

# XIUCHENG LIANG

Residence: Singapore

PhD Researcher

College of Design and Engineering, National University of Singapore

 Personal Website

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 Google Scholar Profile

 LinkedIn Profile

## RESEARCH INTERESTS

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Urban Planning, Urban Data Science, Deep Learning, Computer Vision, Multi-modal Geospatial Data Integration, Urban Sustainability

## EDUCATION

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### •Doctor of Philosophy (PhD) - Third year

08/2023-Now

National University of Singapore (NUS), School of Design and Environment, Singapore

CGPA: 4.93 of 5

### •Master of Urban Planning (Two-year Program)

08/2020-06/2022

National University of Singapore (NUS), School of Design and Environment, Singapore

CGPA: 4.78 of 5

### •Bachelor of Engineering in Urban and Rural Planning

09/2014-07/2019

Shenzhen University (SZU), School of Architecture and Urban Planning, Shenzhen, China

CGPA: 3.45 of 4

## PUBLICATIONS - CITATION: 370+

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### Peer-Reviewed Journal Papers

[1] Liang, X., Zhao, T. and Biljecki, F., 2023. Revealing spatio-temporal evolution of urban visual environments with street view imagery. *Landscape and Urban Planning*, 237, p.104802. [\[DOI\]](#)

[2] Liang, X., Chang, J.H., Gao, S., Zhao, T. and Biljecki, F., 2024. Evaluating human perception of building exteriors using street view imagery. *Building and Environment*, 263, p.111875. [\[DOI\]](#)

[3] Liang, X., Xie, J., Zhao, T., Stouffs, R. & Biljecki, F., 2025. OpenFacades: An Open Framework for Architectural Caption and Attribute Data Enrichment via Street View Imagery. Accepted in the *ISPRS Journal of Photogrammetry and Remote Sensing*.

[4] Zhao, T., Liang, X., Tu, W., Huang, Z. and Biljecki, F., 2023. Sensing urban soundscapes from street view imagery. *Computers, Environment and Urban Systems*, 99, p.101915. [\[DOI\]](#)

[5] Zhao, T., Liang, X., Biljecki, F., Tu, W., Cao, J., Li, X. and Yi, S., 2025. Quantifying seasonal bias in street view imagery for urban form assessment: A global analysis of 40 cities. *Computers, Environment and Urban Systems*, 120, p.102302. [\[DOI\]](#)

[6] Biljecki, F., Zhao, T., Liang, X. and Hou, Y., 2023. Sensitivity of measuring the urban form and greenery using street-level imagery: A comparative study of approaches and visual perspectives. *International Journal of Applied Earth Observation and Geoinformation*, 122, p.103385. [\[DOI\]](#)

[7] Quintana, M., Gu, Y., Liang, X., Hou, Y., Ito, K., Zhu, Y., Abdelrahman, M. and Biljecki, F., 2025. Global urban visual perception varies across demographics and personalities. *Nature Cities*. [\[DOI\]](#)

- [8] Gu, Y., Quintana, M., **Liang, X.**, Ito, K., Yap, W. and Biljecki, F., 2025. Designing effective image-based surveys for urban visual perception. *Landscape and Urban Planning*, 260, p.105368. [\[DOI\]](#)
- [9] Lei, B., Liu, P., **Liang, X.**, Yan, Y. and Biljecki, F., 2025. Developing the urban comfort index: Advancing liveability analytics with a multidimensional approach and explainable artificial intelligence. *Sustainable Cities and Society*, 120, p.106121. [\[DOI\]](#)
- [10] Ito, K., Zhu, Y., Abdelrahman, M., **Liang, X.**, Fan, Z., Hou, Y., Zhao, T., Ma, R., Fujiwara, K., Ouyang, J. and Quintana, M., and Biljecki, F., 2025. Zensvi: An open-source software for the integrated acquisition, processing and analysis of street view imagery towards scalable urban science. *Computers, Environment and Urban Systems*, 119, p.102283. [\[DOI\]](#)
- [11] Fujiwara, K., Tsurumi, R., Kiyono, T., Fan, Z., **Liang, X.**, Lei, B., Yap, W., Ito, K. and Biljecki, F., 2025. VoxCity: A Seamless Framework for Open Geospatial Data Integration, Grid-Based Semantic 3D City Model Generation, and Urban Environment Simulation. Accepted in the *Computers, Environment and Urban Systems*.

