Enhancement of different accuracy constraint in block chain transaction by using Deep Learning in Commercial Uses

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Abstract:
Block chain is a hot topic to research now specially in commercial areas applications. Researchers now get more suitable results when combined the block chain with deep learning methods. In this article we review the previous methods or work done in the field of the applications based on the combination of block chain with deep learning. By evaluating the existing approaches we can evaluate that the main problem is to minimize the testing and training time. To solve this in this article PSO optimization approach is used along with DL and BC.

Keywords: Deep Learning, Optimization, Block-Chain, Commercial Application

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[1] INTRODUCTION

1.1 Block-Chain

Changing, hacking, or cheating the system is difficult or impossible using the blockchain technology. A complete network of computers on the block chain is essentially a digital ledger of transactions that is replicated and disseminated. The blockchain serves as a means for distributing data to everyone with an app that can access it. Unrestricted ('permission less') access to this ledger is possible, whereas the opposite is also possible.

Advantages of Block-Chain

Immutability: An immutable object is one that cannot be altered or changed. As a permanent, unchanging network, this is one of the most important blockchain elements to ensuring that the technology remains as it is now.

Decentralized: The network is decentralized, which means there isn't a one individual in charge of overseeing the infrastructure. Instead, the network is maintained by a group of nodes, which is decentralized. From bit-coins to vital documents, contracts, and other precious digital assets, you can save everything. As a result, you'll be able to access them using your private key, thanks to the power of the blockchain. It's clear that the

decentralized structure is returning the power and rights of the people to their assets.

An Improved Level of Safety: Each and every piece of data on the blockchain is encrypted using cryptography. Using a simple analogy, the data on the network disguises its true nature. Mathematical algorithms are used to any input data to obtain alternative values but the length remains constant. One could think of it as a way to give every piece of data a unique identifying number. The previous block's hash is included in each subsequent block's hash as well. In other words, attempting to alter or tamper with the data will result in all of the hash IDs being changed. And that's a bit of a stretch, too. Private keys are used to access the data, whereas public keys are used to conduct transactions. Multi-step transactions necessitate the verification and traceability provided by blockchain. Transactions are more secure, compliance expenses are lower, and data transfer processing is faster with it. The use of Block-chain technology in business:-

a) Medical data exchanged in a secure manner
b) Marketplaces for NFT
c) Keeping tabs on your music royalties
d) Payments made across borders
e) IoT operating systems in real time
f) Security of one's own identity
g) Anti-money laundering software
h) Keeping tabs on the supply chain and logistics
i) Mechanism of selection
j) Insights from advertising
k) production of new material
l) Exchange of crypto currencies
m) Platform for processing real-estate transactions

1.2 Deep Learning

Machine learning is a subset of artificial intelligence, and deep learning is a subset of machine learning. It is a machine teaching class that employs numerous nonlinear processing units to extract and transform features. A layer's output is fed into the next layer, which then feeds back into the previous layer. To overcome the dimensionality issue, deep learning models rely on the programmer's guidance to focus on the most accurate features on their own. When we have a large number of inputs and outputs, we use deep learning algorithms. When it comes to Neural Networks, deep learning is implemented using biological neurons, which is nothing more than a brain cell. As a result, deep networks, which are neural networks with multiple hidden layers, are used to implement deep learning.

There are a number of different types of deep learning networks which are as follows:

Neural Networks: Perceptions are organized into layers in this type of neural network, so that the input layer receives the input and generates the output. In order to distinguish between the external and internal layers, the term "hidden layers" is used. Any visible or invisible

linkage between layers is not present here. The feed-forward network does not have any back-loops, so nodes cannot form a cycle.

The Recurrent neural network relies primarily on data from previous runs. To be able to correctlyguess the next word in a sentence, for example, one must be familiar with the words that came before it. Because this recurrent neural network does not take into account any future input for the current state, it has a very slow computational speed. It has a hard time remembering previous events.

Artificial Neural Network (ANN): Image classification, image clustering, and object recognition are some of the most common uses for this type of neural network. DNNs allow for the creation of hierarchical image representations without the need for supervision. If you want to get the most accurate results, you should use deep convolutional neural networks.

Restricted Boltzmann Machines: Both the input layer and hidden layer contain neurons with symmetric connections. However, there is no internal linkage within the layer.

Autoencoders: Another type of unsupervised machine learning algorithm is the autoencoder neural network (AEN). It's not like there's a lot of hidden cells in this case. Nonetheless, the number of input cells is equal to the number of output cells in the process. When fed data is fed into an autoencoder, it is trained to produce an output that resembles that of the fed data. The autoencoders are primarily used to represent the input in a smaller form. From compressed data, it helps to reconstruct the original data.

