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(57) Abstract :
During its growing phase, turmeric is susceptible to a number of different ailments. If its infections are not detected in the early stages, this might lead to a decrease in output or possibly the failure of the crop. The correct diagnosis of any problems affecting the turmeric plant is the first and most crucial step. In order to simplify the process of identifying illnesses that might affect turmeric plant leaves, a single-phase detection model has been developed as an alternative to the usual method's use of numerous processes, such as image pre-processing, feature extraction, and feature classification. An improved version of the YOLOV3-tiny model, which is based on deep learning, has been offered as a method for increasing the accuracy of illness diagnosis, including turmeric. This approach makes use of a residual network structure that is built on the convolutional neural network in certain layers in order to increase detection accuracy more so than YOLOV3-tiny. When compared to the YOLOV3-Tiny model, the findings demonstrate that the suggested model's detection accuracy is superior to that of the latter. It allows diagnosis of turmeric leaf diseases to be carried out quickly and accurately by anybody. The Improved YOLOV3-Tiny algorithm is used in this invention to identify key turmeric illnesses such as leaf spot, leaf blotch, and rhizome rot. These diseases are caused by fungal infections. The training and testing photographs are taken at different times of the day and night, and they are analyzed using a number of different YOLO approaches as well as Faster R-CNN using the VGG16 model. In addition, the results of the experiments show that the Cycle-GAN augmentation process on the turmeric leaf dataset supports much for improving detection accuracy for smaller datasets, and the proposed model has an advantage over existing traditional models in that it has high detection accuracy and a fast recognition speed. Both of these advantages can be compared to one another.

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