

Soil Base Crop Prediction using Machine Learning

Prof. Wadgule Y. M¹, Nikam Tejas B², Chavan Visahl M³, Bhamare Akash S⁴, Tutare Ashok S⁵

Assistant Professor, Department Information Technology¹

Students, Department Information Technology^{2,3,4,5}

SND College of Engineering and Research Center, Yeola, India

Abstract: *In general, agriculture is the backbone [Grab your reader's attention with a great quote from the document or use this space to emphasize a key point. To place this text box anywhere on the page, just drag it.] of India and also plays an important role in Indian economy by providing a certain percentage of domestic product to ensure the food security. But now-a-days, food production and prediction is getting depleted due to unnatural climatic changes, which will adversely affect the economy of farmers by getting a poor yield and also help the farmers to remain less familiar in forecasting the future crops. This research work helps the beginner farmer in such a way to guide them for sowing the reasonable crops by deploying machine learning, one of the advanced technologies in crop prediction. Naive Bayes, a supervised learning algorithm puts forth in the way to achieve it. The seed data of the crops are collected here, with the appropriate parameters like temperature, humidity and moisture content, which helps the crops to achieve a successful growth. In addition as the software, a mobile application for Android is being developed. The users are encouraged to enter parameters like temperature and their location will be taken automatically in this application in order to start the prediction process.*

Keywords: Precision Agriculture, Machine learning, Crop prediction, Naive Bayes, Supervised Learning, Effective farming

I. INTRODUCTION

From ancient days, agriculture is considered as the main source of supply to satisfy the daily needs of human lives. It is also considered a primary occupation, and also one of the India's major industrial sectors. The farmers are ought to follow a traditional naked eye observation and yielded healthy crops without the involvement of chemicals for animals and also to their cultivation land in order to keep healthy diversity. But nowadays, weather conditions are being rapidly changing against the elemental assets to deplete the food and increase the security. In meantime, the GDP in agricultural sector is keep on decreasing, where in 2005 it was about 17.211.1, in 2018 it was 52020 it came down to 2farmers come from rural areas, and if the revenue from crop production goes down, their lifestyle would be influenced by the farms at industry level.

Purpose:

1. Predicting crop yield based on soil conditions involves several key steps and components. Here's a proposed system outline:
2. Data Collection: Collect soil data including pH levels, nutrient content (NPK), moisture content, temperature, and other relevant factors. Use sensors, satellite imagery, and ground surveys.
3. Data Processing: Process the collected data to clean it, reinove outliers, and prepare it for analysis. This may involve data normalization, aggregation, and transformation.
4. Feature Selection: Identify the most relevant features (soil parameters) that affect crop growth and yield. Use techniques like correlation analysis, feature importance, or domain knowledge
5. Model Selection: Choose a suitable machine leaning model for predicting crop yield based on soil data. Models like Random Forest, Gradient Boosting, or Neural Networks are commonly used for this purpose.
6. Training: Train the selected model using historical data on soil conditions and corresponding crop yields. Use techniques like cross-validation to ensure the model's generalizability.

7. Prediction: Use the trained model to predict crop yield based on current soil conditions. The model should output a quantitative estimate of yield for different crops.
8. Validation: Validate the model's predictions against actual crop yields to assess its accuracy. This may involve comparing predicted yields with field observations or historical data.
9. Deployment: Deploy the model in a real-world environment, such as a farming community or agricultural extension service, to provide farmers with actionable insights on crop management.

Objective:

- To minimize Time required for surveying process.
- Spread awareness about the government scheme.
- Reduce delay in the settlement of claim.
- Fast assessment of crop damage.
- Analysis of assessment data.
- More Accuracy in records.
- To provide more interactive platform for farmers.
- To provide the accurate data so that the needy farmers will get claim timely.

System architecture:

