Add Company Name

Crypto Trading Strategy

Hurst Exponent Based Trading Strategy

Agenda

Tip: Use links to go to a different page inside your presentation.

How: Highlight text, click on the link symbol on the toolbar, and select the page in your presentation you want to connect.

- Introduction
- Hurst Exponent
- Trading Strategy
- Data Retrieval
- Hurst Exponent Calculation
- Trading Signal
- Backtesting Results
- Backtesting Results - Cumulative Returns
- Backtesting Results - Performance Metrics
- Whiteboard
- Conclusion

Introduction

- In this presentation, I discuss a trading strategy based on the Hurst exponent.
- The Hurst exponent is a measure of the long-term memory of a time series, and is commonly used in the analysis of financial data.

Hurst Exponent

The Hurst exponent (H) is a dimensionless measure of the degree of self-similarity or long-term memory in a time series.

H ranges from 0 to 1, with values of H > 0.5 indicating persistent behaviour, H = 0.5 indicating a random walk, and H < 0.5 indicating anti-persistent behavior.

The Hurst exponent can be estimated using the rescaled range (R/S) analysis or other statistical methods.

Trading Strategy

- The trading strategy based on the Hurst exponent involves taking long positions when the Hurst exponent is above a certain threshold, and taking no positions or short positions otherwise.
- The intuition behind this strategy is that persistent behavior in the time series implies that the current trend is likely to continue, while anti-persistent behavior implies that the current trend is likely to reverse.
- I Used the Python programming language and the yfinance library to implement this strategy.

Data Retrieval

- I retrieved daily historical data for the cryptocurrency Bitcoin (BTC-USD) using the yfinance library.
- The data will cover the period from January 1, 2015 to March 9, 2022.

Hurst Exponent Calculation

- We will calculate the Hurst exponent using the R/S analysis.
- The R/S statistic is the ratio of the range of the cumulative sum of deviations from the mean to the standard deviation of the series.

$$R/S = (\max(R) - \min(R)) \ / \ \text{StdDev}(R)$$

- where R is the cumulative sum of deviations from the mean.
- The Hurst exponent is estimated as the slope of the linear regression line of log(R/S) versus log(n), where n is the number of observations in each subseries.

$$H = \text{slope of } \log(R/S) \text{ versus } \log(n)$$

- where log(R/S) is the natural logarithm of the R/S statistic, and log(n) is the natural logarithm of the number of observations.
- I used a rolling window of 100 days to calculate the Hurst exponent for each trading day.

Trading Signal

I used a threshold of 0.5 for the Hurst exponent to generate the trading signal.

When the Hurst exponent is above 0.5, the algorithm will take a long position in Bitcoin..

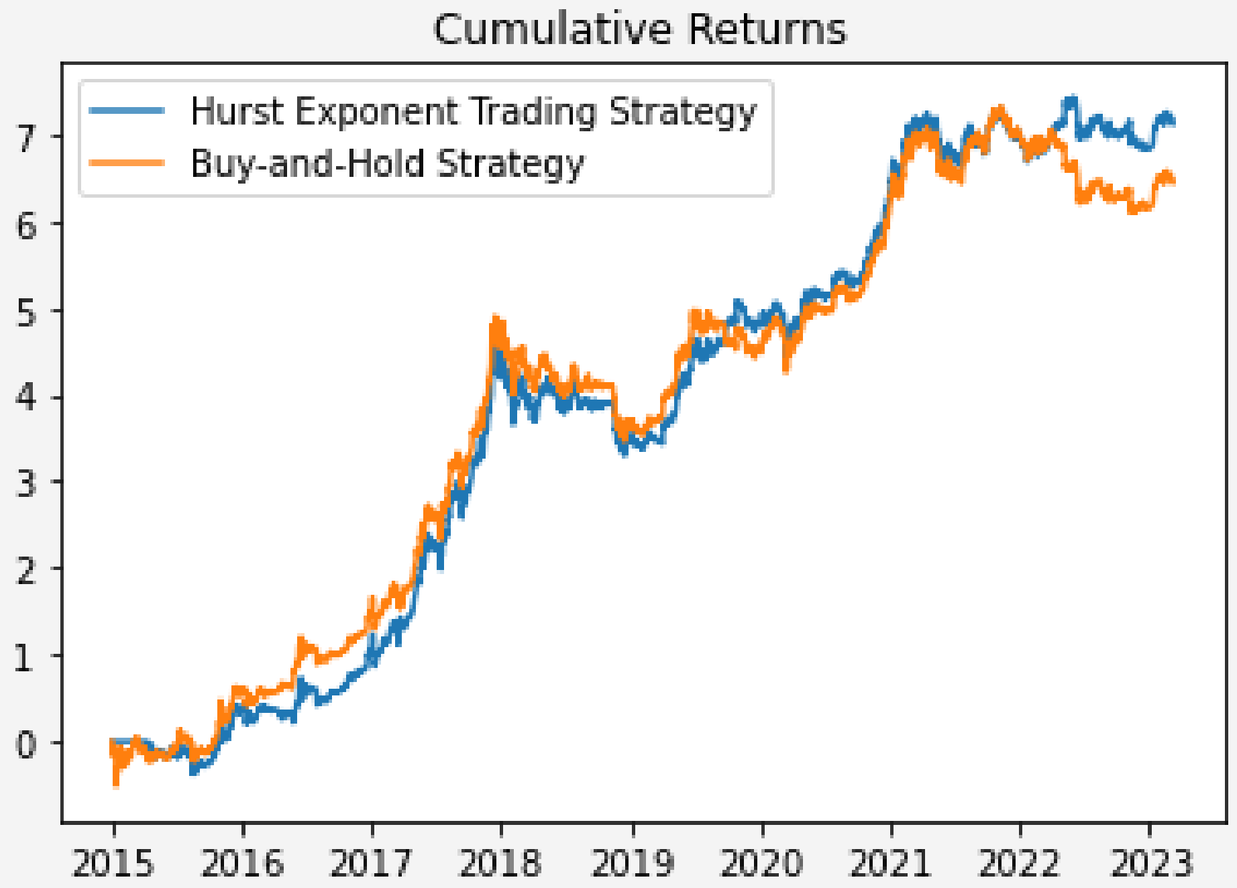
When the Hurst exponent is below or equal to 0.5, the algorithm take a short position in Bitcoin.

Backtesting Results - Cumulative Returns

- The cumulative returns of the trading strategy show a steady increase over the backtesting period, with a total return of 713%.
- The strategy outperforms the buy-and-hold strategy for Bitcoin, which has a total return of 645% over the same period.

Backtesting Results - Performance Metrics

- The performance metrics of the trading strategy are as follows:
- Sharpe ratio: 1.02
- Sortino ratio: 1.33
- ROI: 713%
- Maximum drawdown: 18590.78%


Cumulative Returns
Hurst Exponent Trading Strategy
Buy-and-Hold Strategy
7
6
5
4
3
2
1
0
2015
2016
2017
2018
2019
2020
2021
2022
2023