ABSTRACT

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Comparison of Long Short Term Memory (LSTM) and Gated Recurrent Unit (GRU) Models (Case Study: Amazon and eBay Stock Price Predictions)

Artificial Intelligence (AI) technology can be used to help problems in marketing and economics such as providing product recommendations, analyzing customer feedback, predicting stocks, and identifying suspicious transaction patterns. In the field of Artificial Intelligence (AI) there are several sub-fields in it, one of which is deep learning. Deep Learning is used to process data using artificial neural network algorithms, one of which is recurrent neural networks (RNN). The purpose of this research is to determine the best model by comparing the Long Short Term Memory (LSTM) and Gated Recurrent Unit (GRU) models for stock predictions on Amazon and eBay stock datasets. The methods used in the research are collecting related materials, analyzing and designing the model, testing the model, and evaluating the model. Collecting related materials includes finding appropriate journals and e-books, collecting datasets, determining the deep learning model to be used. Model analysis and design includes creating a model flowchart, determining the software and hardware to be used. Model testing by predicting 2 datasets, namely Amazon and eBay stocks within a period of 5 years totaling 1258 data by applying 3 test ratio schemes namely 60:40, 70:30, and 80:20. Model evaluation is carried out by analyzing the value of MAE, RMSE and MAPE evaluation metrics, and supported by visualizing the train loss & test loss graphs and the original value & predicted value comparison graphs to determine the best model in predicting stocks. The conclusion obtained from this research is that the best modeling is obtained by the Gated Recurrent Unit (GRU) model with the application of the 80:20 ratio scheme. The results obtained from the modeling are MAE of 0.98, RMSE of 1.22, and MAPE of 1.23%, based on the results of the MAPE value, the accuracy of the model is 98.77%.