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Detection of mango leaf spots and mealybugs diseases using deep learning “ConvNet” and LinearSVC

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Leaf Spots and Mealybugs lesion infected a lot of plants of the local city of Beni-Suef. In this proposed paper, pre-trained ConvNet was combined with LinearSVC and some image processing techniques in the process of Detection of Leaf Spots and Mealybugs lesion at mango to enable the farmers to save their crops and improve the quality and the quantity. This research is done to achieve detection of these two diseases at mango and predict a treatment according to each disease with accuracy of 97% in the ordinary lighting conditions using a high-quality photo or mobile camera. This paper covers the detection process using machine learning and deep learning algorithms; LinearSVC, ConvNet and image processing techniques; noise removal filters, resizing the images. The proposed solution achieved the detection of these two diseases and methods of treatment with accuracy of 97%. The proposed system is built over state of the art machine learning, deep learning, transfer learning and image processing used for learning process of the computer vision. It is developed by combining these factors: (A) Pre-processing, (B) Features Extraction, (C) Classification, (D) Testing and Evaluating. The effect of using transfer learning on the processing time and accuracy: When we build a ConvNet from scratch, we need a very large amount of data and a lot of time-consuming to training the network. So we apply the concept of transfer learning that pre-train the ConvNet on a very large dataset e.g. ImageNet which contains about 1.2 million images with 1000 categories then we will use the ConvNet as a fixed features extractor and this led to decreasing the processing time. Features that extracted from pre-trained ConvNet are very relevant and powerful for awesome classification results and this led to increasing the model's accuracy.

Keywords: Deep Learning, Image processing, Leaf spots Mealybugs, Mango Diseases.

Biography

Mohamed Aboalarbe is a researcher and problem solver who uses computer science-based approach to new challenges. He is passionate about development and applying software engineering concepts and principles, and committed to maintaining cutting edge technical skills and up-to-date industry knowledge. Over the last three years, he gained an extensive experience in software engineering, and training programs relevant to the field. He is particularly interested in Android development and applications using different technologies such as Java, XML, Firebase, Google Cloud, third party libraries, responsive screens, Material Design, Gradle Scripts, Node.js, Web Services, REST, etc.

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