International Journal on Recent and Innovation Trends in Computing and Communication
ISSN: 2321-8169 Volume: 11 Issue: 1
DOI: https://doi.org/10.17762/ijritcc.v11i1.6060
***Article Received**: 24 November 2022 **Revised**: 23 December 2022 **Accepted**: 05 January 2023*

Blockchain based Automated Construction Model Accuracy Prediction using DeepQ Decision Tree

L.Megaan Leo[1], A. Jerrin Simla[2], J. Chenni Kumaran[3], AG. Noorul Julalha[4], R. Bhavani [5]
[1]Professor , Department of ECE
Sathyabama institute of science and technology, Chennai, Tamilnadu, India.
megalanleo@gmail.com
[2]Assistant professor, Department of CSE
Panimalar Engineering College, Chennai, Tamilnadu, India.
jerrinsimla@gmail.com
[3]Associate Professor, Division of Spatial Informatics
Department of CSE,Saveetha School of Engineering
Saveetha Institute of Medical and Technical Science, Chennai, Tamilnadu, India.
chennaikumaranj.sse@saveetha.com
[4]Assistant Professor, Department of CSE
Rajalakshmi Institute of Technology, Chennai, , Tamilnadu, India.
ag.nooruljulaiha@gmail.com
[5]Assistant Professor ,Department of IT
St Joseph College of Engineering , Chennai, Tamilnadu, India.
bhavaniramamurthi@gmail.com

Abstract— A growth of Industry 4.0 standards are increasing day by day. Various research application and problem statements are coming to create multiple automation environments. Blockchain technology is the important evolution to produce dynamic and avoid intermediate middleware processing systems. In this paper we propose a blockchain based automated construction modelling and analysis system. Here we check the efficiency of the system by using collaboration, transparency, workflow and reliable data model. DeepQ based classification and prediction method is used to measure the accuracy index. Decision tree algorithm is used to divide the process model and generate the chain codes. 1500 trained dataset and 750 dataset is taken from Revit construction model set and apply blockchain codes to process the dataset. The simulations are taken effectively and reach the accuracy as 96%.

Keywords: Blockchain Technology, Chain Codes, Deep Learning, Decision Tree, Accuracy.

I. INTRODUCTION

Recent debate the various applications are used blockchain technology and provided good accuracy results. According to the technology survey blockchain technology can be used various applications such as voting system, currency identification, supply chain models, share marketing, cyber physical systems, etc [1]. Also various research are going to process the blockchain application with presentation, conference, evaluation and reporting systems. Chain code generation is the key process to handle the data and process the data [2].

Deep learning is the intelligent processing system for making effective decision making results. We need a deep based decision tree method for prediction results and accuracy. In this paper we select the dataset from Revit construction model set. So we need to classify the dataset. DeepQ method is useful for classifying dataset and modulates the process. In existing cases deep learning techniques is proposed to handle image processing dataset [3], cyber physical environments [4], automated processing systems [5] and biometric applications [6]. We will take this as the input to our proposed system to handle the block chain model to construction modelling.

From Figure1. shows blockchain is the platform to perform operation without required any single form of storage or record keeping systems. From the current ideology the blockchain codes has various methods such bitcoin [7], ethereum [8], crytocurrencies [9] and litecoin [10]. Above mentioned methods are secured transaction and modelling systems. We are using construction modelling as core aspects so we linked hash function for processing dataset and optimize the results. In this paper, section 2 explains various related works, section 3 and 4 gives proposed method handling blockchain models, section 5 gives experiments and simulations and section5 explains conclusion and future enhancement.

