Xiaoyue Yan

SMArchs Candidate | Department of Architecture | Massachusetts Institute of Technology
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EDUCATION

Massachusetts Institute of Technology Cambridge, USA
Master of Science in Architecture Studies, Building Technology - SMArchS BT 2027 (expected)
- GPA: 5.00/5.00.
- Thesis: *Designing for Healthy Living: Linking Thermal Environments, Occupant Behavior, and Sleep*
- Advisor: Holly W. Samuelson; Committee member: Christoph Reinhart

Tsinghua University Beijing, China
Master of Architecture - MArch 2025
- GPA: 3.96/4.00; Rank: 8/119.
- Thesis: *Performance-Oriented Design Decision Support and Spatial Optimization: A Case Study of Jinan Science Museum*
- Advisor: Weimin Zhuang

Bachelor of Architecture - BArch 2023
- GPA: 3.94/4.00; Rank: 1/103.
- Thesis: *Design Research on an Interactive Future Industrial Training Center Based on Place Theory*
- Advisor: Nianxiong Liu

RESEARCH INTERESTS

- **Environmental exposure, human behavior, and well-being.** Investigating how indoor and urban environments shape human behavior, comfort, and health through empirical and data-driven approaches.
- **Human behavior, energy performance, and climate resilience.** Developing behavior-informed energy models and design strategies to improve energy performance and climate resilience across building and urban scales.
- **AI-driven systems and human–environment interaction.** Integrating artificial intelligence, smart sensing, and interactive technologies to develop adaptive environmental systems that support human well-being and energy efficiency.

RESEARCH EXPERIENCE

Livable Spaces Lab (LivLab), Building Technology, Department of Architecture, MIT Cambridge, USA
Research Assistant, advised by Prof. Holly W. Samuelson 08/2025–Present
- Older adults' thermal exposure and health — Investigated associations between thermal exposure, adaptive behavior, and sleep outcomes through field measurements and wearable data among older adults. Published papers at *Indoor Air 2026* (confernece) and *Building Simulation* (journal).
- Urban heat and bike-sharing mobility — Analyzed associations between urban heat exposure and NYC bike-sharing behavior by high-resolution land surface temperature recontruction. Produced conference and journal papers; named Geospatial Data Visualization Contest Winner.
- Performance-driven window design — Developed simulation-based window design optimization framework for energy efficiency, daylighting, and view quality, and built an interactive design exploration tool. Contributed to the *ECC Venice 2027 exhibition* and published a conference paper at *ASHRAE Winter Conference 2027*.

Key Laboratory of Eco-planning & Green Building, Tsinghua University, Ministry of Education Beijing, China
Research Assistant, advised by Prof. Weimin Zhuang and Prof. Borong Lin 08/2023–06/2025
- AI-powered green building knowledge platform — Developed an LLM-based multimodal reasoning framework to support knowledge-based question answering and design decision. Published a conference paper at *ACADIA 2024*.
- Performance-driven architectural design — Contributed to a real-world architectural project through design development and simulation-driven optimization of energy efficiency, thermal comfort, and daylighting. Published a conference paper at *Building Simulation 2025*.

Tongyuan Lighting Lab, School of Architecture, Tsinghua University Beijing, China
Research Assistant, advised by Prof. Xin Zhang 09/2023–04/2024

· Residential green space optimization — Developed a multi-objective optimization framework for the design of green spaces between residential buildings, balancing outdoor thermal comfort, indoor daylighting, and green view. Published a journal paper at *Sustainable Cities and Society*.

PUBLICATIONS

Under Review

[U2] **When the city heats up: Shifting bike-sharing patterns in New York City**
Xiaoyue Yan, Guiheng Si, Yuxiao Wang, Holly Samuelson
Submitted to *Sustainable Cities and Society*

[U1] **How the fine-grained distribution of daily living facilities relates to residents' active travel in gated communities: Evidence from three Chinese cities**
Guiheng Si, **Xiaoyue Yan**, Weimin Zhuang, Ye Zhang
Submitted to *Travel Behaviour and Society*

Journal Papers (Peer-Reviewed)

[J2] **Nighttime air-conditioning use and sleep outcomes in older adults**
Xiaoyue Yan, Charu Srivastava, Amir Baniassadi, Peyton Berning, Megan Vain, Holly Samuelson
Building Simulation, 2027

[J1] **A multi-objective optimization framework for designing residential green space between buildings considering outdoor thermal comfort, indoor daylight and green view index**
Yuxiao Wang, **Xiaoyue Yan**, Xin Zhang, Di Zhang
Sustainable Cities and Society, 2025

Conference Papers (Peer-Reviewed)

