

# Neural Networks and Crypto Markets

Forecasting and Insight



# Focus Question

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Can we make predictions on  
cryptocurrency markets using reddit  
social media sentiment analysis and  
historical data as features  
in a neural network?

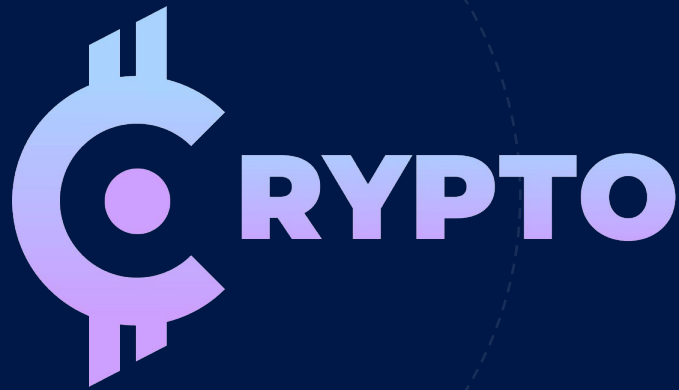
# The Process

Data Science crosses a range of fields and can be applied to almost any problem, but it usually follows the same general framework. This project is no different.

1. Question
2. Data Acquisition
3. Exploration
4. Modeling
5. Assessment and Analysis
6. Moving Forward: What Next?



# **A brief explanation of Cryptos**



# The Basics

- Digital currency
- Utilize encryption techniques
- Often decentralized, no banks
- 2009 and Satoshi Nakamoto
- Buzzword King: Blockchain
- Smart Contracts
- The rise of the “alt coin”
- Change the world, get rich (or not)



# Crypto TimeLine

The origin, the hype, the crash, the hype....

**1983**

Cryptographer David Chuam conceives of electronic money known as "e-cash".

**1998**

Wei Da publishes a description of "b-money", an anonymous distributed electronic cash system. Later described by contemporary as "Bit Gold".

**2009**

A mysterious figure known as Satoshi creates "Bitcoin", the world's first fully functioning crypto.

**2015**

Ethereum goes live, changing cryptos forever by introducing the concept of Smart Contracts

**2018**

After an unprecedented spike, Bitcoin and other currencies experienced and ongoing crash that would end in an 80% loss from the peak.

# Bitcoin

The first market we'll be trying to predict



## Aspects

Decentralized public ledger currency with a massive amount of owners, miners, and media attention.

Reason 1

**Original**

Reason 2

**Large market**

Reason 3

**Wealth of Data**

# Binance Coin

The second market we'll be trying to predict



## Aspects

ERC20 Token distributed by the Binance market, used for fees and general investment. New and evolving.

Reason 1

**Promising**

Reason 2

**Large market**

Reason 3


**Stability**





# **/r/Bitcoin** **Sentiment** **Analysis**

Used the Pushift API  
to neatly scrape 701,252 posts  
from 2013 forward

A large, light gray circle containing a white Reddit mascot (a dog-like creature with a red antenna) holding a large orange Bitcoin. The background of the circle has faint, repeating text: 'sacred post', 'sacred post', and 'sacred post'.

**1,039,791**  
**users**  
**as of 5/16/19**

**188+**  
Posts per Day

# **/r/Bitcoin** **Sentiment** **Analysis**

Used the VADER system  
to analyze the positive,  
negative, and neutral sentiment  
of post titles and self text.

Stat

count	2023.000000
mean	0.142802
std	0.055717
min	-0.008485
25%	0.102534
50%	0.137308
75%	0.177344
max	0.424886

Mostly  
positive...

'Hype train'



# /r/Bitcoin Sentiment Analysis

Found a subreddit full of hype  
and anxiety.



66



Posted by u/OptimusMaximusCrypto 1 year ago 📄

## Drunk AF, BTC IS KING

Went around drinking tonight on the town! Asked about every other personbifntheybowneed btc. Their answer was no. Write it on every bars washroom wall "buy btc". Girls don't like that my btc couldn't buy them drnks 🤔

To the moon! TESLA ROADSTERRRR SOON!

Edit: I am now awake :). For those of you that think this is "cringe", let a young crypto enthusiast have fun jeez. Nothing better than drinking and promoting BTC imo but clearly y'all have better things to do then have fun & express your excitement 🙌 Glad I wrote this over trying to trade 🤔



71 Comments



Give Award



Share



Save ...



