IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Research & Analysis of Crop Recommendation System & Worm Detection Using ML

[1]Rohit Patil, [2]Prof. M.E.Sanap, [3]Soham Tanavade, [4]Prasanna Kohok, [5]Prathamesh Deokar

Department of Computer Engineering,

[1]STES'S Sinhgad Academy of Engineering, Sppu University, Pune, India

Abstract: A significant component of the research is the Worm Detection System, which uses Convolutional Neural Networks (CNNs) to detect worms in crops. This system uses advanced image processing algorithms to identify and alert farmers regarding possible worm infestations based on pictures of crops. This study provides effective, sustainable, and technologically advanced solutions to modern farming challenges, marking a major advancement toward precision agriculture. Assessing the condition and nutrient levels of the soil is the main objective of the soil analysis component. To detect important characteristics including pH, moisture content, temperature, and nutrient concentrations, soil sensors are used. Crop Recommendation is the third system pillar. The system generates customized crop suggestions for farmers through the integration of information from aerial photographs, previous climate data, crop databases, and worm detection and soil analysis data.

Keywords- Machine Learning Techniques, Recommendation System, Crop selection, Soil analysis, Real-time monitoring

I. INTRODUCTION

Agriculture is one of the most important sectors in India. It has the widest variety of enterprises and makes a major contribution to world advancement. Crop prediction and prior crop forecasts are based on farmer experience in a particular region. They won't know much about the nutrients in the soil, leading them to prefer a crop that was planted earlier or nearby, a trendy crop in town, or a crop that is only cultivated there. Due to improvements in technology, there are currently several options available to satisfy the requirement for agricultural inputs. This study looks at a few real-world applications of machine learning techniques.

II. LITERATURE SURVEY

Agricultural intelligent decision systems are useful for guiding agricultural output and can offer a scientific foundation for agricultural research. Intelligent decision systems can benefit from the usage of big data analysis technologies. The research and development of agricultural intelligent decision systems is explored. For the first time, the agricultural decision system is categorized. The frame designation of the intelligent decision system is examined, and the design method is presented [1]..

In this paper, we present RSF, a farmer recommendation system that can propose the best crops to produce in diverse locations. The system recognizes a user's location before calculating similarity across Upazilas utilizing different agroecological and agro-climatic data at the Upazilas level using the Pearson co-relation similarity technique. The top Upazilas that are comparable are then picked. Finally, it recommends top-fc crops to an Upazilas user based on seasonal data and crop production rates in similar Upazilas. We put the system to the test with real data and observed that it was accurate enough. Farmers may use the approach to help them cultivate the correct crops. As a result, they will be able to enhance their quality of life and make greater contributions to society. We made the system layout available in Bangla and English so that farmers and anyone who works with them may easily understand it [2].

Agriculture is India's primary source of revenue and employment. The most common issue that Indian farmers encounter is that they do not choose the right crop for their land. As a result, they will see a considerable reduction in production. Precision agriculture has been utilized to help farmers overcome their problems. Precision agriculture is a contemporary agricultural approach that uses research data on soil characteristics, soil types, and crop production statistics to advise farmers on the optimum crop for their specific site. This reduces the number of times a crop is selected erroneously while also increasing productivity [3].

By analysing an agriculture dataset, this paper focuses on applying Data Mining techniques to develop a crop production forecast system. Different classifiers are used for prediction, and their performance is compared using the WEKA tool. The technique will be more accurate if the error value is smaller. A comparison of classifiers yielded the result [4]. Agriculture is highly important in India. Farmers flourish, and the country prospers as a result. Farmers will be able to sow the proper seed based on soil conditions as a consequence of our efforts, improving the country's output. Our future efforts will be focused on improving the data set by adding more characteristics and including yield prediction [5].

