Problem Statement:

- The paper addresses the challenges of identifying plant leaf diseases accurately and timely, which is crucial for mitigating the reduction in crop productivity in agriculture.

Dataset used:

- The dataset “Plant Disease Detection” is used to identify and detect plant diseases. The dataset includes many plant species, ensuring that disease detection models are not limited to one type.

Methodologies Used:

- **Image Preprocessing:**

  Conversion of images from RGB to BGR to HSV for better color analysis and segmentation.

- **Image Segmentation:**

  Divide images into distinct regions to isolate color-based information.

- **Feature Scaling:**

  Use Min-Max scaling to normalize feature values.

- **Global Feature Descriptor:**

  Extract color, shape, and texture features using techniques like color histograms, Hu Moments, Zernike Moments, Haralick Texture, and Local Binary Patterns (LBP).

- **Hybrid model of CNN and DensNet:**

  Integrates Convolutional Neural Networks (CNNs) and DenseNet architecture. This hybrid model combines the advantages of both CNNs and DenseNet to improve the process of extracting features and classifying data.

Findings and Contributions:

- The hybrid model which merges CNNs and DenseNet architecture achieved an accuracy of 98.79%, outperforming traditional CNNs, Recurrent Neural Networks (RNNs), and Capsule Networks (CapsNets).
- The AUC-ROC score of 0.998 demonstrated the model's robustness in effectively distinguishing between different disease categories.
- Showcases the substantial capabilities of hybrid deep learning models in accurately identifying plant leaf diseases.
- It highlights the effectiveness of alternative deep learning techniques in this particular domain.

Relevance to Project:

- Plant disease detection is a feature that we had planned for our project.
- Consideration of a hybrid model for more accurate prediction.

Citation:

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