

Crop Prediction Using Machine Learning

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Abstract— It is claimed that agriculture is the foundation of the Indian economic structure. Agriculture has undergone a number of technical improvements over the last few decades to increase production. The world population is steadily increasing, but the resources for crop production are continually decreasing. Sustainable crop production is due to environmental degradation, as per the results of the World Trade Organization in the coming decade.

Agriculture hold an important sector in the Indian economy as it contributes around 18% of India's gross domestic product (GDP). India is an agricultural based country where more than 50% of the population depends on agricultural. Hence there is a need to provide farmers with the effective technology and knowledge to yield better crops based on the type of soil. Different types of soil are present in India. Different types of soil have different mineral contents and each crop require different mineral components for their better growth. Each soil has certain specific characteristic and is suitable to grow only certain number of crops.

Introduction

Statistical Analysis Agricultural systems are particularly effective in boosting output and crop production efficiency. However, population growth is modest, and agriculture production resources are deteriorating daily. Farming is traditionally associated with sowing the crop or harvesting it in accordance with a schedule. In order to practise precision agriculture, it is necessary to gather real-time information about the weather, air quality, soil, crop maturity, machinery, labour expenses, and data availability. Making more informed judgments in the agricultural sector is possible with the use of predictive analytics.

I. LITERATURE SURVEY

[1] Machine learning approach for forecasting crop yield based on climatic parameters

Author: S.Veenadhari, Dr. Bharat Misra, Dr. CD Singh

In the current study, a user-friendly web page called "Crop Advisor" has been created as a software tool to anticipate the impact of meteorological conditions on crop yields. The C4.5 method is used to identify the climatic factor that has the greatest impact on the agricultural yields of particular crops in particular areas of Madhya Pradesh. Other agro-input characteristics important for crop production are not taken into account in this tool because their application varies with specific fields in place and time. This programme provides an indicator of the relative influence of different meteorological conditions on the crop yield.

[2]"Crop Selection Method to Maximize Crop Yield Rate using Machine Learning Technique"

Author: Rakesh Kumar¹, M.P. Singh², Prabhat Kumar³ and J.P. Singh

Planning for agriculture is important for a country's economic development and food security. Crop selection is a crucial component of agricultural planning. It is influenced by a number of factors, including market prices, government policies, and production rates. Using statistical approaches or machine learning techniques, many studies looked at crop production rate prediction, weather prediction, soil classification, and crop classification for agricultural planning. Crop production rate is influenced by a region's geography (such as a hilly area, a riverbed, or a deep region), the weather (such as temperature, cloud cover, rainfall, and humidity), the type of soil (such as sandy, silty, clay, peaty, or saline soil), the composition of the soil (such as PH value, nitrogen, phosphate, potassium, organic carbon, calcium, magnesium, sulphur, manganese, copper

[3] “An IoT Environmental Data Collection System for Fungal Detection in Crop Fields”

Author: Thomas Truong, Anh Dinh, Khan Wahid

For the diagnosis and treatment of fungal diseases in rural crop fields, a system that provides real-time local environmental data is required. The design of an Internet of Things (IoT) system is presented in this study. It consists of a device that can transfer environmental data in real-time to cloud storage and a machine learning algorithm that forecasts environmental conditions for fungal diagnosis and prevention. A remote computer accesses and processes the recorded environmental data on variables including air temperature, relative air humidity, wind speed, and rain fall for management and analysis purposes.

[4] “A Study on Various Data Mining Techniques for Crop Yield Prediction”

Author: Yogesh Gandge, Sandhya

India is a heavily agricultural nation where the majority of people depend on this industry for their livelihood. The economy of the nation is greatly impacted by agriculture. India has seen severe natural disasters including floods and drought during the past ten years. Such catastrophes result in significant crop production losses, which eventually hurt farmers.

III. REQUIREMENTS

A . Software Requirements

This is the software configuration in which the project was shaped. The programming language used, tools used, etc are described here.

