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Deep Learning Approach for IOT-Based Multiclass Weed Classification Using YOLOv5

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Abstract

The quality information about soil, local climate, and the crop in an IOT environment is captured by the sensors. Furthermore, it is possible to obtain statistics that goes beyond human observation. They enhance and speed up data collection; perform commands automatically or remotely; and perform remote tasks and actions in real time. Agriculture lives in a digital age, of big data and of

the IoT (Internet of Things). The technical management of weeds in row crops is carried out by applying herbicides mechanically or manually. Mechanical systems are generally effective in eliminating weeds at certain stages of growth. But different types of weeds restrict the performance of mechanical system. As a consequence, labor is required to remove weeds in close proximity to the plants, which can be more expensive than the mechanical procedure and not completely effective and results in large amount of pesticide usage which brings down the quality of crops. This paper presents the hybrid effective normalized vegetation index (NDVI) and YOLOV5 structure for multiclass classification of weeds. Nine different classes have been classified with good classification accuracy.

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