
CROP DISEASE
PREDICTION

TEAM A18

TEAM MEMBERS

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GUIDE

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INTRODUCTION

- Agriculture is the backbone of our society, providing sustenance and livelihoods to billions worldwide.
- However, crop diseases pose a significant threat to agricultural productivity, leading to substantial economic losses and food insecurity.
- In recent years, advancements in deep learning have offered promising solutions to tackle this challenge.
- By preemptively identifying crop diseases, we can ensure stable food production and mitigate the risk of food shortages, especially in vulnerable regions.

OBJECTIVES

- To underscore the significance of early crop disease detection in agriculture, emphasizing its impact on economic stability, environmental sustainability, and global food security.
- To provide a comprehensive understanding of how deep learning techniques, specifically employing the ResNet50 algorithm, can be applied to predict crop diseases accurately.
- To explore real-world applications of crop disease prediction models in agriculture, showcasing examples of successful deployments and their impact on crop yield,

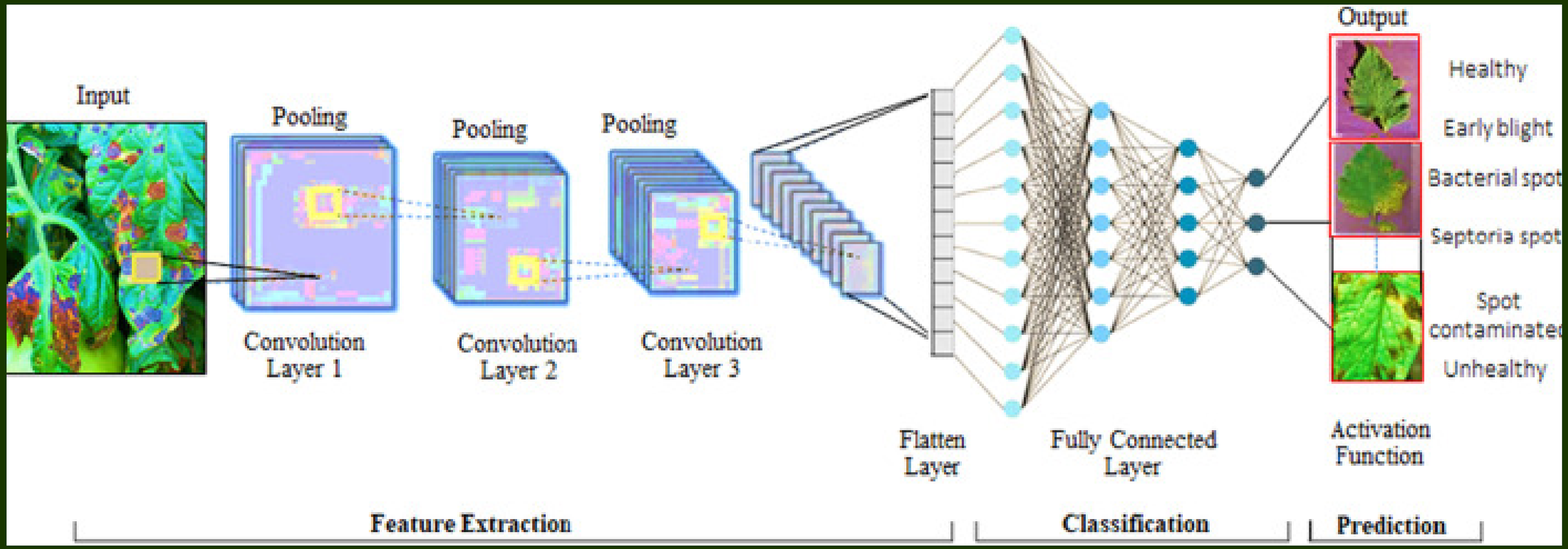
EXISTING SYSTEM

- While deep learning models like VGG16 and VGG19 are powerful feature extractors, they can be prone to overfitting, especially when trained on small datasets.
- The pre-trained VGG16 or VGG19 models are employed as the base architecture for crop disease prediction.
- The fully connected layers of the original models are replaced with a new set of dense layers to adapt the network for the specific classification task.
- When a model achieves an accuracy of 97% in crop disease prediction but falls short of the desired threshold

