Numerical Analysis and Scientific Computing Seminar

Building Energy - Modeling, Optimization and Optimal Control

Raya Horesh

IBM Research AI, TJ Watson Research Center

Abstract: Buildings consume about 40% of the total energy in most countries, contributing to a significant amount of greenhouse gas (GHG) emissions and global warming. Therefore, reducing energy consumption in buildings, making buildings more energy efficient and operating buildings in more energy efficient manner are important tasks. Analytics can play an important role in identifying energy saving opportunities in buildings by modeling and analyzing how energy is consumed in buildings and optimizing energy consuming operations of buildings.

In this talk I will cover areas ranging from physics based (ODE/PDE models) and data driven modeling to inverse problem for parameter estimation and model predictive control (MPC) framework that optimally determines control profiles of HVAC system given dynamic demand response signal, on-site energy storage system and energy generation system while satisfying thermal comfort of building occupants within the physical limitation of HVAC and other equipment.

Friday, January 19, 2018, 2:00 pm

Mathematics and Science Center: W301

Mathematics and Computer Science
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