Title:	Hybrid ANN and artificial cooperative search algorithm to forecast short-term electricity price in de-regulated electricity market
Author(s) Name:	Alireza Pourdaryaei, Hazlie Mokhlis, Hazlee Azil Illias, S HR Aghay Kaboli, Shameem Ahmad, Swee Peng Ang
Contact Email(s):	ahmad.shameem@aiub.edu
Published Journal Name:	IEEE Access
Type of Publication:	Journal
Volume:	7 Issue 1
Publisher:	IEEE
Publication Date:	02/09/2019
ISSN:	2169-3536
DOI:	10.1109/ACCESS.2019.2938842
URL:	https://ieeexplore.ieee.org/abstract/document/8822434
Other Related Info.:	Page 125369-125386, ISI and Scopus indexed

Abstract:

Smart grid has evolved into a viable platform for participants of electricity market to effectively regulate their bidding strategies based on demand-side management (DSM) models ascribed to its immense technological advancements in recent years. Reliability of system operation as well as capital cost investments can improve greatly with responsiveness of market participants. In this regard, efficient design, implementation, evaluation of numerous demand response measures and development of robust short-term price forecasting in the day-ahead transactions are of the utmost importance. Accuracy and efficiency of the day-ahead price forecasting process are complex challenges in deregulated electricity market. The unstable nature of electricity price compared to load series causes lower accuracy. Therefore, this research proposes a hybrid method for electricity price forecasting via artificial neural network (ANN) and artificial cooperative search algorithm (ACS). In parallel, a feature selection technique based on the combination of mutual information (MI) and neural network (NN) is developed in this study to select the input variables subsets, which have substantial impact on forecasting of electricity price. Actual data sets are collected from Ontario electricity market of the year 2017 for the verification of simulation results. Finally, the simulation results validated the premise of the proposed hybrid method through enhanced accuracy compared to the results acquired by implementing hybrid support vector machine (SVM) and hybrid ANN optimization methods.