PROPOSED SYSTEM

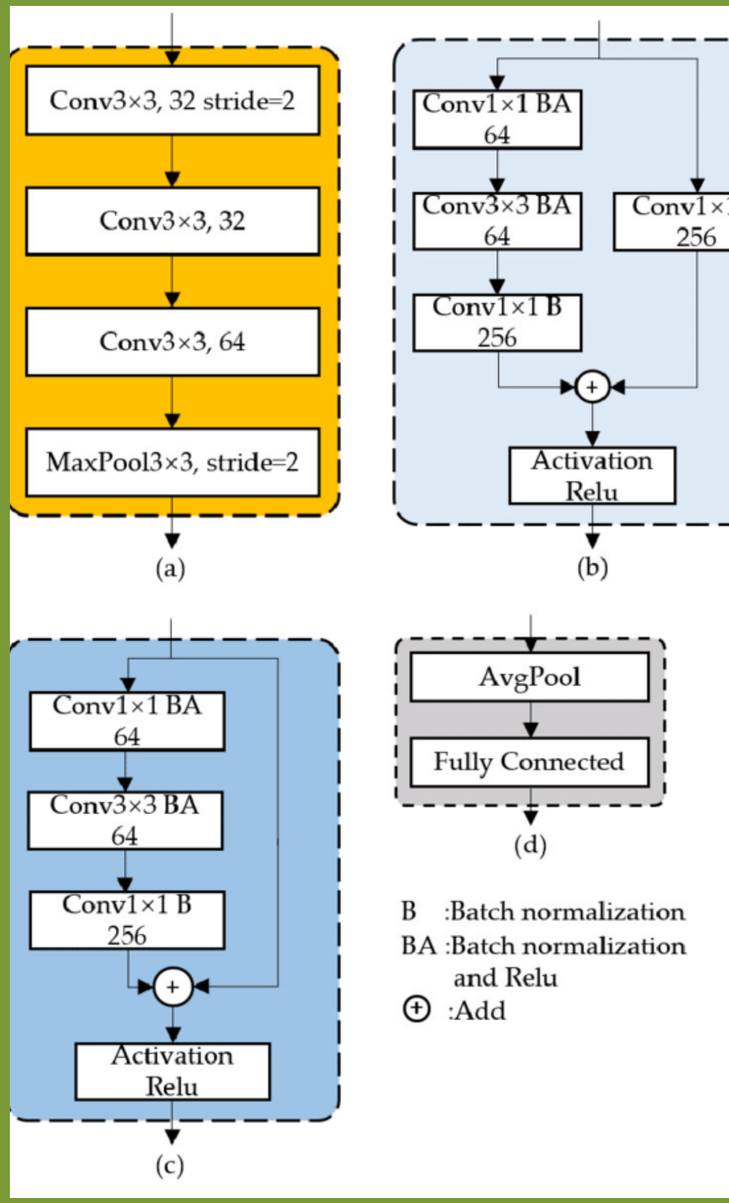
- In the proposed system, we aim to enhance the accuracy of crop disease prediction by leveraging the ResNet50 algorithm, a deep convolutional neural network architecture known for its depth and performance in image classification tasks.
- The pre-trained ResNet50 model on the crop disease dataset to adapt it to the unique characteristics of crop images and disease patterns.
- Once satisfied with the model's performance, deploy it for real-world use. This could involve integrating it into a web or mobile application where users can upload images of crops to receive predictions about their disease status.

