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Abstract:

In this paper, a hybrid electricity price forecasting method which is composed of two-stage feature selection method and optimized adaptive neuro-fuzzy inference system (ANFIS) technique as a forecasting engine is proposed to accurately forecast electricity price. A multi-objective feature selection approach comprises of multi-objective binary-valued backtracking search algorithm (MOBBSA) as an efficient evolutionary search algorithm and ANFIS method is developed in this paper to extract the most influential subsets of input variables with maximum relevancy and minimum redundancy. Through the combination of backtracking search algorithm (BSA) in learning process of ANFIS approach, a hybrid machine learning algorithm has been developed to forecast the electricity price more accurately. Real-world electricity demand and price dataset from Ontario power market; which is reported as among the most volatile market worldwide, has been used as case study to validate the performance of the proposed approach. From the simulation results, it has been seen that the proposed hybrid forecasting method was effective in accurately forecast the Ontario electricity price. In addition, to prove the superiority of the proposed hybrid forecasting method the simulation results obtained using ANN and ANFIS models optimized by other well-known optimization methods have been compared with that of proposed method.