

Stella Zhujing Zhang

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RESEARCH AND TEACHING INTERESTS

My research interests focus on drawing inspiration from natural phenomena to inform design approaches that shape spatial experience and promote human well-being within the built environment. My doctoral work examines how shading systems informed by natural foliage dynamics can modulate light and view filtering to enhance human perceptual and physiological responses. Through design experimentation, virtual reality simulations, human-subject studies, and data analysis, this work contributes empirical insights into how nature-inspired architectural interventions shape human experience and well-being. My teaching interests include design that fosters connections between people and nature, environmental comfort, and sensory experience in architecture.

EDUCATION

PhD in Civil and Environmental Engineering (expected Dec 2026) 09/2022 – Present

École Polytechnique Fédérale de Lausanne (EPFL) | Lausanne, Switzerland

Advisor: Prof. Marilyne Andersen

Thesis: *From Komorebi to Shading: View and Light Patterns Through Shading Systems with Spatial and Temporal Dynamics*

Master of Science in Building Technology

09/2020 – 05/2022

Massachusetts Institute of Technology (MIT) | Cambridge, MA, USA

Advisor: Prof. Les Norford

Thesis: *Mitigating Peak Load and Heat Stress under Heat Waves by Scheduling Cooling and Energy Storage Systems*

Master of Architecture

09/2016 – 02/2020

Massachusetts Institute of Technology (MIT) | Cambridge, MA, USA

Thesis: *Komorebi: Embedding Dappled Sunlight in the Built Environment*

Bachelor of Science in Architecture

09/2011 – 04/2015

University of Michigan | Ann Arbor, MI, USA

Thesis: *A Land of Possibilities*

Wallenberg Thesis Award – Honorable Mention; University Honor

RESEARCH EXPERIENCE

PhD Researcher

09/2022 – Present

EPFL Laboratory of Integrated Performance in Design (LIPID) | Lausanne, Switzerland

- Developing spatio-temporal metrics for Komorebi light patterns and exploring their relation to human responses.
- Investigating shading systems for view filtering and indoor well-being.

Graduate Research Assistant

09/2020 – 08/2022

MIT School of Architecture and Planning | Cambridge, MA, USA

- Researched neighborhood peak load and thermal comfort optimization.
- Developed machine learning models as surrogates for physics-based simulations.

Research Exchange

Summer 2019

University of Fribourg | Fribourg, Switzerland

- Investigated plant-inspired origami through observation of leaves and buds, translating natural folding principles into architectural prototypes.

Design Research Residency

Summer 2017

Les Écoles d'art américaines de Fontainebleau | Fontainebleau, France

- Developed installations exploring multi-sensory human-environment interactions through the integration of spatial, sonic, and performative design.

Research Assistant

06/2014 – 05/2015

University of Michigan | Ann Arbor, MI, USA

- Developed robotic manipulation methods for fabric-formed architectural modeling.

PROFESSIONAL EXPERIENCE

Architect

2015 – 2016

Myefski Architects | Evanston, IL, USA

- Contributed to residential and commercial design development.

PUBLICATIONS

Journals.....

Zhang, Z. and Andersen, M. "A Review of the Effectiveness of Metrics for Assessing Human Responses to Biophilic Environments Involving Views, Shading, and Interior Design Elements." *Journal of Environmental Psychology*, 2025. <https://doi.org/10.1016/j.jenvp.2025.102669>

Zhang, Z., Kircher, K.J., Cai, Y., Brearley, J.G., Birge, D.P., and Norford, L.K. "Mitigating peak load and heat stress under heatwaves by optimizing adjustments of fan speed and thermostat setpoint." *Journal of Building Performance Simulation*, 2023. <https://doi.org/10.1080/19401493.2023.2180538>

Birge, D.P., Brearley, J., **Zhang, Z.**, and Norford, L.K. "Design of heat-resilient housing in hot-arid regions." *Energy and Buildings*, 2025. <https://doi.org/10.1016/j.enbuild.2024.111198>

Conference Papers.....

Zhang, Z. and Andersen, M. "Exploring the benefits of Komorebi light patterns: A pilot study." *Journal of Physics: Conference Series*, 3140 (2025) 122013. <https://doi.org/10.1088/1742-6596/3140/12/122013>

Zhang, Z. and Andersen, M. "Spatio-temporal dynamics of Komorebi light patterns." *CIE International Conference*, 2025.

