*Grenze International Journal of Engineering and Technology, Jan Issue*

# Bug or Pest Identification in Agriculture using ML and Blockchain

Anand R[1], Sumanth K M[2], Velu Praveen Yadav[3], Sreeni V[4] and Thulasi Teja CH[5]
[1-5] Department of CSE, KCG College of Technology, Chennai, India
Email: nowhereanand@yahoo.com, sekmsumanth2000@gmail.com, praveenyadav3012001@gmail.com, sreeni727@gmail.com, mail.me.thulasiteja@gmail.com

***Abstract*—The blockchain is a smart contracts transactions and stored by all the members in the chain. The chain contains different types of farmers, agents, dealers and pesticide controllers. It is one of the most convincing use instances of blockchain that makes the method involved with developing and providing food more straightforward. Keeping steady over the most current advancements in agrarian cycles is however intricate as it very well might be fundamental for working on the whole area. Given the quick advancement of this innovation, it has turned into a need to remain educated regarding the latest improvements in the field to remain in front of the opposition. The proposed solution of the paper to identify the pest or bug using recent trends of neural network algorithms.**

***Index Terms*— Blockchain, Agriculture, CNN, KNN.**

## I. INTRODUCTION

Blockchain for Agriculture is one of the most convincing use instances of blockchain that makes the method involved with developing and providing food more straightforward [1]. Blockchain is quick ending up the innovation that can re-engineer many existing cycle from settling exchanges, following the food beginning and following the client interest to making new thrilling commercial centers [2].To implement blockchain technology using Distributed ledger technology, the innovation that is behind the leader digital currency coin bitcoin and numerous other different elective cryptographic forms of money available for use today, has kept on reforming the commercial center consistently with novel applications being disclosed consistently [3]. Blockchain will probably quick track the agriculture business' development toward more noteworthy straightforwardness and detectability from the field to the table and fork. This will bring open doors and instruments for ranchers and the remainder of the store network to battle food misrepresentation and deal confirmed items to buyers [4].

Blockchain additionally assists with watching bountiful items and decrease instances of unlawful reaping and transporting cheats. The United Nations uncovers that food cheats cost the worldwide economy around $40 billion every year in view of illegal exchanges [5].

Rustic insurance in view of the blockchain with key environment episodes and related pay-outs drafted on a clever contract all associated with flexible wallets with environment data being given reliably by sensors in the field and related by data from area weather patterns stations will work with brief remuneration outs to farmers because of a drought or flooding in the field [6].

*Grenze ID: 01.GIJET.9.1.720*

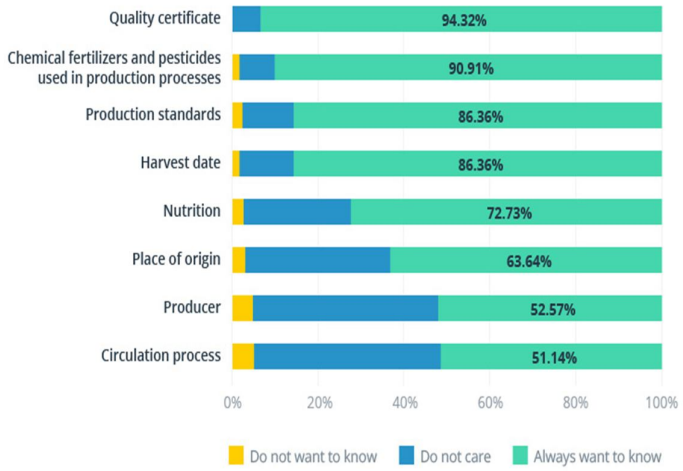



Figure 1: Consumer Preferences for Traceable Food (Source Ref :9)

Agriculture innovations like accuracy cultivating, planning of farmlands, IoT sensors, vertical cultivating frameworks, area knowledge, and yield the executives programming — notwithstanding transportation advances — are engaging rural organizations to accomplish improved results as far as food creation and the whole production network the board in agribusiness [7]. An extended interest for food conveys new issues with it, for instance, counterfeit things that compromise food supply chains at different stages. Nonattendance of straightforwardness and low adequacy put farmers and customers in a difficult situation [8].

