

EDUCATION

Southeast University, China **MEng, Landscape Architecture** 09/2022-06/2025 (Exp.)

□ GPA: 3.96/4.0 Average score: 90.88/100 Rank: 2/28

□ Thesis: Assessing ecosystem services for informing land use decisions in buffer zones of urban scenic areas

Southeast University, China **BEng, Landscape Architecture** 09/2017-06/2022

□ GPA: 3.88/4.0 Average score: 89.29/100 Rank: 4/28

□ Thesis: Examining the factors influencing urban residents' transport-related carbon emissions in the context of dual-carbon goals (Score: 93/100, Outstanding Thesis/Design Award – School of Architecture)

PUBLICATIONS

Journal Articles

[1] **Xu, Y.**, & Tang, J.* (2024). Examining the rationality of Giant Panda National Park's zoning designations and management measures for habitat conservation: Insights from interpretable machine learning methods. *Science of The Total Environment*, 170955. [\[link\]](#)

[2] **Xu, Y.**, & Ma, X.* (2024). Assessing urban street vitality through visual and auditory perception: A case study of historic urban area in Guangzhou, China. *The International Review for Spatial Planning and Sustainable Development*, 12(4), 57-76. [\[link\]](#)

[3] Ma, X., **Xu, Y.***, Pan, M., & Jiang, K. (2024). Rethinking public service facility distribution and management strategies with the consideration of carbon peak - Insights from Suzhou, China. *Journal of Cleaner Production*, 143070. [\[link\]](#)

[4] Rui, J.*, **Xu, Y.**, & Li, X. (2024). Destigmatizing urban villages by examining their attractiveness: Quantification evidence from Shenzhen. *Habitat International*, 150, 103120. [\[link\]](#)

[5] Rui, J.*, & **Xu, Y.** (2024). Beyond built environment: Unveiling the interplay of streetscape perceptions and cycling behavior. *Sustainable Cities and Society*, 109, 105525. [\[link\]](#)

[6] Yuan, Y.*, Gan, Y., **Xu, Y.**, Xie, Q., Shen, Y., & Yin, Y. (2022). SWMM-based assessment of urban mountain stormwater management effects under different LID scenarios. *Water*, 14(1), 78. [\[link\]](#)

Conference Articles

[7] **Xu, Y.**, Ma, X.*, Pan, M., & Jiang, K. (2022). A two-stage simulation approach of urban transport emission evaluation towards carbon peak: A case study in Suzhou, China. *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 10, 285-292. [\[link\]](#)

Working Papers

[8] **Xu, Y.**, Chen, C.*, Deng, W., Dai, L., & Yang, T.* Spatial eco-socio-economic trade-offs inform differentiated management strategies in mega-urban agglomerations. Submitted.

[9] **Xu, Y.**, Tang, J.*, & Zhuang., X. Urban edges, conservation frontiers: Buffer zone planning and management around urban protected areas - Insights from Chinese national-level scenic areas. *Biological Conservation*, Under Review.

RESEARCH EXPERIENCES

Research Assistant, The University of Hong Kong

04/2024-Present

Advisor: *Prof. Tianren Yang*, Department of Urban Planning and Design

□ Integrating causal inference and surrogate-based modeling to optimize spatial performance (Ongoing)

Funded by the National Key Research and Development Program of China “Theory and methods of planning, construction, and governance based on urban sustainable development” (No. 2022YFC3800302)

- Identified 4 key spatial performance indicators—vitality, outdoor thermal comfort, air pollution, and economic density—specific to urban functional zones for targeted improvements.
 - Leveraged DoubleML for causal machine learning to reveal causal effects of urban form indicators on spatial performance. This approach is now being expanded to analyze patterns across 36 cities in China.
 - Applying clustering algorithms to classify blocks by urban scale, form, and functional zones, establishing benchmarks and identifying top-performing blocks to guide optimization strategies.
 - Developing a surrogate model to propose optimization strategies, like adjusting floor area ratios and adding permeable surfaces, within real-world constraints.
- #### □ Exploring spatial eco-socio-economic trade-offs to inform differentiated management strategies ^[8]
- Developed a framework using production possibility frontiers to evaluate eco-socio-economic efficiency and ecosystem service value improvement potential in mega-urban agglomerations.
 - Employed the InVEST model to quantify ecosystem service supply, integrating high-resolution location-based data to measure demand in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA).
 - Conducted k-means clustering and fitted production possibility frontiers to assess trade-offs between ecosystem service value and socio-economic well-being across distinct zones within the GBA.
 - Provided tailored recommendations for eco-economic coordination, ecological restoration, and payment for ecosystem services policies, supporting balanced growth and environmental sustainability within the GBA.

