Identification of tea leaf diseases at industrial level in Sri Lanka using deep learning

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Abstract: Algal leaf spot, Black blight, Blister blight, Gray blight, and Spider mites attack are very common types of tea leaf diseases in Sri Lanka. However, to ensure the healthy development of tea sectors, existing research lacks an accurate and quick detector of tea diseases. To achieve the goal, we proposed a deep learning-based technique that automates the process of identifying tea leaf diseases. To identify an image dataset, researchers specifically used the LeNet architecture as a convolutional neural network. In this study, the dataset of tea leaf disease (DTLD), which is made up of complex images captured under real-world industry conditions, is first built using data augmentation technologies. The proposed Sequential 2 model is trained to recognize these five important tea leaf diseases using a dataset of 607 images of diseased tea leaves. Six classes in all comprise the images. According to the experimental findings, the Sequential 2 model achieves a detection performance with an average accuracy of 95% on DTLD. The findings show that the Sequential 2 model offers a high-performance solution for the early diagnosis of diseases affecting tea leaves and can detect these problems more accurately and quickly than earlier techniques in real-time.

Keywords: CNN, Data augmentation, Feature fusion, Tea leaf diseases