In the long run, blockchain developing and appropriated record advancement in dispersed record innovation might conceivably fabricate capability, straightforwardness, and trust all through agrarian stock chains [9]. Blockchain for agribusiness store organization can empower all market players by building associations of trust [10].

## II. Agriculture In Blockchain Technology

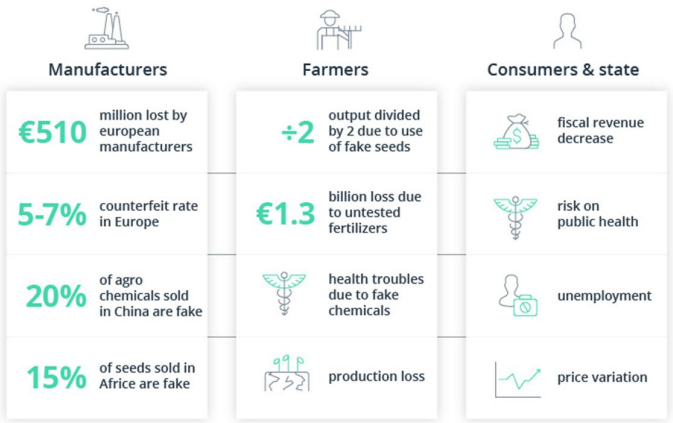



Figure 2: Agriculture challenges & solutions in African country (Source ref :9)

The current framework is, a nuisance's characterization model in view of CNN was recommended in this article. The proposed model gives significant offices to the ranchers to handily perceive gainful and unsafe bugs. To lay out the model irritations with two distinct classes were viewed as where each class thinks about 10 unique species. Countless bugs' pictures were taken to prepare and test the framework. The framework considers different sorts of CNN based order procedures for figuring out the best classifier. To overcome the challenges and improve the productivity of the agriculture system.

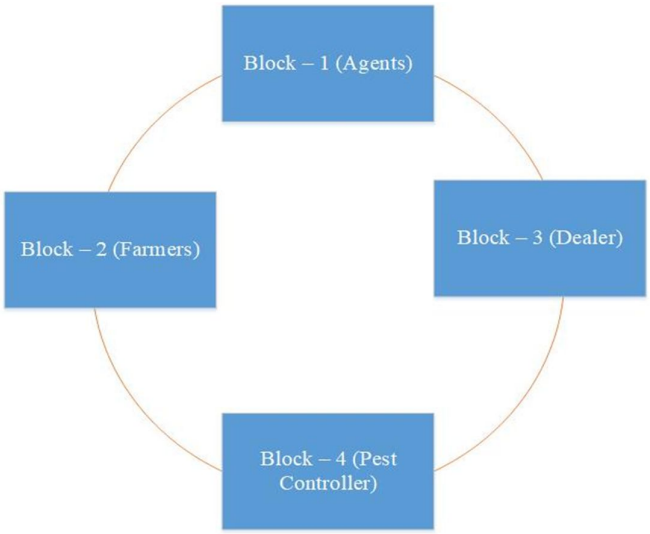



Figure 3: Blockchain based disease identification

In Figure 3 shows that, each and every blocks contains various roles of participants in agriculture sectors. Each and every blocks have crypto id and hash key in the chain. Any of the participants shared the disease leaf in the chain. Inside the chain the particular leaf images shared to all the participants. Some or all the participants shared or find out the leaf disease related information. Based on the feedback and maximum responses from the chain identified and find out the disease.