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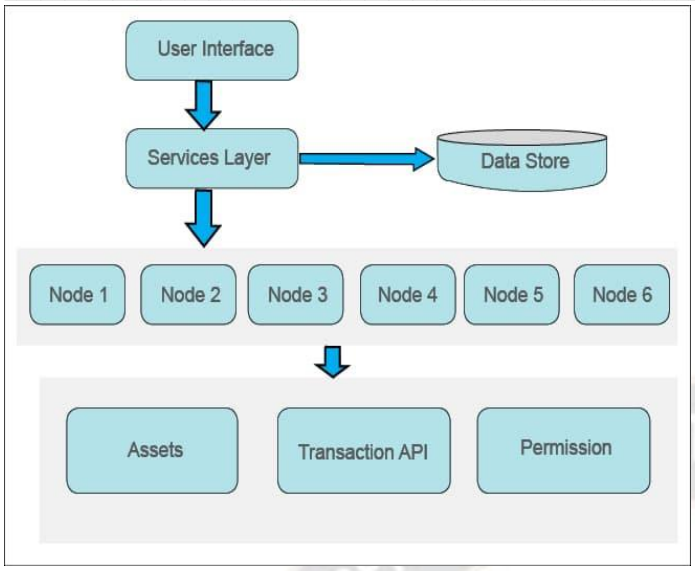

Figure 1: Blockchain services and operations by using node level

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II. Related Work

The challenges are to implement blockchain to the real time applications tedious process and need to familiar tools or else supported platforms to design the emerging trends. Distributed ledger technology is already available for major issue is in already distributed so anyone can stole the data and change or modify the contents [11]. Yaga et al, proposed peer to peer network model is available to remove the centralized controlling systems. Each transaction has repository based indexing method to select the blockchain information and model the system via collaborative nature [12].

Hassan et al, CryptoHash function is proposed to model the network and provide multi object traceable operation polices to predict the contents. To strengthen this process each transaction protocols can be submitted via smart contract polices which is capable to utilize the signed or modelled transaction features. The third party information or user information repository is not to be maintained at any place. Each transaction history has to be processed via unique chain code optimizer [13].

The signed transaction is other major issues which can be deployed based on the network lifetime and predefined feature selection. Here the smart contract can be executed based on involvement of cost and associated by system transaction results. Swan et al, the huge cost as well as third part representation can be monitored by some cyber systems which leads or reduce the overall performance. As the survey report the Accenture invested more the 80 billion USD for implemented or forcing the blockchain based smart audit processing system to the user [14]. From the Table.1 based on literature we need an effective decision making and predicting method to handle the automated smart construction dataset.

III. Blockchain Codes: Proposed Approach

Blockchain technology has one of the current evolution method to handle the data without centralized as well as cash less smart contract management systems. We need to process construction modelling dataset selected from Revit model and apply deep learning process to predict the accuracy. Figure 2. shows that block diagram of proposed processing system. In this case the governance chain can be created based on protocol is framed by the developer which handle the decision making process. While frame the rule we must follow the transparency, scalability and privacy are the key factors. Each vendor can select the private smart contract and move to the chain code. Chain code can be processed and generated the network lifetime for accuracy prediction.

Based on above phase the features are selected based on multiple data sources that is represented in Figure 3. This case the data can be taken from multiple related sources such as ACM library, Scopus dataset, Elsevier proceedia, book reviews and clarivate analytics report. The repository result is consisting of construction values, contracts, smart policies and domain results.

