

Grapes Disease Detection Using Deep Learning

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Abstract: Grapevine diseases pose a significant threat to agricultural productivity, leading to substantial economic losses. This research presents a deep learning-based approach for detecting diseases in grape crops using convolutional neural networks (CNNs). The model is developed using TensorFlow and Keras, leveraging a labeled dataset of grape leaf images to classify healthy and diseased samples. Data preprocessing techniques, including image augmentation and normalization, enhance model performance. Visualization tools such as Matplotlib provide insights into data distribution and training progress. The system is implemented in Google Colab, integrating cloud-based storage for efficient data handling. Experimental results demonstrate high accuracy in disease classification, highlighting the potential of deep learning for precision agriculture. This automated disease detection system enables early intervention, aiding farmers in reducing crop losses and improving vineyard management. Future advancements may incorporate real-time monitoring and enhanced model generalization for broader agricultural applications..

Keywords: Grape Disease Detection, Deep Learning, Convolutional Neural Networks (CNN), TensorFlow, Keras, Image Classification, Precision Agriculture, Plant Health Monitoring, Automated Disease Detection, Computer Vision

