

## ABSTRACT

### **Modeling Bitcoin Price Movements Based On Time Series Data Using Machine Learning**

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*Bitcoin is one type of cryptocurrency that is currently popular. However, with the volatile and volatile bitcoin price, bitcoin users must be careful in monitoring the bitcoin price movement when transacting. To anticipate these problems, a machine learning model is needed with the Random Forest algorithm and Extreme Gradient Boosting (XGBoost) based on time series data to predict volatile bitcoin price movements. The purpose of this study is to overcome this problem by obtaining a machine learning model that can be used to predict bitcoin price movements, and getting the performance of machine learning models with Random Forest and XGBoost algorithms. This study uses a quantitative method with problem recognition based on observation and reference studies as well as secondary data collection obtained from Yahoo Finance. This research produces a model that can predict bitcoin price movements with the Random Forest and XGBoost algorithms. The performance of the Random Forest model produces an accuracy rate of 99.825% with an RMSE of 0.012616, and the XGBoost model produces an accuracy rate of 99.803% with an RMSE of 0.013413.*

**Keywords:** *Cryptocurrency, Bitcoin, Machine Learning, Prediction, Random Forest, XGBoost*

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