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Soyabean Disease Detection

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Abstract: This project develops and applies deep learning-based techniques for the automatic detection and classification of soybean diseases to enhance crop management and productivity. Utilizing convolutional neural networks (CNN), the method analyzes high-resolution images of soybean plants to identify diseases such as soybean rust, brown spot, and blight. The workflow involves detailed data preprocessing, adaptive learning, and the design of a robust CNN architecture to extract relevant features for accurate disease detection. The trained model is integrated into a user-friendly interface for farmers and agronomists, providing quick identification, detailed disease information, and treatment recommendations. Performance evaluations demonstrate high accuracy, sensitivity, and specificity, underscoring the system's effectiveness. This technology aims to reduce soybean crop losses, minimize pesticide use, and promote sustainable agriculture, illustrating the significant potential of AI in advancing precision agriculture and global food security.

Keywords: Deep learning, soybean diseases, CNN, precision agriculture, disease detection