Graduate Researcher, Southeast University

09/2022-Present

Advisor: *Prof. Jun Tang*, Department of Landscape Architecture

□ Reviewing buffer zone planning documents to identify key knowledge gaps and opportunities ^[9]

- Conducted a systematic review of buffer zone planning documents across 123 urban scenic areas in China.
- Employed natural language processing (NLP) methods to categorize management strategies within buffer zone plans for 20 representative scenic areas, highlighting recurring themes and strategies.
- Identified key knowledge gaps in buffer zone planning and proposed strategies for improvement based on ecosystem services and AI-driven insights.

□ National Park zoning and management with interpretable machine learning ^[1]

- Built a species distribution model using the Random Forest algorithm and multi-source geospatial data.
- Applied interpretable methods such as one-way and two-way partial dependence plots (PDPs) and Shapley Additive exPlanations (SHAP) to reveal the correlations between environmental and anthropogenic factors and giant panda habitat (GPH) distribution.
- Used GIS overlay analysis to evaluate national park boundaries’ effectiveness in protecting GPH and identify conflict zones between human settlements, transportation infrastructures, and habitats.

Workshop Participant, DigitalFUTURES2024, Tongji University

06/2024-07/2024

Advisor: *Prof. Jiawei Yao*, Department of Architecture

□ Predicting the carbon-pollution-heat synergy index using GAN modeling and multimodal data

- Integrated satellite imagery with tabular data to create a comprehensive dataset, applying a conditional generative adversarial network (CGAN) model to predict the carbon-pollution-heat synergy index.
- Conducted GIS overlay analysis to identify priority areas for green infrastructure interventions, considering synergistic impacts vulnerable population distributions.

Collaborative Projects

03/2023-06/2024

Collaborators: Jin Rui, Technical University Dortmund; Xiang Li, The University of Hong Kong

□ Measuring urban village attractiveness to support destigmatization ^[4]

- Designed a behavior-space interaction framework to provide quantitative insights for reducing stigma around urban villages, informal settlements in China.
- Analyzed residents' mobility patterns through mobile signaling data, highlighting urban villages' contributions to job-housing balance and diverse service offerings in Chinese megacities.
- Investigated non-linear relationships between attractiveness indices and built environment features, revealing key factors that enhance the appeal of urban villages.

□ Analyzing the interplay between cycling behavior and streetscape perception to guide street innovation ^[5]

- Processed 1.4 million shared-cycling origin-destination (OD) pairs, mapping shortest paths with NetworkX to accurately represent cycling routes.
- Applied k-means clustering for representative sampling of over 110,000 street view images, using XGBoost to predict subjective streetscape perceptions and improve accuracy in perception modeling.
- Integrated different regression models to unveil the non-linear spatial interdependencies between streetscape perception, built environment characteristics, and bicycle-sharing volume.
- Employed a classification method to analyze street perceptual quality alongside bicycle-sharing volumes, enabling the identification of streets where cycling-focused renovations should be prioritized.

Research Assistant, Southeast University

11/2021-12/2023

Advisor: *Prof. Xiaosu Ma*, Department of Urban Planning

Funded by the National Key Research and Development Program of China "Urban Regeneration Design Theory and Methodology" (No. 2022YFC3800302)

□ Assessing street vitality and quality through pedestrians-level visual and auditory perceptions ^[2]

- Developed a framework to assess street vitality from pedestrians' visual and auditory perceptions utilizing data from 242 sampling points, semantic segmentation, and stated preference questionnaires.
- Identified that elements like greenery, infrastructure, and reduced noise correlate with higher street vitality and quality, providing actionable insights for improving street design to enhance pedestrian experience.

