

# Feature-filtered multivariate time series forecast for bitcoin market price.

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## ABSTRACT

The author proposes a tactical approach to feature elimination - a fusion of (1) traditional feature filtering in relation to a target and (2) multicollinearity-based elimination - for high-dimensional datasets. The experiment utilizes a wrangled historical index (N=1,286) comprised of multivariate data points related to the market and network activity for the popular crypto-asset Bitcoin; 34 features reduced to a subset of 7 top priority features.

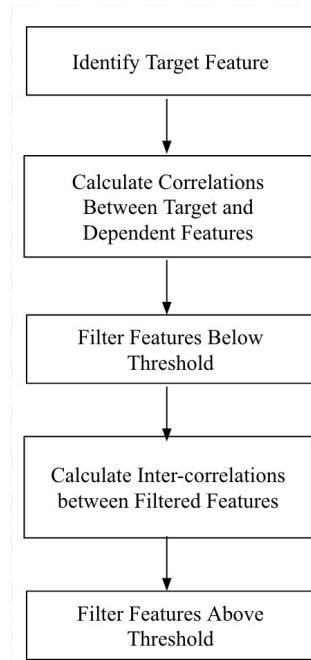


Fig 1. Feature Elimination Steps

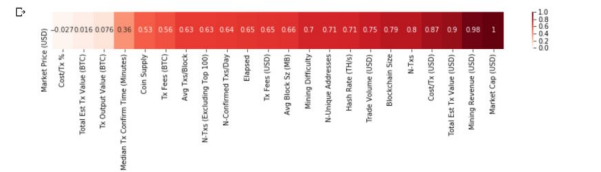


Fig 2. Example of Target-to-Dependent Feature Correlation Matrix

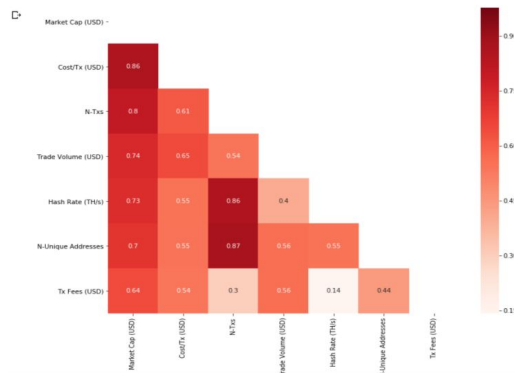


Fig 3. Example Output Matrix Yielded from Method Steps in Fig. 1.

## I. Experimental Results

Results underscore that the proposed strategy retains information with a slight model performance boost (RMSE=35.63,  $r^2$ =.986) over original feature set (RMSE=37.16,  $r^2$ =.984) and a moderate performance boost over the computationally expensive Recursive Feature Elimination (RFE) wrapper method (RMSE=106.43,  $r^2$ =.876).

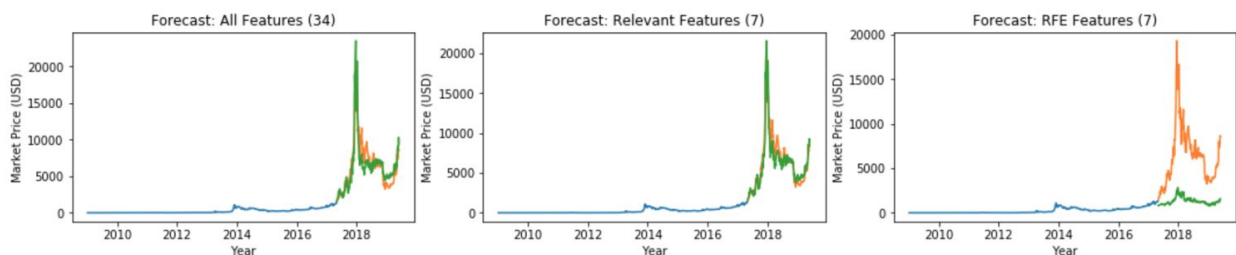


Fig 4. Forecasts (left to right) – (1) All Features, (2) Filtered Subset, (3) RFE Subset