ARCHITECTURE

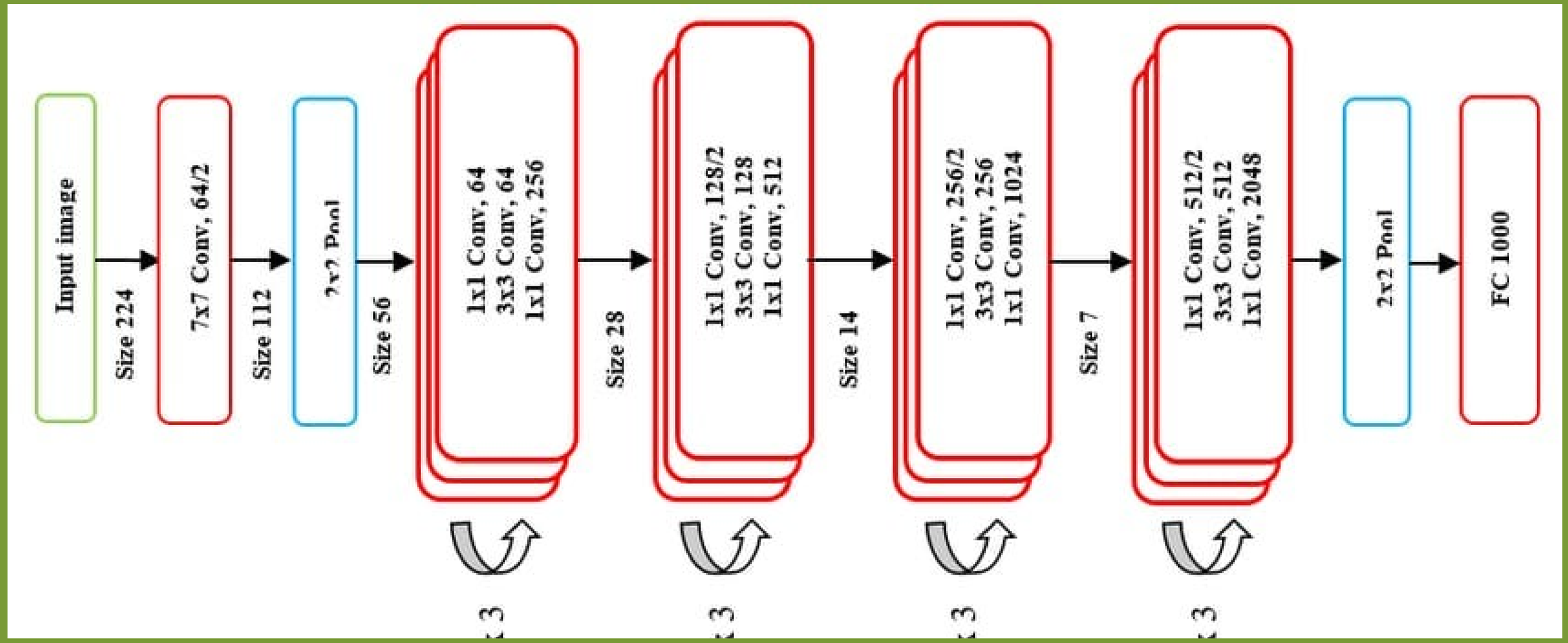


ALGORITHM USED

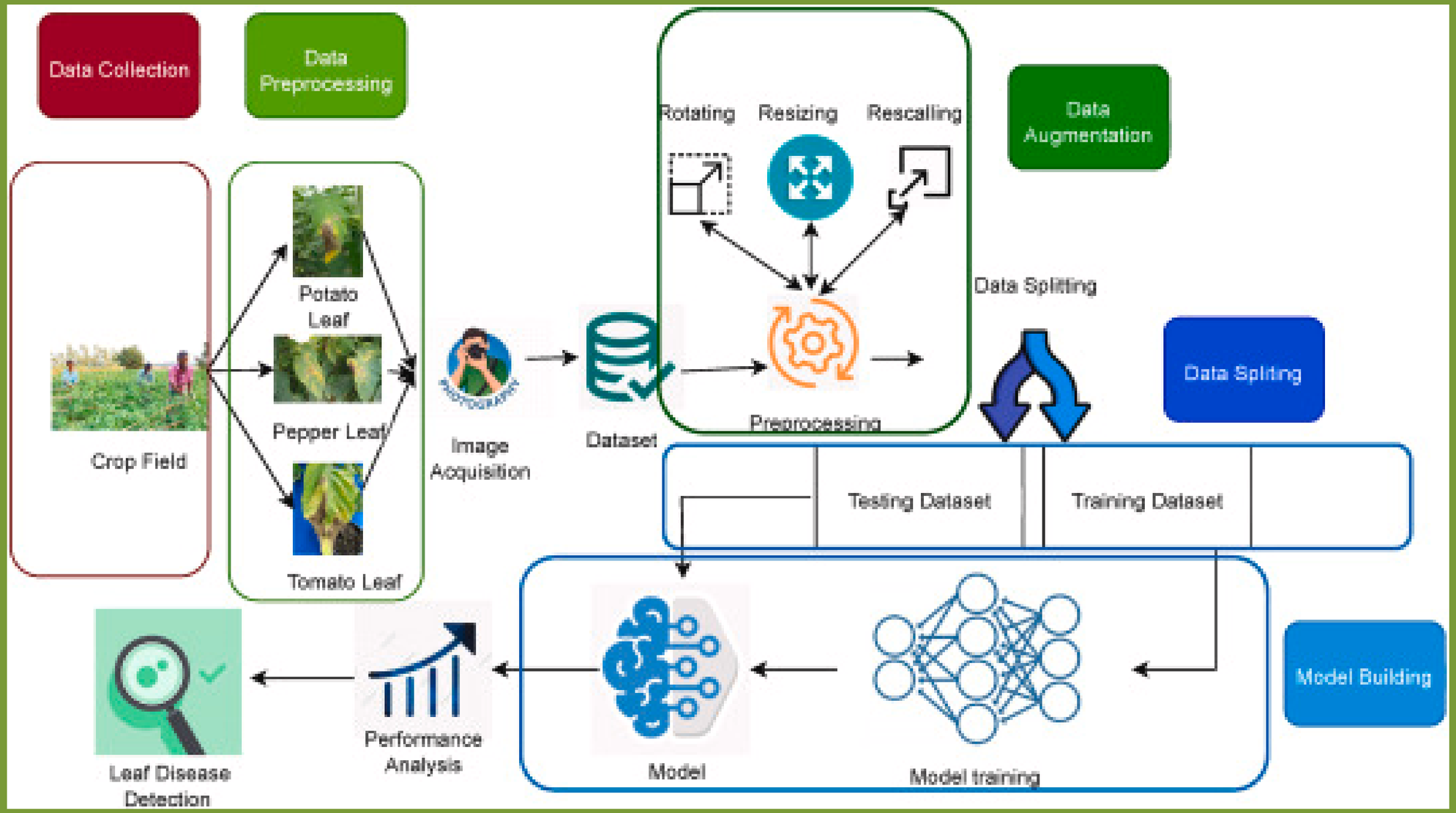
- The ResNet50 algorithm is a deep convolutional neural network (CNN) architecture that has been widely used in various computer vision tasks, including image classification, object detection, and segmentation.
- It consists of a series of convolutional layers, batch normalization layers, and non-linear activation functions (e.g., ReLU) arranged in a hierarchical manner.
- It has also been used as a feature extractor in transfer learning, where pre-trained ResNet50 models are fine-tuned on specific tasks or datasets with limited labeled data.



RESNET-50


Input image
Size 224
7x7 Conv, 64/2
Size 112
3x3 Pool
Size 56
1x1 Conv, 64
3x3 Conv, 64
1x1 Conv, 256
Size 28
1x1 Conv, 128/2
3x3 Conv, 128
1x1 Conv, 512
Size 14
1x1 Conv, 256/2
3x3 Conv, 256
1x1 Conv, 1024
Size 7
1x1 Conv, 512/2
3x3 Conv, 512
1x1 Conv, 2048
2x2 Pool
FC 1000