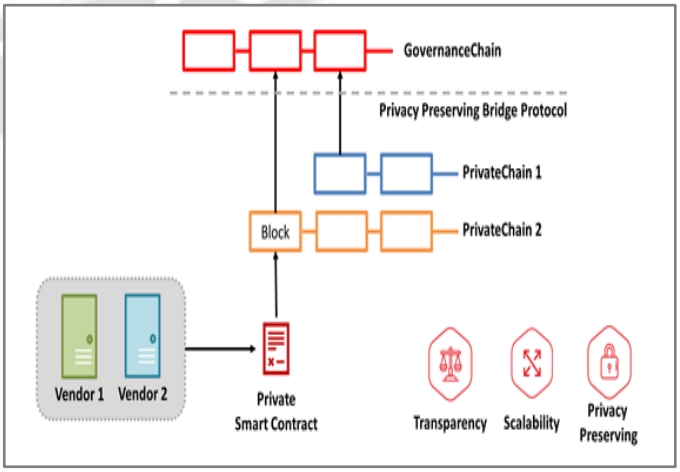

Figure 2: Block diagram of proposed block chain code method

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TABLE 1: COMPARISONS OF VARIOUS RELATED WORK AND RESULTS

Year	Method	Technology	Result	Observations
2017	Support Vector Machine	Data Modelling	Predictive Analysis	It is useful for stored dataset values with fixed number of iterations
2018	Classifier Index	Artificial Intelligence	Computer Aided Modeling	This case the result can be selected based on Assumption index. So the accuracy values can be reduced
2019	Predictive Analysis	Machine Learning	Clustering Approach	It is group the components based on index
2020	Comparative Analysis	Computer Vision	Correlation Index	Prepared confusion matrix to predict the accuracy
2021	DeepQ	Residue Analysis	TensorFlow Representation	Select the dataset from classifier and predict the accuracy

The following are the research steps can be handled for processing dataset with prediction,

TABLE 2: VARIOUS PHASES CAN BE DONE FOR PROCESSING THE DATASET – CHAIN CODE

Phase 1	Search Engine: Select the data source from multiple repository
Phase 2	Review Selection: Review the source and measure or identify the exact copy of dataset for processing
Phase 3	Process Modelling: Apply various pre-processing step to select the dataset and their object modelling
Phase 4	Classification: Classify the dataset based on pre-processed result and their efficiency values
Phase 5	Prediction: Apply deep learning techniques to process the dataset and use TensorFlow to model the environment
Phase 6	Decision Making: Apply various iteration techniques to predict the accuracy index with selected feature

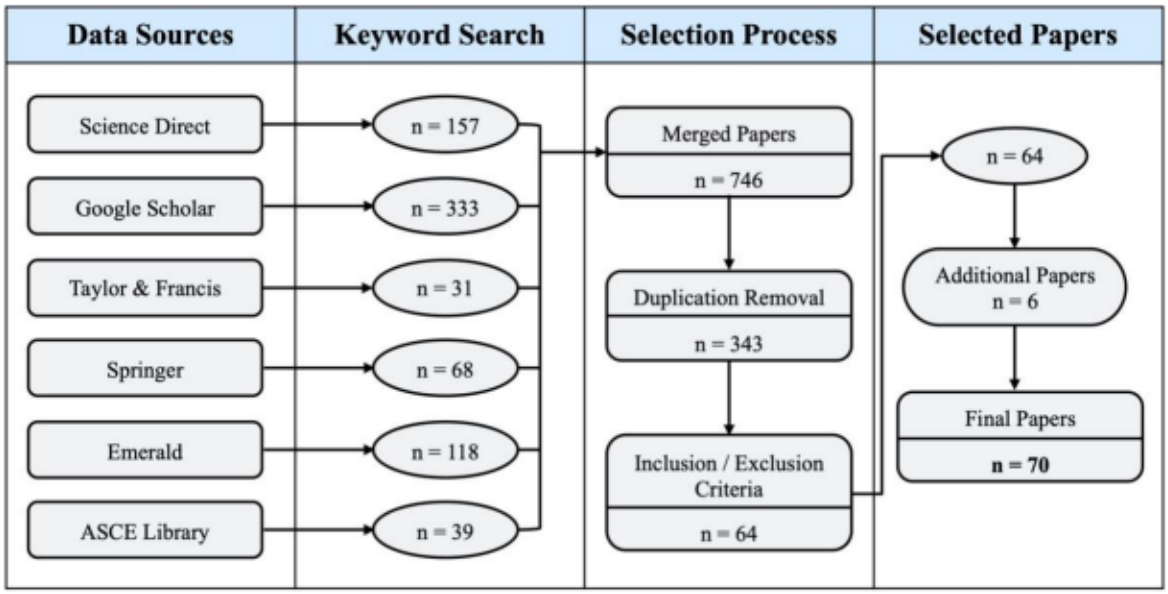

Figure 3: Features selection based on keyword and merged process index representation

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IV. DEEPQ DECISION TREE PROCESS

Decision tree is the process to handle the data and process the data. Here we select the smart contract dataset from Revit Data repository. We prepared chain code based processing steps to handle the dataset shown in Figure 4. Apply those strep to process the dataset. It is completely automated process so we can monitor the system based on requirement.

