Autonomous Bitcoin Trading

Documentation

Gymnasium Thun
26gs
Submitted by:

Juri Stoffers

Supervised by:

Dr. Geoffrey Ostrin

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Abstract

Trading is the act of buying and selling and asset like Stocks or Cryptocurrencies with a goal to make a profit. Meanwhile trading has become pretty popular through social media with a lot of hype and described as an easy way to get rich. While trading is one of the most difficult jobs in the world for serveral reasons. Learnging to overcome basic human instincts and emotions is just one of the many challenges. Shortly said humans aren't made to trade so why not let the computer do the work for us. In my Matura thesis I will try to develop a trading strategy that can run autonomously buy and sell Bitcoin with a profit while showhing why trading isn't a free money machine and that you should probably stick with something else if you want to make money and not lose your mind while doing so.

Contents

1 Foreword

Everything started somwhere in early 2022 where I read "The Bitcoin Standard" by Saifedean Ammous. A book explaining why Bitcoin even exists and what problem it is trying to solve. I probably only understood 30% of the book. These 30% however were enough for me to to start researching Bitcoin and the underlying technology. I watched regular Crypto Market update videos. Then in Novber 2022 FTX experienced a bank run. FTX was the second largest Crypto exchange. (A place to sell and buy various Crypto currencies). The problem was FTX didn't have the exchange funds to cover the withdrawals. This was a big problem because FTX was the second largest exchange. Bitcoin already was down bad from previous highs but this was the final nail in the coffin. Bitcoin was down 80% from its all time high and went down to a price of 15'000 dollars per Bitcoin. That was the first time I wanted to buy Bitcoin after watching it for about half a year. Luckily in 2022 buying Bitcoin even when you are below 18 was possible. One thing led to another and I spend more and more time watching charts and losing my mind. I started to try to trade profitable so basically trying to make money buy buying low and selling higher. This sounds very simple but it seemed impossible. Since I also started coding in 2022 I, and trying to code some autonomous trading bots I caught fire and kinda fell in love with it. So now I'm here.

I had no idea what I was getting myself into and if I knew before I would probably have never started. I spend more time than I wanted and complety lost myself in the work. I totaly fogrot about the writting part and spend a lot of time just coding. This whole thing got way bigger than I initially thought but I'm proud to present what I got since it is a lot.

2 Introduction

The primary object of my thesis is if I am able to develope an autonomous operarating trading algorithm that can generate me a profit. To that end my thesis will cover the entire development cycle, from researching, backtesting strategies and live deployment execution with real money on Bitcoin evaluating the results in the end.

The strategy I will try to find should rely on statistical evidendent found by analysing historical Bitcoin data. The model will be tested on historical timeseries data.

The work is divided in three parts: Researching this can be done in multiple ways just by watching markets over longer time periods to get ideas, reading books about how other people were able to develope strategies and steal logic from then or just try to find something by yourself which can be implemented as a strategy.

The skills I need to complete this project are luckly straight forward: Statistics, Programming and understanding how the market operates. I need to apply stasticial rules to prove if my idea is worthless or has something to it which might allow me to make a profit. Programming is just needed to make the process of testing or applyinng my ideas and in the end to automate the whole process.

So I'm planning to end up with the following products at the end of this project:

- Trading strategy
- Backtests results
- Research documentation
- Trading algorithm
- Live execution results
- Live Dashboard

2.1 Trading strategy

A trading strategy is a set of rules that are used to make a decision to buy or sell a asset. it can consistis out of systematic rules or purly based on discretionary rules. Systematic rules are set for specific values to occure or a signals so for example if we move up 2% in one day we buy x amount of Bitcoin. A discretionary rule is a rule that is based on a human's intuition or a feeling.

My algorithm trading strategy is clearly a systematic rule set since we can't automate discretionary rules.

2.2 Backtesting Results

To find an strategy we have to first test potential ideas on historical data after finding a potential strategy we can run backtests to see how it would have performed in historical environments

2.3 Research documentation

This is a document where write down the formulars I used and explain them in detail in adition to the different results I got. I decided to to this because I just tested and tried out a lot of different things. it will be written so that you can understand it after reading through my thesis.

2.4 Trading algorithm

This will be in form of a github repository, github is a platform where you can share codebases and collaborate with other people. It is the easiest way to share my code and make it available to other people. So in the Github repository I will share the codebase for my trading algorithm

2.5 Live dashboard

This will just be a website where you can see the live performance of the trading algorithm, the live signal calculations results and how my algorithm currently is positioned.

3 Theoretical background

3.1 Algorithmic trading

Algorithmic trading is a trading strategy that uses computer programs to make trading decisions. It is a form of automated trading that is based on pre-defined rules and algorithms.

3.2 Related Work

Discussion of related work.

4 Methodology

Your methodology description.