



Predicting Cryptocurrency Trade Count with Machine Learning Models

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I certify that I have read this thesis and that, in my opinion, it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Science.



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DECLARATION

This is to certify that the work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources). The work has not previously been submitted in any form to the Sri Lanka Institute of Information Technology or to any other institution for assessment for any other purpose.

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ABSTRACT

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This study examines the prediction of cryptocurrency trade counts using machine learning. Minute-level market data were cleaned, merged, and enriched with time features to form a reliable dataset. Two ensemble regressors, Random Forest and Gradient Boosting, were implemented alongside baselines, with performance judged mainly by Mean Absolute Error and supported by RMSE. Model tuning and cross validation were used to improve robustness, and results were visualized to compare errors, track actual versus predicted counts, and explain feature influence.

Across the tested assets, Random Forest delivered the most consistent accuracy and generalizable results. Feature importance analysis showed trading volume in USD as the dominant driver of predictions, with additional value from simple temporal cues such as hour and day. Deep learning approaches were explored for their ability to capture non-linear and temporal patterns, but they required further stabilization to match the ensembles on this dataset.

The work highlights both the promise and the limits of machine learning in a market that trades constantly and moves quickly. Models captured broad trends yet struggled with sharp spikes typical of high volatility periods. The thesis proposes practical next steps, including periodic retraining, integration of sentiment and external signals, and the use of explainable methods to improve transparency. These contributions offer a clear framework for real time trade count forecasting and for building adaptive tools to support decision making in digital asset markets.

Keywords: Cryptocurrency, Machine Learning, Trade Prediction, Ensemble Models, Financial Forecasting

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