ABSTRAK

ANALISIS PENGARUH *CRYPTO FEAR AND GREED INDEX* DALAM PREDIKSI HARGA BITCOIN MENGGUNAKAN *MULTIVARIATE LONG SHORT-TERM MEMORY*

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Harga Bitcoin yang sangat fluktuatif menimbulkan tantangan dalam prediksi harga yang akurat, sehingga integrasi sentimen pasar menjadi penting untuk meningkatkan keandalan model prediksi. Penelitian ini mengkaji pengaruh *Crypto Fear and Greed Index* (FGI) dalam memprediksi harga Bitcoin menggunakan model *Multivariate Long Short-Term Memory* (LSTM). Data yang digunakan berupa harga harian Bitcoin (*open, high, low, close, volume*) dan nilai FGI periode 1 Februari 2018–30 Mei 2025. Dua model dikembangkan , yaitu Model 1 yang hanya menggunakan lima fitur internal harga dan Model 2 yang mengintegrasikan FGI beserta korelasi bulanan antara FGI dan komponen harga. Proses pelatihan model dilakukan dengan penyetelan *hyperparameter* menggunakan algoritma *Hyperband* dan penerapan *early stopping* dengan metrik objektif *Mean Squared Error* (MSE). Evaluasi kinerja model dilakukan pada data uji menggunakan *Mean Absolute Percentage Error* (MAPE). Hasil penelitian menunjukkan bahwa Model 2 mencapai nilai MAPE sebesar 2,33%, lebih rendah dibandingkan Model 1 dengan MAPE sebesar 6,02%. Temuan ini menegaskan bahwa integrasi sentimen pasar melalui FGI dan informasi korelasi bulanan mampu meningkatkan akurasi prediksi harga Bitcoin secara signifikan, serta memberikan implikasi positif bagi pengembangan sistem perdagangan otomatis yang lebih andal.

Kata kunci: Bitcoin, *Crypto Fear and Greed Index*, *Multivariate LSTM*, *Hyperband*, MAPE

ABSTRACT

The Influence of Crypto Fear and Greed Index in Bitcoin Price Prediction Using Multivariate Long Short-Term Memory

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The highly volatile nature of Bitcoin prices presents a significant challenge for accurate price prediction, highlighting the importance of integrating market sentiment to improve the reliability of predictive models. This study investigates the influence of the Crypto Fear and Greed Index (FGI) in forecasting Bitcoin prices using a Multivariate Long Short-Term Memory (LSTM) model. The dataset includes daily Bitcoin price data (open, high, low, close, and volume) along with FGI values from February 1, 2018, to May 30, 2025. Two models were developed: Model 1, which utilizes only the five internal price features, and Model 2, which integrates FGI along with the monthly correlation between FGI and price components. Model training involved hyperparameter tuning using the Hyperband algorithm and the application of early stopping with the Mean Squared Error (MSE) as the objective metric. Model performance was evaluated on test data using the Mean Absolute Percentage Error (MAPE). The results show that Model 2 achieved a MAPE of 2.33%, significantly lower than Model 1's MAPE of 6.02%. These findings confirm that incorporating market sentiment through FGI and its monthly correlations can substantially enhance the accuracy of Bitcoin price predictions, offering positive implications for the development of more reliable automated trading systems.

***Keywords*:** Bitcoin, *Crypto Fear and Greed Index*, *Multivariate LSTM*, *Hyperband*, MAPE