

ABSTRACT

Lettuce (Lectua Sativa L.) is an economically valuable vegetable that is suitable for hydroponic cultivation to overcome land limitations. However, its productivity is often threatened by fungal and bacterial diseases that require fast and accurate treatment. To overcome this problem, this research has implemented an automatic disease detection system on lettuce leaves using Vision Transforemer (ViT) integrated with the Internet of Things (IoT). The IoT system uses ESP32-CAM to capture leaf images and send them to the ViT model for classification. The results showed that the trained ViT model was able to classify three lettuce health conditions ('Bacterial', 'Fungal', 'Healthy') very well. Specifically, the ViT-L/16 model achieved the highest validation accuracy of 88.44%, proving its effectiveness in classification. The integration of IoT for image data transmission has also been successfully verified, resulting in the development of agricultural technology and showing the combination of ViT and IoT is a promising solution for improving the quality and quantity of lettuce harvest.

Keywords: *Internet of Thinks, image recognition, lettuce disease, NODEMCU ESP32, Vision Transformer.*