted spatio-temporal analysis to compare distribution characteristics between taxis and ride-hailing services.
- Analyzed trajectory orders to uncover underlying factors influencing distribution patterns.

Street Quality Pattern Mining Based on Multi-Source Urban Big Data Sept 2021 – May 2022
Advisor: Prof. Wei Tu

- Collected road networks, street view images (SVIs), points of interest (POIs), and building footprints in the Greater Bay Area using Python.
- Developed an evaluation index system for street quality, considering both subjective perceptions and objective physical spaces.
- Analyzed the spatial aggregation of street quality and correlations among various index factors.
- Discovered street quality patterns using hierarchical clustering and compared features across cities in the Guangdong-Hongkong-Macao Greater Bay Area.

2020 Digital China Innovation Contest Sept 2020 – Nov 2020
Advisor: Prof. Wei Tu

- Cleaned and processed large-scale trajectories and order data, integrating them with urban road network data using map matching algorithms.
- Assisted in fusing deep reinforcement learning and travel knowledge to build a smart operating model for electric unmanned networked vehicles, including:
    - Intelligent matching of electric unmanned vehicles and individual travels.
    - Advance scheduling of idle unmanned vehicles.
    - Charging arrangements for electric unmanned vehicles.
- Led the creation of a web application for spatio-temporal data and model visualization, using React.js, Mapbox, and Deck.gl.

REFEREED JOURNAL PUBLICATIONS

1. **Yi, S.**, Li, X., Wang, R., Guo, Z., Dong, X., Liu, Y., & Xu, Q. (2024). Interpretable spatial machine learning insights into urban sanitation challenges: A case study of human feces distribution in San Francisco. ***Sustainable Cities and Society***, *113*, 105695. (JCR Q1, IF=11.7) [link].
2. Dong, X., Yang, R., Ye, Y., **Yi, S.**, Haase, D., & Lausch, A. (2024). Planning for green infrastructure by

integrating multi-driver: Ranking priority based on accessibility equity. ***Sustainable Cities and Society***, *114*, 105767. (JCR Q1, IF=11.7) [link].

3. Chen, X., Tu, W., Yu, J., Cao, R., **Yi, S.**, & Li, Q. (2024). LCZ-based city-wide solar radiation potential analysis by coupling physical modeling, machine learning, and 3D buildings. ***Computers, Environment and Urban Systems***, *113*, 102176. (JCR Q1, IF=7.3) [link].
4. Cui, Q., Tan, L., Ma, H., Wei, X., **Yi, S.**, Zhao, D., ... & Lin, P. (2024). Effective or useless? Assessing the impact of park entrance addition policy on green space services from the 15-minute city perspective. ***Journal of Cleaner Production***, 142951. (JCR Q1, IF=11.1) [link].
5. Tu, W., Ye, H., Mai, K., Zhou, M., Jiang, J., Zhao, T., **Yi, S.,** & Li, Q. (2024). Deep online recommendations for connected E-taxis by coupling trajectory mining and reinforcement learning. ***International Journal of Geographical Information Science***, *38*(2), 216-242. (JCR Q1, IF=5.7) [link].
6. Yang, W., Xu, Q., **Yi, S.,** Shankar, R., & Chen, T. (2024). Enhancing transit-oriented development sustainability through the integrated node-place-ecology (NPE) model. ***Transportation Research Part D: Transport and Environment***, *136*, 104456. (JCR Q1, IF=7.3) [link].
7. Yang, W., Xu, Q., ... **Yi, S**. Are different TOD circles oriented towards sustainability amidst urban shrinkage? Evidence from urban areas to suburbs in the Tokyo metropolitan area. ***Journal of Environmental Management***, *372*, 123274. (JCR Q1, IF=8.0) [link].

PUBLICATIONS IN REVIEW

8. **Yi, S.**, et al. Assessing the differential impact of suburban vegetated areas and urban built-up on heat exposure environment: A case study in Los Angeles. ***Sustainable Cities and Society***. Review.
9. **Yi, S.**, et al. Exploring the nonlinear relationship and threshold effects between heat stress around bus stops and urban environment: A case study of Philadelphia. ***Computers, Environment and Urban Systems***. Review.
10. **Yi, S.**, et al. Assessing homeless shelter accessibility: A Spatio-Temporal 3SFCA approach to uncovering socioeconomic associations. ***Journal of Transport Geography***. Review.
11. **Yi, S.**, et al. Exploring the nonlinear relationships and interaction effects of urban environment on homeless incidence: A case study in New York City. ***Environment and Planning B: Urban Analytics and City Science.*** Review.
12. **Yi, S.**, et al. A sub-meter resolution urban surface albedo dataset for 34 U.S. cities based on deep learning. ***Scientific Data***. Review.
13. Dong, X., Ye, Y., Su Dan., **Yi, S.**, Haase, D., & Lausch, A. Adaptive ranking of specific tree species for targeted green infrastructure intervention in response to local demand. ***Urban Forestry & Urban Greening.*** Review.
14. Zhao T, … **Yi, S***. Quantifying Seasonal Bias in Street View Imagery for Urban form Assessment: A Global Analysis of 40 Cities. ***Computers, Environment and Urban Systems***. Review.
15. Wang, R., **Yi, S.**, et al. (2024). Exploring the associations between street-view green space quantity and quality, and influenza in Guangzhou, China through machine learning and spatial regression: A socio-economic equity perspective. ***Environment and Planning B: Urban Analytics and City Science.*** Revision.
16. Ma, C., Zhang, Y., **Yi, S.** et al. (2024). Optimizing urban agricultural waste planning and management to enhance sustainability: Strategies for three types of cities. ***Sustainable Cities and Society***. Revision.
17. Li, Q., Zhang, J., **Yi, S.** et al. Street-level physical disorders, multi-scale socioeconomic disparities and neighborhood satisfaction among Chinese older adults: Using street view data and a machine learning approach. ***Habitat International.*** Review.

PRESENTATION

1. Presenter (poster) "Assessing the differential impact of suburban vegetated areas and urban built-up on heat exposure environment: A case study in Los Angeles." The 2024 American Association of Geographers' Annual Meeting. In-Person. April 16, 2024.

AWARDS

- Third Prize of 2022 Smart City Research and Innovation Scheme (SCRIS) July 2023
- 2022 Excellent Graduation Thesis Jun 2023
- The Third Prize of 2021 Super Map Cup University GIS Competition Oct 2021
- Software Copyright: Electric Unmanned Networked Fleet Intelligent Operation and Monitoring Prototype System. Dec 2022
- Software Copyright: Parade Car and Online Car-hailing Operation Analysis System Nov 2022
- Shenzhen University "Star of Innovation and Entrepreneurship" Nov 2022
- The Fourth Winner of Big Data Track Creativity Award in 2020 Digital China Innovation Competition. Dec 2021

SKILLS

- **Language**: Chinese (native), English (fluent, IELTS: 7.0)
- **Programming Language**: Python, R, C++, JavaScript
- **Software**: Office Suites, Adobe Creative Suites, QGIS, ArcGIS, SPSS, ENVI