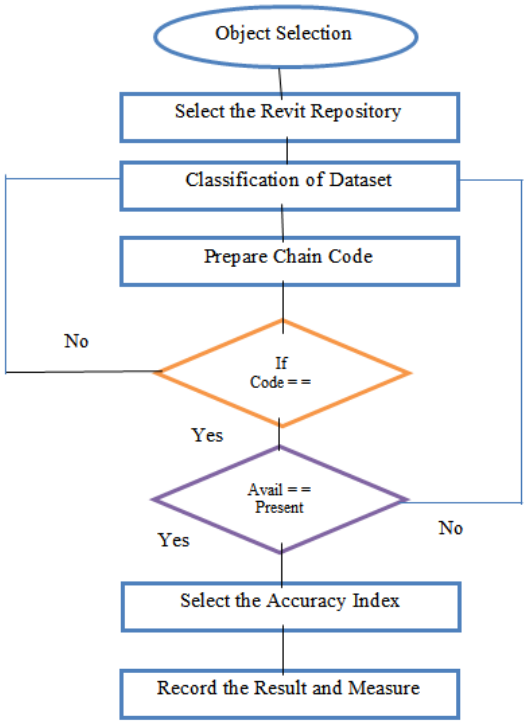

Figure 4: Flowchart for chain code processing systems

From the above flowchart for preparing the dataset and predicting accuracy from multiple evaluation. Based on that the decision tree is generated as follows in Figure 5.

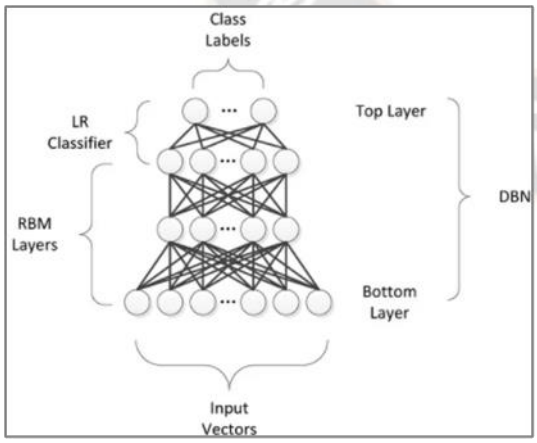

Figure5 (a)

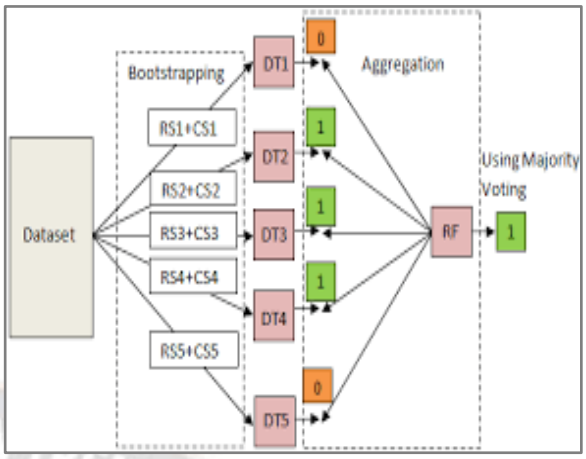

Figure - 5(b)

Algorithm 1: DeepQ – Decision Tree – Approach

Input: Selected Decision features
Output: Classified Result of Chain Codes
Step 1: Initialization – Cluster head, node, weight, swarm size and calculate deepq index
Step 2: Weight = 0, Bias = 1, Loss function >=1
Step 3: Select the trained and test data with the input of R and L features with the relationship of bias conditions
$S(ij) = A + \sum X(ij) X W(ij) X M$
Step 4: Apply feature selection process to find the activation results of each node values
Step 5: Set Decision Parameter index = 1 and find the neuron index n
Step 6: If R(ij) >= DF(X)
Set node = DF(X) (Malicious Index)
Else
Continue
Step 7: Target <- Find (accuracy) and store the features from below representations

