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AI WEED DETECTION AND MONITORING SYSTEM USING COMPUTER VISION

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ABSTRACT

The innovation behind the Weed Eliminator AI Using Arduino lies in the realm of Artificial Intelligence (AI) and Internet of Things (IoT). These technologies empower the system to identify and address one of agriculture's most persistent challenges: weeds. By leveraging AI for real-time weed detection and Arduino for precise control, this project transforms traditional weed management into a highly efficient, automated process. One key AI technique utilized in this project is object detection, specifically through the YOLO (You Only Look Once) model. Imagine the system's camera acting as a vigilant observer, scanning the field and identifying weeds with remarkable accuracy. The YOLO model processes these images in real time, pinpointing the exact locations of weeds while ignoring crops. This ensures targeted spraying, minimizing herbicide wastage and preventing crop damage. The system's capabilities extend beyond simple detection. By integrating Arduino, the project achieves seamless communication between the AI model and the spraying mechanism.

The Arduino acts as a central controller, receiving commands from the YOLO model to activate a 12V DC motor that controls the sprayer. This level of automation eliminates the need for

manual intervention, making the process faster, more precise, and less labour-intensive. Furthermore, the project incorporates energy-efficient design principles. The entire setup is powered by a 12V battery, ensuring portability and adaptability to different field conditions.

KEYWORDS: *Real-Time Object Detection, Audio Feedback, Obstacle Avoidance, Navigation Assistance And User-Friendly Interface.*

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