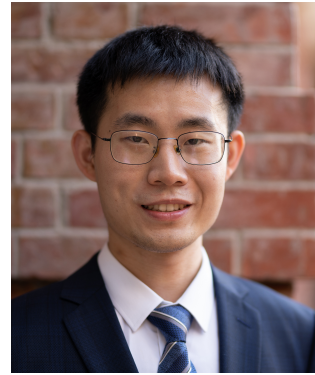# Maosu Li

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VISION

Apply state-of-art **3D City Information Modeling (CIM)**, **AI**, and **Big Data** to smarter **landscape management and urban planning**;

Particularly focus on **disparity of window-level visual exposure to nature and openness** to create **automatic tools and quantified evidence** for decision-making in **healthy high-rise, high-density urban development**.

RESEARCH INTERESTS

Urban Informatics, Analytics, and Computing through i) 3D City Information Modeling, ii) Machine Learning, and iii) Data Management and Analysis.

EDUCATION

Ph.D.   Geographic Information Science, The University of Hong Kong, 2020-2024

B.Eng.   Geodesy and Geomatics Engineering, Southwest Jiaotong University, 2014-2018

AWARDS

2023   Best Conference Paper Award (First Place), Organizing Committee of Global Smart Cities Summit cum The 3rd International Conference on Urban Informatics.

2023   First Prize of Smart City Research and Innovation Scheme, International Society for Urban Informatics.

2023   HKU Foundation Publication Award for Research Postgraduate Students 2023, Graduate School, The University of Hong Kong.

2023   Research Postgraduate Student Innovation Award 2022/23, Graduate School, The University of Hong Kong.

2022   Second Prize (3D modeling) and Third Prize (2D CAD), Second "Scan-to-BIM" challenge, CVPR. [Web]

2022   Talent Development Scholarship, Education Bureau of Hong Kong SAR.

2021   Esri Young Scholars Award (Hong Kong), Environmental Systems Research Institute (Esri). [Web]

2020   Outstanding Paper Award and Merit Paper Award, *25th International Symposium on Advancement of Construction Management and Real Estate*. (Li et al., 2021; Zhang et al. 2021)

2019   National Scholarship, Ministry of Education of the People's Republic of China. [Web]

2019   Excellent Students Award, Southwest Jiaotong University.

2019   Third Prize, 2019 National English Competition for College Students.

2018   Outstanding Paper Award, 2018 National Symposium on Surveying and Mapping Science and Technology.

2018	Mao Yisheng Gold Medal, Mao Yisheng Honor's College, Southwest Jiaotong University.
2018	Outstanding Graduates Award, Southwest Jiaotong University.
2017	Excellent Students Award, Southwest Jiaotong University.
2017	SWJTU Press and Mao Yisheng Scholarship (Honorary Student Award), Southwest Jiaotong University.
2017	Best Paper Award, 9th National College Students' Paper Competition on Surveying and Mapping.
2017	'Hi-Target' Scholarship, Southwest Jiaotong University.
2017	University Scholarship (Special Prize), Southwest Jiaotong University.
2017	Second Prize (Digitalization of topographic map) and Third Prize (Point cloud-assisted 3D building modeling), 3rd University Student Surveying and Mapping Competition of Sichuan Province.
2017	First Prize, 14th May Day Mathematical Modeling Competition.
2017	University Scholarship (Second Prize), Southwest Jiaotong University.
2016	Outstanding Student Leader Award, Southwest Jiaotong University.
2016	University Scholarship (First Prize), Southwest Jiaotong University.
2015	'Qixin' Scholarship, Southwest Jiaotong University.
2015	Outstanding Student Leader Award, Southwest Jiaotong University.
2015	University Scholarship (Third Prize), Southwest Jiaotong University.

