

Weed Identification using Deep Learning and Image Processing

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Abstract: *Weed identification in vegetable plantation is more challenging than crop weed identification due to their random plant spacing. So far, little work has been found on identifying weeds in vegetable plantation. Traditional methods of crop weed identification used to be mainly focused on identifying weed directly; however, there is a large variation in weed species. This paper proposes a new method in a contrary way, which combines deep learning and image processing technology. Firstly, a trained CenterNet model was used to detect vegetables and draw bounding boxes around them. Afterwards, the remaining green objects falling out of bounding boxes were considered as weeds. In this way, the model focuses on identifying only the vegetables and thus avoid handling various weed species. Furthermore, this strategy can largely reduce the size of training image dataset as well as the complexity of weed detection, thereby enhancing the weed identification performance and accuracy. To extract weeds from the background, a color index-based segmentation was performed utilizing image processing.*

Keywords: Weed identification, deep learning, image processing, genetic algorithms, color index.

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