SSBT's College of Engineering and Technology, Bambhori Jalgaon
(Included under section 2 (f) and 12(B)of the UGC Act, 1956)
Grade A (3.14) NAAC Accredited

A Seminar on

AI-Powered Precision Farming: Drones Revolutionizing Agriculture

Activity Report

Academic Year	2024-25
Program Driven by	A Seminar on AI-Powered Precision Farming: Drones Revolutionizing Agriculture
Quarter	II
Program / Activity Name	A Seminar on AI-Powered Precision Farming: Drones Revolutionizing Agriculture
Program Type	
Program Theme	Innovation and startups
Start Date	08-02-2025
End Date	08-02-2025
Duration of the Activity (in Mins)	60
Number of Student Participant	50
Number of Faculty Participant	70
Number of external Participant	--
Expenditure Amount in Rs.	
Any Remark	--
Mode of Session Delivery	Offline
Objective	
Benefit in terms of Learning / Skills / Knowledge obtained	
Feedback	
Video url (mp4)	
Photograph 1 (jpg)	Attached
Photograph 2 (jpg)	Attached
Overall report of the Activity (pdf)	As given below

Dr. P. H. Zope

Convener IIC

SSBT's College of Engineering and Technology, Bambhori Jalgaon
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A Seminar Report on

AI-Powered Precision Farming: Drones Revolutionizing Agriculture

Introduction The integration of Artificial Intelligence (AI) and drone technology is transforming agriculture by enabling precision farming. AI-powered drones are revolutionizing traditional farming methods, improving efficiency, sustainability, and productivity. This report explores how AI-driven drones are reshaping modern agriculture through data-driven decision-making, crop monitoring, and resource optimization.

Role of AI and Drones in Precision Farming

1. **Crop Monitoring and Health Assessment**
    - AI-enabled drones use multispectral and thermal imaging to assess crop health.
    - Early detection of diseases, nutrient deficiencies, and pest infestations.
2. **Precision Irrigation and Water Management**
    - Drones equipped with AI analyze soil moisture levels for optimized irrigation.
    - Reducing water wastage and improving crop yield.
3. **Automated Crop Spraying and Fertilization**
    - AI-powered drones precisely spray pesticides and fertilizers.
    - Minimizing chemical usage and enhancing environmental sustainability.
4. **Yield Prediction and Data Analytics**
    - AI algorithms analyze drone-collected data to predict crop yields.
    - Assisting farmers in decision-making for better planning and resource allocation.
5. **Weed and Pest Detection**
    - AI-based image recognition identifies weed growth and pest activity.
    - Targeted intervention reduces crop damage and increases efficiency.

Benefits of AI-Powered Drones in Agriculture

- **Increased Efficiency:** Automated monitoring and intervention save time and labor.
- **Higher Crop Yields:** AI-driven insights enhance productivity and profitability.
- **Cost Reduction:** Precision farming minimizes resource wastage and operational costs.
- **Sustainable Practices:** Reduced pesticide and water usage promote eco-friendly farming.
- **Real-Time Decision Making:** AI-generated data supports informed agricultural strategies.

Challenges in Implementation

- High initial investment costs for AI and drone technology.
- Need for technical expertise and training for farmers.
- Regulatory challenges and drone usage restrictions in certain regions.
- Data privacy concerns regarding farm and environmental information.

Future Prospects

- Advancements in AI and drone technology will further enhance automation in agriculture.
- Increased adoption of smart farming techniques worldwide.
- Development of AI-powered autonomous farming systems for large-scale agricultural operations.
- Integration of AI with IoT for real-time monitoring and predictive analysis.

Conclusion AI-powered drones are revolutionizing agriculture by making farming more precise, efficient, and sustainable. With continued advancements, AI-driven precision farming will play a crucial role in addressing global food security challenges while promoting environmentally responsible agricultural practices. Farmers embracing AI technology will benefit from improved productivity, cost savings, and better resource management, ensuring a smarter future for agriculture.

Precision Farming Using AI Drones

Date: 08 Feb. 2025

Dr. Amol Chandrakant Wani
Assistant Professor in First Year Engineering

The integration of artificial intelligence (AI) and drone technology is transforming traditional agricultural practices into a data-driven, efficient, and sustainable approach known as precision farming. AI-powered drones are revolutionizing agriculture by enabling farmers to monitor and manage crops with unprecedented accuracy. These drones are equipped with advanced sensors and imaging technologies that capture high-resolution data on crop health, soil conditions, and weather patterns. Through machine learning algorithms, this data is analyzed to provide actionable insights, such as identifying pest infestations, detecting nutrient deficiencies, and optimizing irrigation schedules. By precisely targeting areas that require attention, farmers can significantly reduce resource wastage, increase crop yields, and lower operational costs. Furthermore, real-time monitoring helps in early detection of plant diseases, minimizing losses and ensuring timely interventions.

The scalability and versatility of AI drones make them ideal for both small-scale farms and large agricultural enterprises. Their ability to access remote and challenging terrains further enhances farm management capabilities. As climate change and population growth put pressure on global food security, the adoption of precision farming through AI drones is emerging as a vital solution for sustainable agriculture. This technological revolution holds the potential to reshape the agricultural landscape, fostering a smarter, greener, and more productive future.


Village
बांभोरी
Decimal
DMS
Latitude
21.014066
21°0'50" N
Longitude
75.502681
75°30'9" E