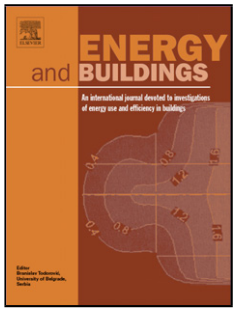

Title: A New Multiplexed Optimization with Enhanced Performance for Complex Air Conditioning Systems

Authors: Jiayu Chen, Yongjun Sun

PII: S0378-7788(16)31793-5
DOI: https://doi.org/10.1016/j.enbuild.2017.09.065
Reference: ENB 7984

To appear in: *ENB*

Received date: 6-12-2016
Revised date: 20-9-2017
Accepted date: 24-9-2017

Please cite this article as: Jiayu Chen, Yongjun Sun, A New Multiplexed Optimization with Enhanced Performance for Complex Air Conditioning Systems, Energy and Buildings https://doi.org/10.1016/j.enbuild.2017.09.065

A New Multiplexed Optimization with Enhanced Performance for Complex Air Conditioning Systems

Jiayu Chen[a], Yongjun Sun[b,*]

[a]Department of Architecture and Civil Engineering, City University of Hong Kong, Hong Kong

[b]Division of Building Science and Technology, City University of Hong Kong, Hong Kong

*Corresponding author Tel.: 852-34422672; fax: 852-34429716 E-mail: yongjsun@cityu.edu.hk

Highlights

- A new multiplexed optimization method for enhanced performances is proposed.
- About 26,070 kWh (10.38%) daily energy can be saved as the proposed method is used.
- The computation load is reduced by 47.2% as compared with the conventional method.
- The proposed method can also significantly improve system stability.

Abstract: With the increased complexity of air conditioning systems, the computational load and complexity of real-time optimization appear to be challenging for applications. To overcome the challenge, multiplexed optimization has been proposed in which multiple set-points are sequentially optimized and updated one by one. In such a way, it can achieve equivalently-good energy performance but with exponentially reduced computational load if compared with those traditional methods that optimize all set-points simultaneously. In fact, the time instant for each set-point optimization and the set-point optimization sequence have