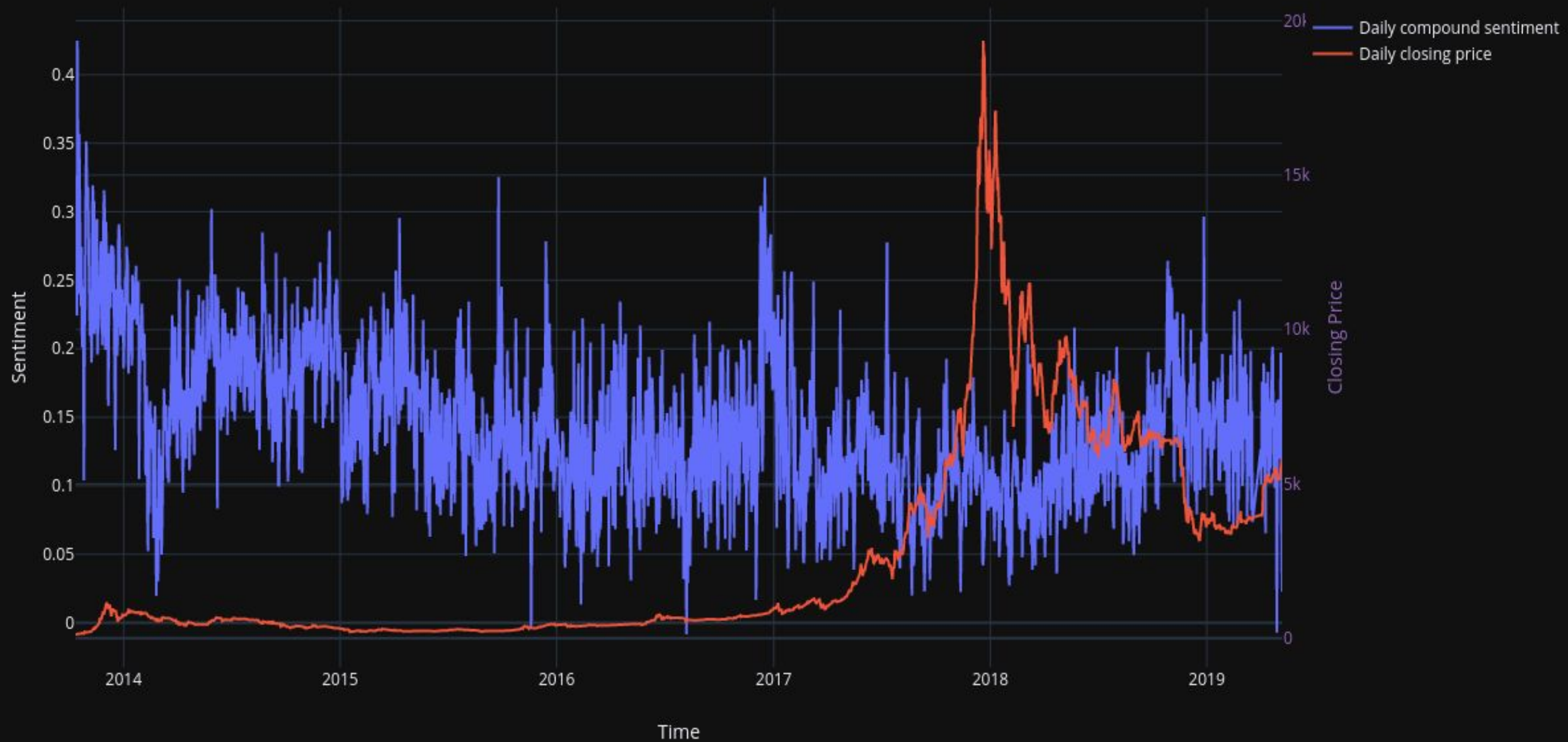
47



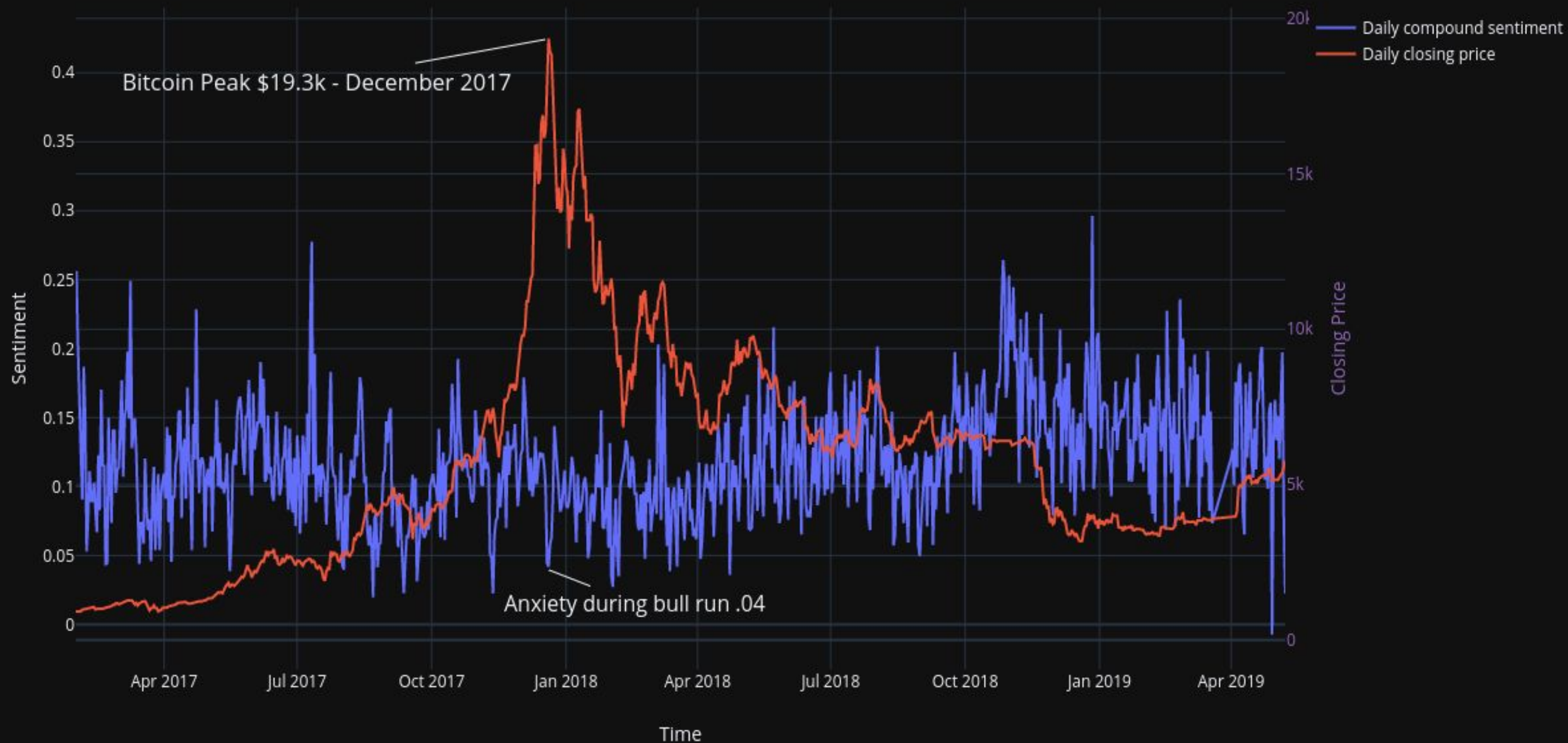
Posted by u/foxevv 4 years ago 📄

## Ukraine bans Bitcoin

## Comparing Prices with Average /r/Bitcoin Sentiment




## Comparing Prices with Average /r/Bitcoin Sentiment





# **/r/Binance** **Sentiment** **Analysis**

Used the Pushift API  
to neatly scrape 21,705 posts  
from July 2017 forward

The Binance logo, consisting of a yellow diamond shape with a black geometric pattern inside, is centered within a white circle. This circle is partially overlapped by two larger circles: a purple one at the bottom left and a blue one at the top right.

**51,037**  
**users**  
**as of 5/16/19**

**30+**  
Posts per Day



# /r/Binance Sentiment Analysis

Used the VADER system  
to analyze the positive,  
negative, and neutral sentiment  
of post titles and self text.

count	601.000000
mean	0.121372
std	0.114070
min	-0.317166
25%	0.050807
50%	0.115796
75%	0.187117
max	0.726400