- Operating System : Windows
- Front End : html , CSS , bootstrap , JavaScript
- Tool : Sublimetext3,pycharm
- Database : MySQL

B . Hardware Requirements

As this is an online application for product management we are not enabling or installing any hardware components for user interface.

- It's not an embedded system
- Processor - Pentium IV 2.4 GHZ
- Speed - 1.5 Ghz and Above
- RAM - 4 GB (min)
- Hard Disk - 220 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse

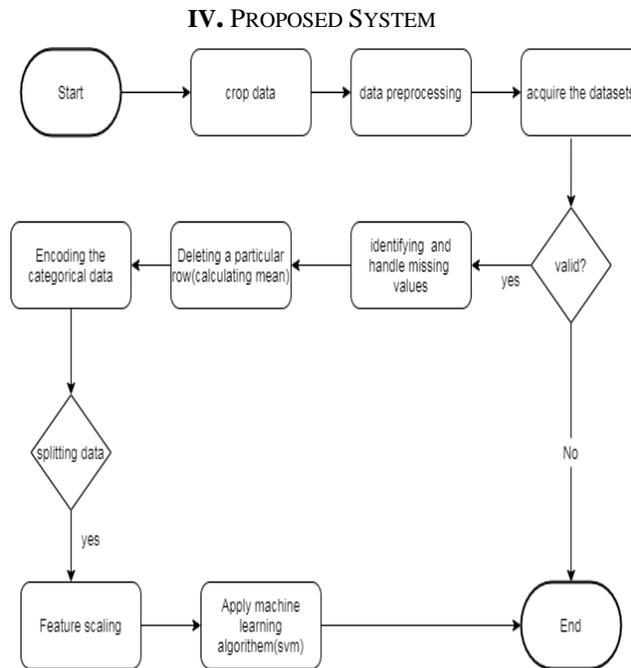


Fig 1-Architecture of Proposed System

THE PROPOSED SYSTEM WILL HELP TO THE PEOPLE WHO WANT TO GO AT PARTICULAR CROP DATASET PREDICT OUTCOME.

THE RECOMMENDATION WHERE GIVEN BASED ON DATASET CROP.

THE INFORMATION SHOWN ON THE APPLICATION IS ONLY FOR THE INFORMATION PURPOSE.

SYSTEM HAS AUTHORITY TO MAINTAIN THE APPLICATION REGULARLY.

IV. SPECIFICATION

A. Applications

1. The user must be fluent in English.
2. The application cannot be used until the user has all necessary software.
3. An internet connection was necessary.
4. There are at least two drawbacks to the max operator. The first limitation is that it is only appropriate for instance-level techniques that demand an instance classifier.

B. Advantages

1. Predict the outcome of the crop
2. Efficient prediction method
3. For the crop to be successfully managed and contained, it is crucial to confirm those afflicted. The actual rates of cases would be difficult to ascertain without trustworthy testing. To use these tests effectively, it is crucial to understand what they can and cannot perform. Dependable and effective system.

C. Future Scope

1. We ought to be able to advise on the amount of nutrients in the soil and the best types of farms for farming.

2. A farmer can take a photo of a crop with their phone and upload it to a system, which can then anticipate the crop's attributes and evaluate the outcome.
3. Crop attributes can be compared to a prior image database, and crop maturity can be determined based on colour and environmental parameters using image processing techniques.
4. As the technology advances, prediction techniques might increase its effectiveness.

V. CONCLUSIONS

Our report states that there is still room to improve the outcome. It was discovered during our investigation that writers rarely apply the algorithm used in most A unified approach when all the variables are present. The impact on agricultural yield can be used to simultaneously estimate crop yield. There is more room for advancement because the dataset is occasionally seen to be limited. Using a huge dataset can also strengthen the result.

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- Crop selection method to maximize crop yield rate using machine learning techniques.
- An IoT Environmental Data collection system for Fungal Detection in Crop Fields.
- A Study on Various Data Mining Techniques for Crop Yield Prediction.
- Predictive Analysis in Agriculture to Improve the Crop Productivity using Zero algorithm.
- A Survey on Predictive Analysis in Agricultural Soil Health Data to Predict the Best Fitting Crop.