Forecasting of Maximum Temperature by using ANFIS and GRU Algorithms, Case Study in Jakarta, Indonesia

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Abstract
Climate change is a highly complex phenomenon and has a significant impact on daily life. One of the climate features is temperature. When the temperature is high, the electricity requested by the population is more. That is due to the sophisticated technologies that the people need to employ to decrease the hotness. In this study, two methods from the Deep Learning discipline, namely Adaptive Neuro-Fuzzy Inference System (ANFIS)and Gated Recurrent Unit (GRU), are used to forecast Maximum Temperature (MT) time series. This research use dataset from ECWMF ERA-5. The objective is to analyze and compare GRU and ANFIS methods to experimental results and provide more insights into their capabilities to forecast the Maximum Temperature. Based on the result, both ANFIS and GRU can target the forecasting of MT. The two models give satisfactory performance because the CC values are above 0.95, and both models' RMSE and MAPE are lower than 2. Moreover, the GRU algorithm is more efficient for short-term forecasting. Besides, the ANFIS model improves its effectiveness when the forecasting is longer. For the training time, the GRU algorithm gives far shorter computational time than the ANFIS.

Keywords: Forecasting, Maximum temperature, time series, ANFIS, GRU.