PUBLICATIONS

Articles in Peer-Reviewed Journals

2024	**Li, M.**, Yeh, A. G., & Xue, F. "CIM-WV: A 2D semantic segmentation dataset of rich window view contents in high-rise, high-density areas based on photorealistic City Information Models." *Urban Informatics*, 3, 1-24.
2024	Wang, B., **Li, M.**, Peng, Z., & Lu, W. "FaçadeGraph: A hierarchical attributed graph-based generative façade parsing approach for high-rise residential buildings." *Automation in Construction* (Under review, Round 2).
2024	Wu, Y., Xue, F., **Li, M.**, & Chen, S. "A novel building section skeleton for compact 3D reconstruction from point clouds: A study of high-density urban scenes." *ISPRS Journal of Photogrammetry and Remote Sensing*, 209, 85-100.
2023	**Li, M.**, Xue, F., & Yeh, A. G. "Bi-objective analytics of 3D visual-physical nature exposures in high-rise high-density cities for landscape and urban planning." *Landscape and Urban Planning*, 233, 104714.
2023	Yuan, L., Lu, W., Xue, F., & **Li, M.** "Building feature-based machine learning regression to quantify urban material stocks: A Hong Kong study." *Journal of Industrial Ecology*, 27, 336-349.
2022	**Li, M.**, Xue, F., Wu, Y., & Yeh, A. G. "A room with a view: Automatic assessment of window views for high-rise high-density areas using City Information Models and deep transfer learning." *Landscape and Urban Planning*, 226, 104505.
2022	**Li, M.**, Peng, Y., Wu, Y., Xu, J., Tan, T., Guo, H., ... & Xue, F. "Role of the built environment in the recovery from COVID-19: Evidence from a GIS-based natural experiment on the city blocks in Wuhan, China." *Frontiers in Built Environment*, 7, 813399.
2020	Zhu, Q., Chen, M., Feng, B., Zhou, Y., **Li, M.**, Xu, Z., ... & Xie, X. "Optimized spatiotemporal data scheduling based on maximum flow for multilevel visualization tasks." *ISPRS International Journal of Geo-Information*, 9 (9), 518.
2020	Zhu, Q., Feng, B., **Li, M.**, Chen, M., Xu, Z., Xie, X., ... & Feng, Y. "An efficient sparse graph index method

for dynamic and associated data." *Acta Geodaetica et Cartographica Sinica*, 49 (6), 681-691 (*in Chinese*).

2020　　Zhu, Q., **Li, M.**, Ding, Y., Feng, B., Zhang, J., Cao, Z., Qiu, L., & Yin, H. "Multi-level semantic retrieval method for landslide disaster data." *Journal of Southwest Jiaotong University*, 55 (3), 467-475 (*in Chinese*).

Conference Proceedings

2023　　**Li, M.***, Yeh, A. G., & Xue, F. "HRHD-HK: A benchmark dataset of high-rise and high-density urban scenes for 3D semantic segmentation of photogrammetric point clouds." *2023 Proceedings of the 29th IEEE International Conference on Image Processing* (Accepted). IEEE.

2023　　**Li, M.***, Xue, F., & Yeh, A. G. " Efficient assessment of window views in high-rise, high-density urban areas using 3D color city information models." *2023 Proceedings of the 18th International Conference on Computational Urban Planning and Urban Management*, 1-11. OSF.

2023　　Wu, Y. **Li, M.**, & Xue, F. " Towards fully automatic Scan-to-BIM: A prototype method integrating deep neural networks and architectonic grammar." *Proceedings of the 2023 European Conference on Computing in Construction and the 40th International CIB W78 Conference*, 1-8. European Council on Computing in Construction.

2021　　Laovisutthichai, V., **Li, M.***, Xue, F., Lu, W., Tam, K. L., & Yeh, A. G. "CIM-enabled quantitative view assessment in architectural design and space planning." *2021 Proceedings of the 38th International Symposium on Automation and Robotics in Construction*, 65-72. International Association for Automation and Robotics in Construction.

2021　　**Li, M.***, Xue, F., Yeh, A. G., & Lu, W. "Classification of photo-realistic 3D window views in a high-density city: The case of Hong Kong." *Proceedings of the 25th International Symposium on Advancement of Construction Management and Real Estate*, 1339-1350. Springer.

2021　　Zhang, J., **Li, M.**, Zhang, W., Wu, Y., & Xue, F. "Prospect of architectonic grammar reconstruction from dense 3D point clouds: Historical building information modeling (HBIM) of Guangdong cultural heritages." *Proceedings of the 25th International Symposium on Advancement of Construction Management and Real Estate*, 1421-1431. Springer.

Patents

2021　　Yeh, A. G., **Li, M.**, & Xue, F. *System and methods for quantifying and calculating window view openness indexes*. PCT/United States patent PCT/CN2023/077947, US 63/269,891, WO 2023/179296 A1.

2019　　Zhu, Q., Feng, B., Chen, M., **Li, M.**, Ding, Y., & Zhu, J. *A scheduling method, device, and storage medium for scene data of natural resources*. Chinese patent CN110516119A.

RESEARCH PROJECTS

2023　　Assessing Human-perceived Window View Openness in High-rise High-density Cities: An Automatic Machine Learning-based City Information Modeling Approach, HKU Leung Kau Kui and Run Run Shaw Research and Teaching Endowment Funds, HKD 50,000, Primary Investigator.