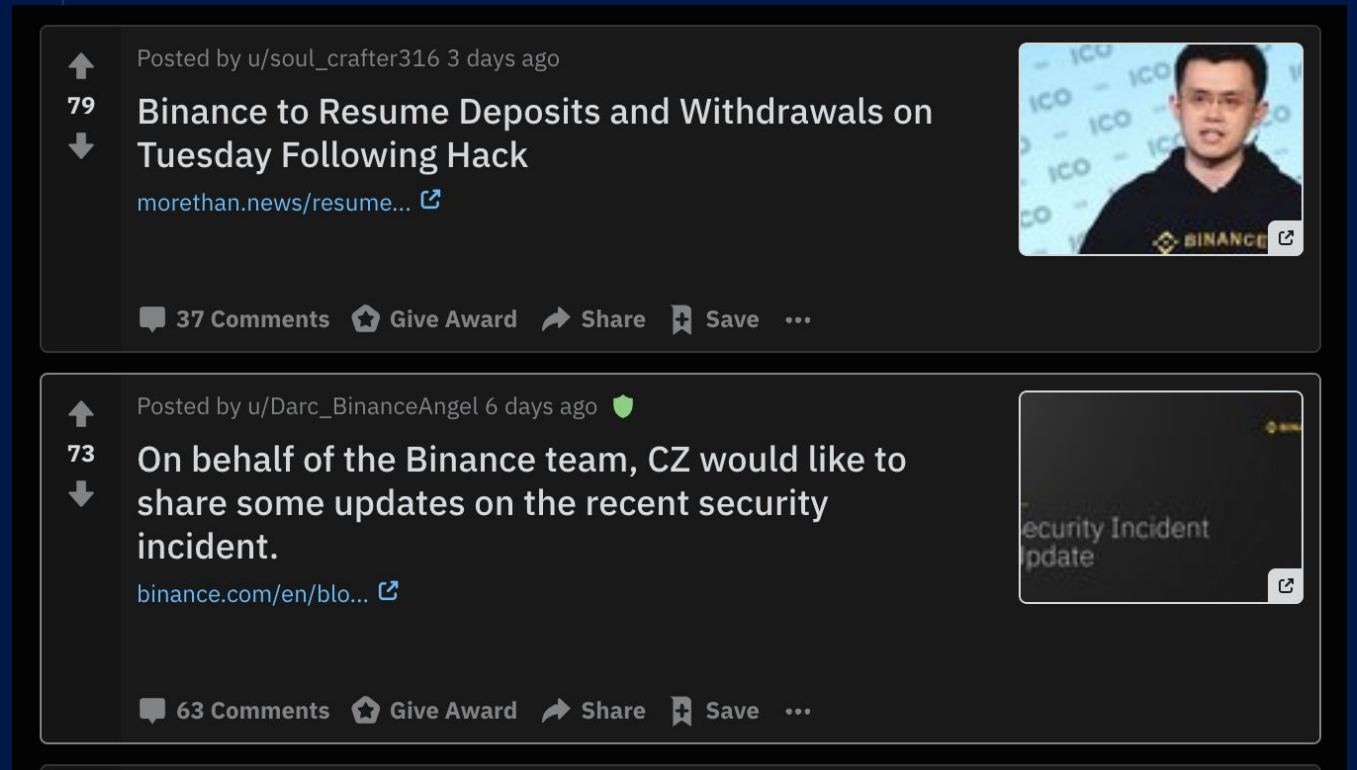
Stat

Stat



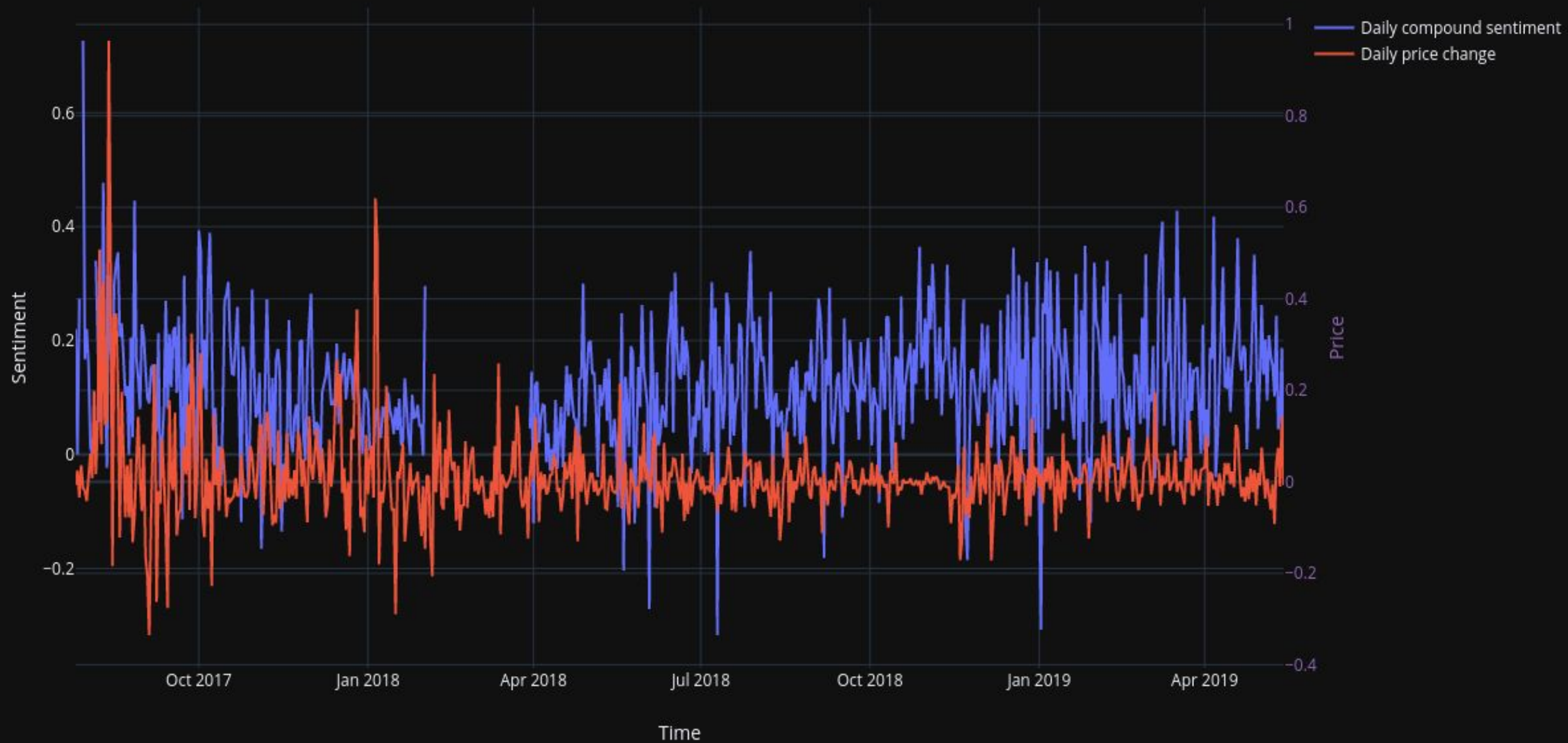
# /r/Binance Sentiment Analysis

Found a subreddit full of optimism with the occasional fretting about site drama.

