



FAN FENG

Ph.D. | Texas A&M University

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I've been actively engaging myself in developing simulation models and controllers for building systems in the past years. My interest and expertise include building performance simulation, data analysis in building systems, optimal control and differentiable model predictive control for dynamic systems. I am interested in new methodologies that can help us understand our world better by discovering useful insights from data.

EDUCATION

Ph.D. Mechanical Engineering [GPA:3.5/4.0] Texas A&M University	Jan. 2020 – Present College Station, TX, USA
Ph.D. Mechanical Engineering [GPA:4.0/4.0] The University of Alabama	Aug. 2018 – Dec. 2019 ¹ Tuscaloosa, AL, USA
M.S. Mechanical Engineering Tongji University	Sep. 2015 – Mar. 2018 Shanghai, China
Bachelor Mechanical Engineering Tongji University	Sep. 2011 – Jun. 2015 Shanghai, China

SKILLS

Programming	Python, R, Matlab, C/C++, VBA
Energy Simulation	EnergyPlus, TRNSYS, DOE-2, Radiance, Grasshopper
Data Analysis	Machine learning (PyTorch, XGBoost, Time series analysis), Optimization algorithms
Others	Git, Linux, High-performance computing

PROJECT AND RESEARCH

Present	Cost-effective Thermally Activated Building Systems to Support a Power Grid System With High Penetrations of As-available Renewable Energy Resources , TEXAS A&M UNIVERSITY, TX, USA <ul style="list-style-type: none">Design a multi-functional building envelope with both phase change materials (PCM) and a radiant heat/cooling system. .Develop and implement a simulation module for industrial-grade PCMs in EnergyPlusDevelop control-oriented models for energy and thermal estimation of buildings using this multi-functional panelDevelop a model-predictive control framework for this system to optimize the cost and thermal comfortImplement the proposed control framework using High-performance computers <div>Control-oriented model Model-predictive control E+ development High-performance computer</div>
Jan. 2020	
Jul. 2022	Collaborative Research: Adaptive, Multi-Layered Fenestration Elements for Optimum Building Energy Performance and Occupant Comfort, TEXAS A&M UNIVERSITY, TX, USA <ul style="list-style-type: none">Develop simulation models for complex fenestration systems with Electrochromic glazing and shading devices using EnergyPlus and RadianceDevelop control-oriented models for building with complex fenestration systems.Develop control framework to optimize the system cost and occupants' comfort (both thermal and visual) <div>Daylighting simulation E+development Model-predictive control</div>
Sep. 2018	

¹Not completed, and transferred to Texas A&M Univ then

Aug. 2020	Advanced Technology Intern, LENNOX INTERNATIONAL, TX,USA ▶ Develop simulation models for residential chillers using Kalman filter.
Jun. 2020	▶ Develop thermal network models for the whole residential houses. ▶ R-language was used to implement these models because R has extensive facilities for analyzing time series data. . Kalman filterer R language Data-driven model Thermal network model

