Rong Huang

Ph.D. Candidate
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Research Focus and Vision

My research focuses on **Human-AI Interaction in Environmental Design**, intergrating Generative AI and Human-Computer Interaction methodologies in two design stages. For understanding stage, I **diagnose the misalignment** between human and GenAI, and enable targeted **adaptation strategies to enhance GenAI's capability** to perceive and reason, aligning with human-centric values. For creation stage, I **transform design intent into computational representations and design interactive systems** to integrate controllable GenAI into design workflows.

Education

2022 – now ● **Ph.D. Candidate, Computational Media and Arts** in *The Hong Kong University of Science and Technology (Guangzhou)*, supervised by Prof. Wei Zeng and Prof. Kang Zhang.
Thesis: From Understanding to Co-Creation: A Human-AI Interaction Framework for Aligning Generative AI with Environmental Design Intent.
`Human-Computer Interaction` `Generative AI`

2019 – 2022 ● **M.Eng., Architecture** in *Tongji University*, supervised by Prof. Yu Ye.
Thesis: Economic Benefit Measurement of Street Space Quality and Urban Design Guidance: Based on Multi-source Data and Machine Learning.
`Urban Data Analysis` `Data-Driven Urban Design`

2014 – 2019 ● **B.Arch., Architecture** in Hunan University, China
`Architecture Design` `Urban Design`

Research Publications

I have published 9 peer-reviewed papers at prestigious venues including *ACM CHI*, *IJHCS* and *IEEE TVCG*. **Note about venues.** In the fields of Human-Computer Interaction, ACM Conference on Human Factors in Computing Systems (*CHI*), and International Journal of Human-Computer Studies (*IJHCS*) are recognized as the very top tier venues. In the Data Visualization field, IEEE Transactions on Visualization and Computer Graphics (*IEEE TVCG*) is recognized as the top-ranked venue *(Google Scholar ranking)*.

First Author Publications

① **PlantoGraphy: Incoporating iterative design process into generative artificial intelligence for landscape rendering** in *Proceedings of ACM CHI Conference on Human Factors in Computing Systems*, 2024. 🔗 D O I: 10.1145/3613904.3642824.
Rong Huang, Hai-chuan Lin, Chuanzhang Chen, Kang Zhang, and Wei Zeng*   *(CCF-A, Citation: 51)*

② **Synthetic data generation with spatial and semantic fidelity for multimodal large language model on architectural heritage interpretation** *Revision at npj Heritage Science.* 2025.
Rong Huang, Hai-chuan Lin, and Wei Zeng*   *(SCI Q1)*

③ **Introducing ManyViews: An AI-assisted tool to support citizens' engagement in the design of urban spaces** *Minor revision at International Journal of Human-Computer Studies.* 2025.
Rong Huang, Yihan Hou, and Wei Zeng*   *(SCI Q1)*

④ **SceneWeaver: A multi-agent collaborative system for 3D scene creation in video games** in *Proceedings of the International Symposium on Visual Information Communication and Interaction*, 2025. 🔗 D O I : 10.1145/3769534.3769540.

Rong Huang, Chenxi Ruan, Bingchuan Jiang, and Wei Zeng*

Co-Author Publications

① **VISAtlas: An image-based exploration and query system for large visualization collections via neural image embedding** in *IEEE Transactions on Visualization and Computer Graphics*, vol. 30, no. 7, 2024. 🔗 D O I : 10.1109/tvcg.2022.3229023.

Yilin Ye, Rong Huang, and Wei Zeng* *(SCI Q1, Citation: 40)*

② **Is it the end? guidelines for cinematic endings in data videos** in *Proceedings of ACM CHI Conference on Human Factors in Computing Systems*, 2023. 🔗 D O I : 10.1145/3544548.3580701.

Xian Xu, Aoyu Wu, Leni Yang, Zheng Wei, Rong Huang, Yip David, and Huamin Qu* *(CCF-A, Citation: 15)*

③ **A data-informed analytical approach to human-scale greenway planning: Integrating multi-sourced urban data with machine learning algorithms** in *Urban Forestry & Urban Greening*, vol. 56, 2020. 🔗 D O I : 10.1016/j.ufug.2020.126871.

Ziyi Tang, Yu Ye, Zhidian Jiang, Chaowei Fu, Rong Huang, and Dong Yao *(SCI Q1, Citation: 87)*

④ **Unified visual comparison framework for human and AI paintings using neural embeddings and computational aesthetics** in *IEEE Computer Graphics & Applications*, vol. 45, no. 2, 2025. 🔗 D O I : 10.1109/MCG.2025.3555122.

Yilin Ye, Rong Huang, Kang Zhang, and Wei Zeng* *(SCI Q3)*

⑤ **HeritageExplorer: Interactive visualization and dialogue system for multi-modal architectural heritage exploration** in *Proceedings of the International Symposium on Visual Information Communication and Interaction*, 2025.

Yusong Wang, Yihan Hou, Rong Huang, and Wei Zeng*

Research Projects

2025.01 – 2027.12   ● **Guangxi Key Research and Development Program:** "Key Technologies for Trustworthy Intelligent Integration of Guangxi Traditional Architecture Based on Multimodal Data" (PI: Prof. Wei Zeng)

Funding: ¥600K out of ¥1.5M.

Role: Project Coordinator

- Contribute to the grant proposal, defining the core technical roadmap and the project timeline.
- Lead and manage the research team, and responsible for the core technical development and key research outputs.
- Prepare progress reports and technical documentation.

| 2020.01 – 2022.06 | • **National Natural Science Foundation of China:** "Measuring public space quality: An evaluation model and its design support based on multi-sourced urban data and deep learning algorithms" (PI: Prof. Yu Ye)
Role: Student Researcher |

- Multi-sourced urban dataset construction using Python and GIS.
- Statistical analyses to support the development of the evaluation model.

2020.01 – 2021.12 • **National Natural Science Foundation of China:** "Walkability of street interfaces: A fine-scale measurement and design control methods" (Case study: Shenzhen) (PI: Prof. Yu Ye)
Role: Student Researcher
- Performed data statistical analysis using Python.
- Managed the visualization and layout of research findings for publication.

Work Experience

2019 – 2022 • **Research Assistant,** the Computational Urban Design Research Centre (PI: Dr. Yu Ye), Joint Laboratory for International Cooperatuon on Eco-Urban Design (Tongji University), Ministry of Education, China.

2021.06 – 2021.09 • **Urban Design Intern,** Skidmore, Owings & Merrill LLP (SOM), Urban Design Department, Shanghai Office, China.

2018.06 – 2018.09 • **Architecture Design Intern,** URBANUS architecture and urban design practice, Shenzhen Office, China.

Awards

2019.12 • **First Prize,** Shanghai Urban Design Challenge (award ¥100K about $14,000). The best team among 105 teams from different countries.

2016.06 • **Research Prize,** Architecture and Urban Design: Case Study House in USA (award ¥20K about $3,000). Only the top 1% students were prized among 500 peers.

Skills

Design Tools • Interactive Prototyping (Figma), 3D Modeling & Animation (Rhino, SketchUp, Cinema4D, Unity, Unreal Engine), Adobe Suites

Analysis & Programming • Python, ArcGIS, SPSS, P5.js, PyTorch

HCI Methods • User-Centered Design, Qualitative Methods (Thematic Analysis, Interviews), Quantitative Methods (Statistical Analysis), Prototyping

Languages • Mandarin (Native), English (Professional Proficiency), Cantonese, Hakka