ملخص البحث رقم (٨)

السيد الأستاذ الدكتور/ مقرر اللجنة العلمية الدائمة لترقية الأساتذة والأساتذة المساعدين للحاسبات والمعلومات

تحية طيبة وبعد – احيط سيادتكم علما بان البحث رقم ٨ بياناتة كالتالي:

عنوان البـــــحث باللغة الانجليزية:

A New Hybrid Model for Energy Consumption Prediction Based on Grey Wolf Optimization

مكان النشر و تاريخه:

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١ ، سماء المشاركين في البحث:

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ملخص البـــــحث باللغة الانجليزية :

The prediction of building energy consumption (BEC) facilitates an effective energy management system based on the comprehensive understanding of the energy reduction potential, contributing to the reduction in climate variations. Several factors influence the energy efficiency of buildings. Therefore, a suitable technique that considers these factors must be implemented to predict BEC. Herein, a hybrid prediction model that combines a metaheuristic technique, namely, the gray wolf optimization (GWO) algorithm, with a machine learning algorithm, namely, support vector machine (SVM), (hereinafter referred to as GWO–SVM) is proposed based on 10-fold cross validation. Several machine learning and statistical techniques are employed to predict the energy consumption and show the robustness of the proposed model, including SVM, artificial neural networks, a hybrid genetic algorithm–SVM model, and the multiple linear regression. The energy consumption prediction models are evaluated on five real datasets (1) to predict the monthly energy consumption of four governmental sectors in the US (residential, industrial, commercial, and transportation) using two environmental parameters from January 1973 to May 2021 and (2) to predict the BEC, particularly hourly consumption in 2010, using eight environmental parameters employed for short- and long-term predictions. Results show that for the annual prediction, the GWO–SVM model outperforms all the other models with a prediction accuracy of 98.012% and an execution time of 10 min. These findings indicate that the proposed GWO–SVM model achieves a better accuracy and prediction time in short- and long-term predictions than the other models.