□ Investigating transport-related carbon emissions (CEs) for informed planning and policy decisions ^{[3][7]}

- Conducted a two-stage simulation, including multi-scenario sensitivity analysis and link-based CE estimation, to identify uncertainties in achieving transport-related carbon peak.
- Built an interpretable XGBoost model using PDPs to explore the relationship between built environment characteristics and CE intensity, identifying key factors like density and facilities as high-impact.
- Analyzed individual medical care travel characteristics from two OD surveys, revealing that high level transportation CEs around hospitals are related to residents' activity preferences.
- Discussed trade-offs and synergies between current and low-carbon-oriented planning and policy decisions.

Undergraduate Researcher, Southeast University

01/2020-12/2021

Advisor: *Prof. Yangyang Yuan*, Department of Landscape Architecture

Funded by the National Key Research and Development Program of China (No. 2019YFD1100405), and the National Natural Science Foundation of China (No. 51838003)

- ❑ Comparing runoff control effects of Low Impact Development (LID) systems for optimal scenario selection ^[6]
 - Contributed to designing LID systems to manage stormwater runoff in mountainous urban areas.
 - Analyzed and compared the effectiveness of segmental versus terminal LID schemes, visualizing results to support optimal scenario selection.

SELECTED INTERNSHIP

Assistant Planner, Southeast University Urban Planning & Design Institute Co., Ltd. 12/2022-08/2024

- ❑ General plan for Mount Tianmu Scenic Area (Chinese national-level scenic area)
 - Developed a GIS database and drafted planning schemes, with a focus on conservation and land use plans.
 - Investigated conflicts between environmental conservation and economic development within urban scenic area boundaries, leading to a first-authored paper on buffer zone planning challenges. ^[9]

Assistant Designer, Southeast University Architecture Design Institute Co., Ltd. 04/2023-07/2023

- ❑ Development planning and urban design for the Mount Tanshi Cultural Park and its surroundings
 - Proposed ecological strategies for wetland conservation by reviewing blue-green infrastructure approaches.
 - Conducted elevation and sightline analysis in ArcGIS to design an optimized viewing system.

Analytical Assistant, Southeast University Urban Planning & Design Institute Co., Ltd. 10/2022-11/2022

- ❑ Urban design for the historical urban area of Guangzhou based on heritage conservation
 - Analyzed population distribution, temporal patterns, and work-residence relationships, visualizing spatial demographics in ArcGIS Pro and Kepler.

CONFERENCE PRESENTATIONS

60th World Congress of the International Federation of Landscape Architecture (Istanbul, Türkiye, 2024)

- ❑ Title: Deciphering anthropogenic influences on habitats: Implications from interpretable machine learning.

Beijing-Hong Kong Conference on Agricultural Microbial Resources (Beijing, China, 2024)

- ❑ Title: Spatial eco-socio-economic trade-offs inform differentiated management strategies in mega-urban regions.

International Conference on Spatial Planning and Sustainable Development (Kanazawa, Japan, 2023)

- ❑ Title: Assessing urban street vitality through visual and auditory perception.

SCHOLARSHIPS AND AWARDS

Kang Qi Scholarship and Grant (Top 10%)	2023-2024
Second Prize Chinese University Data-driven Innovation Competition (CNY 10,000)	2022
Southeast University President Scholarship (Top 5%)	2018-2019

SKILLS

Languages	Native Mandarin Chinese, Fluent English (TOEFL iBT: 101, GRE: 326 + 4.5)
Analytical skills	Spatial analysis (ArcGIS Pro, Arcpy, FME), Python (Libraries: Pandas, Numpy, Matplotlib, Geopandas, Scikit-learn, DoubleML, NetworkX)
Design skills	Rhinoceros (basic Grasshopper), SketchUp, AutoCAD, Adobe Suite (Photoshop, Illustrator, Indesign), Lumion, Enscape