Youlong Gu

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Summary

A strong interest in urban analytics, particularly in leveraging computer vision and statistical knowledge to evaluate the quality of urban visual data and use it as a medium for mapping urban patterns and sensing urban dynamics.

Education

- **University of Leeds** – ***PhD in Geography*** 2026-2029
  Research Interests: Computer Vision, Human Mobility, Data Visualization
- **National University of Singapore** – ***Master of Urban Planning*** 2023-2025
  Modules: Urban Planning; Statistics; Data Visualization *GPA:4.50/5*
- **Hefei University of Technology** – ***Bachelor of Engineering in Urban Planning*** 2018-2023
  Modules: Urban Planning; Geo-Information Science; Urban Economics *GPA:85.76/100*

Publications

- **Journals**

3. Quintana, M., Gu, Y., Liang, X., Hou, Y., Ito, K., Zhu, Y., Abdelrahman, M., & Biljecki, F. (2025). Global urban visual perception varies across demographics and personalities. *Nature Cities,* 2(11): 1092-1106. https://www.nature.com/articles/s44284-025-00330-x
2. Gu, Y., Quintana, M., Liang, X., Ito, K., Yap, W., & Biljecki, F. (2025). Designing Effective Image-based Surveys for Urban Visual Perception. *Landscape and Urban Planning*, 260, 105368. https://doi.org/10.1016/j.landurbplan.2025.105368
1. Hu, H., Gu, Y., Liu, W., Nie, X., & Zhang, M. (2022). Research on Micro-Regeneration of Street Corners in the Old Downtown Based on Rhizome Concepts: A Case of Hongxing Road, Yicang Lane, and Wushan Lane in Hefei. *Urbanism and Architecture*, 19(3), 63–67. https://doi.org/10.19892/j.cnki.csjz.2022.03.14

- **Conferences**

5. Cai, C., Kuriyama, K., Gu, Y., & Herthogs, P. (2025). Can a large language model assess urban design quality? Evaluating walkability metrics across expertise levels. *20th 3D GeoInfo & 9th Smart Data Smart Cities 2025.* https://doi.org/10.5194/isprs-annals-X-4-W7-2025-1-2025
4. Gu, Y., Liu, H., Lan, L., He, Y., & Biljecki, F. (2025). A Bayesian Spatiotemporal Framework for Explaining Bus Ridership Dynamics in Singapore. *Proceedings of the 19th International Conference on Computational Urban Planning and Urban Management (CUPUM).* https://doi.org/10.17605/OSF.IO/ABYQH
3. Quintana, M., Gu, Y., & Biljecki, F. (2024). Poster abstract: My Street is Better than Your Street: Towards Data-Driven Urban Planning with Visual Perception. *Proceedings of the 11th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation.* https://doi.org/10.1145/3671127.3698700
2. Gu, Y., Zhang, Y., & Xuan, W. (2023). Generative Design Method of Building Groups Based on AIP (Aging in Place) Assessment: The Case of Dense Urban Renewal Districts in Hong Kong. *Design for Inclusivity: Proceedings of the World Congress of Architects 2023*, 479–495. https://doi.org/10.1007/978-3-031-36302-3
1. Gu, Y., Bai, Y., Shen, J., Zhang, S., Li, L., & Ouyang, Y. (2023). Evaluation and optimization of pedestrian space in urban village streets from a child-friendly perspective: A case study of Hefei city. *Proceedings of the 2023 Annual National Planning Conference.* https://doi.org/10.26914/c.cnkihy.2023.055726

