

AI, ML, and IoT for Smart Agriculture: Innovations in Crop Yield, Resource Optimization, and Sustainable Farming Practices

Chapter	Title	Page No.
1	An Introduction to Smart Agriculture: Leveraging AI, ML, and IoT to Transform Traditional Farming and Ensure Food Security	12
2	Future Directions: Next-Generation AI, ML, and IoT Innovations for Sustainable and Resilient Farming	40
3	Climate-Smart Agriculture: Using AI and Predictive Models for Weather Forecasting and Risk Mitigation	69
4	Robotics and Automation in Smart Farming: The Path Towards Autonomous Agricultural Systems	98
5	Robotics and Automation in Smart Farming: The Path Towards Autonomous Agricultural Systems	127
6	Integrating Remote Sensing with IoT for Crop Health Monitoring, Land Mapping, and Precision Agriculture	156
7	Deep Learning for Plant Growth Monitoring, Stress Detection, and Prediction in Smart Farming	185
8	IoT and AI Applications for Reducing Water Usage: Advanced Strategies for Smart Irrigation and Conservation	214
9	Intelligent Pest Detection and Control Using AI Vision, IoT Sensors, and Predictive Analytics	243
10	ML Approaches for Early Detection, Classification, and Prediction of Crop Diseases in Agriculture	273
11	AI-Driven Fertilizer Recommendation Systems Using Big Data, Soil Health Indicators, and Predictive Models	302
12	Seed Quality Prediction and Selection Using ML, Image Processing, and IoT Data for Crop Performance	351
13	Drone-Based Precision Spraying: Applying AI and IoT for Targeted Fertilizer, Pesticide, and Nutrient Delivery	358

14	Smart Irrigation: Integrating IoT Sensors, ML Models, and Automated Control for Precision Water Management	386
15	AI-Powered Monitoring and Optimization of Crop Cultivation Techniques to Maximize Yield and Resource Use	411