Application of Deep Learning

a. Self-driving automobiles
b. The use of voice-activated technology
c. Automated Captioning of Images
d. Translation by Automated Means

The Drawbacks of Deep Neural Networks are

a) The only way it can learn is by observing.It includes issues of bias.**Deep Learning's Pros and Cons** These are Pros of Deep Learning:

- It reduces the amount of time and effort required for feature development.
- It eliminates all of the unnecessary costs that are associated with it.
- It quickly identifies even the most challenging defects.
- When it comes to solving

problems, it is the best in the business.

There are some cons of Deep Learning:

- It needs a lot of information.
- The cost of training is high.

There isn't a lot of theoretical support for this.

1.3 Optimization

PSO becomes a method of assessment. It exists in the form of method which is quite simple in use and implemented on regular basis. It was already assessed that such

type of assessment methods discovers best possible solution in a very efficient manner. In the field of information technology, one can define this technique as a method that is able to optimize any considered problem. It is observed that in PSO based model, the efforts are put one by one for enhancing the performance of candidate solution. It deals with any issue of population related to candidate solutions. Here around in search-space, the dubbed particles move.

This technique performs on the basis of arithmetical rule above position and velocity of particle. Its domestic well known location make a huge impact on its movement. This location is updated in the form of better positions. These locations can be easily identified by other particles. In the present scenario, it becomes most important and useful met heuristics because it showed success of various optimization problems after applied on. It is a self-organized model. It specified the activeness of this complicated systems. In order to take care of optimization problems, in a cooperative and smart structure it use an extremely streamlined model of social conduct.

1.4 Commercial Application

A pesticide is considered to be used commercially when it is used for hire or remuneration in the promotion of services, the advice of their use, the preparation for their application, or the actual application itself. Using aerosol coatings in the manufacturing of goods or the provision of services for a profit, including touch-up and repair, is known as "commercial application." And by "commercial application," we mean any use of a pesticide that does not fall within the purview of private or residential pesticide use.

[2] LITERATURE REVIEW

For the discussed method of research on the topic “Deep Learning based Optimization of Block-chain transactions for Commercial Applications” ideas and knowledge have been overlooked from reading the various research papers prepared by different researchers on Block-chain and Deep Learning. These papers act as a basis for discussed method of work and help to keep the research in right direction towards this research objective.

For the selection of parameters in SVM, Long Zhang et al. [1] suggested a unique variation of particle swarm optimization (PSO). PSO-TS are the name given to the discussed method of algorithm, which uses a team-based local search approach with a dynamic inertia factor. As a result of the strategy's design, the algorithm can be used for many issues with a good balance between exploration and exploitation, and it is able to effectively manage the flow of the flight.

According to [2] Ishaani Priyadarshi, blockchain technology is critical to the security business. A closer look at blockchain technology's properties,

structure, kinds, design, and workings is presented in the article. When discussing blockchain technology, she also discussed bit-coins since they are one of the most common uses. Later, she explored some of the obstacles that this technology faces and its potential in the future.

It has been shown that open research may benefit from the qualities of blockchain technology, asshown by Stephan Leible, et al [3]. In order to demonstrate the technology's suitability as an infrastructure, they assessed the needs of an open research environment and compared them to BT's qualities. Projects in particular were reviewed for their relevance and impact on open science by the researchers.

An order to employ blockchain technology for contract recording came in 2015 from Watanabe [4]. In this article, we explain a novel protocol employing the technology that makes it possible to verify that the contractor's approval has been received and to save the contractual document in the blockchain.

A year later, blockchain technology was referred to be a disruptive technology by Michael Nofer [5]. It is their opinion that the financial sector is the most likely to benefit from blockchain technology. Various financial and non-financial blockchain applications were also explored during the conference. They also looked at how it may be used in the present period in a variety of different sectors.

In the year 2019, Suma [6] demonstrated how a blockchain-based system may be used to avoid abuse and corruption when a massive amount of data is shared across many government agencies. Data sharing in communication channels using the block chain with the RSA digital signature may be guaranteed to be secure and trustworthy. Java programming is used to show how the suggested system can improve latency and privacy and security when it comes to information exchange.