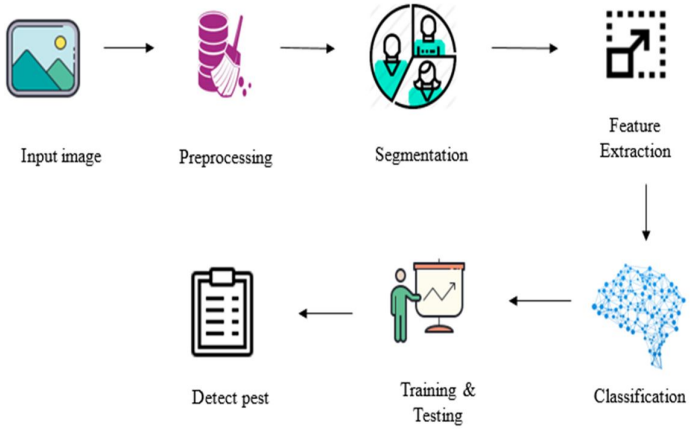


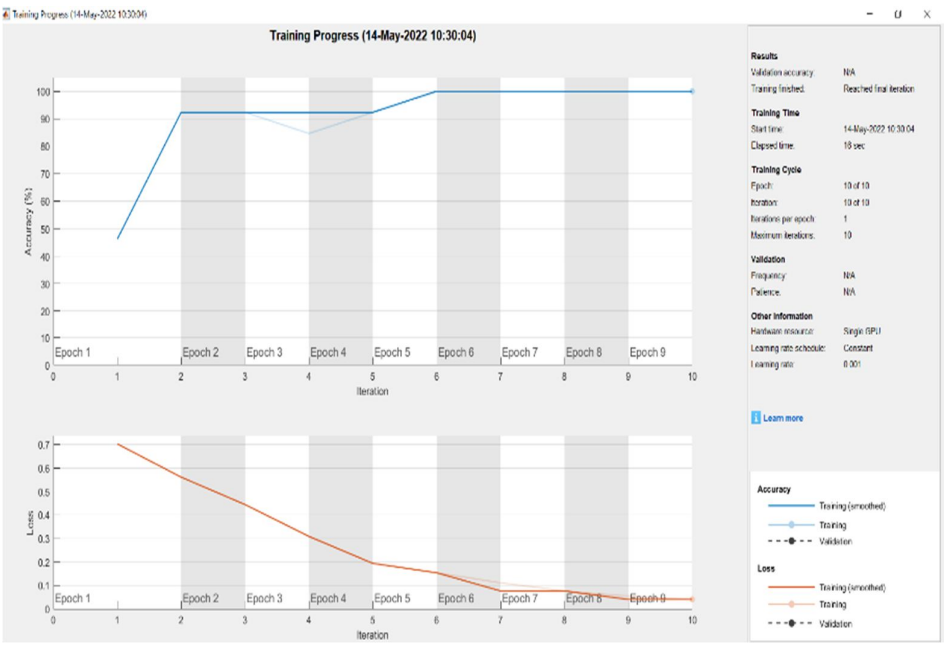

Figure 4: Proposed model leaf disease process

Figure 4 shows that proposed model pest or bug disease process to find out the different types of leaf diseases. In the classification model properties of pest and leaf affected ratio identified. In the classification phase training set applied and convolution neural network compare the user image and training set and gives best accuracy in the given bug.

## III. Results And Disscussion

Graph 1 shows that, First iteration of images can secured 46.15% accuracy and continue the iteration in the stage of 10 and secured 100% accuracy with best learning rate. It will help us to identify exact identification of bug or pest and it will check harmfulness in the agriculture system.

In the training system graph1, Accuracy of the pest which we have selected and it will be show the iteration percentage of the particular pest. In this graph will be compared to the trained sets which will give to the Eposh.

