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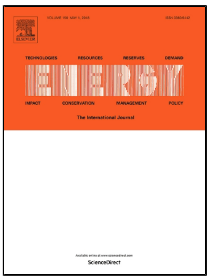

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Effective Long short-term Memory with Differential Evolution Algorithm for Electricity Price Prediction

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Abstract: Electric power, as an efficient and clean energy, has considerable importance in industries and human lives. Electricity price is becoming increasingly crucial for balancing electricity generation and consumption. In this study, long short-term memory (LSTM) with the differential evolution (DE) algorithm, denoted as DE–LSTM, is used for electricity price prediction. Several recent studies have adopted LSTM with considerable success in certain applications, such as text recognition and speech recognition. However, problems in the application of LSTM to solving nonlinear regression and time series problems have been encountered. DE, a novel evolutionary algorithm that effectively obtains optimal solutions, is designed to identify suitable hyperparameters for LSTM. Experiments are conducted to verify the performance of the DE–LSTM model under the electricity prices in New South Wales, Germany/Austria, and France. Results indicate that the proposed DE–LSTM model outperforms existing forecasting models in terms of forecasting accuracies.

Keywords: Long short-term memory; Differential evolution algorithm; Electricity price prediction

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