### Conference and Workshop Papers

- [1] **Liang, X.**, Cheng S., Biljecki, F., 2025, Decoding characteristics of building facades using street view imagery and vision-language model. *Proceedings of the 19th International Conference on Computational Urban Planning and Urban Management*. [\[DOI\]](#)
- [2] Ignatius, M., Xu, R., Hou, Y., **Liang, X.**, Zhao, T., Chen, S., Wong, N.H. and Biljecki, F., 2022. Local Climate Zones: Lessons from Singapore and potential improvement with street view imagery. *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 10, pp.121-128. [\[DOI\]](#)
- [3] Lei, B., **Liang, X.** and Biljecki, F., 2024. Integrating human perception in 3D city models and urban digital twins. *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 10, pp.211-218. [\[DOI\]](#)
- [4] Tang, W., Li, W., **Liang, X.**, Wysocki, O., Biljecki, F., Holst, C. and Jutzi, B., 2025. Texture2LoD3: Enabling LoD3 Building Reconstruction With Panoramic Images. In *Proceedings of the Computer Vision and Pattern Recognition Conference* (pp. 2016-2026). [\[PDF\]](#)

### Books and Book Chapters

- [1] Liu, P., Hou, Y., Lei, B., **Liang, X.** and Biljecki, F., 2025. GeoAI and Urban Geography. In *GeoAI and Human Geography: The Dawn of a New Spatial Intelligence Era* (pp. 251-266). Cham: Springer Nature Switzerland. [\[PDF\]](#)

### Open-access Software and Datasets

- [1] **Liang, X.**, Xie, J., Zhao, T., Stouffs, R. & Biljecki, F. OpenFACADES: An Open Framework for Architectural Caption and Attribute Data Enrichment via Street View Imagery. *GitHub* 2025. [\[ACCESS\]](#)
- [2] **Liang, X.**, Xie, J., Zhao, T., Stouffs, R. & Biljecki, F. OpenFACADES: Global Street-Level Buildings Caption and Attribute Dataset. *Hugging Face* 2025. [\[ACCESS\]](#)
- [3] Fujiwara, K., Tsurumi, R., Kiyono, T., Fan, Z., **Liang, X.**, Lei, B., Yap, W., Ito, K. and Biljecki, F.,

2025. VoxCity: A Seamless Framework for Open Geospatial Data Integration, Grid-Based Semantic 3D City Model Generation, and Urban Environment Simulation. *GitHub* 2025. [\[ACCESS\]](#)

[4] Ito, K., Zhu, Y., Abdelrahman, M., **Liang, X.**, ... Quintana, M., and Biljecki, F. Zensvi: An open-source software for the integrated acquisition, processing and analysis of street view imagery towards scalable urban science. *GitHub* 2024. [\[ACCESS\]](#)

## RESEARCH & PROJECT EXPERIENCE

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• **Urban Analytics Lab, National University of Singapore, Singapore**

11/2021–02/2022

*Research Intern*

- Developed a deep learning model to map urban soundscapes from street view imagery.
- Designed and conducted a soundscape perception survey with curated attributes.
- Handled data processing, model training, and drafting of methodology and results.

• **Urban Analytics Lab, National University of Singapore, Singapore**

05/2022–08/2022

*Student Researcher*

- Assisted in cross-city analysis on SVI-derived metric sensitivity to FOV and MAUP.
- Performed literature review and Python-based data analysis.

• **College of Design and Engineering, National University of Singapore, Singapore**

08/2021–04/2022

*Dissertation Module*

- Studied spatio-temporal visual patterns using CNN-based street view feature extraction.
- Built a framework to extract visual features, construct spatial graphs, and cluster scenes.
- Applied the method in Singapore to map and analyze evolving visual domains.