Work & Research Experience

- **College of Design and Engineering, National University of Singapore** Singapore, SG
  *Research Engineer (**Urban Analytics Lab**) | Full-time* *10/2025 – 12/2025*
  - Funded by National Parks Board project: 'Spatio-temporal trends in usage and perception of parks and green spaces'.
  - **Data Science**: Conducted large-scale data analysis of Google Maps Reviews to quantify park perception and satisfaction in Singapore.
- **Future Cities Lab Global, Singapore-ETH Centre** Singapore, SG
  *Research Assistant (**Semantic Urban Elements**) | Full/Part-time* *05/2024 – 06/2025*
  - **Experimental Research**: Developed and refined urban perception surveys, ensuring methodological rigor and cross-market comparability across five continents on the globe.
  - **Data Science**: Conducted preprocessing, statistical analysis, and interpretation of survey data to derive actionable insights.
- **College of Design and Engineering, National University of Singapore** Singapore, SG
  *Research Assistant (**Urban Analytics Lab**) | Part-time* *08/2023 – 04/2024*

- **Experimental Research**: Led a one-month survey, gathering over 600 responses on subjective human perception.
- **Data Science**: Conducted cross-sectional and longitudinal analyses to evaluate the consistency and variability across diverse survey settings.

- **College of Architecture and Art, Hefei University of Technology** Hefei, CHN
  *Teaching Assistant (**Architectural DigitalFUTURES**) | Full-time* *08/2022 – 09/2022*
  - **Project Management & Teaching**: Managed and supported the instruction of a Computational Art and Technology Workshop involving a team of 15 undergraduate students.
  - **Hardware & Software Management**: Oversaw and maintained laboratory computational resources to ensure support for scientific research activities.

- **Anhui Urban and Rural Planning and Design Institute** Hefei, CHN
  *Assistant Engineer (**GIS Module**) | Full-time* *07/2021 – 09/2021*
  - **Field Research**: Conducted on-site demographic surveys and data collection in Tianchang City.
  - **Data Science**: Identified village layouts in Tianchang City using remote sensing imagery and performed data entry, analysis, and visualization of demographic information.

Other Independent Research

- **Comparative Analysis of Microscopic Geographic Data and Macroscopic Geographic Data for Housing Price Prediction: A Case Study in Singapore**
  Tutor: Chaewon Ahn *05/2024*
  - Collected resale housing prices in Singapore, geocoded addresses to obtain coordinates, and aggregated them into level-8 H3 grid cells.
  - Gathered macro-scale (e.g., Point of Interest, Night-time light intensity) and micro-scale (Street View Images) urban data to analyze their contributions to housing prices using GWR models at both levels.
  - Performed t-tests to statistically compare explanatory differences between the two levels and offered integrated policy recommendations and urban planning insights for future housing development and renewal.

- **Assessing the Impact of Urban Built Environment on MRT Ridership Dynamics in Singapore: A Spatiotemporal Analysis**
  Tutor: Filip Biljecki *04/2024*
  - Examined MRT ridership trends across Singapore's planning areas from 2020 to 2023.
  - Aggregated built environment variables: bus ridership, POI density, nighttime light density, and population density.
  - Used OLS, GWR, and GTWR models to analyze the relationship between MRT ridership and built environment variables, compared model performance, and interpreted variable contributions from a spatiotemporal perspective.

- **Correlation Between Campus Environment Elements and Relaxing Effects based on Mobile Sensing**
  Tutor: Ying Long *07/2023*
  - Captured 4,575 street view images of Tongji University using a GoPro mobile sensing device.
  - Applied SegFormer for semantic segmentation to obtain campus environment element metrics and trained a ViT model with human scorings to obtain relaxation probabilities.
  - Analyzed correlations between relaxation probabilities and segmentation factors to inform campus design recommendations.

- **Optimal Design of GAN Generative Masterplan based on Urban Carbon Emission Effects**
  Tutor: Jiawei Yao *07/2022*
  - Annotated urban elements (e.g., buildings, plants, roads) from satellite images using LabelMe.
  - Segmented satellite tiles with Mask R-CNN and trained datasets using pix2pix GAN.
  - Integrated GAN models with building scheduling algorithms, optimizing for road and plant carbon emissions metrics.

Skills

- **Languages**: Chinese, English
- **Programming & Scripting languages**: Python, R, HTML
- **Softwares**: QGIS, AutoCAD, Photoshop, Illustrator, Figma, Grasshopper