ABSTRACT

Jakarta's rapid population growth and increased industrial activity has led to an increase in air temperature, a phenomenon known as Urban Heat Island (UHI). Higher air temperatures have significant impacts on urban climate, health and quality of life. Accurate prediction of air temperature is necessary for environmental planning and management. Long Short-Term Mermory (LSTM) is one of the modified methods of Recurrent Neural Network (RNN) that can predict data with long timesteps, as well as remove information that is no longer relevant. This research will implement the LSTM method with the Adaptive Moment Estimation (Adam) optimizer algorithm to predict air temperature data. The data used is daily temperature data from BMKG Tanjung Priok Maritime Meteorological Station for the period January 1, 2019 to December 31, 2023. All of data is processed through a preprocessing stage which includes handling missing values, normalization, and data windowing. The LSTM model was built and tested with various combinations of hyperparameters, including the number of LSTM units, dense layer units, learning rate, batch size, and number of epochs. Model evaluation is performed using the Root Mean Squared Error (RMSE) metric. The best LSTM model was obtained with a combination of hyperparameters 32 LSTM units, 16 dense layer units, learning rate 0.001, batch size 32, and 100 epochs which resulted in an RMSE value of 0,708029. The RMSE shows that the prediction results are quite accurate.

Keyword: *Air Temperature, Long Short-Term Memory, Prediction, Adam Optimizer*