ABSTRACT

The daily average temperature is an important meteorological parameter for describing the thermal condition of the atmosphere and the climate dynamics of a region. This parameter is influenced by solar radiation, cloud cover, rainfall, and air circulation. Consequently, daily average temperature data is fluctuating, dynamic, exhibits nonlinear patterns, and indicates non-stationarity. Given these complex data characteristics, an advanced forecasting method capable of optimally capturing these patterns is required. Therefore, this study aims to forecast the daily average temperature data using the *Adaptive Neuro-Fuzzy Inference System* (ANFIS) method based on *R-Square Increment*. This approach was chosen due to its reliability in handling nonlinear and non-stationary time series data. The data used is the daily average temperature in the Jakarta area from October 2024 to October 2025, obtained from NASA POWER. The construction of the *Fuzzy Inference System* (FIS) in this model compares the *Fuzzy C-Means* (FCM) and *Grid Partition* techniques. Based on the *R-Square Increment* analysis results, lag 1 and lag 4 were selected as significant input variables. The forecasting results showed that the FCM technique produced a MAPE of 1.081%, while the *Grid Partition* produced a MAPE of 1.228%. Overall, the ANFIS model using the FCM technique and the selected input lags (lag 1 and lag 4) proved to provide the most accurate forecasting performance with the lowest error rate.

Keywords: Average Daily Temperature, Forecasting, ANFIS, R-Square Increment, MAPE