WU SI

Ph.D., The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong
Email: wusi@ust.hk

WORK EXPERIENCE

The Hong Kong University of Science and Technology, Postdoctoral Fellow **2025 - now**
Supervisor: Prof. WANG Zhe
Research interests: Energy Efficient Data Center; Predictive Maintenance.

EDUCATION

The Hong Kong University of Science and Technology, Ph.D. in Civil Engineering **2022 - 2025**
Thesis: *Enhancing HVAC System Efficiency: Development of Virtual Testbed and Evaluation of Equipment Performance*
Supervisors: Prof. WANG Zhe and Prof. CHEN Guanghao
*HKUST RedBird Academic Excellence Award for Continuing PhD Students (2025)

Shanghai Jiao Tong University, M.Sc. in Power Engineering and Engineering Thermophysics **2019 - 2022**
Thesis: *Numerical Investigations on a Turbofan Afterburner Fuel Pump*
Supervisors: Prof. OUYANG Hua and Prof. WU Yadong

Dalian University of Technology, B.E. in Process Equipment and Control Engineering **2015 - 2019**

PUBLICATIONS

1. **Wu, S.**, Wang, Z.* (2026). Predictive maintenance of large-scale building cooling plants under operational constraints: A review. *Energy Conversion and Management*, 366, 121874. https://doi.org/10.1016/j.enconman.2026.121874
2. **Wu, S.**, Yang, P., Li, D., Chen, G., & Wang, Z.* (2025). Towards predictive maintenance: A performance evaluation framework for cooling towers in HVAC systems. *Building and Environment*, 284, 113443. https://doi.org/10.1016/j.buildenv.2025.113443
3. **Wu, S.**, Zheng, W., Wang, Z.*, Chen, G.*, Yang, P., Yue, S., ... Wu, Y. (2025). *AlphaDataCenterCooling*: A virtual testbed for evaluating operational strategies in data center cooling plants. *Applied Energy*, 380, 125100. https://doi.org/10.1016/j.apenergy.2024.125100
4. **Wu, S.**, Yang, P., Chen, G., & Wang, Z.* (2025). Evaluating seasonal chiller performance using operational data. *Applied Energy*, 377, 124377. https://doi.org/10.1016/j.apenergy.2024.124377
5. **Wu, S.**, Wu, Y.*, Tian, J., & Ouyang, H. (2022). On the cavitation-induced collapse erosion of a turbofan fuel pump. *Engineering Applications of Computational Fluid Mechanics*, 16(1), 1048–1063. https://doi.org/10.1080/19942060.2022.2067243
6. Yang, Z., Ming, L., **Wu, S.**, Wu, Y., Tian, J., & Ouyang, H. (2022, June). On the mode characteristics of rotating instability with different tip clearances. *In Turbo Expo: Power for Land, Sea, and Air* (Vol. 86120, p. V10DT37A013). American Society of Mechanical Engineers. https://doi.org/10.1115/GT2022-82072

RESEARCH EXPERIENCE

Model Predictive Control for Energy Efficient Data Center **Feb. 2023 - June 2024**
School of Engineering, HKUST
Developed an open-sourced virtual testbed *AlphaDataCenterCooling* for data center cooling plant control strategy optimization. https://github.com/wfzheng/AlphaDataCenterCooling
Proposed a method for benchmarking chiller performance using operational data without shutdown measurements.

On the Cavitation-Induced Collapse Erosion of a Turbofan Fuel Pump **Oct. 2020 - Aug. 2022**
School of Mechanical Engineering, SJTU

High-speed multi-phase flow field analysis based on computational fluid dynamics (CFD) simulations.
Optimized design of a turbofan fuel pump based on fluid-structure coupling simulations.

SERVICE

Teaching Assistant	Civil and Environmental Engineering Final Year Project/Thesis (HKUST, 2025/26) Fundamental of Green Buildings (HKUST, 2023) Energy System Modelling for Buildings and Cities (HKUST, 2023)
Journal Reviewer	Building Simulation Energy and Buildings
Organizing Committee	The International Conference of Building and Simulation (BAS 2026)