ABSTRACT

Kevien Aqbar, 92320036

PERFORMANCE ANALYSIS OF LSTM AND XGBOOST MODELS OPTIMIZATION IN FORECASTING CRUDE PALM OIL (CPO) PRODUCTION AT PALM OIL MILL (POM)

This research aims to test and compare the performance of LSTM (Long Short-Term Memory) and XGBoost (eXtreme Gradient Boosting) prediction models in forecasting the amount of crude palm oil (CPO) production in supporting production planning, stock management, and CPO sales. The background of this research was conducted because of the importance of accurate predictions in overcoming the instability of palm oil production in the future. Various prediction methods use univariate and multivariate data, and produce selected models such as ARIMA, SVR, Prophet, XGBoost, and LSTM. However, this research focuses on evaluating the performance of LSTM and XGBoost models by performing hyperparameter tuning optimization using multivariate data to find the most optimal model in forecasting CPO production with the smallest error rate. The results showed that after hyperparameter tuning, the LSTM model produced better prediction results with an accuracy rate of 93.7% and RMSE of 21.04. The XGBoost model also experienced improved performance after tuning with an RMSE of 22.17 and an accuracy rate of 92.8%. Although XGBoost initially provided superior prediction results closer to the actual data, the LSTM model became the best choice after passing the tuning process. This LSTM model can be used by POM management in production planning, tank stock management, and CPO sales. The results of this study are also expected to help improve the efficiency of PKS production in terms of planning and anticipating the number of factory workers when the amount of production is predicted to increase.

Bibliography (2008-2022)