Amber Jiayu Su

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EDUCATION

2020 - 2025 **Cornell University**

Bachelor of Architecture, Minor in Computer Science (GPA 4.0/4.3)

- Selected Courses: Environmental Systems, Special Investigations in Environmental Systems, Energy Seminar, Building Technology, Strucure, 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 - Research Assistant

2022 - Present **Building Window Detection & Facade Reconstruction Automation**

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

- 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. Training a custom machine learning model and developing a post-optimization approach utilizing signal processing for window pattern recognition and large-scale vision models for segmentation enhacement.

2023 - Present **Urban Building Energy Modeling Tool Development**

Advisor: Prof. Timur Dogan

- Developing a data processing framework in C# to handle, process, and standardize urban data in diverse and complex formats into standardized input file for UBEM.
- Synthesizing space loads and construction templates from DOE prototype and reference buildings as UBEM archetypes.
- Designing and developing core geometrical data structures and infrastructure for UBEM tool development. Responsibilities include program structure architecture, and the creation of geometrical processing algorithms, such as meshing and triangulation.

2024 - Present **Urban Building Sunlit Area Calculation**

- 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.

KPF - Environmental Performance Analysis 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 - 2024.5 **Static and Dynamic Thermal Comfort Modeling Development and Optimization**

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

- Optimizing workflow for thermal comfort analysis with radiation and CFD wind simulation integration.
- Researching dynamic thermal comfort analysis in transient conditions, and implemented a 2-node thermoregulatory and dynamic thermal sensation model for thermal comfort analysis in transient condition in Grasshopper.

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

- Assisted in the design and fabrication of The Friendship WC (Water Chandelier) for the Tallinn Architecture Biennial, utilized various parametric design in Grasshopper and digital fabrication techniques, 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. *Proceedings of SimBuild Conference 2024.*

2023 **Su A. J.**, Xu K., Ren A., Liu T., Dogan T. (2023). Facade Scanner: A Scalable Workflow for BuildingGeometry 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 Recontruction

AWARDS

2020 - 2024 Dean's List - Cornell

2024 SimBuild 2024 Scholarship

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

2022 Modular Housing Honorable Mention - BeeBreeder

2022 The Baird Prize - Cornell AAP

2021 The Labyrinth Design Competition Winner - Arch8

SKILLS

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

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

Language Chinese (Native), English (Bilingual)

ACTIVITIES + INVOLVEMENT

2024 **AEC Tech Hack**

- Designed and implemented a 3D scanning-based platform for for qualitatively assessing indoor environments and real estate value. Responsibilities included the parametric reconstruction of rooms 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.

2022.6 - 2022.8 **EveryArt - Web & Graphic Designer**

- Developed mobile/web pages; designed exhibition posters, and graphical advertisements for art organizations.

2021 **Exhibition Curation - "EXIT" Chengdu, China**

- Curated and organized an exhibition for emerging artists, showcasing installations, architectural designs, and multimedia art.