The Picolo project

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Whitepaper for the project can be found here [1]

Abstract

This is a work in progress. Methods and equations presented here will most likely change as the platform evolves. Current thinking towards methods for training AI algorithms that make price predictions for cryptos and take bets from users are presented. AI algorithms used here work on two distinct types of data: unstructured in the form of text and structured in the form of polls and games. While the research on sentiment analysis on unstructured data is vast and several off the shelf solutions are available, we explore an approach based on LSTM networks. For structured data, a novel approach is proposed where the state of the platform (all current bets, buzzing topics, randomly timestamped snapshots of past platform state) is reduced to a game state and presented as a Markov Decision Process. Incentive decay functions that govern the payouts made to users for contributing on the platform are discussed.

1 Introduction

Blockchain technology is taking the world by storm and is increasingly capturing peoples attention. The total market cap of all the cryptocurrencies and tokens was about $4 billion at the beginning of 2017 and has grown close to $300 billion as of December 2017. It is hard to recall such a rate of growth for any industry in history. Much like a startup company that found viral success, the crypto space has much to deal with the unexpected growth in order to take on traditional asset classes and challenge the status quo. While there are excellent infrastructural projects in the works like plasma [2] for solving scaling issues and filecoin [3] for solving storage issues, there are few projects that take on the problems experienced by the drivers of this boom: investors. In the accompanying whitepaper [1] we discussed the problem in greater detail and the solution we are building. This paper details some of the initial thoughts on the implementation and underlying technology for the features presented in the whitepaper. The incentive payout system is partly inspired by concepts from Mechanism design theory [4] while AI algorithms draw upon research in the fields of reinforcement learning techniques [5] and artificial neural networks [6].

2 Incentive decay functions

Incentives are based on different categories of contribution. Two examples of categories are bringing new users to the platform and contributing original content. The incentive amount paid out for a user is dependent on how beneficial the users contribution is to the platform relative to other users contributions in that category. It is calculated by equation (1)

$$i = (w/W) * (I_c) \tag{1}$$

where

i is the incentive amount paid to the user

w is the user's contribution

W is the sum of all contributions on the platform

I_c is the current incentive constant for category c

For example in user growth category, W is the total number of new users on the platform for time period t and w is the number of new users brought to the platform by the user in the same time period. Incentive constant for a category can be calculated based on heuristics or a time/value based function. A possible heuristic for the user growth category is that the incentive constant halves for every 50,000 new users and can be calculated by the exponential decay function (2)

$$p_{k+1} = (1/2) * p_k \tag{2}$$

or reformulated as a log linear function (3)

$$\log(p_{k+1}) = -\log 2 + \log(p_k) \tag{3}$$

where

p_{k+1} is the incentive amount at time k+1

p_k is the incentive amount at time k

and the number of users at time k+1 is 50,000 more than the users at time k

See figure Fig. 1 for a visualization of how the incentives decrease over time.

3 AI algorithms

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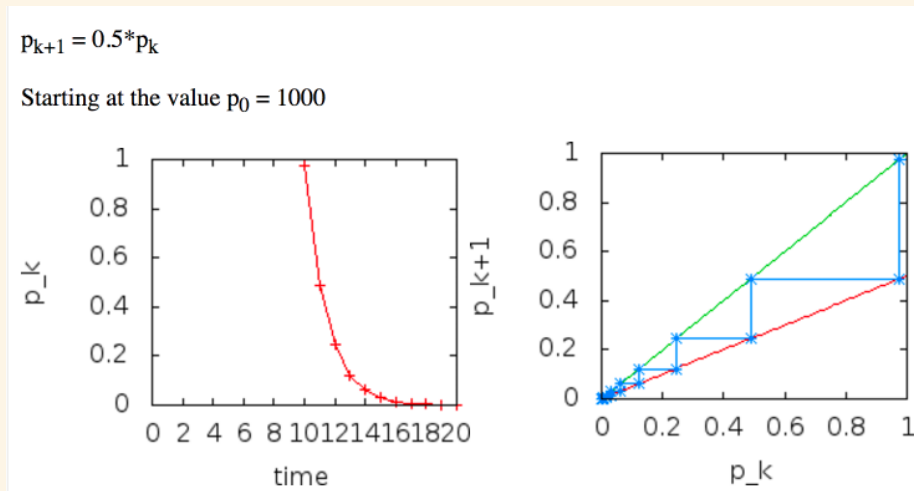
Figure 1: Incentive decay

3.1 Analyzing unstructured data

LSTM (Long short term memory) is a type of neural network architecture that Analysing structured data

3.2 Analyzing structured data

RL methods here

4 Conclusion

We have proposed initial implementations of the incentive payout system

References

[1] Adi Kancherla. Picolo: peer to peer and peer to AI betting for crypto tokens and currencies. https://picolo.xyz/Whitepaper.pdf.

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