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# Abstract

This report covers the entire production cycle of building and evaluating two reasonably complex AI models. The intention was to replicate, compare and understand one more widely adopted and reliable model (random forest), and another more recent and complex model (xLSTM-TS). The implementation of which was guided by case studies that are referenced throughout (Tyralis & Papacharalampous, 2017), (Gil et al., 2024) with attention paid to following and contrasting the feature selection processes and data pre-processing of the said mentioned case studies. Such as including an additional random forest algorithm being used for the feature selection and a “de-noising” (multi-resolution wavelet) process on the datasets (the process for this was detailed by (Peng et al., 2021)). The reason for such lengths and scope of study was for the purpose of exploring the current best practices for time series financial forecasting (in this case specifically for trend prediction in BTC-USD price trends).

Further hyper-parameter tuning was performed on only the random forest model with cross comparison evaluations were conducted upon both models (including before and after tuning) for all eight feature sets generated from the 17 features collect for their potential value in BTC price trend analysis.

# Introduction

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# References

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(Gil et al., 2024)

(Tyralis & Papacharalampous, 2017)

(Pabuccu & Barbu, 2023)

(Ghosh et al., 2022)