

Comparing the Real Time Statistics of Crop Yield Prediction Parameters and Supporting Farmers to Increase Their Crop Yield Using Machine Learning

Rama Krishnan R¹, Venkatesh S², Visveswaran K.V.S³, J.Sathiya Jothi⁴,
Assistant Professor, Department of Information Technology⁴
Anjalai Ammal Mahalingam Engineering College, Kovilvenni – 614 403, Thiruvavur.^{1,2,3,4}

Abstract— Farming is the foundation of the Indian economy. In India, Agricultural yield essentially relies upon climate conditions. Development primarily relies upon precipitation. Convenient counsel to foresee the Future yield profitability and an investigation is to be made to assist the ranchers with expanding the harvest creation of yields. Yield expectation is a significant farming issue. In the past ranchers used to anticipate their yield from earlier year yield encounters. Along these lines, for this sort of Data investigation in harvest expectation, there are various methods or Algorithms, and with the assistance of those calculations we can foresee crop yield. Random forest calculation is utilized. Utilizing every one of these calculations and with the assistance of between connection between them, there are developing scope of uses and the job of Big information examination methods in Agriculture. Since the production of new creative advancements and Techniques the agribusiness field is gradually debasing. Because of these, Abundant creation individuals are focused on developing fake Products that are half breed items where there prompts an unfortunate life. These days, current individuals don't have mindfulness about the Cultivation of the harvests at the perfect time and at the perfect spot. In view of these developing strategies the occasional climatic conditions are additionally Being changed against the central resources like soil, water and air Which lead to instability of food. By breaking down every one of these issues and Problems like climate, temperature and a few elements, there is no Proper arrangement and advances to conquer the circumstance looked by Us. In India, there are a few different ways to build the monetary development in the field of agriculture. There are various approaches to increment and Improve the harvest yield and the nature of the yields. Information digging is likewise valuable for foreseeing crop yield creation. The fundamental destinations are
To use machine learning techniques to predict crop Yield, To provide easy to use User Interface, To increase the accuracy of crop yield prediction, To analyse different climatic parameters (cloud cover, Rainfall, temperature). Machine learning model predictions allow businesses to make highly accurate guesses as to the likely outcomes of a question based on historical data, which can be about all kinds of things – customer churn likelihood, possible fraudulent activity, and more. Crop Yield Prediction involves predicting yield of the crop from available historical available data like weather parameter, soil parameter and historic crop yield. To predict the crop yield in future accurately Random Forest, a most powerful and popular supervised machine learning algorithm is used.

Index Terms— Crop, machine learning, prediction.

I. INTRODUCTION

To predicting the crop yield by learning the past data of the farming land. By considering various factors such as soil conditions, rainfall, temperature, yield and other entities the system builds a predicting a model followed by machine learning techniques.

To attain the crops by using SVM classifier, then this is cost effective and user friendly techniques will be filled as commercial and economical applications.

The proposed system aims at predicting or forecasting the crop yield by learning the past data of the farming land. By considering various factors such as soil conditions, rainfall, temperature, yield and other entities the system builds a predicting a model using machine learning techniques. Here we make use of different machine learning techniques such random forest, SVM, Decision Tree. Performance is evaluated based on predicted accuracy.

II. METHODOLOGY

A. Dataset Collection

The dataset is part of surveys which are carried out regularly. Primary data for the soil survey are acquired by field sampling. These samples are then sent for chemical and physical analysis at the soil testing laboratories; hence this dataset was collected from a private soil testing. It contains information about number of soil samples. Dataset has 9 attributes and a total 1988 instances of soil samples.

An algorithm that maps the input data to a specific category. Classification model: A classification model tries to draw some conclusion from the input values given for training. It will predict the class labels/categories for the new data

Crop Yield Prediction involves predicting yield of the crop from available historical available data. To predict the crop yield in future accurately Random Forest, a most powerful and popular supervised machine learning algorithm is used.

SVM is a supervised machine learning algorithm which can be used for classification or regression problems. It uses a technique called the kernel trick to transform your data and then based on these transformations it finds an optimal boundary between the possible outputs. Supervised learning is a learning method which maps known input resulted into output which maps from input to output.

B. Random Fores

Random forest, as the name says it is a combination of number of decision trees and an ensemble classification model. Random forest model collects trained data from all the tree nodes and separates the weaker nodes training data to get better predictions. Both classification and regression problems are solved using RF mode

Dataset Description Generally researchers used .csv files of agriculture dataset for crop yield prediction. The dataset is supervised learning. It consists of different attributes like Country Name, State, humidity, temperature, NDVI, wind Speed, yield etc.

III. WORK PLAN

A. Training Phase

Training Phase and Test Phase. In the training phase the data was collected and preprocessed. The pre-processed data was clustered using k-means clustering algorithm. The association rule mining process will apply on clustered data to find the rules. The training phase ends with number of generated rules

B. Testing Phase

In the testing phase, the yield value is predicted based on the generated rules. The work starts with preprocessing step. In this step the collected data was pre-processed. In the pre-processing, some data was removed from the data set. Some of the area was not suitable for crop production. So that data will be removed

C. Prediction Model

Data classification model tries to draw some conclusion from the input values given for training. It will predict the crop yields for future cultivation. It's suitable for massive crop yield prediction in agricultural planning. This makes the farmer to take the right decision for right crop such that agricultural sector will be developed by innovative ideas.

IV. CONCLUSION

Based on the climatic input parameters the present study provided the demonstration of the potential use of data mining techniques in predicting the crop yield based. The developed webpage is user friendly and the accuracy of predictions are above 75 percent in all the crops and districts selected in the study indicating higher accuracy of prediction. By providing climatic data of that place the user-friendly web page developed for predicting crop yield can be used by any user their choice of crop. By using this, it will

- Increase farmer's income.
- Increase farm productivity.
- Reduction

REFERENCES

- [1] Gautam Gupta et al, Environment Monitoring System for Agricultural Application using IoT and Predicting Crop Yield using Various Data Mining, IEEE Conference Record # 48766; IEEE Xplore ISBN: 978-1-7281-5371
- [2] CHENGHAO YANG et al, Soil pH Value Forecasting Using UWB Echoes Based on Ensemble Methods, Digital Object Identifier 10.1109/ACCESS.2019.2956170 Nimesh Gondchwar, R. S. Kawitkar, "IoT Based Smart Agriculture," International Journal of Advanced Research in Computer and Communication Engineering (IJARCCE), vol. 5, no. 6, Jun 2016.
- [3] Kiruthika M, Shweta T, Mritunjay O, Kavita S, "Parameter monitoring for the precision agriculture", International Journal Of The Scientific Research and Innovation 2015.
- [4] Kuljit Kaur, Kalnwalpreet Singh Atwal "Effect of Temperature and Rainfall on Paddy Yield using data mining ", 2017 7th international conference on Cloud Computing, Data Science and Engineering Confluence.
- [5] S.R. Gunn, "Support vector machines for classification and regression", Technical Report, School of Electronics and Computer Science, University of Southampton, Southampton, U.K., 1998.
- [6] Dakshayini Patil et al, "Rice Crop Yield Prediction using Data Mining Techniques: An Overview", International Journal of Advanced Research in Computer Science and Software Engineering, Volume 7, Issue 5, May 2017.