

# Amber Jiayu Su

Cambridge, MA – USA

amberjys@mit.edu | [LinkedIn](#) | [GitHub](#) | [ResearchGate](#) | [HomePage](#)

## Education

---

### Massachusetts Institute of Technology

*M.S. in Building Technology / EECS, GPA: 5.0 / 5.0*

2025–2027

Advisor: Prof. Christoph Reinhart

Selected Coursework: Advanced CV, DL, AI for Climate Actions, Bayesian Modeling and Inference, Optimization, Urban Building Modeling

### Cornell University

*B.Arch. / Minor in Computer Science, GPA: 4.07 / 4.3*

2020–2025

Advisor: Prof. Timur Dogan

Selected Coursework: Algorithm Analysis, Computer Systems, AI, ML, NLP, Numerical Analysis, Probability, Linear Algebra, Data Visualization, Environmental Systems

## Research Experience

---

### Massachusetts Institute of Technology

#### *Research Assistant – Sustainable Design Lab*

2025–Present

- 2025–Now **Explainable Occupant Behavior Modeling for Grid-Aware Urban Building Energy Modeling:** Developing a multi-scale building energy modeling framework integrating probabilistic, explainable occupant behavior models inferred from unstructured survey data with substation-level validation. Building grid-compatible, stock-level models to evaluate electrification and retrofit impacts on substation peak demand. Prototyping lightweight, interpretable surrogate models for rapid stock-level peak-load prediction to support data-driven AEC and grid planning.

### Cornell University

#### *Research Assistant – Environmental Systems Lab*

2022–2025

- 2022–2025 **Building Facade Reconstruction and Window Detection:** Led the development of an automated window detection and façade reconstruction pipeline using 3D urban data, integrating fine-tuned segmentation models with a post-optimization framework utilizing signal processing for pattern recognition and large-scale vision models for segmentation enhancement, to achieve robust cross-region generalization and adaptability to diverse façade typologies.
- 2023–2025 **Urban Building Energy Modeling Development:** Developed a C#-based data processing framework to standardize heterogeneous urban datasets into UBEM-ready inputs, established a building archetype generation workflow, and designed core geometric data structures and algorithms for data cleaning, meshing, and triangulation.
- 2025 **Urban-scale Radiation Modeling:** Designed and implemented EnergyPlus-compatible algorithms for city-scale sunlit fraction and solar radiation simulation, employing point cloud voxelization, hierarchical voxel grids, and parallel ray traversal techniques optimized for computational performance.

#### *Research Assistant – Ecological Action Lab*

2022.6–2022.8

- 2022 **Computational Design and Digital Fabrication:** Contributed to the computational design and fabrication of a kinetic water chandelier installation, developing parametric models in Grasshopper and supporting digital fabrication workflows using CNC machining and 3D printing.

## Work

---

### Kohn Pedersen Fox

#### *Environmental Modeling and Applied Science Intern*

2023 / 2024

- Summer 2024 **Early-Stage Building Energy Modeling:** Developed an automated early-stage Building Energy Modeling (BEM) workflow in CAD environment integrating geometry processing, template-based load assignment, and interactive result visualization, enabling rapid generation and analysis of energy models from early design data.
- Summer 2023 **Transient Thermal Comfort Modeling:** Developed a simulation framework for transient state thermal comfort analysis, coupling environmental modeling with occupant dynamics to evaluate comfort performance across varying design and operational scenarios.

## Peer-Reviewed Journals

---

Su, A.J., Dogan, T. (2025). Voxel Shader – An efficient shadow calculation approach for urban building energy modeling, preprint under review in *Energy and Buildings*

Dogan, T., Li, C., Tseng, H.M., **Su, A.J.**, Kastner, P. (2025). A bottom-up urban building energy model for evaluating thermal load electrification measures. *Journal of Building Performance Simulation*

**Su, A.J.**, Brown, C.X., Mermelstein, R., Cerezo Davila, C. (2025). Dynamic thermal comfort simulation: model parameter considerations for early-stage design applications. *Journal of Building Performance Simulation*.

**Su, A.J.**, Ren, A., Xu, K.C., Dogan, T. (2025). Scalable building reconstruction and window detection for urban building energy modelling applications. *Journal of Building Performance Simulation*.

## Conference Proceedings

---

**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*.

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*.

**Su, A.J.**, Xu, K.C., 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*.

## Awards

---

**2025:** AIA Henry Adams Medal and Certificate of Merit (Top Ranking Graduate), Cornell University

**2024:** SimBuild 2024 Scholarship, IBPSA USA

**2023:** The Addison G. Crowley, B.Arch'38 Prize, Cornell University

**2022:** The Baird Prize, Cornell University

**2022:** Modular Housing Honorable Mention, BeeBreeder

**2020–2025:** Dean's List, Cornell University

## Technical Skills

---

**Programming:** Python, C, C#(.Net Framework), Java, OCaml, SQL, HTML / CSS / Javascript

**ML/AI:** PyTorch, TensorFlow, scikit-learn, OpenCV, Seaborn, NLTK

**Simulation:** EnergyPlus, Climate Studio, Ladybug Tools, CFD (Eddy3D, SimScale), GIS

**3D & Design:** AutoCAD, Rhino, Grasshopper, SketchUp, Revit, Blender, Adobe Creative Suite, Figma, VRay, Enscape

**Infrastructure:** Git, Docker, AWS

**Language:** Chinese, English

## Activities

---

### AEC Tech Hack

2024

Designed and implemented a 3D scanning prototype for qualitative assessment of indoor environments of properties for real estate, including parametric room reconstruction from semantically segmented point-cloud data using computer vision techniques.

### Big Red Hack

2024

Developed a collaborative Pomodoro web app with group rooms, shared timers, to-do lists, task feeds, and break-time chat, implementing both front- and back-end functionality using Next.js for task management features.