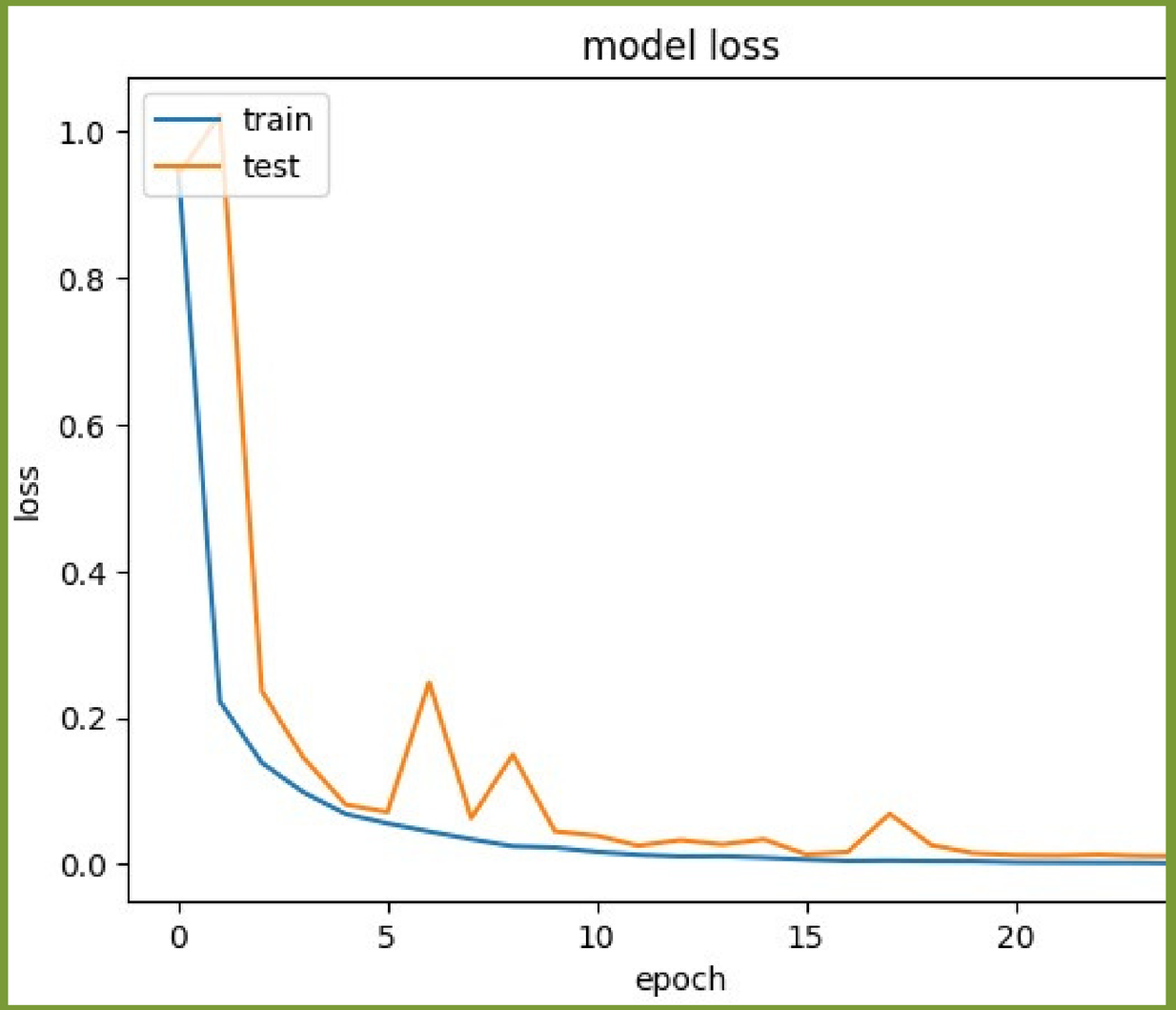
PROCESS FLOWCHART

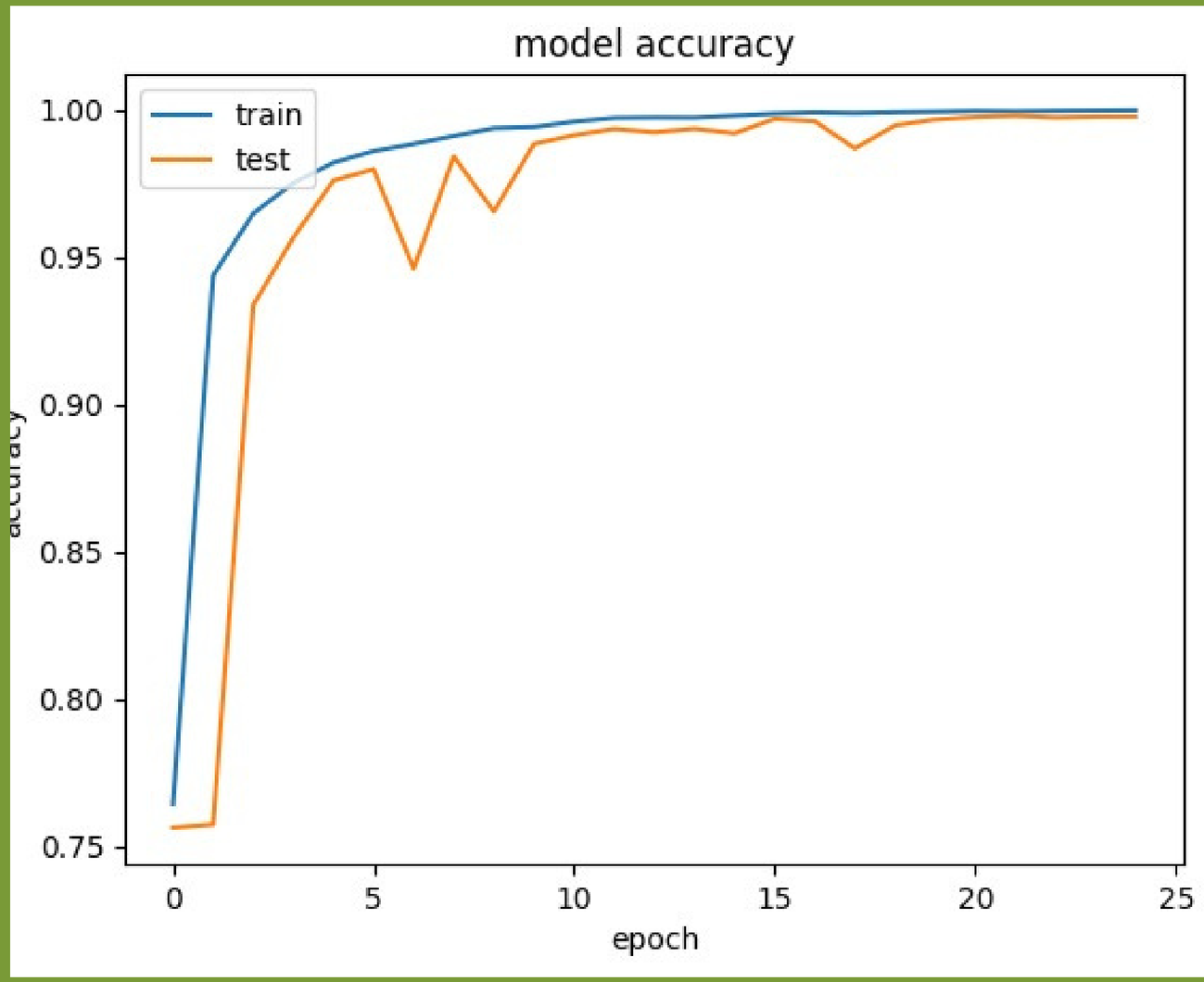


RESULTS

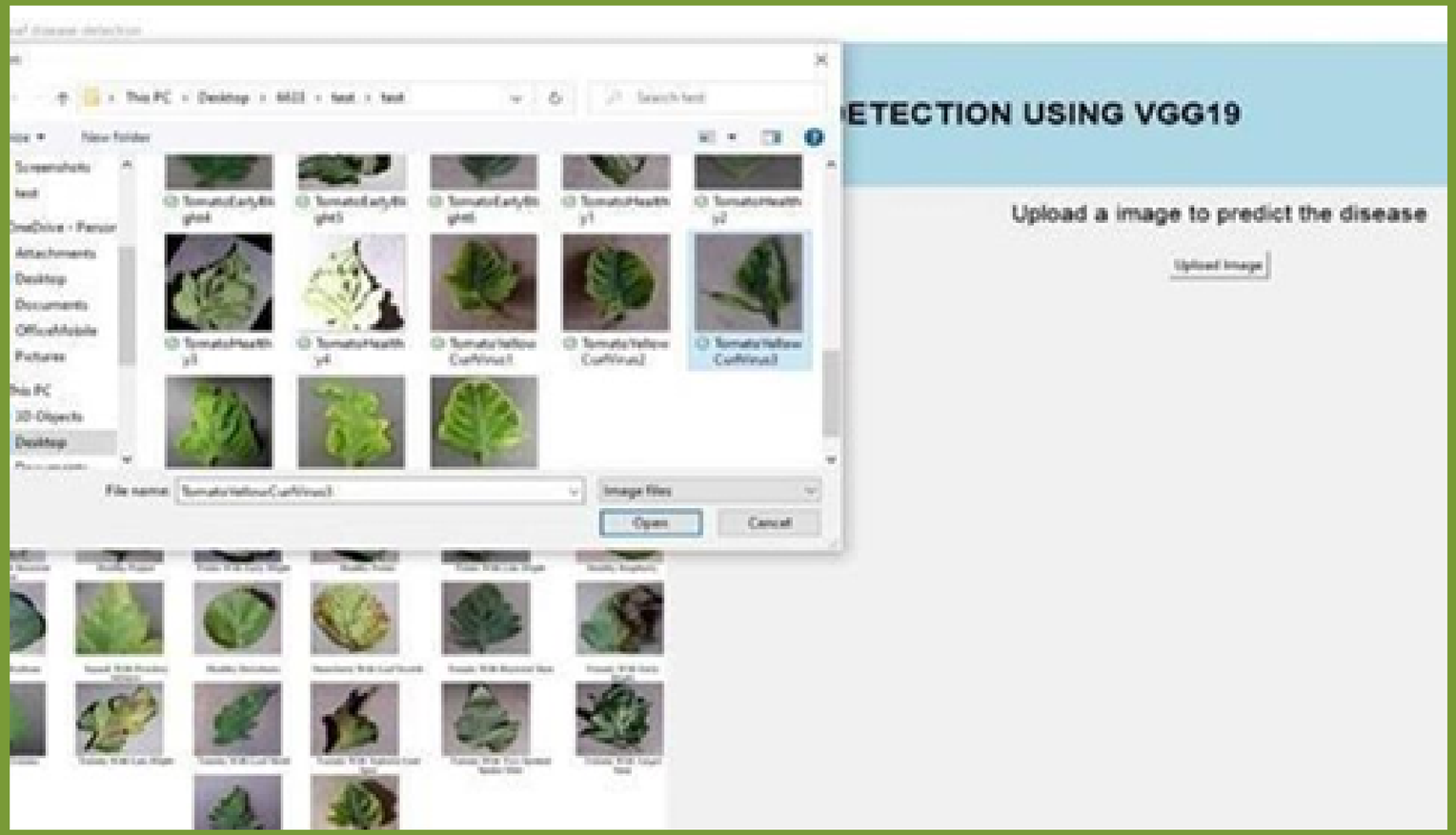
```
Epoch 14/25
1099/1099 [==============================] - 125s 113ms/step - loss: 0.0108 - accuracy: 0.9972 - val_loss: 0.0270 - val_accuracy
Epoch 15/25
1099/1099 [==============================] - 125s 114ms/step - loss: 0.0090 - accuracy: 0.9979 - val_loss: 0.0339 - val_accuracy
Epoch 16/25
1099/1099 [==============================] - 125s 114ms/step - loss: 0.0065 - accuracy: 0.9986 - val_loss: 0.0135 - val_accuracy