$ygz=gM4lz+Wrec4yz-1+b4$
$iz=\sigma W3lz+Wrec3yz-1+Wp3cz-1+b3$
$fz=\sigma W2lz+Wrec2yz-1+Wp2cz-1+b2$
$cz=fz\circ cz-1+i(z)\circ yg(z)$
$oz=\sigma W1lz+Wrec1yz-1+Wp1cz-1+b1$
$vz=oz\circ hcz$

Figure 5(a),5(b): Selecting the features from chain code and apply various deepq learning techniques to process the dataset for predicting accuracy

From the above algorithm experiments are done by using dataset optimization and predict the accuracy in below section

V. EXPERIMENTAL SETUP

The experiments can be done by using GPU Computing systems with 32GB of Primary Memory and Deep Learning Computing systems with Redhat operating system with 1TBHDD. TensorFlow simulator is used to simulate the dataset based various pre-processing techniques.

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TABLE 3: INPUT DATA FOR DATA PROCESSING SYSTEM

Approach	DeepQ Decision Tree Approach
Dataset	Revit Construction Model Set
Data	Trained Data: 1500 Test Data: 750
Connected Layer	128 X 128X 3 layer
Classifier	Support Vector Machine
Iteration	1,5,10,15,25
Packet Size	64 – 128Mbps
Data rate	1 – 2Gbps

From this we applied TensorFlow processing dataset and below Table 4 shows that result of various iteration of revit dataset.

TABLE 5. RESULT REVIT CONSTRUCTION MODEL DATASET ACCURACY VALUES USING DEEP LEARNING

Iterations	Packet Size	Data Rate	Precision	Accuracy	Recall	Execution Time
1	64	1,2	97,96	96,96	12,14	0.75,0.68
	128	1,2	95,96	95,97	17,19	0.67,0.67
5	64	1,2	94.96	96,95	16,17	0.56,0.72
	128	1,2	94,95	95,96	16,15	0.72,0.75
10	64	1,2	94,94	95,94	17,17	0.77,0.78
	128	1,2	95,94	95,96	18,16	0.76,0.78
15	64	1,2	94,95	95,96	19,18	0.78,0.76
	128	1,2	94,95	94,96	15,17	0.78,0.87
25	64	1,2	95,94	96,95	16,16	0.67,0.78
	128	1,2	94,95	95,96	17,19	0.78,0.87

From the above result tested by using 1500 trained dataset and 750 dataset using deep learning. Decision tree is formed based on multiple iterations and data rate. The results are recorded and average accuracy is achieved as 96%. The result is compared with existing deep learning method for comparison which is shown in Table 5.

TABLE 5: COMPARISON OF RESULTS WITH EXISTING METHODS

Method	Accuracy in %	Execution Time in ms
Support Vector Machine	67	0.98
Machine Learning	75	0.97
Computer Modeling	68	0.87
AlexNet	81	0.86
DeepQ Decision Tree	96	0.72

Table 5 shows that the comparison results of accuracy and execution time. From this result our proposed system provides 96% accuracy and 0.72ms for execution time.

VI. CONCLUSION

Blockchain technology is the one of the major area for handling smart details especially record keeping or ledge monitoring applications. Chain Code is the key player for handling the dataset. We proposed Revit Construction Smart ledger dataset for processing to handle blockchain based automated system for prediction. Deep learning technique is applied for classification, prediction and accuracy. We used DeepQ Decision tree method for processing dataset. We simulate the dataset using TensorFlow by using 1500 trained and 750 test dataset. Based on simulation we achieved accuracy as 96% percentage and compare with existing method. In future block chain technology may be used for real time smart applications.

ACKNOWLEDGMENT

The preferred spelling of the word “acknowledgment” in America is without an “e” after the “g”. Avoid the stilted expression, “One of us (R.B.G.) thanks . . .” Instead, try “R.B.G. thanks”. Put applicable sponsor acknowledgments here; DO NOT place them on the first page of your paper or as a footnote.

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