RUI MA

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Research Interests

An urban researcher with a PhD from the City University of Hong Kong, focusing on urban building energy modeling, geospatial data science, 3D building reconstruction, and urban microclimate analysis. Skilled in applying advanced modeling techniques to enhance the efficiency and sustainability of urban environments.

Education

City University of Hong Kong   **Hong Kong SAR, CN**
Ph.D. in Architecture and Civil Engineering   *09/2020 - 07/2024*
- Supervisors: Prof. Xin Li and Prof. Jiayu Chen (Tsinghua University)
- Ph.D. Dissertation: Urban Building Energy Modeling: A City-scale Distributed Simulation Approach

National University of Singapore   **Singapore, SG**
Visiting Scholar   *01/2024 - 07/2024*
- Supervisor: Prof. Filip Biljecki

Tongji University   **Shanghai, CN**
M.Eng. in Communication and Transportation Engineering   *09/2017 - 06/2020*
- Supervisor: Prof. Chuanzhi Geng

Inner Mongolia University   **Hohhot, CN**
B.Eng. in Civil Engineering   *09/2013 - 06/2017*
- Outstanding Graduate, GPA: 3.7/4.0

Publications (0000-0003-4153-9101)

Journal Articles:

1. <u>Rui Ma</u>, Qi Li, Botao Zhang, Hao Huang, Chendi Yang. (2024). An Ontology-driven Method for Urban Building Energy Modeling. ***Sustainable Cities and Society***, 106, 105394.

2. <u>Rui Ma</u>, Dongping Fang, Jiayu Chen, Xin Li. (2023). A Tiled Multi-city Urban Objects Dataset for City-scale Building Energy Simulation. ***Scientific Data (Nature)***, 10(1), 352.

3. <u>Rui Ma</u>, Jiayu Chen, Chendi Yang, Xin Li. (2023). OSMsc: A Novel Framework for Semantic City Modeling Using OpenStreetMap. ***International Journal of Geographical Information Science***, 38(1), 1–26.

4. <u>Rui Ma</u>, Tao Wang, Yan Wang, Jiayu Chen. (2022). Tuning Urban Microclimate: A Morpho-patch Approach for Multi-scale Building Group Energy Simulation. ***Sustainable Cities and Society***, 76, 103516.

5. <u>Rui Ma</u>, Xin Li, Jiayu Chen. (2021). An Elastic Urban Morpho-blocks (EUM) Modeling Method for Urban Building Morphological Analysis and Feature Clustering. ***Building and Environment***. 192.

6. <u>Rui Ma</u>, Bin Ren, Dong Zhao, Jiayu Chen, and Yujie Lu. (2020). Modeling Urban Energy Dynamics under Clustered Urban Heat Island Effect with Local-weather Extended Distributed Adjacency Blocks. ***Sustainable Cities and Society***, 56, 102099.

7. <u>Rui Ma</u>, Chuanzhi Geng, Zhun Yu, Jiayu Chen, Xiaowei Luo. (2019). Modeling City-scale Building Energy Dynamics through Inter-connected Distributed Adjacency Blocks. ***Energy and Buildings***, 202, 109391.

8. Chendi Yang, <u>Rui Ma</u>, Hongqiang Fang, Siu Ming Lo, Jacqueline TY Lo. (2024). Street Characteristics and Human Activities in Commercial Districts: A Clustering-based Approach Application for Shenzhen. ***Environment and Planning B: Urban Analytics and City Science***. (Online)

9. Chendi Yang, Siu Ming Lo, <u>Rui Ma</u>, Hongqiang Fang. (2024). The Effect of the Perceptible Built Environment on Pedestrians' Walking Behaviors in Commercial Districts: Evidence from Hong Kong. ***Environment and Planning B: Urban Analytics and City Science***, 51(2), 329–346.

10. Yongjun Sun, <u>Rui Ma</u>, Heuristic Optimization for Grid-interactive Net-zero Energy Building Design Through the Glowworm Swarm Algorithm. ***Energy and Buildings, 208***, 109644.

