

Quant Trading Strategies Using HMM or ML





Table of contents

(01) Data Processing

(02) Model & Strategy Design

(03) Trading Execution

01



Data Processing

Let's have a look

Step 1: Data Processing

Multiple Sources

CryptoQuant

Glassnode

CoinGlass

Bitcoin Data

Ethereum Data

Quality Control

Scaling

Imputation

Step 2: HMM Model

Miner Flows

Exchange Flows

Network Data

Market Data

Whale Data

On-Chain Features

Derived into

Technical Indicators

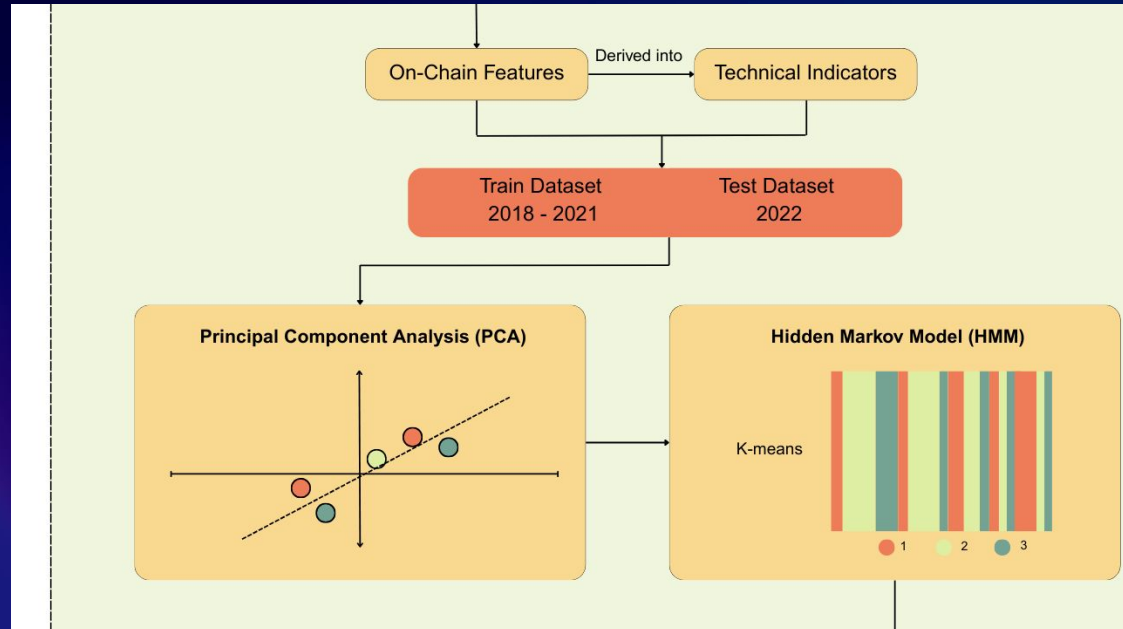
Train Dataset
2018 - 2021

Test Dataset
2022



Model & Strategy Design

Let's have a look



5

States from
Regime Detection

3

01 Sideways



02 Slightly Bearish



03 Strongly Bearish

5

States from Regime Detection

3

04 Mildly Bullish



05 Strongly Bullish

5

States from Regime Detection

Determine through



Returns

Average return using:
`close price.pct_change()`



Volatility

`Close price.pct_change().rolling(window).std()
* 100`



Trend

`np.where(df['ema_50'] > df['ema_200'], 1, -1)`

5

States from Regime Detection

Determine through



Volume

Volume & Count



Relative Strength Index (RSI)

`RSIIndicator(close=df['close'], window=14).rsi()`

Trading Signal?



When to buy & When to sell

Flat Position



Sideways?

- Use ***Bollinger Bands*** to determine upper and lower price range levels.
- Sell at ***resistance level***.
- Buy at ***support level***.

Flat Position



Discover a Trend?

- Buy when transitioning to bullish trend.
- Sell when transitioning to bearish trend.

Long Position

When to Enter & Exit

- Buy when discover a bullish trend.
- Sell when the return is greater than invested or found a bearish trend.



Short Position

When to Enter & Exit

- Borrow and sell when discover a bearish trend.
- Buy back when the price falls to a level where the return is sufficient to cover the loan



03



Trade Execution

Trade Execution

1

Buy Signal & Flat Position

Buy Amount < Cash's 50%
Calculate 6% trading_fee

2

Sell Signal & Long Position

Sell Amount \geq Portfolio's 20%
Calculate 6% trading_fee

Sell Signal & Short Position

Sell Amount < Portfolio's 20%
Calculate 6% trading_fee

3

Buy Signal & Short Position

Buy Amount \geq Loan
Calculate 6% trading_fee

4

Thanks!

