# Amber Jiayu Su

Cornell University, Ithaca, NY | js3498@cornell.edu
ResearchGate | GitHub | Personal Website

## EDUCATION

2020 - 2025

### Cornell University

Bachelor of Architecture, Minor in Computer Science (GPA 4.067/4.3)

- Selected Courses: Environmental Systems, Special Investigations in Environmental Systems, Energy Seminar, Building Technology, Structure, Algorithm Analysis, Computer Systems, Machine Learning, Object-Oriented Programming and Data Structure, Functional Programming, Linear Algebra, Probability, Data Visualization, Human Computer Interaction

## WORK + RESEARCH

### Cornell Environmental Systems Lab - Researcher

2022 - Present

**Urabn Building Facade Reconstruction**

*Project Lead | Advisor: Prof. Timur Dogan | Team Member: Ann Ren, Curtis Xu, Tony Liu*

- Leading the development of an automated workflow for window detection and façade reconstruction using 3D photogrammetry models (Google 3D Tiles). Building a geometry pre-processing pipeline to extract texture maps with isolated individual façade information. Fine-tuning pre-trained semantic segmentation models and developing a post-optimization approach utilizing signal processing for window pattern recognition and large-scale vision models for segmentation enhancement.

2023 - Present

**Urban Building Energy Modeling Tool Development**

*Advisor: Prof. Timur Dogan*

- Developed a data processing framework in C# to handle, process, and standardize urban data in diverse and complex formats into GeoJSON input file for UBEM.
- Created a package to extract system, internal loads, and construction information from EnergyPlus input files to serve as UBEM archetypes.
- Designing and implementing geometric data structures and processing infrastructure for high-level-of-detail (LOD) building representations.

2024 - Present

**Urban Building Sunlit Area Calculation**

*Advisor: Prof. Timur Dogan*

- Developing methods for urban-scale building sunlit area fraction calculation using pixel-counting algorithm, integrating temporal vegetation effects for calculation using LiDAR data and transparency schedule design.

### KPF - Environmental Performance Analyst and Researcher

2024.6 - 2024.8

**Early Stage Building Energy Modeling Optimization**

*Advisor: Dr. Carlos Cerezo Davila*

- Automated and optimized early-stage energy modeling by developing workflows in Grasshopper for building geometry processing (including thermal zone separation, window and shading generation). Defined space loads and construction templates, and created a visualization pipeline.

2023.6 - 2023.8

**Static and Dynamic Thermal Comfort Modeling Development and Optimization**

*Advisor: Dr. Carlos Cerezo Davila | Collaborator: Remy Mermelstein, Christina Brown*

- Optimized workflow for thermal comfort analysis with radiation and CFD wind simulation integration.
- Conducted research on dynamic thermal comfort analysis in transient conditions and implemented a two-node thermoregulatory and dynamic thermal sensation model in Grasshopper for enhanced thermal comfort assessment.

### Cornell Ecological Action Lab - Research and Fabrication Assistant

2022.6 - 2022.8

**Friendship WC - Installation at Tallinn Architecture Biennial**

*Project Lead: Freddo Daneshvaran | Team: Kate Heath, Zhisui Ren, and Amber Su*

- Contributed to the design and fabrication of The Friendship WC (Water Chandelier) for the Tallinn Architecture Biennial. Focused on parametric design using Grasshopper and assisted in digital fabrication processes, including CNC machining, 3D printing, and metal casting.

## PUBLICATIONS

2024 **Su, A. J.**, Brown, C. X., Mermelstein, R., & Cerezo Davila, C. (2024). Early Design Thermal Comfort Modeling in Transient Conditions for Warming Hot Climates. *Proceedings of SimBuild Conference 2024.*

2024 Dogan, T., Kastner, P., Tseng, H. M., **Su, A. J.**, & Xu, K. C. (2024). Impact and Cost Analysis of Thermal Load Electrification Measures using Automated Urban Building Energy Modeling in Ithaca, NY. *Proceedings of SimBuild Conference 2024.*

2023 **Su A. J.**, Xu K., Ren A., Liu T., Dogan T. (2023). Facade Scanner: A Scalable Workflow for Building Geometry and Window-to-Wall Ratio Capture for Urban Building Energy Modeling. *Proceedings of Building Simulation 2023: 18th Conference of IBPSA.*

Manuscript In Progress **Su A. J.**, Ren A., Xu K., Dogan T. (Manuscript in Progress) Automated Workflow for Urban Scale Building Facade Reconstruction

## PRESENTATIONS + TALKS

2024 **Su, A. J.**, Mermelstein, R. "Early Design Thermal Comfort Modeling in Transient Conditions for Warming Hot Climates." Presentation at IBPSA-USA SimBuild 2024 Conference, Denver, USA

2024 **Su, A. J.**, Tseng, H. M., & Xu, K. C. "Impact and Cost Analysis of Thermal Load Electrification Measures using Automated Urban Building Energy Modeling in Ithaca, NY." Presentation at IBPSA-USA SimBuild 2024 Conference, Denver, USA

2023 **Su A. J.** "Facade Scanner: A Scalable Workflow for Building Geometry and Window-to-Wall Ratio Capture for Urban Building Energy Modeling." Presentation at Building Simulation 2023, Shanghai, China

## AWARDS

2020 - 2024 Cornell Dean's List

2024 IBPSA-USA SimBuild 2024 Scholarship

2024 BigRed Hacks 2024 People's Choice

2023 Cornell AAP The Addison G. Crowley, B.Arch'38 Prize

2022 Modular Home Design Challenge Honorable Mention

2021 Cornell AAP Baird Prize

## SKILLS

**Programming** C, C# (.Net Framework), Java, OCaml, HTML / CSS /Javascript (d3.js, next.js), MangoDB, SQL, git
Python (PyTorch, TensorFlow, scikit-learn, NumPy, Pandas, SciPy, OpenCV)

**Environmental Simulation** EnergyPlus, Climate Studio, Ladybug / Honeybee / Butterfly, HT Flux
CFD Simulation (Eddy3D, SimScale)

**3D Modeling** Rhino, Grasshopper, Revit, AutoCAD, SketchUp, Blender, Cinema4D

**Visualization** VRay, Enscape, Unity, Unreal Engine, Adobe Creative Suite (PS, AI, ID, AE, PR), Figma, PowerBI, Tableau

**Fabrication** Laser Cutting, 3D Printing, CNC, Woodworking, Metalworking, Molding / Casting

## ACTIVITIES

2024 **AEC Tech Hack**

Designed and implemented a 3D scanning-based web platform for qualitatively assessing indoor environments and real estate value. Responsibilities included the parametric reconstruction of 3d models from semantically segmented point-cloud data through computer vision based approach.

2024 **Big Red Hack**

Developed a collaborative Pomodoro timer web app enabling users to stay productive together. The app features group rooms with a Pomodoro timer, to-do list, task feed, and break-time chat. Responsible for front-end and back-end development of the to-do list and task feed.