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Plant seedling classification using machine learning

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Abstract

Precision agriculture is a farming approach that uses artificial intelligence and information technology to improve crop yield, preserve the environment and maximize profits. Farmers need to follow precision agriculture to improve their crop quality and production. Weed control is one of the challenges that agriculture faces. The growth of weed leads to a decrease in crop yield and to prevent that, weed must be identified and achieved earlier to avoid the adverse effects on the crops. Applying deep learning techniques has become an important field of study in precision agriculture. In this paper, we presented two deep learning models to classify crops and weeds in their early growth stages. From the comparison of the two models ResNet50 and MobileNetV2, MobileNetV2 with 500x500 pixel size gave the best performing results with average f1-score of 88% and accuracy score of 88% which shows that this deep learning model can successfully classify 12 segmented plant seedlings in their early growth stages and this tool can be useful to farmers in identifying weeds