Algorithmic Trading approaches on real time blockchain data

Krzysztof Jankowski
Supervisor: Rafał Połoczański

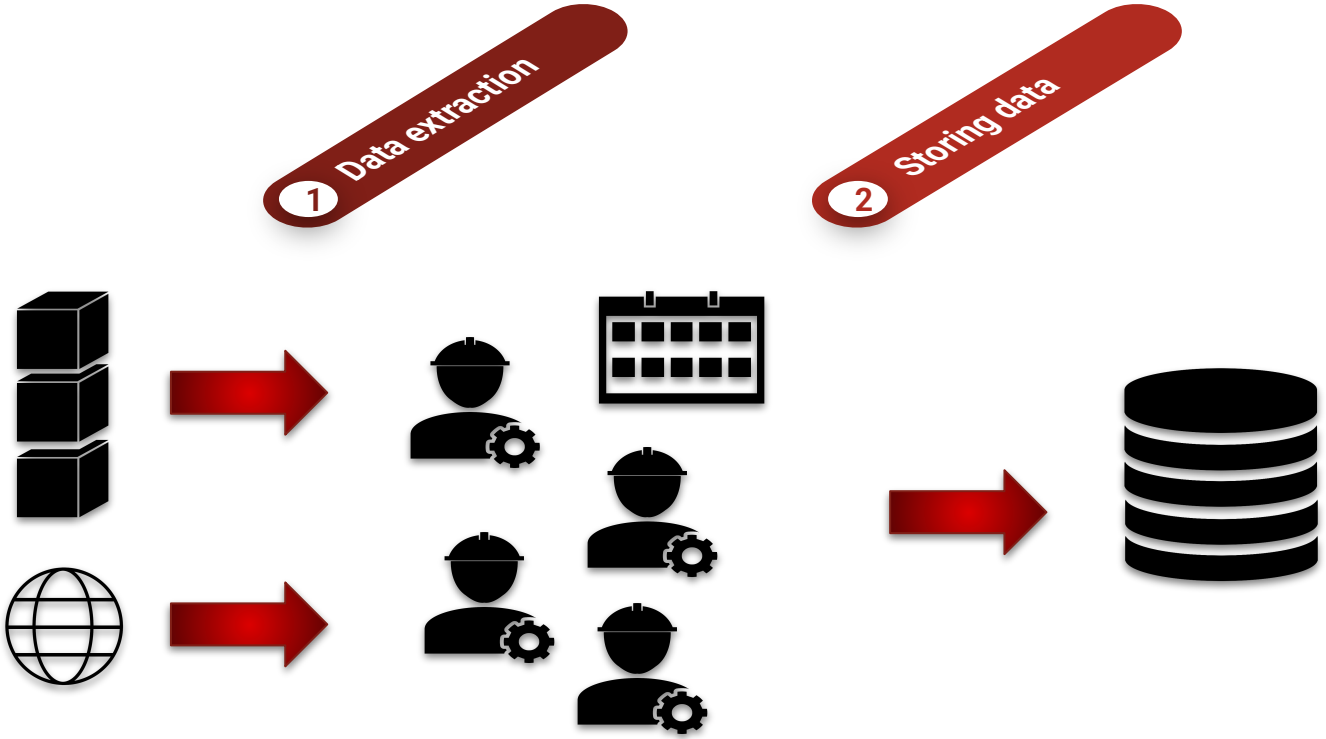
Agenda

- Data provider
- Trader

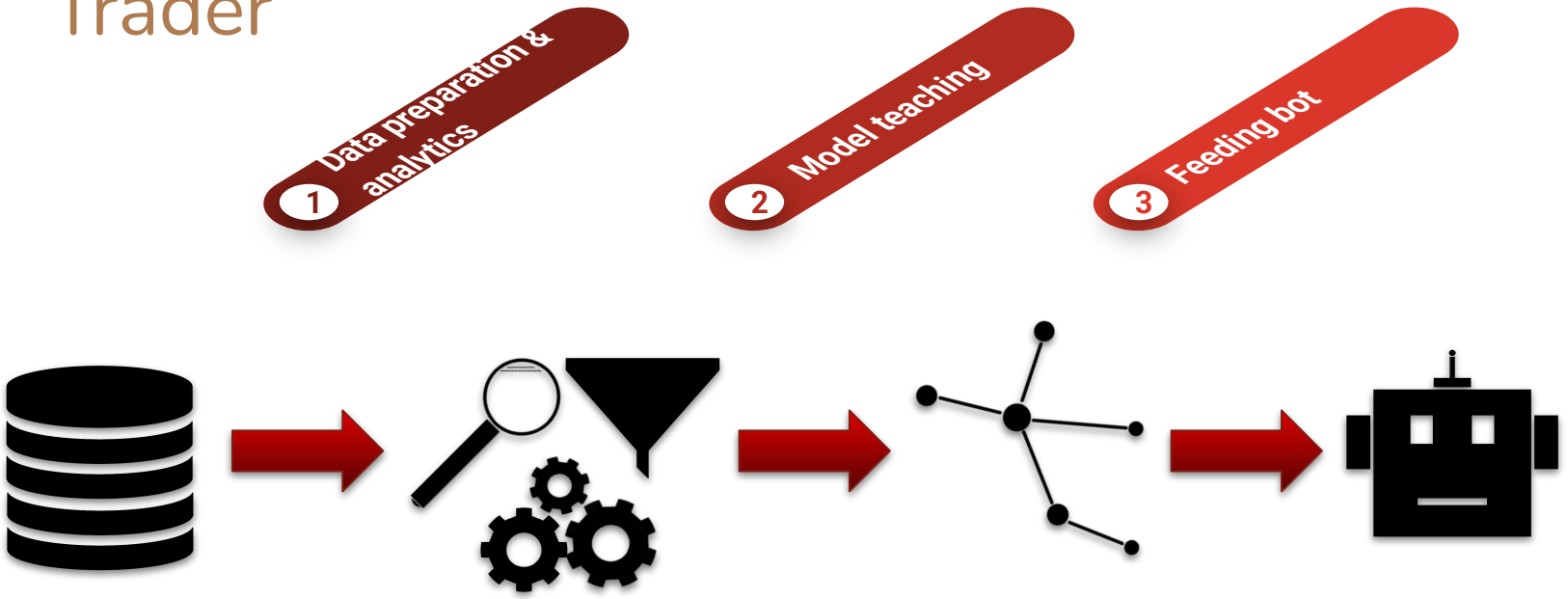
- Block
- Balance
- Exchange
- Stock

- TVL
- SOPR
- EF
- CDD

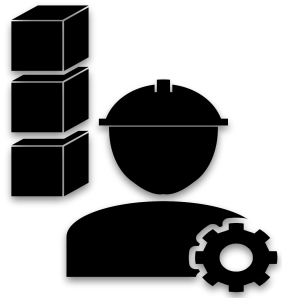
Data Provider



Trader

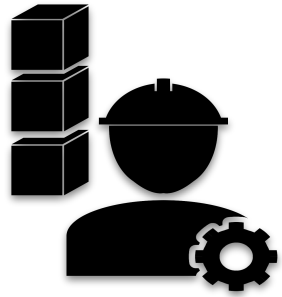

1 Data preparation & analytics
2 Model teaching
3 Feeding bot

Block Worker



01	**Block metadata**	• block timestamp • Hash rate • Size • ...
02	**Transactions**	• Transfers • Withdrawals
03	**Wallets**	• From activities

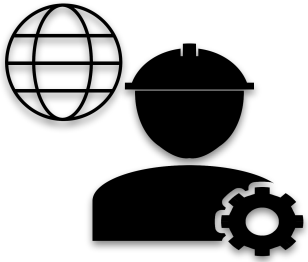
Balance Worker



01 **Balance**

- Staked
- Free

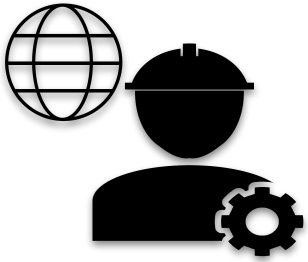
Exchange Wallets Worker



01 **Wallets**

- Top 20 wallets for each of top 8 Markets

Stock Price Worker



01 Stock price

On-chain metrics

Total Value Locked

$$\mathrm{TVL} = n_s f$$

n_s-staked tokens
f- exchange rate

Exchange Flow

$$\mathrm{EF} = \sum_{k=1}^{N} CF_k$$