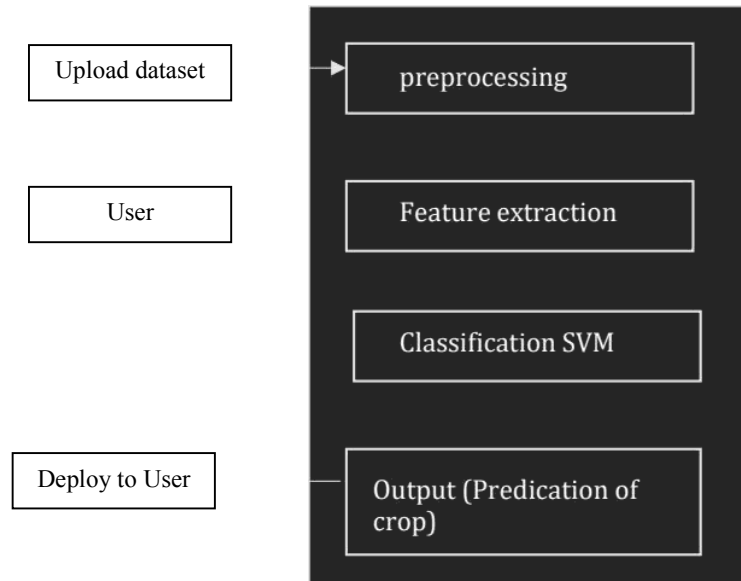


Figure: System architecture

In this module, the Admin has to log in by using valid user name and password. After login successful he can do some operations such as View All Users and Authorize, View All E-Commerce Website and Authorize, View All Products and Reviews, View All Products Early Reviews, View All Keyword Search Details, View All Products Search Ratio, View All Keyword Search Results, View All Product Review Rank Results. • View and Authorize Users • In this module, the admin can view the list of users who all registered. In this, the admin can view the user's details such as, user name, email, address and 21 admin authorizes the users. • View Charts Results • View All Products Search Ratio, View All Keyword Search Results, View All Product Review Rank Results. • I commerce User • In this module, there are n numbers of users are present. User should register before doing any operations. Once user registers, their details will be stored to the database. After registration successful, he has to login by using authorized user name and password Once Login is successful user will do some operations like Add Products, View All Products with reviews, View All Early Product's reviews, View All Purchased Transactions. • End User • In this module, there are n numbers

of users are present. User should register before doing any operations. Once user registers, their details will be stored in the database. After registration successful, he has to login by using authorized user name and password. Once Login is successful user will do some operations like Manage Account, Search Products by keyword and Purchase, View Your Search Transactions, View.

II. CONCLUSION

Agriculture is the field which helps in economic growth of our country. But this is lacking behind in using new technologies of machine learning. Hence our farmers should know all the new technologies of machine learning and other new techniques. These techniques help in getting maximum yield of crops. Many techniques of machine learning are applied on agriculture to improve yield rate of crops. These techniques also help in solving problems of agriculture. We can also get the accuracy of yield by checking for different methods. Hence we can improve the performance by checking the accuracy between different crops.

ACKNOWLEDGMENT

We express our heartfelt gratitude to our esteemed mentors and professors, especially Prof. Y. M. Wadgule, for their invaluable guidance in our academic and project endeavours. We also extend our thanks to the Information Technology Department and its staff for their continuous support. Our sincere thanks go to Dr. Yadav D.M., Principal of SND COLLEGE OF ENGINEERING & RESEARCH CENTRE, YEOLA. for his support and permission to complete this project. We appreciate the assistance of our department's support staff, and we're grateful to our parents, friends, and all those who supported us throughout this project.

REFERENCES

- [1]. tulips en.ss ikipeclia.r\ra si iki. A i icuiliii c.
- [2]. <https://en.wikipedia.org/wiki/Dataanalysis>. Jcetendra Shenoy, Yogesh Pingle, "IOT in agriculture", 2016 IEEE.
- [3]. M.R. Bendre, R.C. Thool. V.R. Thool, "Big Data in Precision agriculture", Sept, 2015 NGCT.
- [4]. Monali Paul, Santosh K. Vishwakanna, Ashok Verma, "Analysis of Soil Behavior and Prediction of Crop Yield using Data Mining approach", 2015.
- [5]. International Conference on Computational Intelligence and Communication Networks.
- [6]. N. 1-leeinageetha, "A survey on Application of Data Mining Techniques to Analyze the soil for agricultural purpose", 2016 IEEE.
- [7]. <https://en.wikipedia.org/wiki/Linearregression>. Y. Jeevan Nagendra Kumar, Dr. T. V. R. A. Jini Kanth, "GIS MAP Based Spatial Analysis of Rainfall Data", 2018-5705.
- [8]. B Sarikara Babu, A Suneetha, G Charles. Babu, Y. Jeevan Nagendra Kumar, G Karuna, " Medical Disease Prediction using Grey Wolf optimization and Auto Encoder based Recurrent Neural Network", Periodicals of Engineering and Natural Sciences, June 2018 ISSN 2303-4521 Vol.6, No.1, pp. 229-240