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Gang Jiang

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Research Interests

AI4Building, LLM in Building, Scientific-Machine Learning, Building Energy Modeling & Calibration

Education

- **The University of Utah** — Salt Lake City, UT, USA
  Ph.D. in Construction; GPA: 3.8 — *Aug. 2022 – Jul. 2026*
- **Tianjin University** — Tianjin, China
  M.Sc. in Smart Building; GPA: 3.6 — *Aug. 2019 – Jul. 2022*
- **Yancheng Institute of Technology** — Yancheng, Jiangsu, China
  B.Sc. Heating, Ventilation, and Air Conditioning; GPA: 3.0 — *Aug. 2015 – Jul. 2019*

Experience & Projects

- **The University of Utah** — Salt Lake City, UT
  Research Assistant — *Aug. 2022 - Present*
  - **US-NSF #2311685**: (Principal researcher) Developed a **natural language-driven auto-building modeling platform (EPlus-LLM)** by integrating a large language model with physics-based simulation.
  - **US-NSF #2318720**: (Main researcher) Conducted **co-simulations of thermo-responsive desiccants** for building dehumidification and decarbonization using EnergyPlus, Modelica, and Ansys.
  - **Global Change & Sustainability Center**: (Principal researcher) Developed a **high-fidelity building modeling and calibration framework** that integrates an enhanced Bayesian inference method with a deep-learning-based surrogate model, facilitating the development of Digital Twins for real-time building and HVAC monitoring.
  - **US-Utah-DOT #24-8342**: (Principal researcher) Designed a **scalable Vision-AI tool** for automated road condition assessment.
  - **US-Utah-DOT #24-8332**: (Main researcher) Developed an **advanced volumetric measurement system** for salt piles using photogrammetry, LiDAR, and depth cameras.
- **Tianjin University** — Tianjin, China
  Research Assistant — *Aug. 2019 - Jul. 2022*
  - **China-NSFs**: Developed **fault detection & diagnosis** methods for building systems with **incomplete data**, **integrating Modelica simulations with machine learning** to enhance accuracy and robustness.
  - **Industry Projects**: Conducted research on building energy efficiency and management, focusing on **optimizing energy consumption and sustainability strategies**.
- **Amazon Web Services (AWS)** — Beijing, China
  Intern — *Jun. 2021 and Dec. 2021*
  - **Data Center Design**: Assisted in **planning and optimizing** data center infrastructure, including local generators, uninterruptible power supplies (UPS), power distribution, cooling systems, and network architecture to enhance **resilience and scalability**.
  - **Data Center Operation**: Contributed to improving **energy efficiency and fault detection** in data centers through **operational optimizations and system monitoring**.

Publications

[1] Z. Ma, **G. Jiang**, Y. Hu, J. Chen. A Review of Physics-Informed Machine Learning for Building Energy Modeling. *Applied Energy*, 2025.

[2] **G. Jiang**, Z. Ma, L. Zhang, J. Chen. Prompt Engineering to Inform Large Language Models in Automated Building Energy Modeling. *Energy*, 2025.

[3] Z. Ma, **G. Jiang**, J. Chen. Physics-Informed Ensemble Learning with Residual Modeling for Enhanced Building Energy Prediction. *Energy and Buildings*, 2024.

[4] **G. Jiang**, Y. Chen, Z. Wang, K. Powell, B. Billings, J. Chen. A Deep Learning-Based Bayesian Framework for High-Resolution Calibration of Building Energy Models. *Energy and Buildings*, 2024.

[5] **G. Jiang**, Z. Ma, L. Zhang, J. Chen. EPlus-LLM: A Large Language Model-Based Computing Platform for Automated Building Energy Modeling. *Applied Energy*, 2024.

[6] **G. Jiang**, L. Zhang, J. Chen. EPlus-LLM: A Novel Automated Building Simulation Platform Using Natural Language Processing. *ASHRAE Annual Conference*, 2024.

Workshop & Conference Presentations

- **ASHRAE Annual**: Jun. 2024 – Oral Presentation
- **GCSC Environment and Sustainability Research Symposium**: Feb. 2023 – Poster

Programming Skills

- **Languages**: Python, Pytroch, Javascript
- **Technologies**: High-Performance Computing on Linux, Fine-Tuning & Prompt Engineering for LLMs, Retriever-Augmented Generation, Scientific-Machine Learning, Building Energy Modeling & Calibration, Fault Detection & Diagnosis
- **Software**: EnergyPlus, SketchUp, Matlab, Dymola (Modelica)