[C8] **Personalized window design for visual preference, energy, and daylight**
Xiaoyue Yan, Holly Samuelson
ASHRAE Winter Conference, 2027

[C7] **Decarbonization and thermal resilience in community retrofit planning: a multi-objective urban building energy modeling framework**
Xiaoyue Yan, Nada Tarkhan, Christoph Reinhart, Holly Samuelson
The 6th Asian Conference of the International Building Performance Simulation Association (ASim), 2026

[C6] **Thermal adaptation for improving sleep in older adults: environmental and behavioral drivers on summer nights**
Xiaoyue Yan, Charu Srivastava, Peyton Berning, Megan Vain, Amir Baniassadi, Holly Samuelson
The 19th International Conference of the International Society of Indoor Air Quality and Climate (Indoor Air), 2026

[C5] **Multi-objective optimization of energy, thermal comfort and daylighting for exhibition building design based on a spatial archetype**
Xiaoyue Yan, Yuxiao Wang, Weimin Zhuang
Building Simulation 2025: 19th Conference of IBPSA, 2025

[C4] **Modeling the joint effects of thermal comfort, built environment, and socio-demographics on active mobility: a data-driven approach**
Xiaoyue Yan, Timur Dogan, Yang Yang
2025 Annual Modeling and Simulation Conference (ANNSIM), 2025

[C3] **Question answering for decisionmaking in green building design: a multimodal data reasoning method driven by large language models**
Yihui Li*, **Xiaoyue Yan***, Hao Zhou, Borong Lin
The 44th Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA), 2024

[C2] **A multi-objective optimization framework for designing green space between buildings considering indoor visual environment quality**
Yuxiao Wang, **Xiaoyue Yan**, Xin Zhang
The 15th Asia Lighting Conference (ALC), 2024 — *Student Best Paper*

[C1] **Enhancing spatial configurations in informal learning spaces: an early-phase design decision-making framework**
Song Guo, Weimin Zhuang, **Xiaoyue Yan**
2024 Annual Modeling and Simulation Conference (ANNSIM), 2024

PROFESSIONAL EXPERIENCE

Architectural Design and Research Institute, Tsinghua University Beijing, China
Design Team Member, Academician Weimin Zhuang Studio 11/2023–05/2024
· Contributed to real-world architectural projects through design development and performance-driven optimization.

Aedas Shanghai, China
Intern Architect 05/2023–08/2023
· Developed conceptual design for large-scale commercial projects, integrating generative AI tools into design workflows.

Shao Weiping Studio, Beijing Institute of Architectural Design Beijing, China
Intern Architect 06/2022–08/2022
· Developed conceptual designs for large-scale commercial projects, leveraging parametric design to improve design efficiency.

POSITION OF RESPONSIBILITY

Academic Services
· Peer reviewer, Building Simulation 2027
· Peer reviewer, The 32nd Conference on Computer-Aided Architectural Design Research in Asia (CAADRIA 2027)
· Peer reviewer, The 46th Conference of the Association for Computer Aided Design in Architecture (ACADIA 2026)

Memberships
· American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
· International Society of Indoor Air Quality and Climate (ISIAQ)
· Northeast Sustainable Energy Association (NESEA)

Leaderships
· Team Leader, Oversea Practica North America Team, School of Architecture, Tsinghua University
· President of The 29th Student Association, School of Architecture, Tsinghua University

FELLOWSHIPS AND AWARDS

Fellowships and Grants
· ASHRAE Graduate Student Grant-in-Aid Award (12k USD) 2026
· President's Graduate Fellowship, National University of Singapore (top 0.2%) 2025
· Comprehensive Excellence Scholarship, Tsinghua University (two-time recipient; top 1%) 2021, 2022
· China National Scholarship (top 0.2%) 2020

Honors and Awards
· ASHRAE Herman and Dorothy Behls Travel Award (1.5k USD) 2026
· S. Klein Prize for Technical Writing, MIT Writing and Communications Center 2026
· Geospatial Data Visualization Contest Graduate Winner, MIT Libraries 2026
· Student Travel Award, International Society of Indoor Air Quality and Climate (ISIAQ, 1k USD) 2026
· Student Travel Award, International Building Performance Simulation Association (IBPSA, 1k USD) 2025
· Outstanding Graduate of Beijing (top 0.2%) 2025
· Outstanding Graduate of Tsinghua University (top 1%) 2025
· Outstanding Undergraduate of Tsinghua University (top 1%) 2023
· Outstanding Student Cadre of Tsinghua University (top honor of social work) 2022
· Social Work Excellence Award, Tsinghua University (three-time recipient) 2020, 2021, 2022