The goal of Homoliak [7] in 2019 was to organize information regarding block-chain security and privacy. A security reference architecture based on models that depict the stacking hierarchy of different threats as well as the threat-risk assessment utilizing ISO/IEC 15408 is discussed method of to accomplish this goal. Instead than focusing on categorizing security flaws based on their source, this study presents current preventive and mitigation strategies utilizing the suggested architecture. Although operational security and countermeasures are mentioned obliquely, our study focuses on the nature of block-chains.

An interactive dashboard for BloSS security management was built and shown by Killer [8] earlier this year. Although BloSS is now operating, the DDoS mitigation is neither interactive nor displayed. Human cyber security analysts make the final decision on whether or not a DDoS threat should be mitigated in real-world protection systems.

[3] Methodology

It has been observed that there are several researches in field of block chain technology. Considering existing research in deep learning, optimization and block chain it has been concluded that previous research did limited work and there is need to integrate the optimization approach in deep learning to reduce the training and testing time taken during deep learning operations. The prediction of commercial transaction requires the data filtering in order to minimize the dataset size. Considering performance and accuracy issues of previous research, here we discuss a method of work which has integrated PSO optimization mechanism to eliminate the useless data from dataset and deep learning approach has been used to train the transaction data set to predict probability of success and failure.

Block chain transaction Present study has primarily centered on deep learning based optimization of block chain in case of commercial use. Taking a look at past research in deep learning, optimization, and block chain, it has been demonstrated that previous study did not do enough to decrease the training and testing time necessary during deep learning operations. Data filtering is important for the prediction of commercial transactions in order to limit the volume of the dataset. The recommended study integrates a PSO optimization strategy to eliminate extraneous data from the dataset and a deep learning approach to train the transaction data set to anticipate the chances of success and failure.

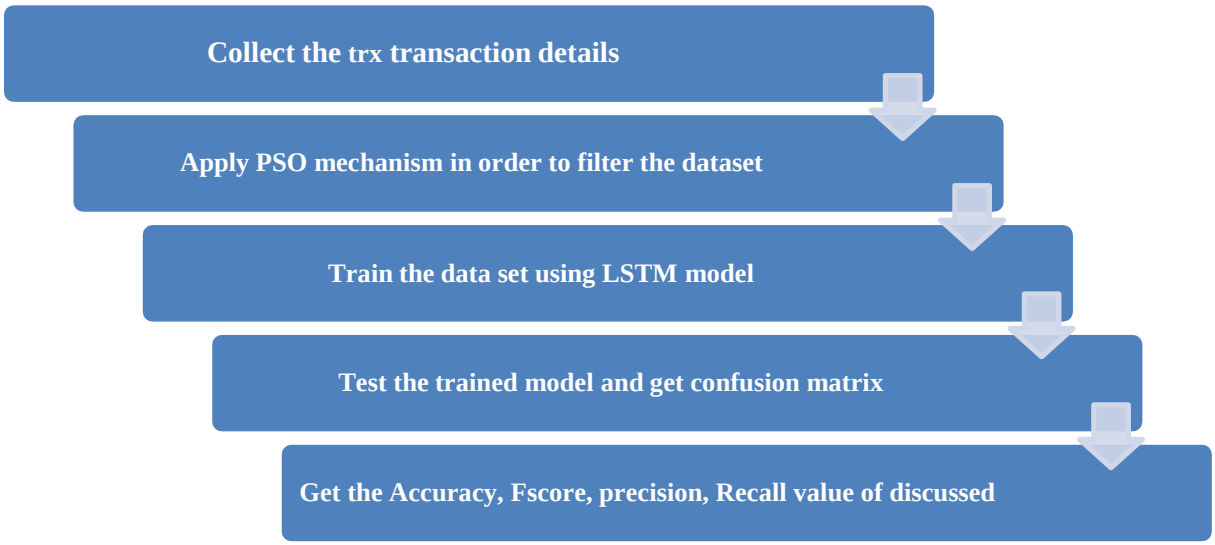

Fig 1 Process Flow of Blockchain with DL and PSO optimization method

[4] RESULT

1. Simulation for Non Optimized Block-Chain Transaction

Considering the discussed method of mechanism the TRX transaction details has been collected fromtronscan.com. The dataset of 1000 records has been considered for training and testing. In phase 1 the dataset has been trained without applying optimization mechanism. Then in phase 2 dataset has been classified in three type of transaction that is pending, rejected, successful. The data set considers the attributes sender, receiver address, time stamp, and amount.