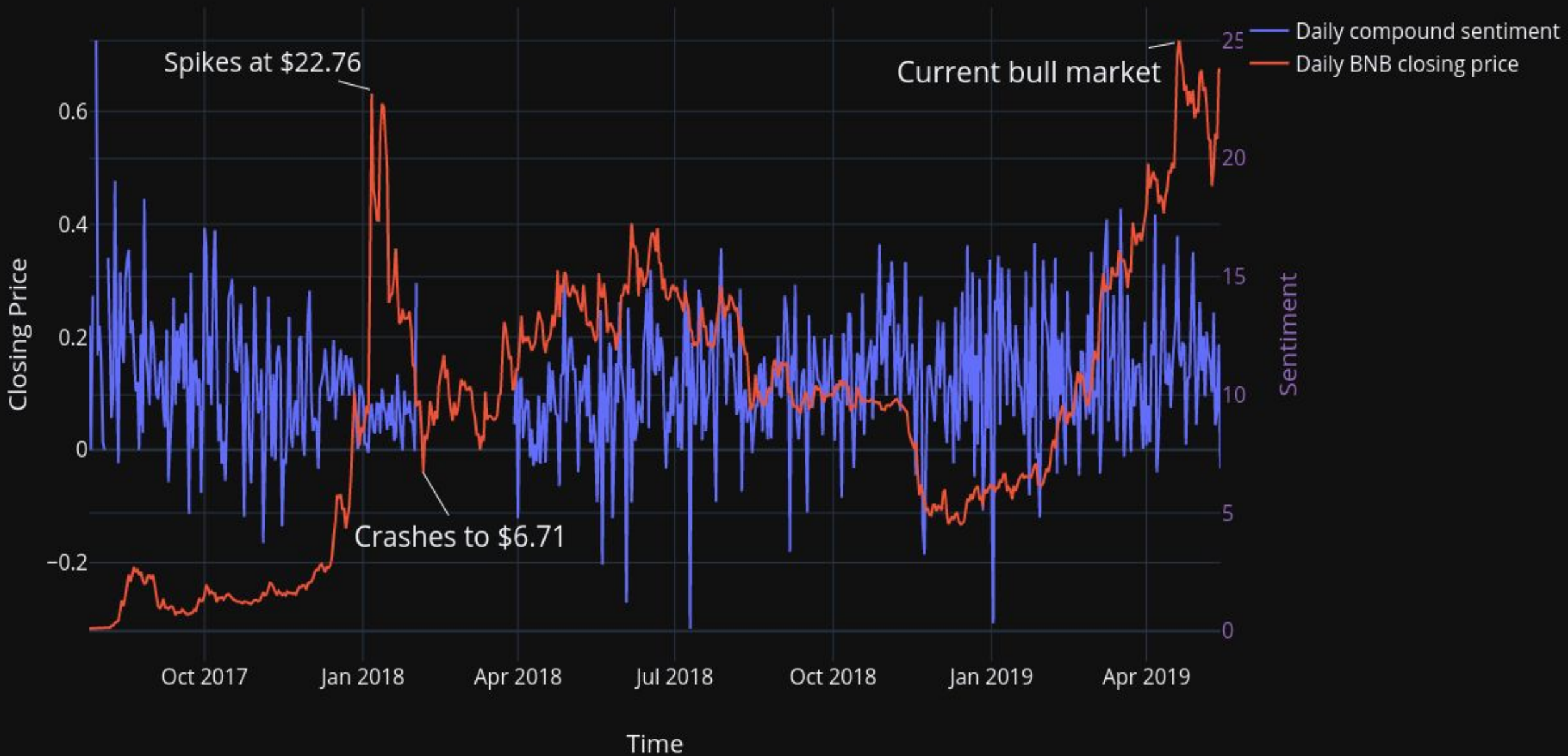




Comparing Price Changes with Average /r/Binance Sentiment



## Comparing Prices with Average /r/Binance Sentiment





# Modeling!

What's involved in our model?

## Sentiment

-1 to 1

For every single day of data, we compounded the sentiment combining the positive, negative, and neutral analysis into a single number.

## Price History

USD values

I took the general price history, particularly the closing price, and then created a dataset with the percent change in price for each day.

