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# Smart Farming: Automated Farm Spraying, Weeding and Crop Monitoring Using IoT and Computer Vision

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**Abstract**: *This project proposes an IoT-based smart farming system that automates pesticide spray- ing and crop health monitoring using a Raspberry Pi 4, Pi Camera, and YOLOv8 object detection. The system integrates an MPU6050 for vehicle stability, a VL53L1X for precise spraying distance measurement, and a GPS module for field mapping. Real-time data is processed on-device, reducing reliance on cloud connectivity, while servo-controlled nozzles enable targeted spraying, achieving a 40% reduction in chemical usage during trials. The system's edge AI capabilities, cost-effectiveness, and open-source framework make it a scal- able solution for precision agriculture, addressing challenges like pest-induced crop losses and environmental degradation due to pesticide overuse.*

**Keywords**: Smart Farming, YOLOv11, Raspberry Pi, Precision Agriculture, IoT



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