2023-25　　From 3D Real Scene to 3D Semantics: Reconstruction of Semantic Volumetric Building Models using 3D Skeletons in Urban Point Clouds, Natural Science Fund of Guangdong Province, RMB 100,000, Co-Investigator.

2023-25　　Scan-to-BIM Automation System for Built Assets Digitization in Hong Kong, Hong Kong Innovation and Technology Fund, HKD 7,510,000, Co-Investigator.

TEACHING EXPERIENCE

2022　　Course tutor, URBP7003 Research Methods in Spatial Planning, the University of Hong Kong.

2021　　Course tutor, URBP7003 Research Methods in Spatial Planning, the University of Hong Kong.

ACADEMIC TALKS

2023   Invited talk,"HRHD-HK: A benchmark dataset of high-rise and high-density urban scenes for 3D semantic segmentation of photogrammetric point clouds." *2023 IEEE International Conference on Image Processing*. Kuala Lumpur, Malaysia. October 8.

2023   Invited talk,"CIM-WV: A 2D semantic segmentation dataset of rich window view contents in high-rise, high-density areas based on photorealistic City Information Models." *3rd Global Smart Cities Summit cum The 3rd International Conference on Urban Informatics*. Hong Kong, China. August 23.

2023   Invited talk,"Efficient assessment of window views in high-rise, high-density urban areas using 3D color city information models." *18th International Conference on Computational Urban Planning and Urban Management*. Montreal, Canada. June 21.

2023   Winner's talk,"Automatic Assessment of Window View Distance for High-rise, High-density Areas using 3D Color CIMs." *Smart Cities Innovation Competition, International Society for Urban Informatics*. Hong Kong, China. January 13. [Web]

2022   Winner's talk,"Floor layer-based kernels and pillars of points (FLKPP): 3D building model reconstruction." *2nd Workshop and Challenge on Computer Vision in the Built Environment for the Design, Construction, and Operation of Buildings, CVPR 2022*. New Orleans, USA. June 19. [Web]

2021   Invited talk,"Exposure to nature in high-rise high-density cities: bi-objective analytics of 3D visual-physical nature accessibility for landscape and urban planning." *HKU/PKU-SZ Joint Doctoral Colloquium on Smart Cities Analytics*. Shenzhen, China. November 27. [Web]

2021   Plenary talk,"CIM-enabled quantitative view assessment in architectural design and space planning." *38th International Symposium on Automation and Robotics in Construction*. Dubai, UAE. November 3. [Web]

2021   Winner's talk, "Save people from the concrete barriers: Integrated assessment of visual and physical accessibility to nature in 3D cities." *Webinar on "GIS Applications"*. City Gallery and Planning Department. Hong Kong SAR, China. August 26. [Web]

2021   Winner's talk, "Save people from the concrete barriers: Integrated assessment of visual and physical accessibility to nature in 3D cities." *Esri Young Scholars Award Ceremony*. Hong Kong SAR, China. July 20. [Web]

2021   Winner's talk, "Save people from the concrete barriers: Integrated assessment of visual and physical accessibility to nature in 3D cities." *Seminar on Spatial Analytics*. Urban Renewal Authority. Hong Kong SAR, China. June 29.

SOCIAL WORK

2020-23   Research Advisor, Residential Academic Advising System (RAAS), Lap-Chee College, the University of Hong Kong.

2020-21   Committee Member, New Urban Researchers' Seminar Series (NURSS) Organizing Committee, Department of Urban Planning and Design, the University of Hong Kong.

2020-21   Vice President, Mao Yisheng Honor's College Student Union, Southwest Jiaotong University.

MEDIA COVERAGE

2023   HKU Research Postgraduate Student Research Innovation Award, *HKU Annual Report 2023*. The University of Hong Kong. [Web]

2023   First Prize in ICUI Smart Cities Innovation Competition, *The Graduate School Newsletter*. The University of Hong Kong. [Web]

2023   Scan-to-BIM Prizes, *26th Recognition Ceremony*. CEDARS, The University of Hong Kong. [Web]

2022   Esri Young Scholars Award, *25th Recognition Ceremony*. CEDARS, The University of Hong Kong. [Web]

2021   PhD student wins young scholars award in geospatial sciences, *The Graduate School Newsletter* (Cover). The University of Hong Kong. [Web]

2021   A new angle on views, *The University of Hong Kong Bulletin*. [Web]

2021   How 3D spatial information brings people closer to nature, *Hong Kong Economic Journal*. [Web]