## Predictions

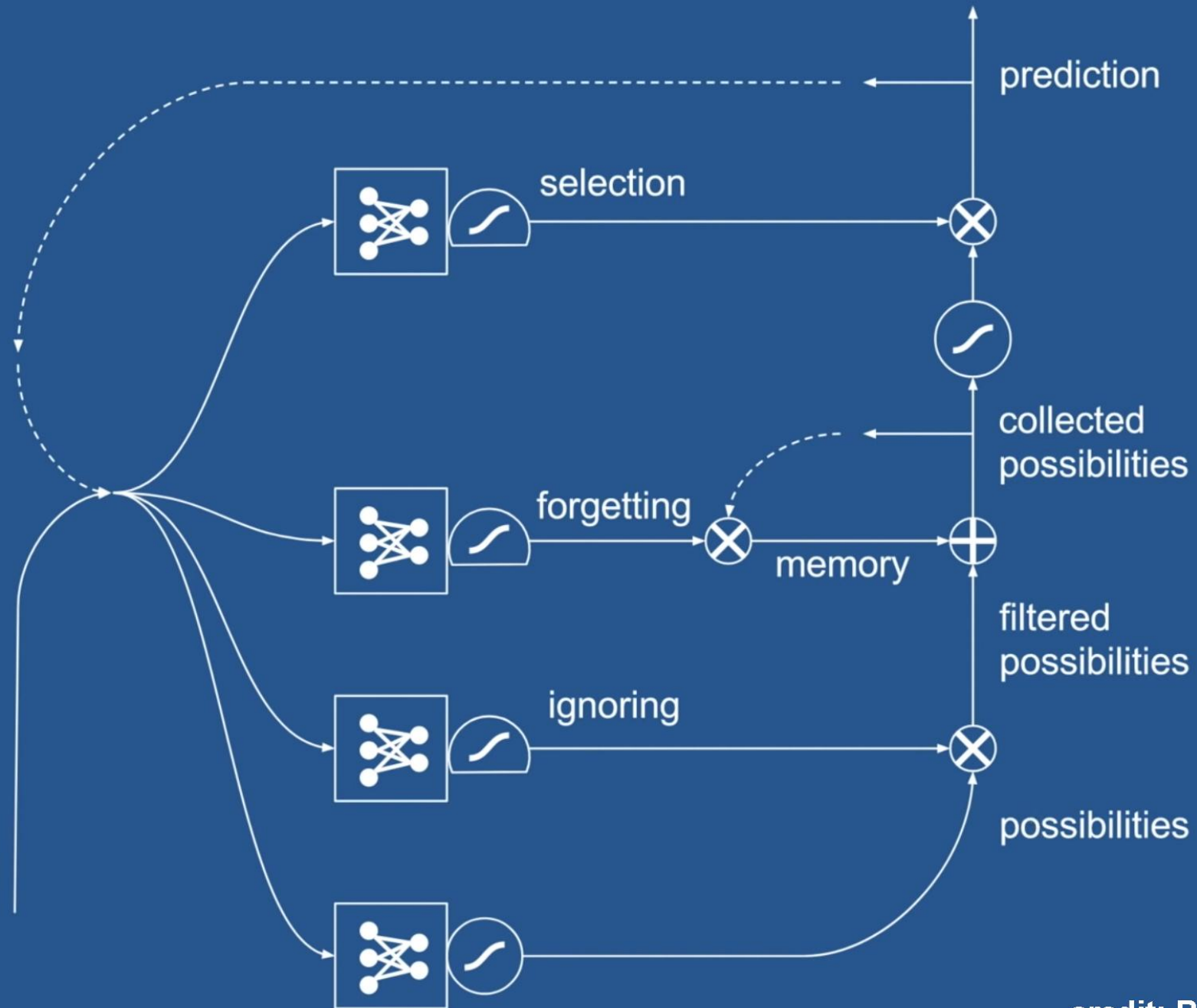
0, 1, 2

Up? Down? Stagnant  
within + or -1%

long  
short-term  
memory

## Recurrent Neural Network

new  
information



credit: Brandon Roher

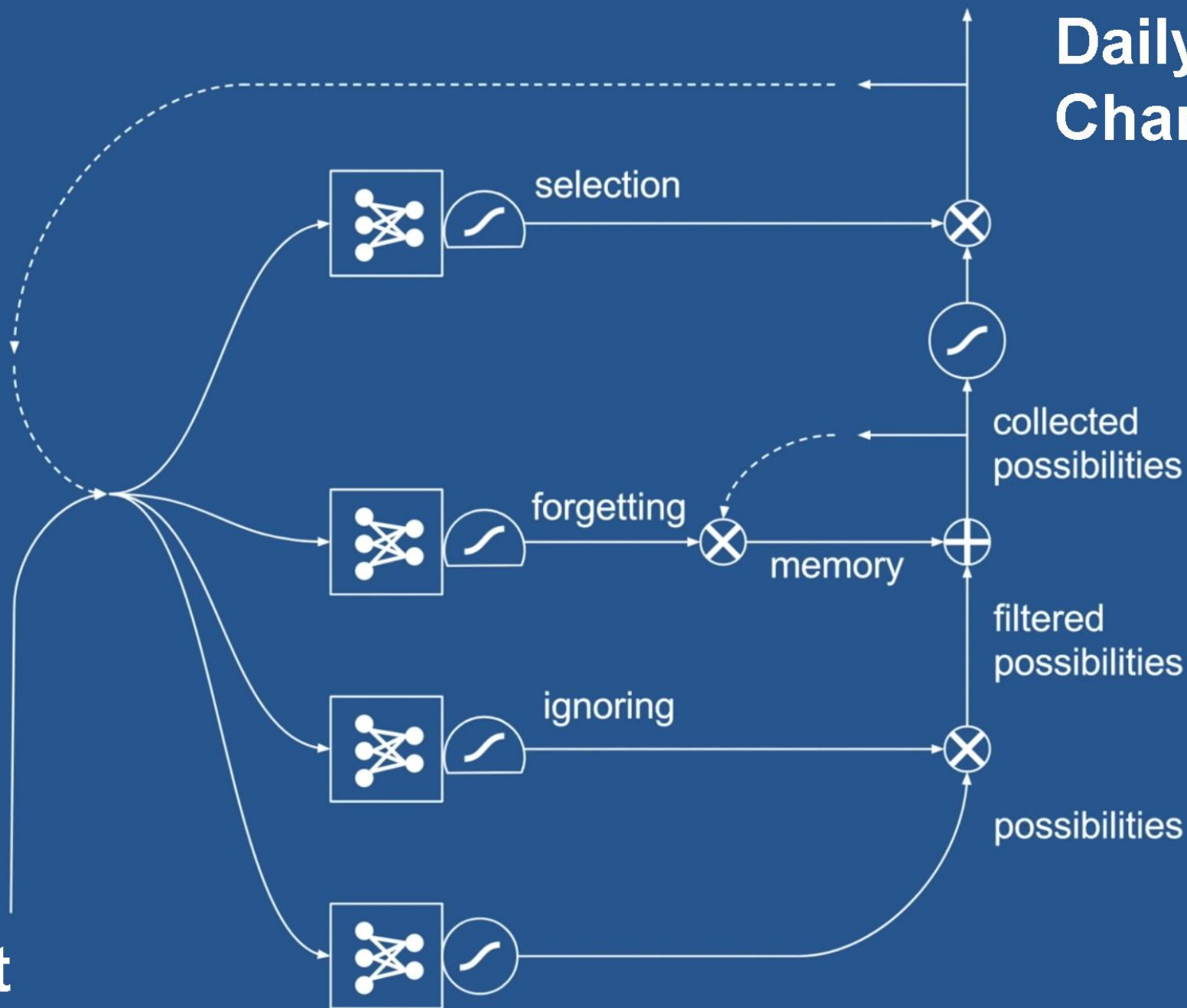


long  
short-term  
memory

Recurrent  
Neural  
Network

Price History  
and Sentiment

