

Assessment of renewable energy plans using AI-sampling-based deep learning time series forecasting model : A case study of Korea

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Renewable energy(RE) has recorded rapid growth worldwide in terms of environmentally friendly and sustainable development. Prediction of RE is very important for increasing the proportion of RE and providing stable energy, which is very difficult to predict and attempts are made in various fields because it is determined by a combination of various factors. This study solves the problem that lack and uncertainty of the amount of time series data using VAE, a generative model favorable to generating high-quality data distributions. The four models, Long-Short Term Memory (LSTM), Deep Neural Network (DNN), Gated Recurrent Unit (GRU), Auto Regressive Integrated Moving Average (ARIMA), which are primarily machine learning models used for time series prediction, were compared and selected for prediction. The results show that all four models are LSTM 0.9667, GRU 0.9634, DNN 0.9514 and ARIMA 0.8433 based on R2 score. LSTM shows the best performance in Korea's new and RE time series data. However, this result may vary depending on the pre-processing of data and parameter settings, and the characteristics of the data.