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An IoT Based Real Time System for Weed Identification and Selective Removal in Mixed Farming Environment

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Abstract: *This project promotes sustainable agriculture through the creation of an autonomous rover for weed detection and removal with deep learning as the engine. The system combines high-speed object detection models from the YOLO (You Only Look Once) family. It can detect objects with up to 89.4% accuracy (YOLOv5) and process images in 0.6 seconds (YOLOv5). The model uses computer vision to solve the "green-on-green" problem by telling weeds apart from crops based on their shape, texture, and colour. The rover uses built- in processors like the Raspberry Pi and Jetson Nano, as well as motor drivers and proximity sensors, to move around and manage power efficiently. The system makes it possible to apply herbicides or remove weeds mechanically with great accuracy, cutting down on manual labour by about 80%,this cost- effective and scalable method shows how powerful intelligent automation can be in farming, encouraging better weed control and higher crop yields.*

Keywords: Weed Detection, YOLOv5,autonomous rover, Deep Learning, Precision Agriculture, Sustainable Farming