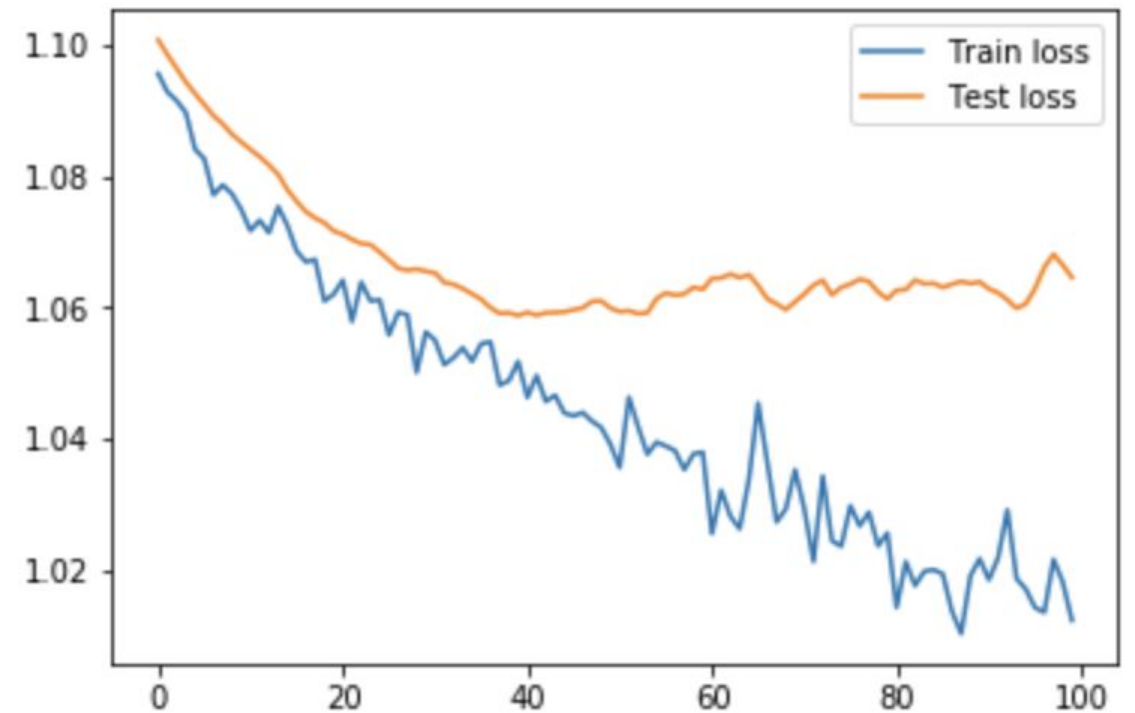
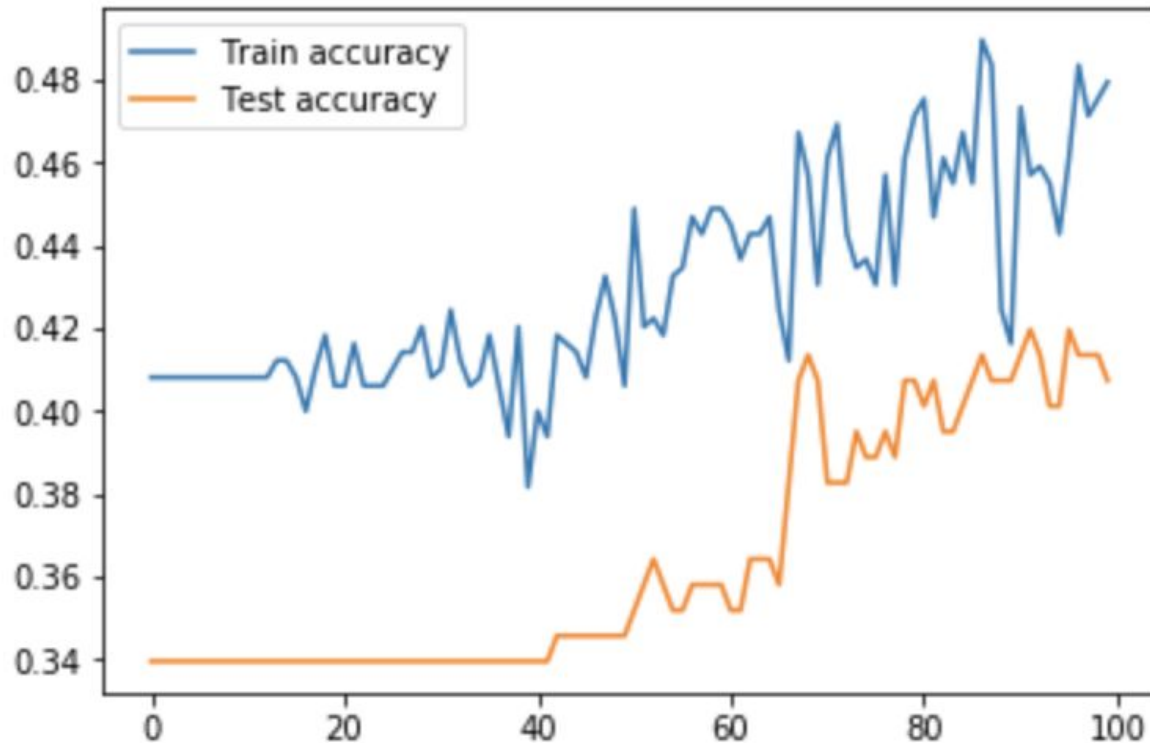
Daily Price  
Change





# Binance Results... Not so great!

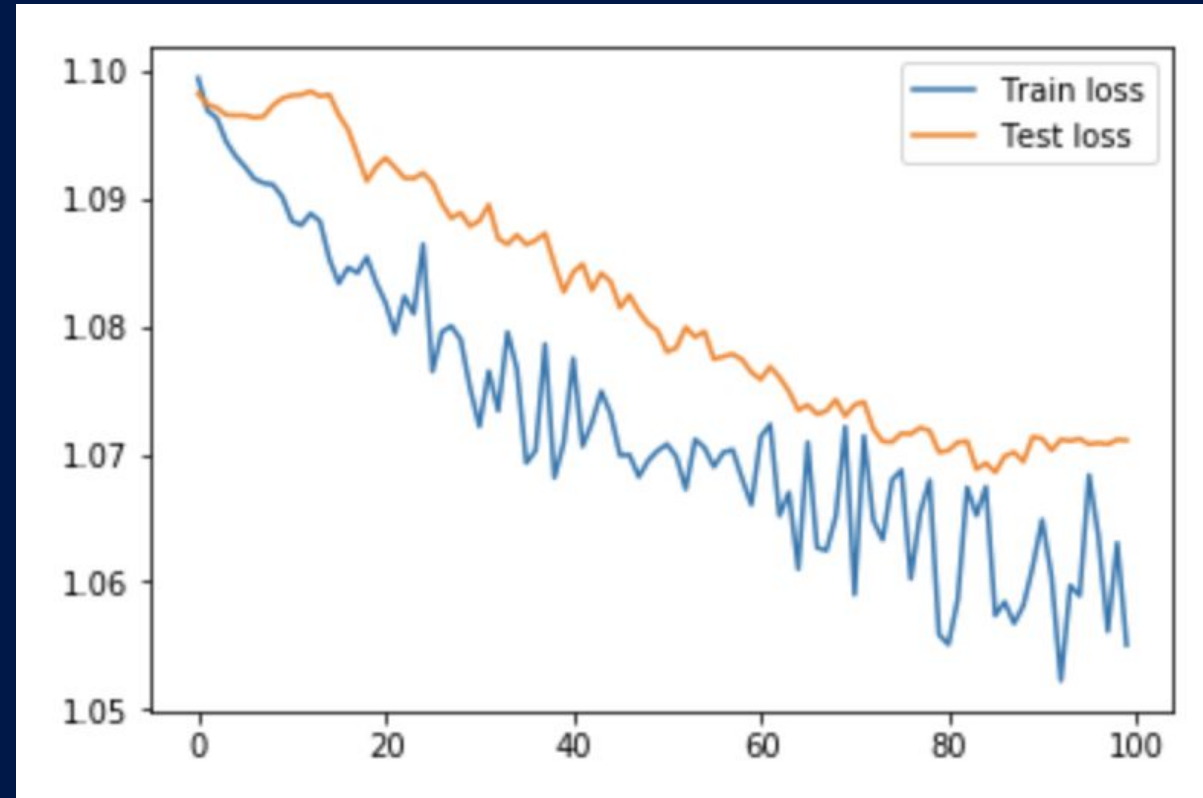
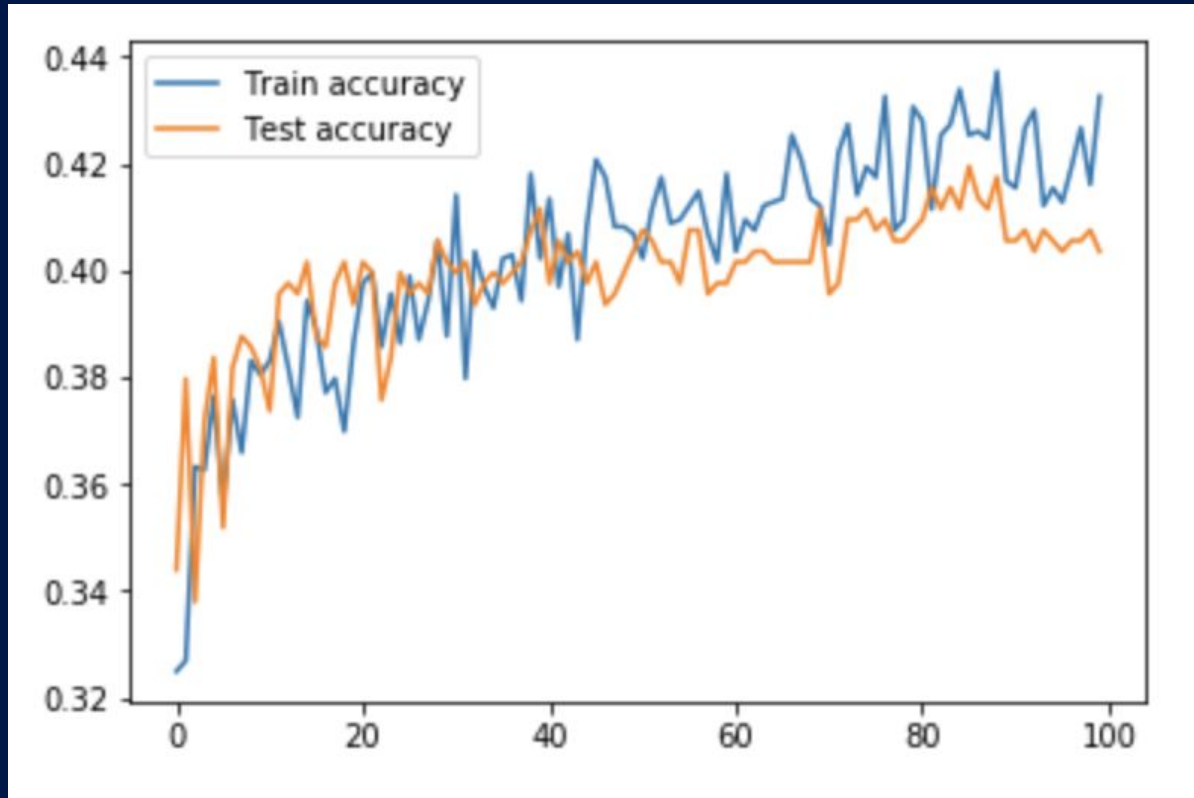
I was unable to build a model that I could reasonably say would get me rich, but it's a solid start. --- Baseline: .39