Journal Articles in Review:
1. <u>Rui Ma</u>, Chendi Yang, Jiayu Chen, Filip Biljecki, Xin Li. Reconstructing 3D Building Facade Openings: A Street View Imagery-based Enhancement Approach. (Under Review, *International Journal of Applied Earth Observation and Geoinformation*)

2. Chendi Yang, Yunjie Zhang, Siu Ming Lo, Jacqueline T. Y. Lo, <u>Rui Ma</u>*. Assessing and Predicting Commercial Attractiveness: A Machine Learning-based Block Typology Approach. (Under Review, *Computers, Environment and Urban Systems*)

3. Qi Li, <u>Rui Ma</u>, Jiayu Chen, Xiaowei Luo. Knapsack Ranking Algorithm for High-rise Building Passive Radiative Cooling Retrofit with Trigonometric Shadow Calculation Model. (Under Review, *Building Simulation*)

4. Botao Zhang, Ziyi Dai, <u>Rui Ma</u>, Tieqiao Tang, Siuming Lo. What Determines a Step: Observations from Pedestrian Movement Evaluation at Intersections with Machine Learning Methods. (Under Review, *IEEE Transactions on Intelligent Transportation Systems*)

5. Koichi Ito, Yihan Zhu, Mahmoud Abdelrahman, Xiucheng Liang, Zicheng Fan, Yujun Hou, Tianhong Zhao, <u>Rui Ma</u>, Kunihiko Fujiwara, Jiani Ouyang, Filip Biljecki. ZenSVI: An Open-Source Software for Integrated Acquisition, Processing and Analysis of Street View Imagery. (Under Review, *Computers, Environment and Urban Systems*)

Journal Articles in Prep:
1. <u>Rui Ma</u>, Zicheng Fan, Filip Biljecki. Assessing the Impact of Window-to-Wall Ratio on Urban Building Energy Modeling: Insights from Amsterdam.

Conference Papers:
1. <u>Rui Ma</u>, Chendi Yang, Xin Li. (2023). Enriching the Semantics of CityJSON Road Objects with OpenStreetMap. *GSCS & ICUI 2023*. Hong Kong SAR, China.

2. Chendi Yang, <u>Rui Ma</u>, Siu Ming Lo. (2023). Identifying the built environment factors for revitalizing the vitality of commercial districts. *GSCS & ICUI 2023*. Hong Kong SAR, China.

3. <u>Rui Ma</u>, Jiayu Chen, Chendi Yang, Xin Li. (2023). A Method for Semantic City Modeling. *CEAC 2023*. Kyoto, Japan. **(Honorable Mention)**

4. Chendi Yang, Siu Ming Lo, <u>Rui Ma</u>. (2023). Identifying the Influencing Factors for the Walkability of Business Streets Based on Urban Multi-source Data. *CEAC 2023*. Kyoto, Japan.

5. <u>Rui Ma</u>, Jiayu Chen, Xiaowei Luo. (2021). Simulating Urban Building Energy Dynamic with Inter-Building-Effects (Ibes) Linked Building Networks. *ACMR 2020*. Chongqing, China. **(Best Paper Award)**

6. <u>Rui Ma</u>, Jiayu Chen, Xiaowei Luo. (2020). Distributed Adjacent Block Modeling (DAB): A Rapid Urban Building Energy Dynamics Simulation with Urban Building Digital Model. *ASCE CRC 2020*. Tempe, USA.

7. <u>Rui Ma</u>, Chuanzhi Geng. (2019). Analysis of the Vibration Reduction Effect of the Floating Slab Track with Different Base Forms in a Small Radius Curve of Subway Lines. *CADP 2018*. Hefei, China.

Presentations

1. Reconstructing 3D Building Facade Openings with Street View Imagery. *ReLoD3 workshop jointly organized by the National University of Singapore and the Technical University of Munich*. Online. March 19, 2024.

2. Urban Building Energy Modeling. *NUS Urban Analytics Lab seminar*, Singapore. February 05, 2024.

3. OSMsc: a framework for semantic 3D city modeling using OpenStreetMap. *City University of Hong Kong - Chongqing University Exchange Conference on New Urban Infrastructure Construction and Practice*. Chongqing, China. December 15, 2023.