CF_k-cashflow
N- exchange wallets number

Network Value to Transaction Value

$$\text{NVT Ratio} = \frac{\text{MarketCap}}{\text{Total Transaction Value USD}}$$

Coin Days Destroyed

$$\text{CDD} = n\Delta t$$

n-coins in transaction

Δt-difference between current and last transaction

Spent Output Profit Ratio

$$\text{SOPR} = \frac{\text{Value of BTC when spent}}{\text{Value when acquired}}$$

Net Unrealized Profit or Loss

$$\text{NUPL} = \frac{\text{Marker Cap} - \text{Realized Cap}}{\text{Marker Cap}}$$

Bibliography

[1]N. Jagannath *et al*., "An On-Chain Analysis-Based Approach to Predict Ethereum Prices," in *IEEE Access*, vol. 9, pp. 167972-167989, 2021, doi: 10.1109/ACCESS.2021.3135620.
[2]BitBO 2025, Net Unrealized Profit Loss (NUPL), accessed 3 May 2025, <https://charts.bitbo.io/net-unrealized-profit-loss/>
[3]BitBO 2025, CDD (Coins Days Destroyed), accessed 3 May 2025, <https://charts.bitbo.io/cdd/>
[4]Nguyen, Q. (2025). Onchain Analytics: a new methodology for cryptocurrency analysis.

Thank you for your attention