# Bitcoin Results... Not so great!

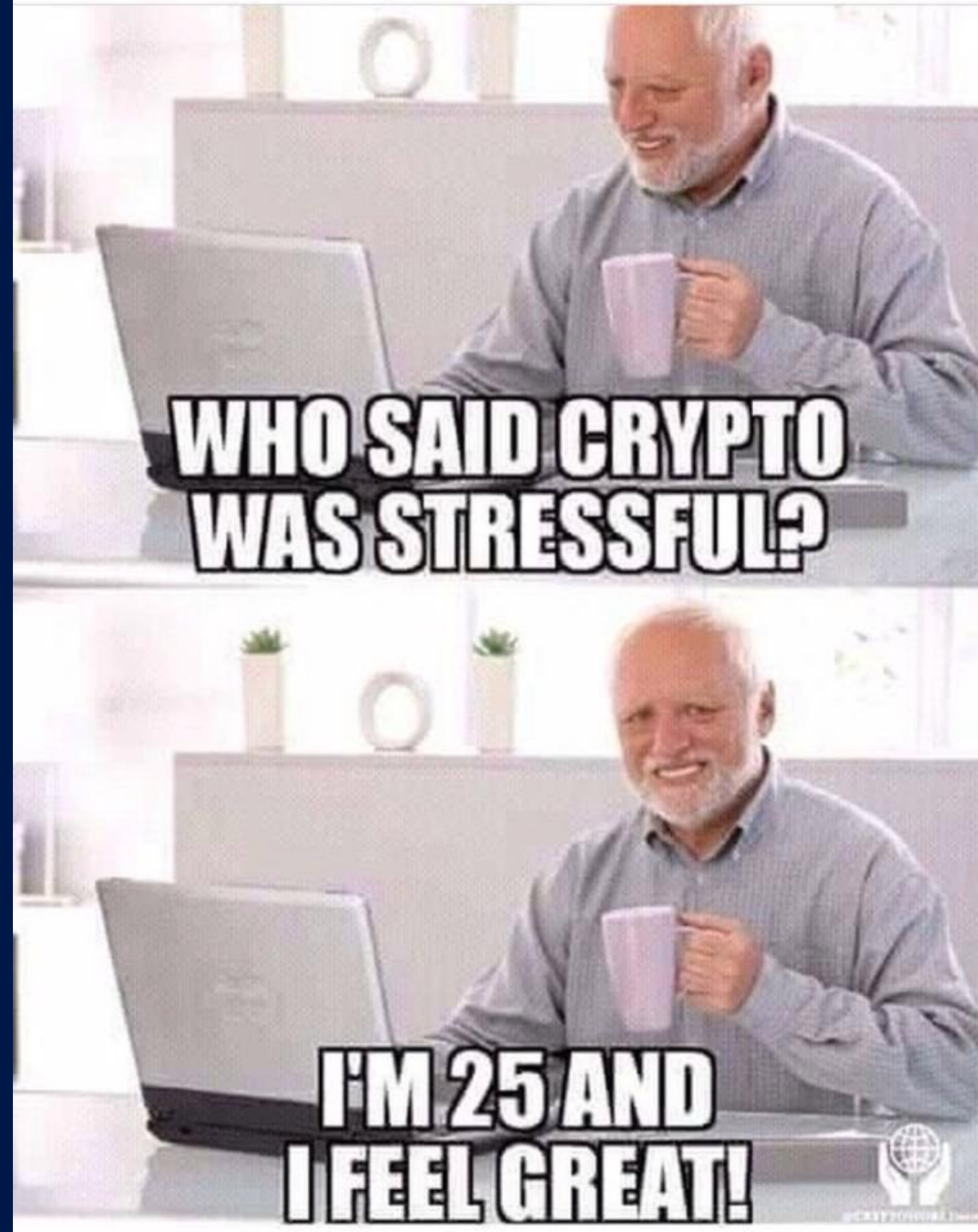
I was unable to build a model that I could reasonably say would get me rich, but it's a solid start. --- Baseline: .36





