PERBANDINGAN MODEL LSTM DAN GRU PADA PREDIKSI HARGA SAHAM ANTAM DENGAN TEKNIK *FEATURE ENGINEERING*

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ABSTRAK

Prediksi harga saham menghadapi tantangan kompleks karena sifat data yang tidak dapat diprediksi secara linear dan memiliki volatilitas tinggi yang sulit ditangkap oleh metode konvensional. Penelitian ini bertujuan membandingkan performa model *Long Short-Term Memory* (LSTM) dan *Gated Recurrent Unit* (GRU) dalam memprediksi harga saham PT Aneka Tambang Tbk (ANTAM) dengan menerapkan teknik *feature engineering*. Metode penelitian menggunakan data historis saham ANTAM periode Mei 2015-2025 sebanyak 2.483 observasi dengan penambahan tujuh fitur turunan (*High_Low*, *Open_Close*, *HL_PCT*, *OC_PCT*, *Volume_Change*, *Return*, *Volatility*). Kedua model dibangun dengan arsitektur identik dua layer (64 dan 32 unit) dengan validasi *TimeSeriesSplit* 5-fold dan evaluasi menggunakan metrik MAE, RMSE, MAPE, dan R^2. Hasil menunjukkan GRU mengungguli LSTM dengan MAE 0.0037, RMSE 0.0057, MAPE 2.78%, R^2 0.9588, sementara LSTM mencatat MAE 0.0041, RMSE 0.0099, MAPE 3.08%, R^2 0.9455, dengan kedua model memenuhi kriteria evaluasi standar tanpa *overfitting*.

Kata Kunci: *deep learning*, *feature engineering*, GRU, LSTM, Prediksi Harga Saham

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ABSTRACT

Stock price prediction faces complex challenges due to data that cannot be predicted linearly and exhibits High volatility that is difficult to capture using conventional methods. This study aims to compare the performance of Long Short-Term Memory (LSTM) and Gated Recurrent Unit (GRU) models in predicting PT Aneka Tambang Tbk (ANTAM) stock prices by implementing feature engineering techniques. The research methodology utilizes ANTAM historical stock data from May 2015-2025 consisting of 2,483 observations with the addition of seven derived features (High_Low, Open_Close, HL_PCT, OC_PCT, Volume_Change, Return, Volatility). Both models were built with identical two-layer architecture (64 and 32 units) using 5-fold TimeSeriesSplit validation and evaluation with MAE, RMSE, MAPE, and R^2 metrics. Results show GRU outperformed LSTM with MAE 0.0037, RMSE 0.0057, MAPE 2.78%, R^2 0.9588, while LSTM recorded MAE 0.0041, RMSE 0.0099, MAPE 3.08%, R^2 0.9455, with both models meeting standard evaluation criteria without overfitting.

Keywords: *deep learning, feature engineering, GRU, LSTM, Stock Price Prediction*