4. A Method for Semantic City Modeling. *The Global Smart Cities Summit cum The 3rd International Conference on Urban Informatics*. Hong Kong SAR, China. August 21, 2023.

5. Enriching the Semantics of CityJSON Road Objects with OpenStreetMap. *The 3rd International Civil Engineering and Architecture Conference*. Kyoto, Japan. March 18, 2023.

Teaching & Work Experience

City University of Hong Kong   **Hong Kong SAR, CN**

Teaching Assistant	Environmental Economics, Planning and Policy	*Fall 2023*
Teaching Assistant	Beauty of Ancient Chinese Architecture	*Spring 2023*
Teaching Assistant	Integrated Building Project Development	*Fall 2022*
Teaching Assistant	Integrated Building Project Development	*Fall 2021*
Teaching Assistant	Building Science	*Spring 2021*
Teaching Assistant	Structural Systems	*Spring 2021*

Volvo Car (Asia Pacific) Investment Holdings Co., Ltd.   **Shanghai, CN**

Data Statistics Intern	*2018*

Services

Academic Journal Peer Review

- Sustainable Cities and Society   *Reviewed 2 times, 2024*
- Applied Energy   *Reviewed 1 time, 2024*
- Environment and Planning B: Urban Analytics and City Science   *Reviewed 1 time, 2023*
- Journal of Cleaner Production   *Reviewed 1 time, 2020*

City University of Hong Kong Service

- Course Invigilator   *2020 - 2023*
- Teaching Assistant   *2020 - 2023*

- Supervising Ms. Fan Yujun, M.S. in Urban Design and Regional Planning *2021 - 2023*

Tongji University Service

- Tongji University Graduate Student Union *2017 - 2018*
- Volunteer for First World Innovation & Entrepreneurship EXPO *2018*
- Volunteer for World Artificial Intelligence Autonomous Driving Championship *2018*
- Volunteer for the 2017 World Autonomous Vehicle Ecosystem Conference *2017*

Inner Mongolia University Service

- Student Union of Department of Bridge Engineering *2014 - 2015*
- Inner Mongolia University Student Union *2013 - 2014*

Professional Society Membership

- W3C Linked Building Data Community Group *2019 - present*

Scholarships & Awards

1. City University of Hong Kong Research Tuition Scholarship (HKD $35,080). *2023*
2. City University of Hong Kong Research Tuition Scholarship (HKD $42,096). *2021*
3. Postgraduate Studentship Fully Funded by Hong Kong Government (HKD $823,968). *2020*
4. IBM Data Science Professional Certificate. *2020*
5. Best Paper Award in the 24th International Symposium on Advancement of Construction Management and Real Estate. *2019*
6. Tongji University Guanghua Scholarship (CNY ¥6,000). *2019*
7. Second Prize of the 15th China Graduate Mathematical Modelling Competition. *2018*
8. Outstanding graduate of Inner Mongolia Autonomous Region. *2017*
9. Outstanding graduate of Inner Mongolia University. *2017*
10. First Class Scholarship of Inner Mongolia University. *2017*
11. Outstanding graduate of Inner Mongolia Autonomous Region. *2016*
12. Outstanding student of Inner Mongolia University. *2015*

Travel Grants

1. CityU Research Activities Fund for visit to National University of Singapore, Singapore, SG (HKD $45,000). *2024*
2. CityU Conference Grant for Global Smart Cities Summit (GSCS 2023) cum 3rd International Conference on Urban Informatics (ICUI 2023), Hong Kong SAR, CN (HKD $10,000). *2023*
3. CityU Conference Grant for 3rd International Civil Engineering and Architecture Conference, Kyoto, JP (HKD $10,000). *2020*

Technical Skills

Languages: Chinese (native), English (fluent).

Computer Skills: Python, JavaScript, Ruby, SQL, GeoSPARQL, QGIS, Mapbox, Protégé, Rhino, OpenStudio, EnergyPlus, Grasshopper, ANSYS, ABAQUS.

References

Xin Li

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