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Short-Term Operation Planning for Energy Management of Exhibition Hall

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Abstract : This paper deals with the establishment of a short-term operational plan for an air conditioner for efficient energy management of exhibition hall. The short-term operational plan is composed of a time series of operational schedules, which we have searched using genetic algorithms. Establishing operational schedule should be considered the future trends of the variables affecting the exhibition hall environment. To reflect continuously changing factors such as external temperature and occupant, short-term operational plans should be updated in real time. But it takes too much time to evaluate a short-term operational plan using EnergyPlus, a building emulation tool. For that reason, it is difficult to update the operational plan in real time. To evaluate the short-term operational plan, we designed prediction models based on machine learning with fast evaluation speed. This model, which was created by learning the past operational data, is accurate and fast. The collection of operational data and the verification of operational plans were made using EnergyPlus. Experimental results show that the proposed method can save energy compared to the reactive control method.

Keywords : exhibition hall, energy management, predictive model, simulation-based optimization
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