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PADDY LEAF DISEASE DETECTION USING DEEP NEURAL NETWORK AND GLCM ALGORITHMS

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Paddy leaf diseases have been increasing significantly due to environmental pollution, climate change, and globalization, thus affecting the country's economy. The conventional way of detecting paddy leaf diseases is time-consuming. In the present world, many technological solutions are provided to detect diseases for sustainable agriculture. A number of research studies on the detection of paddy leaf diseases using digital technologies are facilitating the development of artificial intelligence techniques that can examine the paddy leaf data automatically to localize the affected area and detect the types of disease. Those numerous techniques are still competing with accuracy due to the complication of algorithms and features of the data set. The research paper proposes a novel idea for creating an autonomous system to identify paddy diseases such as paddy blast, brown spot, and narrow brown spot disease using image processing techniques for improving image resolution and the Deep Neural Network (DNN) for diagnosing paddy diseases. The proposed system inputs the collected paddy leaf images and use canny edge detection, multilayer thresholding, and region-growing algorithms for image segmentation and GLCM (grey level co-occurrence matrix) techniques to extract texture data, as well as colour and shape features to increase the framework's accuracy, and DNN for classification. The overall segmentation accuracy of 88.5%, the sensitivity of 86.1%, and the specificity of 90.5% in the experiments, and the results compete and significant improvements with existing segmentation algorithms.

Keywords: Deep Neural Network (DNN), Grey Level Co-Occurrence Matrix (GLCM), Canny Edge Detection, Multilayer Thresholding, and Region-Growing Algorithm.