

Automated Bitcoin Trading – Feinkonzept

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1 Research Objectives

1. Identify statistically significant signals that signal potential short-term price moves.
2. Convert the most promising signal(s) into an executable rule-based strategy.
3. Evaluate performance via back-testing and a four-week live test (16 Jun – 14 Jul 2025).
4. Document robustness, limitations and possible improvements.

2 Contents of Thesis

2.1 Market Mechanics

Here I explain what Bitcoin is and what the value of Bitcoin represents. I then cover the basics of auction theory and why it is important for understanding how markets work. Finally, I discuss the efficient market hypothesis and its relevance to algorithmic trading.

2.2 Exploratory Data Analysis

Here I describe the process of exploring the data. I look at the data in plain terms, plot the bid- and ask-side deltas, check how often and how strongly they move, and see whether large changes line up with later price moves. I also use simple tools such as line charts and histograms to spot patterns that seem to be statistically relevant.

2.3 Risk & Position Size

Here I explain how I handle risk and position size. How I calculate the position size and how I set the stop-loss and take-profit levels. How I came up with the numbers and how I adjusted them.

2.4 Automation and Test Run

Here I describe how I automate the trading process. I explain how the bot is set up to run automatically, how signals are processed, and how orders are sent to the exchange. I also cover how I monitor the system, log trades and errors, and set up alerts for any issues. Finally, I explain how I run a test phase (paper trading) to make sure everything works as expected before using real money.

2.5 Termonology

3 Project Timeline

Phase	Weeks / Dates
Exploratory analysis & signal ideation	KW 17 – KW 21 (24 Apr – 26 May)
Parameter tuning & dry-run (paper trading)	KW 22 – KW 25 (27 May – 23 Jun)
Live deployment (real funds)	KW 28 – KW 31 (8 Jul – 4 Aug)
Result analysis & thesis writing	KW 32 (5 Aug – 11 Aug)
Editing, final layout, submission	KW 33 – KW 35 (12 Aug – 1 Sep)

This timeline could change and is just a rough estimate.

3 Expected Delivery

- Python code for data handling, back-testing and live execution in a GitHub repository.
- Example datasets already available at GitHub repository.
- A statistical report comparing other strategies I tested and other signals I considered.
- Final thesis detailing methodology, live results and critical reflection.