Stella Zhujing Zhang

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RESEARCH AND TEACHING INTERESTS

My research explores the intersection of nature-inspired design, light, view quality, and human responses to the built environment. My doctoral work examines how shading systems informed by natural foliage dynamics can modulate light and view filtering to enhance human well-being. This research integrates virtual reality experiments, human-subject studies, and data analysis to assess perceptual and physiological responses. 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   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
- Explored the intersection of architecture, music, and performance, and designed installations with musician fellows that merged spatial design with musical composition.

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." *CISBAT International Conference*, 2025.

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.

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

Research: Light simulation, EnergyPlus, Climate Studio, Machine learning, Statistical analysis, Image processing, Optimization, Human response assessment

Design: Rhino, Grasshopper, Digital fabrication, Adobe Creative Suite, Physical prototyping, Parametric design

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