Daubmann, K.M., Foley, R., Reed, Q., and **Zhang, Z.** "RoboPinch – Robotic Manipulation of Fabric Formwork for the Creation of Plaster Architectural Models." *IASS Symposium*, 2015.

EXHIBITIONS

Lighten Up! On Biology and Time — *Circa Diem*

2023-2024

EPFL Pavilions / Lausanne, Switzerland

- Contributed to the ideation and capture of light-environment scenes projected within the immersive chamber.

Research Through Making Exhibition — *RoboPinch*

2015

Taubman College Liberty Research Annex, University of Michigan / Ann Arbor, MI

- Contributed to design development, robotic fabrication, and installation of the exhibition display.

TEACHING & CRITIQUE

Semester-long Workshop Instructor

Fall 2025

ENAC Semester Project: Tree Canopy to Architecture: Collective Design of Nature-Inspired Shading Systems | Lausanne, Switzerland

- Supervised four architecture students in developing kinetic shading prototypes inspired by natural foliage dynamics, using VR, physical modeling, and iterative peer feedback cycles.

Teaching Assistant

Fall 2022 – 2025

EPFL AR-442: Comfort and Architecture: Sustainable Strategies | Lausanne, Switzerland

- Delivered lectures and tutorials on architectural performance and environmental design principles, including Climate Studio simulations.

Invited Lecturer

Spring 2022

MIT 4.421: Space-Conditioning Systems for Low-Carbon Buildings | Cambridge, MA, USA

- Delivered a lecture on building energy and performance simulation with EnergyPlus, eppy, and Geomeppy scripting workflows.

Invited Critic

Fall 2022

MIT D-Lab: Building Technology Laboratory (4.411J/4.412/EC.713J) | Cambridge, MA, USA

- Critiqued student designs for an education center in Sierra Leone, focusing on performance-driven architecture.

HONORS AND AWARDS

Merit-Based Scholarship

09/2016 – 02/2020

MIT School of Architecture and Planning

- Covered half of tuition for the entire duration of study; awarded to outstanding incoming M.Arch students at MIT.

First Design Prize

Summer 2018

MIT–Wang Shu Design and Build Workshop

- Awarded first place by Pritzker Prize laureate Wang Shu for a bamboo pavilion design employing vernacular materials and techniques in a team of four.

Design Research Fellowship

Summer 2017

Les Écoles d'art américaines de Fontainebleau

- Fully funded summer design research residency.

Wallenberg Thesis Award – Honorable Mention

2015

University of Michigan

- Received Honorable Mention as one of five finalists from the whole class of approximately seventy architecture undergraduates for an outstanding thesis at the Taubman College of Architecture and Urban Planning.

University Honor

2012 – 2015

University of Michigan

- Awarded to top-performing undergraduate students for academic excellence.

PROFESSIONAL SERVICE

Reviewer

2025

Journal of Environmental Psychology

Reviewer

2025

Journal of Lighting Research and Technology

KEY SKILLS

Research: Building performance simulation (EnergyPlus, Climate Studio), human-subject studies, virtual reality experimentation, machine learning, statistical data analysis, image processing, and optimization

Design: Parametric and computational design (Rhino, Grasshopper), digital fabrication, physical prototyping, and visual communication (Adobe Creative Suite)

REFERENCES

Prof. Marilyne Andersen

Full Professor of Sustainable Construction Technologies, École Polytechnique Fédérale de Lausanne (EPFL)

Director General, GESDA Foundation (Geneva Science and Diplomacy Anticipator)

Ph.D. Thesis Advisor

marilyne.andersen@epfl.ch

Prof. Les Norford

Professor, Massachusetts Institute of Technology (MIT)

Master's Thesis Advisor

lnorford@mit.edu

Prof. Terry Knight

Professor of Design and Computation, Massachusetts Institute of Technology (MIT)

M.Arch Thesis Committee

tknight@mit.edu

Prof. Yolande Daniels

Associate Professor of Architecture and Urbanism, Massachusetts Institute of Technology (MIT)

Studio Instructor

jyd@mit.edu