Table 1 Confusion Matrix in Case of Non Optimized Block-chain Transaction Training

	Pending	**Rejected**	**Successful**
Pending	435	25	30
Rejected	24	250	26
Successful	17	14	179

2. Simulation of Optimized Block-Chain Transaction

The dataset of 1000 records has been filed by PSO optimized mechanism considered for training and testing. In phase 1 the dataset has been trained after applying optimization mechanism e in phase 2, the dataset is filtered using PSO optimization mechanism. Finally in 3rd phase data set has been classified in three type of transaction that is pending, rejected, successful. The data set considers the attributes sender, receiver address, time stamp, and amount.

Table 2 Confusion Matrixes In Case of PSO Optimized Block-chain Transaction Training

	Pending	**Rejected**	**Successful**

Pending	435	5	2
Rejected	4	250	5
Successful	3	8	179

3. Comparative Analysis of Time Consumption

The time taken to train the dataset of 1000 record was more than that of 891 records in case ofoptimized solution. Following figure is presenting the time difference in 10 different simulations.

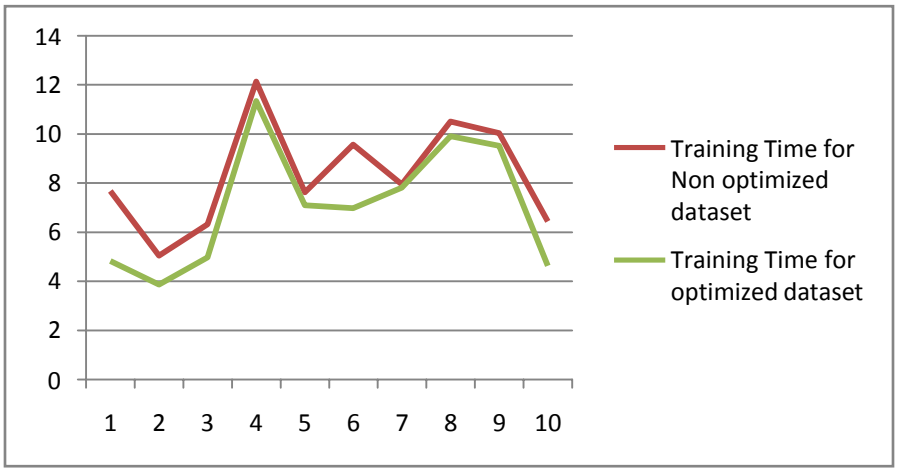

Fig2 Training Time Comparison for optimized and non-optimized

4. Comparative Analysis of Accuracy

Following figure is presenting the chart wise comparison of accuracy for non-optimized blockchain and optimized block chain.

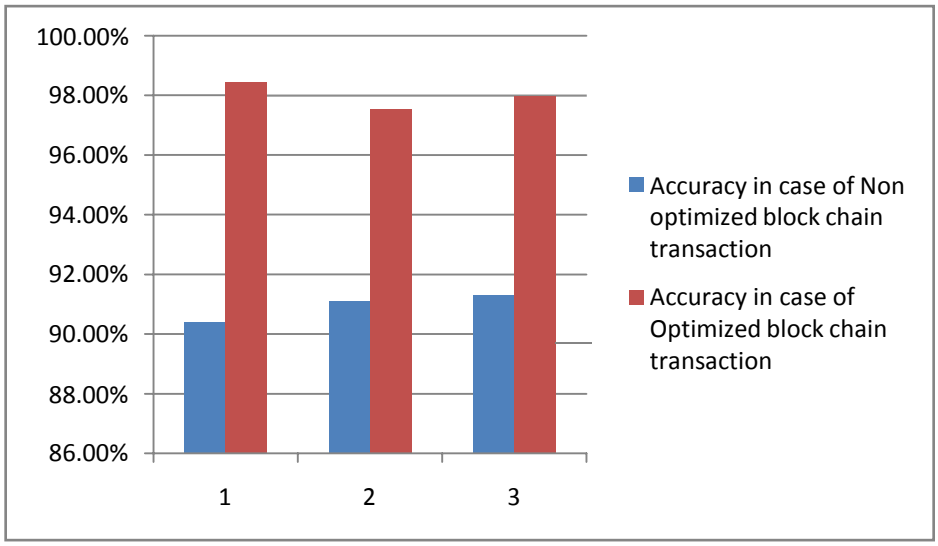

Fig 5 Comparison of Accuracy

[5] CONCLUSION

It has been concluded that PSO mechanism has eliminated the useless record in order to improve the training and testing time. Moreover the elimination of irrelevant records leads to higher accuracy. The results conclude that the discussed method of work is producing more accurate outcome in less time. The integration of optimization mechanism in deep learning for commercial block chain transaction has provided flexible and scalable solution.

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