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Application of Data-Driven Method for HVAC System

Edited by
Yabin Guo, Zhanwei Wang, Yunpeng Hu and João M. M. Gomes

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About the Editors

Yabin Guo

Guo Yabin, PhD, graduated from Huazhong University of Science and Technology. He is a senior member of the Chinese Association of Refrigeration. He hosted and participated in multiple national and horizontal projects, and he has published over 30 academic papers both domestically and internationally. Among them, he has published 12 SCI indexed papers, 1 EI indexed paper, and 3 international conference papers. The first inventor authorizes one patent. He participated in the compilation of the book "Refrigeration and Air Conditioning Encounters Big Data - Industry Revolution". The main research directions include: fault detection and diagnosis of air conditioning systems based on artificial intelligence methods; optimization of control for heat pump air conditioning systems; data mining and energy-saving optimization of building air conditioning systems.

Zhanwei Wang

Wang Zhanwei graduated with a PhD from Xi'an University of Architecture and Technology. The main research direction is the development and application of energy-saving and intelligent fault diagnosis technology in building energy systems. I have led one National Science Foundation project, one sub project, and four provincial and ministerial level projects. I have also published 17 scientific research papers as the first (corresponding) author, including 8 papers indexed by SCI; applied for 6 national invention patents; and granted 3 authorizations.

Yunpeng Hu

Hu Yunpeng graduated from Huazhong University of Science and Technology. He hosted one project funded by the Hubei Provincial Natural Science Foundation and one project funded by the Hubei Provincial Excellent Young and Middle-aged Science and Technology Innovation Team in Higher Education Institutions. More than 20 of his academic papers have been published. The main research directions are fault detection of air conditioning systems, optimization of building energy efficiency, etc.

João M. M. Gomes

João Gomes graduated with a PhD from University of Algarve. He has published, as co-author, 9 scientific research articles in indexed journals and more than 40 articles in conference proceedings and book chapters in the fields of building energy conservation, HVAC control systems, among others. The current research directions include building energy savings, fault detection for electrical energy systems, HVAC control systems and renewable energies.

Preface

Artificial intelligence has become a hot topic in current research. Various industries are using data-driven methods to solve the problems they face. The HVAC industry is an important and long-standing industry with considerable relevance to everyday life and industrial production. Moreover, as the operation of HVAC systems consumes a large amount of energy, it is of great significance to utilize data-driven methods to improve the operational reliability and energy-saving effects of HVAC systems.

The data-driven approach is currently mainly applied in various aspects of HVAC systems, such as fault detection and diagnosis, energy consumption prediction, predictive control, and data mining. The application of data-driven methods in the field of HVAC is gradually shifting from simple models to complex models and from shallow models to deep models. Gradually, the study of the transferability, interpretability, and other aspects of the model are being studied. From current research results, it can be seen that data-driven methods have shown great potential in HVAC applications.

It is a great honor to be invited by MDPI Publishing, which has received support from dozens of peer authors and published multiple high-quality and very interesting research articles, to organize a Special Issue on "Application of Data-Driven Method for HVAC System". Once again, we would like to express our gratitude to MDPI.

Yabin Guo, Zhanwei Wang, Yunpeng Hu, and João M. M. Gomes
Editors