III. Comparisons of Different Research Papers on Crop Recommendation Using Machine Learning

1.	Ji-chun Zhao, Jian-xin Guo	2018	Big Data Analysis Technology Application in Agricultural Intelligence Decision Systems [5]	Inference engine, expertise, Knowledge engineering, Knowledge base for recommendation system	1. An good harvestable database 2. Compose an agreement A big data platform is Hadoop. 3. Expert Experience 4. The prior knowledge 5. Objective Selection High-Definition File System, or HDFS 6. Future Applicability: Artificial Neural Networks using Hadoop for Hadoop.
2.	Shruti Mishra Priyanka Paygude	2018	Use of Data Mining in Crop Yield Prediction [6]	LWL J48, LAD tree, IBK algorithm	1. Make use of WEKA. 2. The least precise tree was the one shown below. 3. By chopping the oak tree, mistakes can be minimized. 4. IBK stood for observed at a higher precision afforded.
3.	D. Anantha Reddy, Bhagyashri Dadore, Aarti Watekar	2019	Crop Recommendation System to Maximize Crop Yield in Ramtekregion [7]	1. Random Tree 2. K-Nearest Neighbour 3. Random Forest 4. Decision Tree	1. Precision agriculture 2. The model's assembly 3. The majority's voting procedures 4. The KNN algorithm 5. Bayes, (Naive Bayes)
4.	Kodimalar Palanivel	2019	An Approach For Prediction Of Crop Yield Using Machine Learning And Big Data Techniques [8]	1. Linear Regression 2. Artificial neural Networks 3. Support vector Machine	1. obtaining the image back 2. The phrase's faithfulness in the L2 data 3. Regularization's function 4. variance overall
5.	Alok Kumar Jagadev	2021	Agricultural Recommendation System for Crops Using Different Machine Learning Regression Methods [10]	1. Linear Regression Prediction, Machine Learning, 2. Polynomial Regression 3. Random Forest Regression, 4. Support Vector Regression	1. Accuracy 94.78% 2. The majority voting method has been applied
6.	Shilpa Mangesh Pande; Prem Kumar Ramesh; Anmol Anmol; B. R Aishwarya	2021	Crop Recommender System Using Machine Learning Approach [11][2][13] [14]15][16]	1. Support Vector Machine 2. Artificial Neural Network 3. Random Forest 4. Multivariate Linear Regression 5. K-Nearest Neighbour	1. Accuracy 95% 2. It suggests the best time to use the fertilizers to boost up the yield. 3. The Random Forest showed the best results

In order to achieve optimal crop selection and growth, this research attempts to design a complete system for worm detection and soil analysis. The process entails integrating a number of sensors to gather essential data from the soil, such as pH, temperature, moisture content, and NPK values. In order to identify whether worms are present and evaluate the quality of the soil, the gathered data will be processed and evaluated using machine learning algorithms. Based on the results of the soil study, this system will then create a recommendation system that makes recommendations for appropriate crops. The goal of this study is to improve agricultural practices through the use of cutting-edge technology in data processing, artificial intelligence, and sensor data collection. This will ultimately lead to more effective and sustainable crop cultivation.

CONCLUSION

In summary, this work effectively utilized machine learning to develop and construct two critical systems: a worm detection system and a crop recommendation system. These developments give farmers data-driven insights that improve crop choices and make early insect detection possible. There are a number of possible advantages for agriculture, such as increased yields and sustainable methods. In the future, real-time monitoring and the incorporation of more data sources show potential for enhancing the impact of precision farming.

REFERENCES

[1] Zhao, Ji-chun, and Jian-xin Guo. "Big data analysis technology application in agricultural intelligence decision system." 2018 IEEE 3rd International Conference on Cloud Computing and Big Data Analysis (ICCCBDA). IEEE, 2018.

[2] Mokarrama, Miftahul Jannat, and Mohammad Shamsul Arefin. "RSF: A recommendation system for farmers." 2017 IEEE Region 10 Humanitarian Technology Conference (R10-HTC). IEEE, 2017..

[3] Pudumalar, S., et al. "Crop recommendation system for precision agriculture." 2016 Eighth International Conference on Advanced Computing (ICoAC). IEEE, 2017

[4] Mishra, Shruti, et al. "Use of data mining in crop yield prediction." 2018 2nd International Conference on Inventive Systems and Control (ICISC). IEEE, 2018. [5]. Zhao, Ji-chun, and Jian-xin Guo. "Big data analysis technology application in agricultural intelligence decision system." 2018 IEEE 3rd International Conference on Cloud Computing and Big Data Analysis (ICCCBDA). IEEE, 2018.

[5] Reddy, D. Anantha, BhagyashriDadore, and Aarti Watekar. "Crop recommendation system to maximize crop yield in ramtek region using machine learning." International Journal of Scientific Research in Science and Technology 6.1 (2019): 485-489.