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Learning Predictive Models for Efficient Energy Management of Exhibition Hall

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Abstract : This paper addresses the problem of predictive control for energy management of large-scaled exhibition halls, where a lot of energy is consumed to maintain internal atmosphere under certain required conditions. Predictive control achieves better energy efficiency by optimizing the operation of air-conditioning facilities with not only the current but also some future status taken into account. In this paper, we propose to use predictive models learned from past sensor data of hall environment, for use in optimizing the operating plan for the air-conditioning facilities by simulating future environmental change. We have implemented an emulator of an exhibition hall by using EnergyPlus, a widely used building energy emulation tool, to collect data for learning environment-change models. Experimental results show that the learned models predict future change highly accurately on a short-term basis.

Keywords : predictive control, energy management, machine learning, optimization
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