



Job Title: Post-doctoral Fellow

Monthly Salary Range: HKD 30000-40000 per month

Closing Date: Open until filled

Job Description

This postdoctoral position is part of a collaborative project between HKU, MIT, and Trane Technologies, focusing on mitigating the environmental impact of rapidly expanding data centers (DCs). Recovering the waste heat that would otherwise be emitted has emerged as a promising pathway to reduce DC carbon emissions through synergistic integration with surrounding energy systems. Despite the promise, the low thermodynamic quality of waste heat and persistent supply-demand mismatches remain critical challenges that hinder practical deployment. This project aims to develop integrated solutions for utilizing DC waste heat through fifth-generation district heating and cooling (5GDHC), addressing the challenges with a systematic design framework that determines the optimal DC-5GDHC configurations based on the temporal and spatial distribution of thermal loads.

The successful candidate will take a leading role to develop a high-fidelity Modelica-based models for data center cooling and thermal network integration, investigate the impact of key design and operational parameters, and conduct 3E (energy, economic, and environmental) analysis across different climates.

Key responsibilities

- Develop and maintain an open-sourced Modelica library for DC-5GDHC integration
- Use the model to perform parametric simulation and sensitivity analysis
- Implement optimal operation in co-simulation to support design decisions
- Analyze simulation results and publish high-quality publications
- Engage in regular meetings and knowledge exchange with collaborators

Qualifications and Skills

- PhD in Mechanical Engineering, Built Environment, Energy Systems, or a related field.
- Strong knowledge of data center cooling systems and/or waste heat recovery
- Experience with Modelica-based modeling (e.g., Modelica Buildings Library, Dymola)
- Experience in optimal control and optimization of energy systems
- Understanding of district thermal networks, including 5GDHC systems
- Demonstrated proficiency in programming
- Strong communication skills for academic and industry collaboration

Application instructions

Submit the following to Dr. Zhan at szhan@mit.edu:

- CV
- Cover letter describing relevant expertise in thermodynamics, energy system modeling, and optimization