



"Gheorghe Asachi" Technical University of Iasi, Romania



AGRICULTURAL DISEASE DETECTION BY DEEP LEARNING AND OBJECT DETECTION

Mevlüt Karakaya¹, Mehmet Fatih Çelebi^{1*}, Akın Emrecañ Gök², Sezgin Ersoy¹

¹Mechatronics Engineering Department, Marmara University, Istanbul, Turkey

²Environmental Engineering Department, Istanbul University-Cerrahpasa, Istanbul, Turkey

Abstract

In this study deep learning and object detection models for image-based plant disease recognition have been carried. Trained models were tested on pictures and in real-time with a video camera for five different diseases in tomato leaves. Object detection algorithm was implemented from the personal computer, and deep learning models were applied via Google Colab. Real-time object detection was achieved in the developed model with YOLOv5 algorithm with the highest accuracy of 93.38% in validation accuracy and 94.48% in training accuracy with the highest value of 92.96% in precision. Furthermore, it has been observed that YOLOv5 algorithm gives faster and more accurate results than the previous versions of YOLO.

Key words: agricultural disease, deep learning, disease detection, object detection

Received: March, 2021; *Revised final:* September, 2021; *Accepted:* October, 2021