



MGM's College of Engineering, Nanded

Department of Computer Science & Engineering

“ AI-DRIVEN SMART SEEDING DECISION SUPPORT SYSTEM ”

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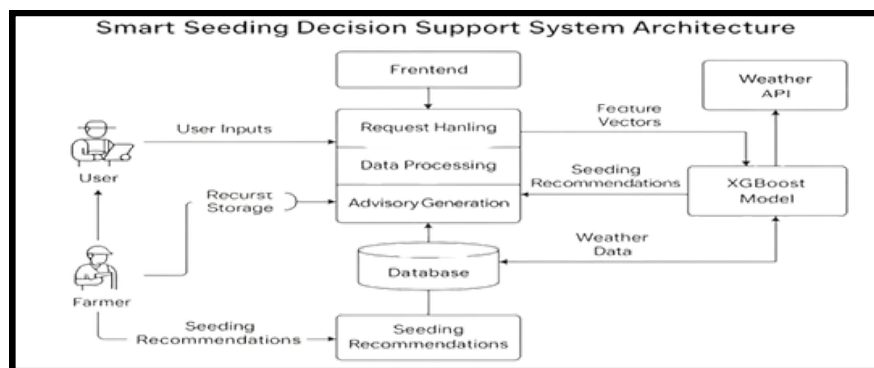
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Introduction

The AI-Driven Smart Seeding Decision Support System is designed to improve agricultural productivity through data-driven decision-making. The system uses machine learning and real-time weather data to predict optimal seed quantity and spacing for different crops. By reducing seed wastage and ensuring uniform sowing, it helps farmers minimize costs and improve crop yield. The system also generates a robot-friendly seeding layout to support automated field operations. Overall, the project promotes precision agriculture and sustainable farming practices.

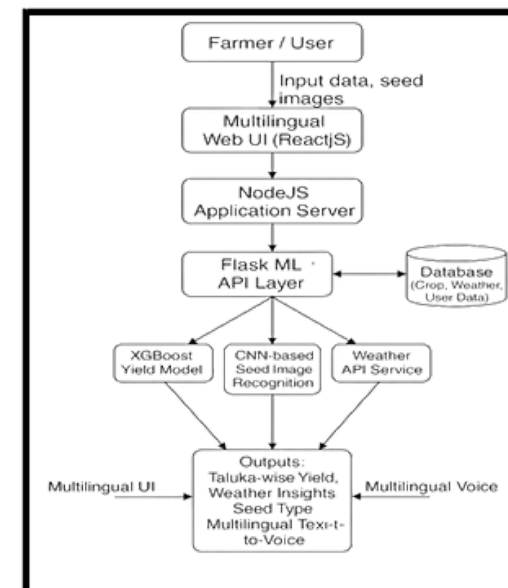
System Architecture

The Smart Seeding Decision Support System is designed using a modular and layered architecture to ensure efficient data flow and scalability. It integrates user interaction, application logic, machine learning, and data management into a structured system. A trained XGBoost model processes farm inputs to predict seed quantity and spacing, while real-time weather data supports climate-aware decisions. All user, farm, and prediction data are stored in a structured database for efficient access and management.



Methodology

The Smart Seeding Decision Support System collects farm details such as location, soil type, crop variety, and farm area from the user. Real-time weather data is retrieved using an external API to support climate-aware decisions. The collected data is processed and analyzed using a trained XGBoost machine learning model to predict optimal seed quantity and spacing. Based on these predictions, a robot-friendly seeding layout is generated. The final recommendations are displayed through a user-friendly web interface and stored in the database for future reference.



Conclusion

The AI-Driven Smart Seeding Decision Support System improves agricultural sowing through machine learning and real-time weather data. It reduces seed wastage, lowers farming costs, and supports precise seeding decisions. The system also enables future automation through robot-friendly seeding layouts.

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