

IoT-Based Disease Diagnosis and Knowledge Dissemination System for Coconut Plants

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Abstract

The coconut plant plays a significant role in the Sri Lankan domestic and export industries. It is a major livelihood crop of which more than 65% is consumed locally. However, it is a fact that most coconut trees suffer from various pest and disease incidences, which impact the economy of coconut production. Out of them, infestations of Whiteflies, Plesispa Beetle, and Red Palm Weevil are destructive to the coconut plant at different stages so early detection of those infections is a major task. As a solution the paper describes an IoT-based prediction system for detecting and classifying infections in the coconut industry. Internet of Things (IoT), image processing, audio processing, and deep learning were used as techniques to utilize to detection of those infestations. Audio and Image Capturing Devices are developed to collect audio and image data. Additionally, there's a knowledge dissemination system to identify the main coconut pests in Sri Lanka and share this knowledge with farmers. With the audio and image datasets gathered from mentioned diseases with the use of Deep Learning (DL) models performance evaluation revealed that the accuracy of the identifications of Red Palm Weevil infestation Plesispa beetle and Whitefly infestations is 88, 96, and 98% respectively.

Keywords

Coconut Diseases, CNN, Mask R-CNN, Deep Learning, IoT, OpenCV