Plant Disease Detection and Remedies Recommendation for Rice Crop

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Abstract. *We have developed a comprehensive system for detecting plant diseases and recommending appropriate pesticides to safeguard crops from potential threats. Leveraging Convolutional Neural Network (CNN) classification techniques, our system not only identifies diseases but also assists in protecting crops from animals and other detrimental factors. By integrating advanced CNN algorithms, we ensure efficient and accurate detection of diseases, enabling farmers to take proactive measures to protect their crops. In our ap- proach, we have targeted three key diseases affecting crops: bacterial blight, brown spot, and leaf smut, alongside a category for healthy plants. Each dataset contains 4000 images for both training and testing phases, ensuring robust model training and evaluation. Our system has achieved an impressive accuracy rate of 90%, indicating its reliability in disease detection and classification. This high level of accuracy is instrumental in providing farm- ers with reliable guidance on identifying crop diseases accurately. By accurately detecting these diseases, farmers can take timely and targeted actions to address them, thereby minimizing crop damage and optimizing yields.*

Keywords: *Machine Learning, CNN Algorithm, Rice Plant disease detection and Remedies Recommendation.*

1. Introduction

In the agriculture sector today, rice plants are frequently affected by various diseases, leading to significant crop losses. To effectively address this issue, individuals with knowledge of fertilizer management and a deep understanding of crop diseases are crucial. These experts should be capable of identifying the diseases affecting crops and devising appropriate solutions to prevent their further spread, thereby ensuring healthy crop growth. With this knowledge, we can become better equipped to protect our crops and ensure a healthy harvest. Rice, the backbone of many regions, faces silent infections that can devastate our yields. The economic impact of rice diseases in Asia is substantial, with an estimated annual loss of 10 to 15% of rice production due to diseases. This results in billions of dollars in economic losses for farmers and agricultural economies across the region. These losses can have serious