# UNLEASHING THE POWER OF SVM AND CNN IN PADDY CROP DISEASE ANALYSIS

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The pivotal role of the agricultural sector in global food production underscores the critical importance of maintaining crop health to meet increasing food demands sustainably. Paddy crops, prevalent in many regions worldwide, face significant vulnerability to various diseases, which can profoundly affect both yield and quality. Detecting these diseases early and accurately is imperative for timely intervention and effective crop management. This study introduces a holistic approach to paddy crop disease detection, merging SVM and CNN. SVM is leveraged for its proficiency in classifying multidimensional data, while CNN excels in extracting intricate features from image data. The methodology commences with the acquisition of highresolution images of paddy fields through advanced imaging techniques, capturing detailed visual characteristics of the crop. Experimental findings showcase the efficacy of the proposed method in precisely identifying and categorizing diverse paddy crop diseases. Evaluation metrics such as precision, recall, and F1-score validate the system's performance. The fusion of SVM and CNN not only enhances disease detection accuracy but also fortifies the system's resilience, enabling adaptation to varying environmental conditions and disease patterns. This research contributes significantly to the advancement of precision agriculture, offering a dependable and automated solution for paddy crop disease detection. The proposed methodology holds promise for extension to other crop varieties, laying the groundwork for smart farming systems aimed at optimizing agricultural practices and ensuring global food security.

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