## HONORS & AWARDS

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**2023 NUS Research Scholarship**

2020 Comics work selected for the first Guangdong Provincial Comics Exhibition

2020 Merit Award of the First Guangdong Youth Lacquer Painting Exhibition

**2019 Hundred Excellent Graduation Thesis / Design Award, Shenzhen University**

**2018-2019 Star of Shenzhen University**

2018 3rd Prize of “Challenge Cup” Undergraduate Extracurricular Academic Science and Technology Works Award, Shenzhen University

2015-2016 3rd Prize of SUIADR Academic Scholarship

2014-2015 Excellent Student of Academic Performance (Second Prize), Shenzhen University

2014-2015 1st Prize of SUIADR Academic Scholarship

## RESEARCH TALKS

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- 09/2024 At Urban Governance and Design Thrust, Society Hub, Hong Kong University of Science and Technology (Guangzhou)
- 09/2024 At School of Civil Engineering & Transportation, South China University of Technology, Guangzhou, China
- 09/2024 11th GISChat in Chinese social media
- 10/2024 Climate Change AI (CCAI) discussion seminar
- 11/2024 At College of Architecture and Urban Planning, Shenzhen University
- 06/2025 At the 19th International Conference on Computational Urban Planning and Urban Management (CUPUM), London, 2025
- 08/2025 London-Singapore Urban Analytics Seminar for Liveable Cities
- 10/2025 GeoMod 3D: Mapping, Modeling and Management, Malaysia, 2025

## MEDIA & COMMUNICATION

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- Architectural Perception and Emotional Well-being** (2024), YouTube ► [\[Video Link\]](#)
- Tutorial: Generating voxel 3D city model for cities worldwide** (2025), YouTube ► [\[Video Link\]](#)
- Presentation: Climate Change AI Discussion Seminar: Multimodal AI Approaches for Urban Microclimate Prediction and Building Analysis** (2024), YouTube ► [\[Video Link\]](#)
- Presentation: 11th GISChat, the Application of Human Perception in Urban Studies** (*in Chinese*) (2024), Bilibili ► [\[Video Link\]](#)

## STUDENTS MENTORED

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- **Youlong Gu, National University of Singapore (NUS), Singapore** 08/2023–06/2025  
*Master of Urban Planning*
  - Supervised a research internship project titled *Designing effective image-based surveys for urban visual perception*.
  - Advised master's thesis titled *Street view video for urban sensing: a new approach for measuring urban vitality*.
- **Jing Tang, National University of Singapore (NUS), Singapore** 08/2024–06/2025  
*Master of Urban Planning*
  - Advised master's thesis titled *Towards finer and location-specific microclimate studies: recasting local climate zone mapping using spatial signatures*

## SERVICE AND TEACHING

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### Teaching assistance:

- AY2023/2024-Semester 2 DEP5111 Planning Technologies
- AY2024/2025-Semester 1 UD5625 Methods and Tools for Urban Design

AY2024/2025-Semester 2 DEP5107 Dissertation

AY2025/2026-Semester 1 CDE2212 AI for Design

**Academic journal peer review:**

1. *Landscape and Urban Planning*, Elsevier
2. *Computers, Environment and Urban Systems*, Elsevier
3. *Humanities and Social Sciences Communications*, Nature Portfolio
4. *Scientific Reports*, Nature Portfolio
5. *Building and Environment*, Elsevier
6. *Cities*, Elsevier
7. *International Journal of Health Geographics*, Springer Nature
8. *Environment and Planning B: Urban Analytics and City Science*, Sage Journals
9. *Transactions in Urban Data, Science, and Technology*, Sage Journals

**TECHNICAL SKILLS**

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**Programming Languages:** Python (proficient), R (familiar)

**Tools:** R-studio, VScode, Git, Github

**Machine & Deep Learning:** PyTorch, Tensorflow, Scikitlearn, CUDA, Geopandas

**Others:** ArcGIS, QGIS, SketchUp, Rhino, Photoshop, LaTeX