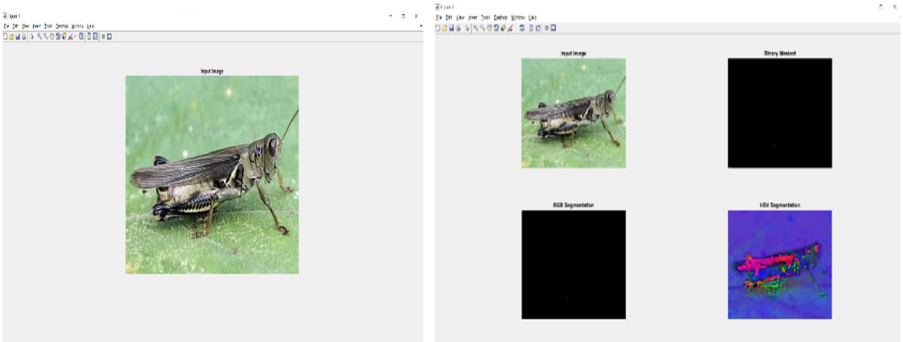


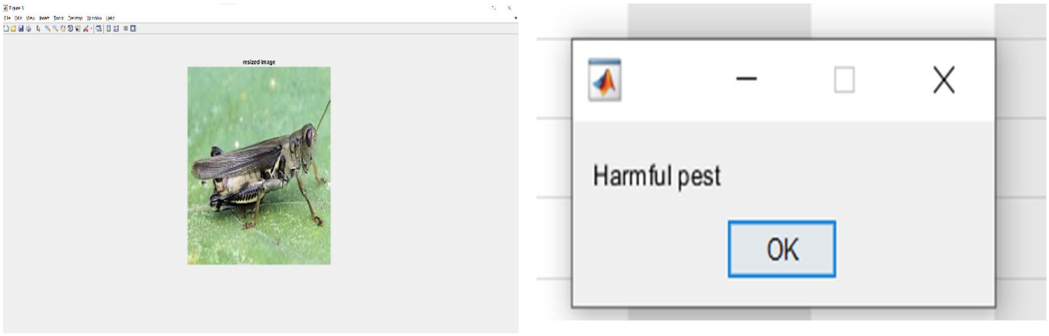

Graph 1: loss in Accuracy and training system


Graph 2: Accuracy representation & Loss representation

TABLE II: ITERATION CYCLE

| Training Cycle | |
|---|---|
| Epoch | 10 Of 10 |
| Iteration | 10 Of 10 |
| Iteration Per Epoch | 1 |
| Maximum Iteration | 10 |






Screenshots

## IV. Conclusion

In the decentralized network secured transactions in the supply chain. Accuracy of the system is 100% has been secured in the agriculture system. In the existing system observed that less accuracy and heavy loss in the training system. In this paper secured 100% accuracy and harm bug identified in the system.

## References

[1] Anand, R., Divya Karthiga, R., Jeevitha, T., Leandra Mithra, J., Yuvaraj, S. (2021). Blockchain-Based Agriculture Assistance. In: Komanapalli, V.L.N., Sivakumaran, N., Hampannavar, S. (eds) Advances in Automation, Signal Processing, Instrumentation, and Control. Lecture Notes in Electrical Engineering, vol 700. Springer, Singapore.

[2] N. Ullah, "Blockchain Technology in Smart Agriculture Environment: A PLS-SEM," 2021 International Conference on Electronic Information Technology and Smart Agriculture (ICEITSA), 2021, pp. 514-519

[3] M. R. M. Kassim, "IoT Applications in Smart Agriculture: Issues and Challenges," 2020 IEEE Conference on Open Systems (ICOS), 2020, pp. 19-24

[4] Y. Song, X. Duan, Y. Ren, J. Xu, L. Luo and D. Li, "Identification of the Agricultural Pests Based on Deep Learning Models," 2019 International Conference on Machine Learning, Big Data and Business Intelligence (MLBDBI), 2019, pp. 195-198

[5] Z. Wang, Z. Shi, H. Wang, F. Bu, T. Liang and X. Zhang, "An Intelligent Identification and Detection Method for Forest Pests Based on YOLOv5s Algorithm," 2021 20th International Symposium on Distributed Computing and Applications for Business Engineering and Science (DCABES), 2021, pp. 152-154

[6] H. Li, Y. Yuan, L. Zhang and T. Huang, "Research and Application on Microgrid Integrated Energy Service Technology for Modern Agriculture," 2018 2nd IEEE Conference on Energy Internet and Energy System Integration (EI2), 2018, pp. 1-4

[7] V. V. h. Ram, H. Vishal, S. Dhanalakshmi and P. M. Vidya, "Regulation of water in agriculture field using Internet Of Things," 2015 IEEE Technological Innovation in ICT for Agriculture and Rural Development (TIAR), 2015, pp. 112-115

[8] Prasath, J.S., Jayakumar, S., Karthikeyan, K. "Real-time implementation for secure monitoring of wastewater treatment plants using internet of things"nternational Journal of Innovative Technology and Exploring Engineering ,Volume 9, Issue 1, November 2019, Pages 2997-3002

[9] https://intellias.com/how-to-apply-the-blockchain-to-agricultural-supply-chains-while-avoiding-embarrassingmistakes/#:~:text=Research%20by%20MarketsandMarkets%20reveals%20that,47.8%25%20during%20the%20projected%20period.

[10] https://medium.com/onesoil/why-big-data-is-crucial-for-modern-agriculture-107707c061ca