# Some possible flaws

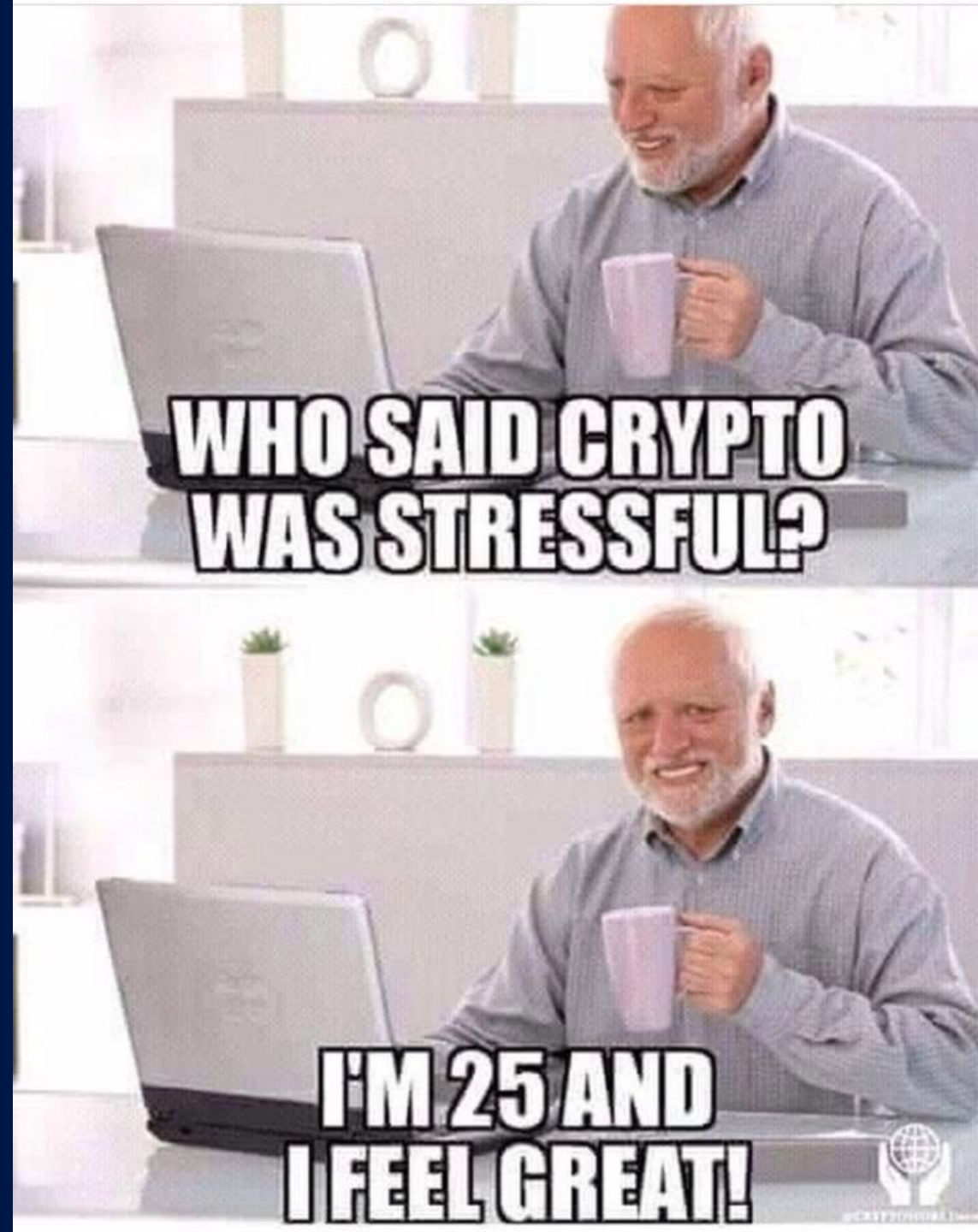
1. Emotions are not always predictive.
2. Users are not necessarily representative of major investors - especially foreign.
3. NOT HERE - Chicken or EGG problem



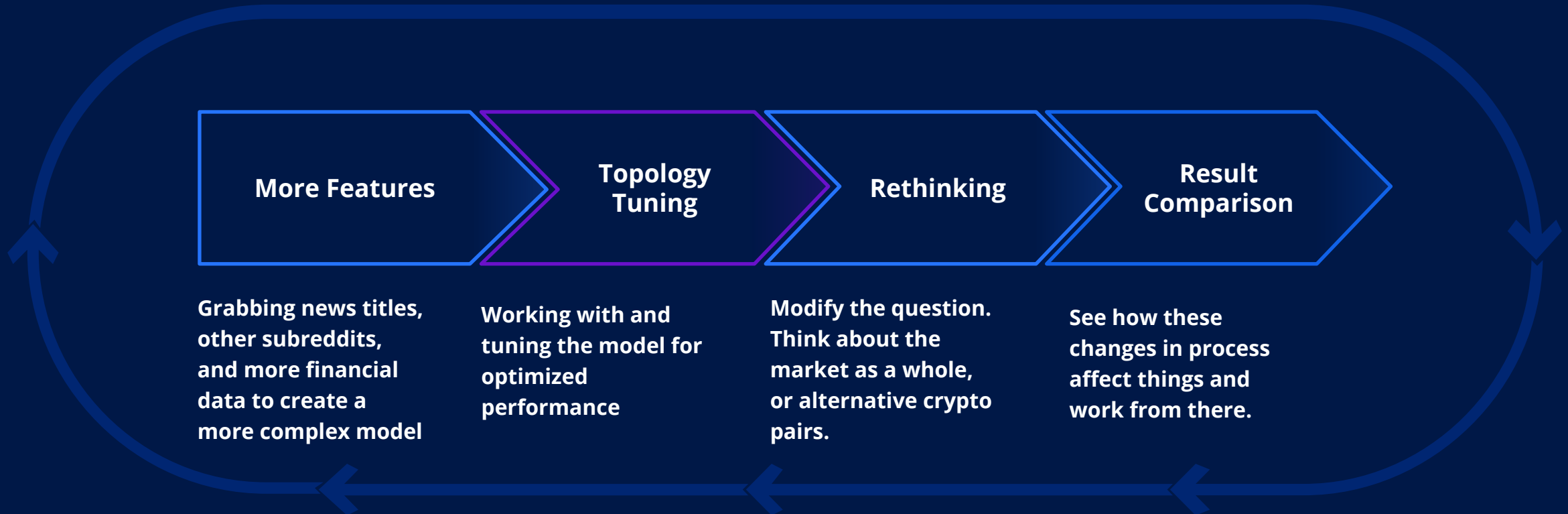


# What went Right?!

1. Using only publicly available libraries, I was able to make a promising model.
2. These models can be improved significantly!
3. Using these models in conjugation with other indicators is totally feasible.
4. The moon is the limit!



# NEXT Steps



The background is a dark blue gradient. It features several concentric circles. Two of these circles are dashed lines, and two are solid lines. There are two small blue dots: one on the upper right dashed circle and one on the lower left solid circle.

# Thank you

See the code and  
learn more at:

**[zoenawar.com](https://zoenawar.com)**

