D Y Patil University Pune, Ambi

--School of Engineering & Technology's Department of Computer Engineering--

Under-Graduate Program: TY (CE/IT)

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"Crop Recommendation System"

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Abstract:

The project aimed to develop a real-time crop recommendation system using machine learning and data analytics. The system focused on analyzing soil properties, climate conditions, historical crop yields, and farmer preferences to provide personalized crop recommendations tailored to individual farming environments. Overall, the project highlights the potential of machine learning techniques in addressing agricultural challenges and offers a foundation for further research and application in sustainable farming practices and efficient crop management.

Introduction:

In today's world, agriculture plays a crucial role in the global economy, and with the advancements in technology, there has been a growing interest in leveraging machine learning techniques to improve agricultural practices. Crop recommendation systems powered by machine learning algorithms have emerged as effective tools for assisting farmers in making informed decisions regarding crop selection, thereby optimizing yields and resource utilization.

The proposed project aims to develop a crop recommendation system utilizing machine learning techniques to assist farmers in making informed decisions regarding crop selection. By leveraging data on soil properties, climate conditions, historical crop yields, and farmer preferences, One powerful application is crop recommendation systems, which aid farmers in choosing the right crops for optimal yields and resource management. Our project aims to develop such a system, customized to individual farming environments by analyzing soil properties, climate data, historical yields, and farmer preferences.

Objectives:

1. The system helps the farmers in selecting a suitable crop for their agricultural land based on the required parameters. Design an intuitive and user-friendly interface for farmers to easily input data, receive recommendations, and visualize results.
2. The system is to design and develop a recommendation model to generate recommendations for crops based on geographical and climatic parameters using machine learning algorithms.
3. To develop a comprehensive system that leverages machine learning techniques to provide farmers with personalized insights for optimizing agricultural productivity, sustainability, and profitability.

Scope:

The introduction underscores the pivotal role of agriculture in the global economy and highlights technological advancements, especially in machine learning, as game-changers in agricultural practices. It introduces the objective of developing a crop recommendation system tailored to individual farming environments by leveraging diverse data sources like soil properties, climate conditions, historical yields, and farmer preferences. The system aims to empower farmers with personalized recommendations to optimize yields, resource utilization, and overall profitability. This approach not only promises to revolutionize decision-making in agriculture but also underscores the potential of technology to foster sustainable and efficient farming practices globally.

The scope emphasizes the importance of agriculture and the role of machine learning in enhancing farming practices. It introduces a project to develop a crop recommendation system using data like soil quality and climate conditions to provide farmers with personalized crop suggestions for better yields and resource management.

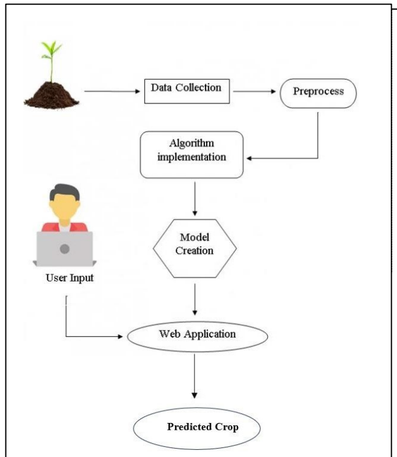

Figure 1: Working of the model

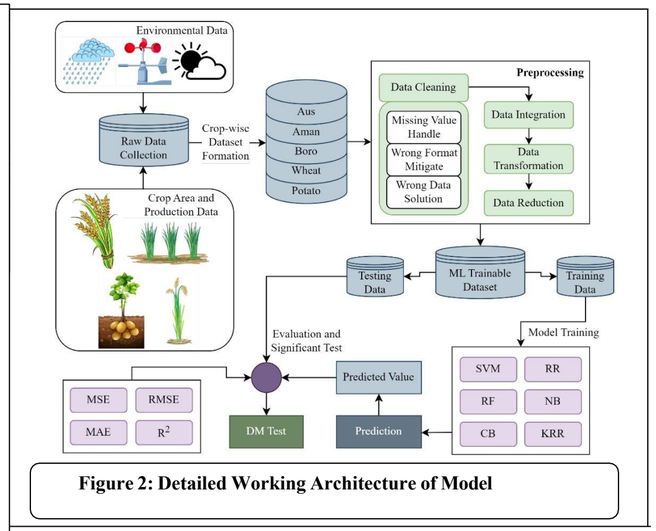

Figure 2: Detailed Working Architecture of Model

Literature Review:

Research on crop recommendation systems shows how using smart computer tools can help farmers pick the best crops for their land and weather. By looking at things like soil quality and local climate, these tools suggest which crops might grow best, making farming easier and more successful. These systems are like helpful guides that use technology to give farmers advice for better crops and bigger harvests.

- The earliest study by Li et al. [1] primarily focused on utilizing deep learning techniques to analyze agricultural data for crop recommendations.
- Subsequent research by Rana et al. [2] expanded the scope to include various machine learning techniques, emphasizing the analysis of diverse datasets for tailored crop suggestions.
- The study by Shastry and Sanjay [3] introduced a hybrid approach by integrating traditional statistical methods with machine learning, aiming to enhance prediction accuracy.
- The latest study by Dhruvi Gosai et al. [4] highlighted the development of computer-based systems, emphasizing the integration of technology to provide actionable insights for farmers.

The evolution showcases a progression from initial deep learning-based approaches to more comprehensive and hybrid methodologies, emphasizing the integration of diverse data sources and technology-driven solutions to enhance agricultural practices and decision-**making**.

Conclusion:

The project involved several key steps. First, a dataset of eye images was prepared by collecting and pre-processing images of open and closed eyes. The dataset was then split into training and testing sets to train a deep learning model.

An InceptionV3 model was chosen as the base model and customized by adding additional layers for classification. Transfer learning was utilized by freezing the weights of the base model while training the added layers. The model was trained using the prepared dataset and evaluated using validation of data.

Overall, the project provides a foundation for developing an eye state monitoring system and highlights the potential for using computer vision techniques to enhance safety and awareness in various contexts.

References:

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2. Rana, A., Sharma, V., Kumar, V., & Jha, D. (2020). Intelligent Crop Recommendation System Using Machine Learning. International Journal of Advanced CS and Applications, 11(1), 303-309.
3. K.A. Shastry, and H. A.Sanjay, "Hybrid prediction strategy to predict agricultural information," Applied Soft Computing,vol. 98, pp.106811, 2021
4. Dhruvi Gosai et al Int. J. Sci. Res. Comp. Sc. Eng. Inf. Tech, May-June - 2021, 7 (3) : 554-557