JOURNAL PUBLICATIONS

- 1 Fan Feng, Yangyang Fu, Zhiyao Yang and Zheng O'Neill. 2022. Enhancement of Phase Change Material Hysteresis Model: A Case Study of Modeling Building Envelope in EnergyPlus. Accepted by Energy and Buildings.
- 2 Fan Feng, Niraj Kunwar, Kristen Cetin, and Zheng O'Neill. "A critical review of fenestration/window system design methods for high performance buildings." Energy and Buildings 248 (2021): 111184.
- 3 Xing Lu, Fan Feng, Zhihong Pang, Tao Yang, and Zheng O'Neill. "Extracting typical occupancy schedules from social media (TOSSM) and its integration with building energy modeling." In Building Simulation, pp. 1-17. Tsinghua University Press, 2020.
- 4 Zhihong Pang, Fan Feng, and Zheng O'Neill. 2020. "Investigation of the Impacts of COVID-19 on the Electricity Consumption of a University Dormitory Using Weather Normalization." arXiv preprint arXiv:2012.07748
- 5 Zhe Chen, Peng Xu, Fan Feng, Yifan Qiao, and Wei Luo. "Data mining algorithm and framework for identifying HVAC control strategies in large commercial buildings." In Building Simulation, pp. 1-12. Tsinghua University Press, 2020.
- 6 Bing Dong, Vishnu Prakash, Fan Feng, and Zheng O'Neill. "A review of smart building sensing system for better indoor environment control." Energy and Buildings 199 (2019): 29-46.
- 7 Shunian Qiu, Fan Feng, et al. "Data Mining Based Framework to Identify Rule Based Operation Strategies for Buildings with Power Metering System." Building Simulation, 2018, doi:10.1007/s12273-018-0472-6.
- 8 Fan Feng, Yangyang Fu, Jin Hou & Peng Xu: "Optimizing the topologies of HVAC water systems in supertall buildings: A pilot study." Science and Technology for the Built Environment, 2017. DOI: 10.1080/23744731.2017.1393255
- 9 Yingjun Ruan, Jiahui Cao, Fan Feng, and Zhengwei Li. "The role of occupant behavior in low carbon oriented residential community planning: A case study in Qingdao." Energy and Buildings 139 (2017): 385-394.
- 10 Yangyang Fu, Zhengwei Li, Fan Feng, and Peng Xu. "Data-quality detection and recovery for building energy management and control systems: Case study on submetering." Science and Technology for the Built Environment 22, no. 6 (2016): 798-809. .

CONFERENCE PUBLICATIONS

- 1 Xing Lu, Fan Feng, Zheng O'Neill. "Occupancy Sensing in Buildings through Social Media from Semantic Analysis." ASHRAE transactions 126 (2020): 265-272.
- 2 Xing Lu, Fan Feng, and Zheng O'Neill. "Acquisition of Typical Occupancy Schedules for Commercial Buildings from Social Networks." Proceedings of the 1st ACM International Workshop on Urban Building Energy Sensing, Controls, Big Data Analysis, and Visualization. 2019.
- 3 Fan Feng, and Zheng O'Neill. "Identifying Models of HVAC Systems Using ARIMAX." 2019 ASHRAE Annual Meeting. Kansas City, MO. Jun 22–26, 2019.. 2019.
- 4 Fan Feng, Zheng O'Neill PhD PE. A Real-Time Platform for Assessment of Chiller-Side Demand Response Strategies. ASHRAE Transactions. 2019;125:305-12.
- 4 Fan Feng, et al. "The Status Quo of Operation of HVAC Water-Side Systems in China: A Perspective from BAS Data." Energy Procedia, vol. 143, Elsevier B.V., 2017, pp. 67–72, doi:10.1016/j.egypro.2017.12.649.
- 5 Fan Feng and Zhengwei Li. "A methodology to identify multiple equipment coordinated control with power metering system." Energy Procedia 105 (2017): 2499-2505.
- 6 Tianren YangYang, Haisu Chen, Yisha Zhang, Shihao Zhang, and Fan Feng. "Towards low-carbon urban forms: A comparative study on energy efficiencies of residential neighborhoods in Chongming eco-island." Energy Procedia 88 (2016): 321-324.

- 7 Li Yuan, Yingjun Ruan, Guang Yang, Fan Feng, and Zhengwei Li. "Analysis of factors influencing the energy consumption of government office buildings in Qingdao." Energy Procedia 104 (2016): 263-268.
- 8 Fan Feng, Zhengwei Li, Yingjun Ruan, and Peng Xu. "An empirical study of influencing factors on residential building energy consumption in Qingdao City, China." Energy Procedia 104 (2016): 245-250.

HONORS AND AWARDS

2022	Continuing student fellowship in Texas A&M University
2021	Graduate Summer Research Grant in Texas A&M University
2018	Graduate Council Fellowship in the University of Alabama