Changda Ma

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Research Interests: Urban Health System, Urban Risk Management System, Music Perception, Spatial Sound, Circular Economy

EDUCATION

Georgia Institute of Technology. The US
Master of Science in Architecture(High Performance Building) 08/2024-05/2025

Georgia Institute of Technology. The US
Master of Architecture 08/2022-05/2024

Guizhou University. China
Bachelor of Architecture 09/2017-07/2022

PUBLICATION

Ma, C.(2025). **Establishing a Fire Risk Map Based on Planned Spatial Layouts and Environment in Rural Planning: A Case Study of a Stereotype Village in China** In Proceedings of 27th International Conference on Human-Computer Interaction (HCI International 2025). **(Under Review)**

Wang, C., Shi, Y., **Ma, C**., & Xu, H. (2025). **Reimagining Chinese Garden Design: An Interactive Approach Using Stable Diffusion**. Under review for The Association for Computer-Aided Architectural Design Research in Asia (CAADRIA) 2025.**(Under Review)**

Shi, Y., **Ma, C.**, Wang, C., Wu, T., & Jiang, X. (2024). **Harmonizing Emotions: An AI-Driven Sound Therapy System Design for Enhancing Mental Health of Older Adults**. In H. Degen & S. Ntoa (Eds.), Artificial Intelligence in HCI (pp. 439–455). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-60615-1_30 **(Published)(Cited by 15, Google Scholar)**

Shi, Y., **Ma, C**., Mamoli, M.(2023). **A Study on Shape Grammar-based Creating Methods and Generative Design of Cellular Bracket on Dong Drum Towers.** In Proceedings of 2024 Academic Conference of Computational Design Professional Committee of the Architectural Society of China. **(Published)**

RESEARCH EXPERIENCE

Neuroarchitecture: Urban Built Environments' Impact on Mental Health – A Systematic Literature Review Atlanta, The US

Researcher|Advisor: Prof. Patrick Kastner and Prof. Shalaila S. Haas 08/2024-12/2024

- Learned how to write the structure and content of a systematic literature review, and study systematic literature reviews that have been published in journals.
- Identified selected terms for the study; searched for papers using appropriate boolean formulas in various databases and imported into Covidence(Systematic Review Tool);
- Screened titles and abstracts, developed eligibility criteria, screened full-texts, and drafted data extraction
- Drafted the Introduction and method part of paper

Data-Driven Fire Risk Mapping in Rural Planning: A Case Study of Stereotype Villages Atlanta, The US

Researcher|Advisor: Prof. Patrick Kastner 01/2024-05/2024

- Reviewed literature related to urban or suburban fire risk management, found there are two research gaps: i. Only research on a single factor to manage fire risk in an area, without considering the impact of the interaction of different factors; ii. more research on building materials and emergency infrastructure to assess fire, but not in a data-driven way through the microclimate, topography, and spatial layout of the area.
- Used the plugin “urbano” in Grasshopper to simulate the spatial layout of the village investigated, divided into 100 cells; utilizing the spatial syntax plugin “decoding space” in Grasshopper to simulate the visibility of houses to evacuation routes. Combined the length of the evacuation route with the area of the visual field gives the coefficients of fire assessed by spatial layout.
- Studyed the CFD-based grasshopper plug-ins “Butterfly” and “Eddy3D” to simulate the wind environment in the area; analyzing the terrain slope using the plug-in ladybug; and collecting “Monthly Mean Precipitation Probability” data for the study area.
- Researched “BehavePlus 5.0” (fire calculation software)to calculate Wind adjustment factors (WAF), mid-flame wind speeds, flame lengths, and maximum surface fire spread rates.Based on this data, obtained the coefficients of fire assessed by environmental factors.
- Combined the coefficients of fire assessed by spatial layout and evironment to get the fire risk map simulated the fire risk management.

Sound Therapy System Design for Enhancing Mental Health of Older Adults Atlanta, The US

Researcher|Advisor: Dr. Yousef 08/2023-12/2023

- Collected evidence from global reports and studies to assess the emotional well-being of elderly during the COVID-19 pandemic.
- Developed different types of songs and using “mirtoolbox” in MATLAB to analyze the brightness, flatness, centroid, and spread of high-mid and low-mid, pulse strength and rhythmic clarity as well as novelty. Through the theoretical models of arousal and valence, connecting the obtained music feature data to the theoretical models
- Participated in setting up an Arduino-based setup for precise HRV measurement and incorporated strategies to minimize error and noise.
- Designed the UI of the Sound Therapy robot and the guardian mobile app.

