

## CROP PREDICTION USING MACHINE LEARNING

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### ABSTRACT

In general, agriculture is the backbone of India and conjointly plays a very important role within the Indian economy by providing an exact share of domestic merchandise to ensure food security. However now-a-days, food production and prediction is depleted thanks to unnatural environmental condition changes, which is able to adversely have an effect on the economy of farmers by obtaining a poor yield and conjointly facilitate the farmers to stay less acquainted in prediction of the longer term crops. This analysis work helps the beginner farmer in such a way to guide them for sowing affordable crops by deploying machine learning, one among the advanced technologies in crop prediction. Naive Bayes, a supervised learning algorithmic rule puts forth within the thanks to win it. The seed information of the crops are collected here, with the suitable parameters like temperature, humidness and wet content, that helps the crops to realize a flourishing growth. In addition to the package, a mobile application for mechanical man is being developed. The users are inspired to enter parameters like temperature and their location are going to be taken mechanically during this application so as to begin the prediction method.

**Keywords:** Image Processing, Analysis, Machine Learning, Learning Algorithm, Crop Prediction.

### I. INTRODUCTION

The framework essentially analyses the soil pictures . These soil pictures are then used to predict the crops supported by the soil types. In India there are multiple ways to rise the crop learn profit and improve the quality of the crops thus to carry on the economic growth inside the sector of agriculture. Now-a-day's climatic conditions aren't predictable like decades ago. It is changing day by day due to globalization So, the implementation of one of the recent advancement in technology such as, Machine learning is one of the solutions for predicting the crop . The proposed system analyzes the application of supervised machine learning approaches. Thereby this proposed work will suggest the farmers with effective solutions for more profitable cultivation.

### II. LITERATURE SURVEY

| Paper Title   | Author                                       | What they Proposed   | Advantages  |
|---|--|--|---|
| 1]Crop Yield Prediction using Machine Learning Techniques | Yogesh Gandge                                | Predicting crop yields far ahead of harvest can assist farmers and government agencies in making proper planning decisions such as storing, selling, setting minimum support prices, importing/exporting, and so on. Predicting a harvest in advance necessitates a methodical examination of vast amounts of data derived from many variables<br><br>Technology Used – KNN                      | Various soil samples taken from different placed can be tested. Portable<br><br>Time consumption is low   |
| 2]Crop prediction using predictive analytics              | P. S. Vijayabaskar, Sreemathi.R, Keertanaa.E | In this paper, two different Machine Learning (ML) algorithms are proposed to analyze the crops' yield. These two algorithms, Support Vector Regression (SVR) and Linear Regression (LR), are quite suitable for validating the variable parameters in the predicting the continuous variable estimation with 140 data points that were acquired. The parameters mentioned above are key factors | This paper integrates the work of various authors in one place which helps the researcher to understand the current scenario in agriculture and data mining |

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|--|--------------|--|--|
|  |              | affecting the yield of crops.<br>Technology Used – ANN , multi-linear regression model , radial basis function (RBF)   |  |
| 3] Crop Yield Prediction using Machine Learning Techniques | Ramesh Medar | This paper is intended to support agriculture by classifying 7 different types of soils like Clay, Clayey Peat, Clayey Sand, Humus Clay, Peat, Sandy Clay and Silty Sand, and in suggesting suitable crops that could be grown in those particular soils using image processing. The features obtained from the test image are then compared with the features obtained from the images in the dataset. Finally the soil is predicted with the help of segmented images that are given as input for simulation using Matlab R2018a and is followed by crop suggestion.<br>Technology Used -MATLAB , Computer Vision and Image Processing Tools | The concept of this paper is to implement the crop selection method so that this method helps in solving many agriculture and farmers problems. This improves our Indian economy by maximizing the yield rate of crop production |

### III. METHODOLOGY

For farmers it is very important to know which crop they should plant in their farm . So this software helps the farmers to manage this selection process of selecting the crop on the basis of soil type, temperature and location .This will help farmers to reduce time while selecting the proper crop to yield , traditionally it takes time as we have to check ph , nitrogen , potassium ,humidity. By using this system farmers will get a brief idea of not only soil type but also crops that will grow best in that soil. This system will enhance the agricultural field in the future.