Generative Design and Shape Grammar for Honeycomb Arches in Dong Drum Towers Atlanta, The US

Researcher|Advisor: Dr. Myrsini Mamoli 01/2023-05/2023

- Research on the ethnic culture of the Dong people in China and the architectural characteristics of the Dong drum towers
- Based on the mathematical characteristics of the different types of “Baoding” on the Dong drum towers, different “Baodings” were drawn using shape machine, which optimize shape grammar in Rhino.
- Research on the Future Potential of Digital Heritage for Dong Drum Towers through Shape Grammar

PROFESSIONAL EXPERIENCE

Graduate Teaching Assistant Of Georgia Tech — Atlanta, The US

M.Arch Required Course *"Media Modelling II"* Fall 2024 Teaching Assistant — 08/2024-12/2024

- Evaluated the assignment on "Mathematical Surfaces + 3D Attractor" and "Building System".
- Developed tutorials for "Enscape for Rhino" and "How to install grasshopper toolkit"
- Managed daily attendance and solve students' problems on grasshopper.(44 students across two teaching sections)

Lab Research Assistant Of Georgia Tech — Atlanta, The US

I2CE Lab Research Assistant led by Prof. Rocker — 05/2024-07/2024

- Conducted 3D modeling and created layouts and sections for the Georgia Tech Art Square Urban Design Study
- Calculated areas (sqft) for various types and floor layouts.

Graduate Teaching Assistant Of Georgia Tech — Atlanta, The US

M.Arch Required Course *"Integrated Building Systems II"* Spring 2024 Teaching Assistant — 01/2024-05/2024

- Conducted tutorials and provided guidance on Revit and Rhino, focusing on collaborative workflows.
- Assisted in identifying structural and construction-related issues.
- Organized and maintained weekly sign-up sheets for group reviews, overseeing 23 students across 6 groups.
- Created instructional content on "How to Collaborate in Teams in Revit", enhancing students' technical skills.

Atelier Global Limited — Hong Kong

Architecture Internship — 06/2023-08/2023

- Developed design schemes, 3D models, and reports for the Qingdao Zhongshan Road No.78 Renovation Project.
- Created interior renderings for the Zhengzhou East Railway Station.
- Contributed to exhibition modeling for Atelier Global Limited showcases.

Galaxy Global International LLC — Atlanta, The US

Packaging Designer Internship — 05/2023-06/2023

- Designed packaging for prepared dishes, seafood, and frozen products.

Survey and Design Research Institute of Guizhou University — Guiyang, China

Old Town Renewal Internship — 03/2022-06/2022

- Conducted on-site investigations in Yunyan District, Guiyang City, including surveying, documentation, and stakeholder communication.
- Designed and detailed plans for facade rehabilitation and roofing replacements of existing buildings.
- Created Rhino models for integrated building design and analyzed the role of public spaces in old towns.

SOFTWARE SKILLS

Design & Modeling	Rhinoceros (master), Sketchup (master), AutoCAD (master), Revit (master)
Visualization & Representation	Adobe Suit(Photoshop (master), Illustrator (master), Indesign (master)), TouchDesigner (Medium)
	V-ray(master), Enscape (master), Lumion (medium), Keyshot (medium)
Parametric Design	Grasshopper (master), Processing (mideum), P5.js (mideum)
Programming Language	C/C++(medium), Python(master), Java(medium), Javascript (master), R(medium)
Office	Word (master), Excel (master), Power Point (master)
AI Tools	Midjourney(Medium), Stable Diffusion(Master)
Game & Animation	Unity(Master), Blender(Master)
Audio Production & Sound Design	Ableton Live (Master), FL Studio (Master), Max/MSP/Jitter (Medium)
Hardware & Prototyping	Arduino (Medium)
UI/UX Design	Figma (Master)
GIS & Spatial Analysis	ArcGIS Pro (Master), Arcgis Online(Medium), Arcgis Storymap(Medium)

LANGUAGE&INTEREST

Language	Mandarin(Native), English(Fluent)
Interest	Guitar, Electric Piano, Drum, Singing, Basketball