### IV. MODELING AND ANALYSIS

**Module:**

1) Preprocessing-

a) Image processing is a method to perform some operations on an image, in order to get an enhanced image or to prize some useful information from it. It's a type of signal processing in which input is an image and output may be image or characteristics/ features associated with that image.

2) Feature Extraction –

a) Involves reducing the amount of resources required to explain an large set of information. Feature extraction may be a general term for ways of constructing groups of the variables to induce around these issues whereas still describing the information with decent accurateness.

3) Classification-

A classification is a division or type in a system which divides things into groups or types.

4) Algorithm-

CNN is a supervised learning algorithm of Deep learning, basically used in image recognition.

The Four important layers in CNN are - Convolution layer, ReLu Layer, Pooling Layer, Fully Connected Layer

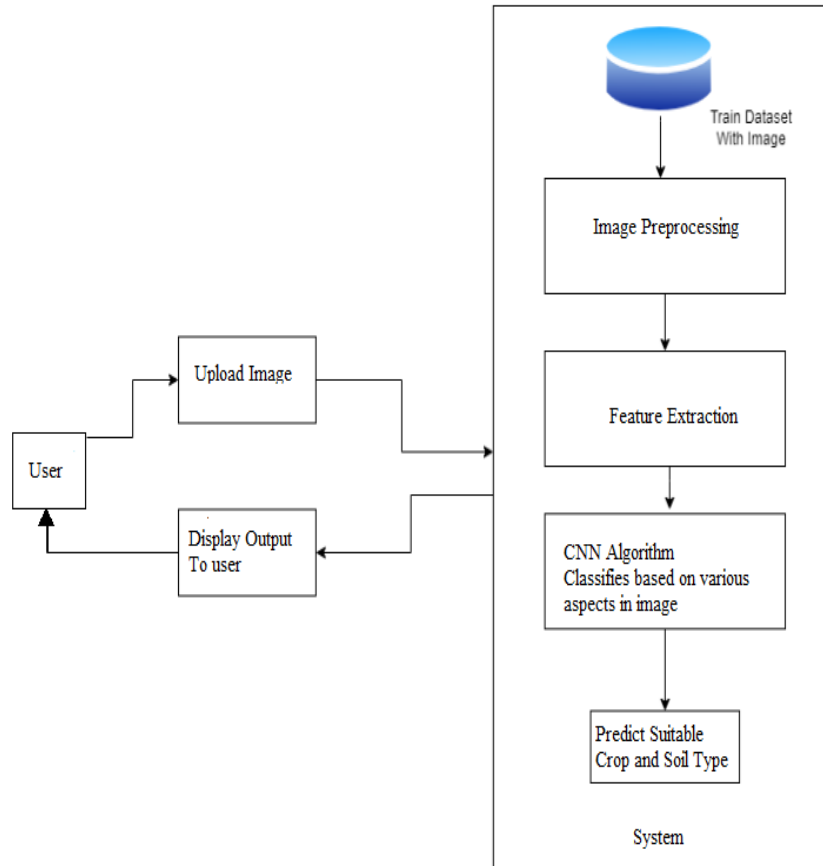


Figure 1: System Architecture

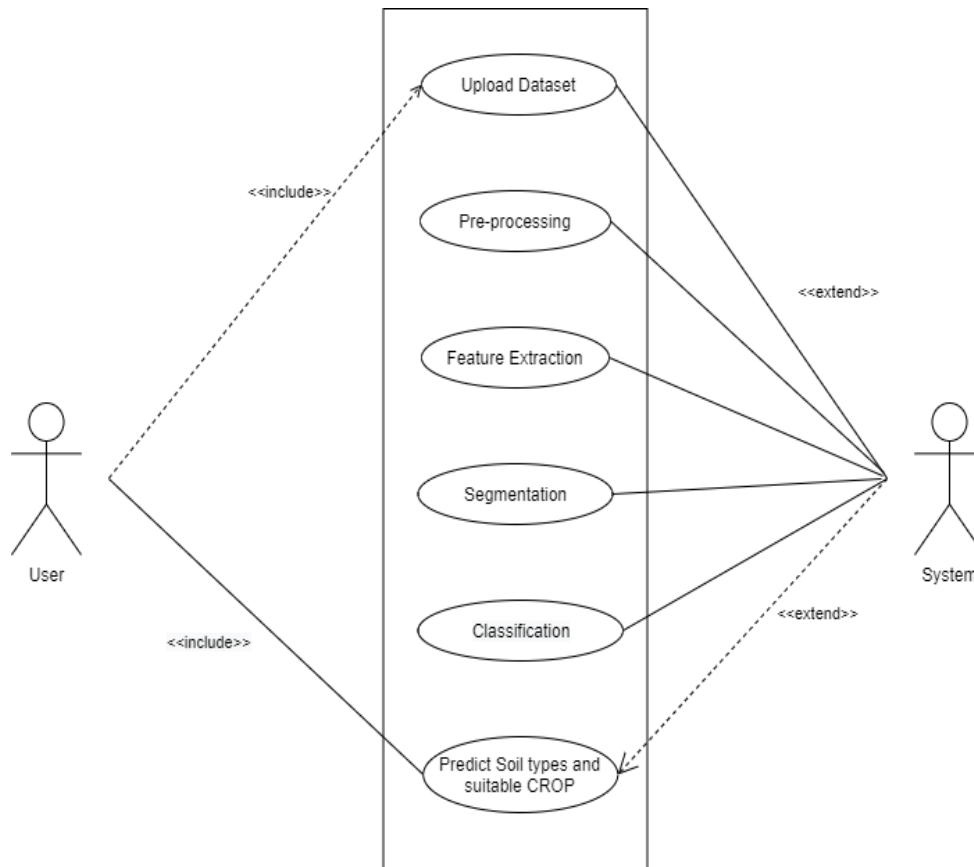
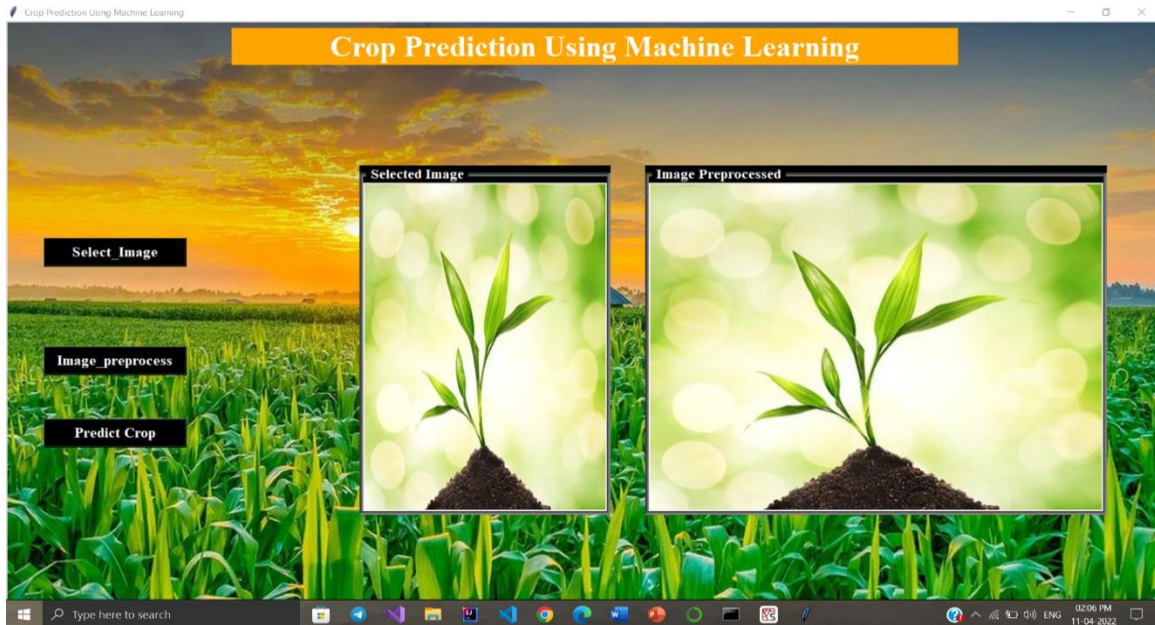
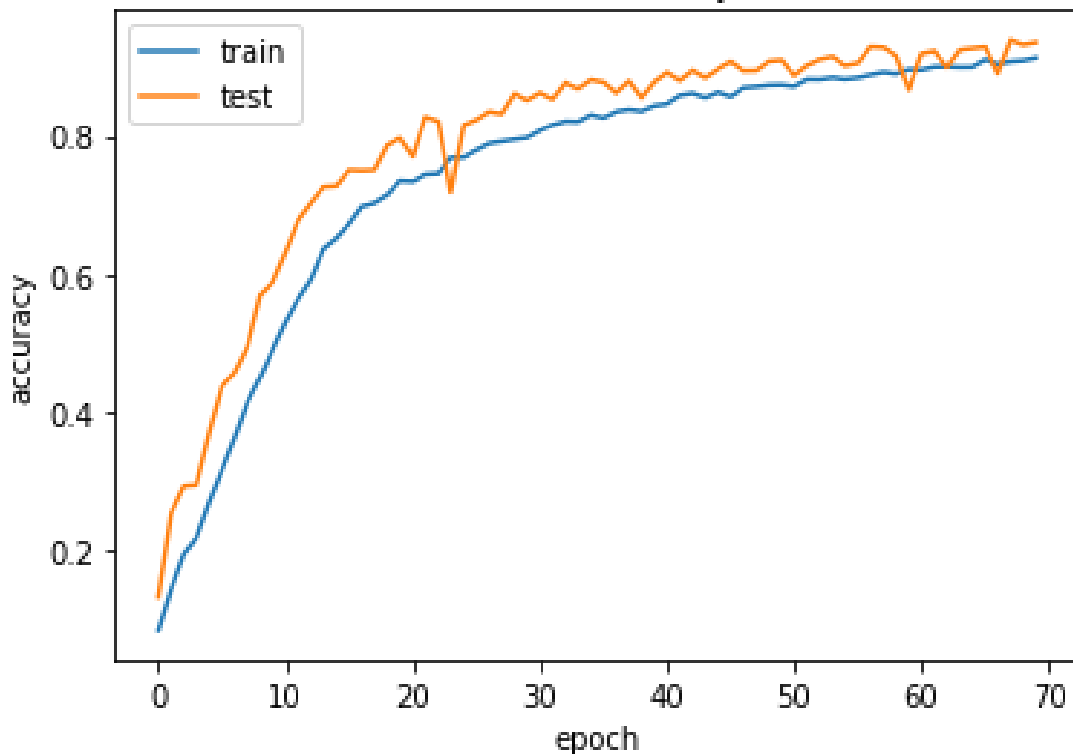


Figure 2: Use Case Diagram

**V. RESULTS AND DISCUSSION**



**Figure 3: Main Window**



**Figure 4: Model Accuracy**

**VI. 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 cultivators should know all the new technologies of machine learning and other new ways. Numerous ways of machine learning and deep learning are applied on farming to help yield rate of crops. These ways also help in working problems of farming. We can also get the accurateness of yield by checking for different approaches. Hence we can enhance the performance by checking the accuracy between different crops. In the future, this system can be administered further using IOT to get the real time data. In the farm, the detectors can be installed to collect information about the current soil conditions

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### ACKNOWLEDGEMENTS

It gives us great pleasure in presenting the preliminary paper on 'Crop Prediction Using Machine Learning'. I would like to take this opportunity to thank my internal guide. Prof. Yadav N.G. for giving me all the help and guidance I required. I'm really thankful to them for their kind support. Their valuable suggestions were really helpful. I'm also grateful to Prof. S. V. Bodake , Head of Computer Engineering Department, PVPIT for his necessary support, suggestions. In the end our special thanks to all teachers for providing various resources such as laboratory with all needed software platforms, continuous Internet connection, for Our Project.

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