Epoch 17/25
1099/1099 [==============================] - 125s 113ms/step - loss: 0.0044 - accuracy: 0.9990 - val_loss: 0.0165 - val_accuracy
Epoch 18/25
1099/1099 [==============================] - 125s 113ms/step - loss: 0.0048 - accuracy: 0.9988 - val_loss: 0.0688 - val_accuracy
Epoch 19/25
1099/1099 [==============================] - 125s 114ms/step - loss: 0.0042 - accuracy: 0.9990 - val_loss: 0.0261 - val_accuracy
Epoch 20/25
1099/1099 [==============================] - 125s 114ms/step - loss: 0.0041 - accuracy: 0.9992 - val_loss: 0.0150 - val_accuracy
Epoch 21/25
1099/1099 [==============================] - 125s 114ms/step - loss: 0.0028 - accuracy: 0.9995 - val_loss: 0.0127 - val_accuracy
Epoch 22/25
1099/1099 [==============================] - 125s 114ms/step - loss: 0.0025 - accuracy: 0.9994 - val_loss: 0.0120 - val_accuracy
Epoch 23/25
1099/1099 [==============================] - 125s 114ms/step - loss: 0.0023 - accuracy: 0.9995 - val_loss: 0.0133 - val_accuracy
Epoch 24/25
1099/1099 [==============================] - 125s 114ms/step - loss: 0.0022 - accuracy: 0.9996 - val_loss: 0.0114 - val_accuracy
Epoch 25/25
```

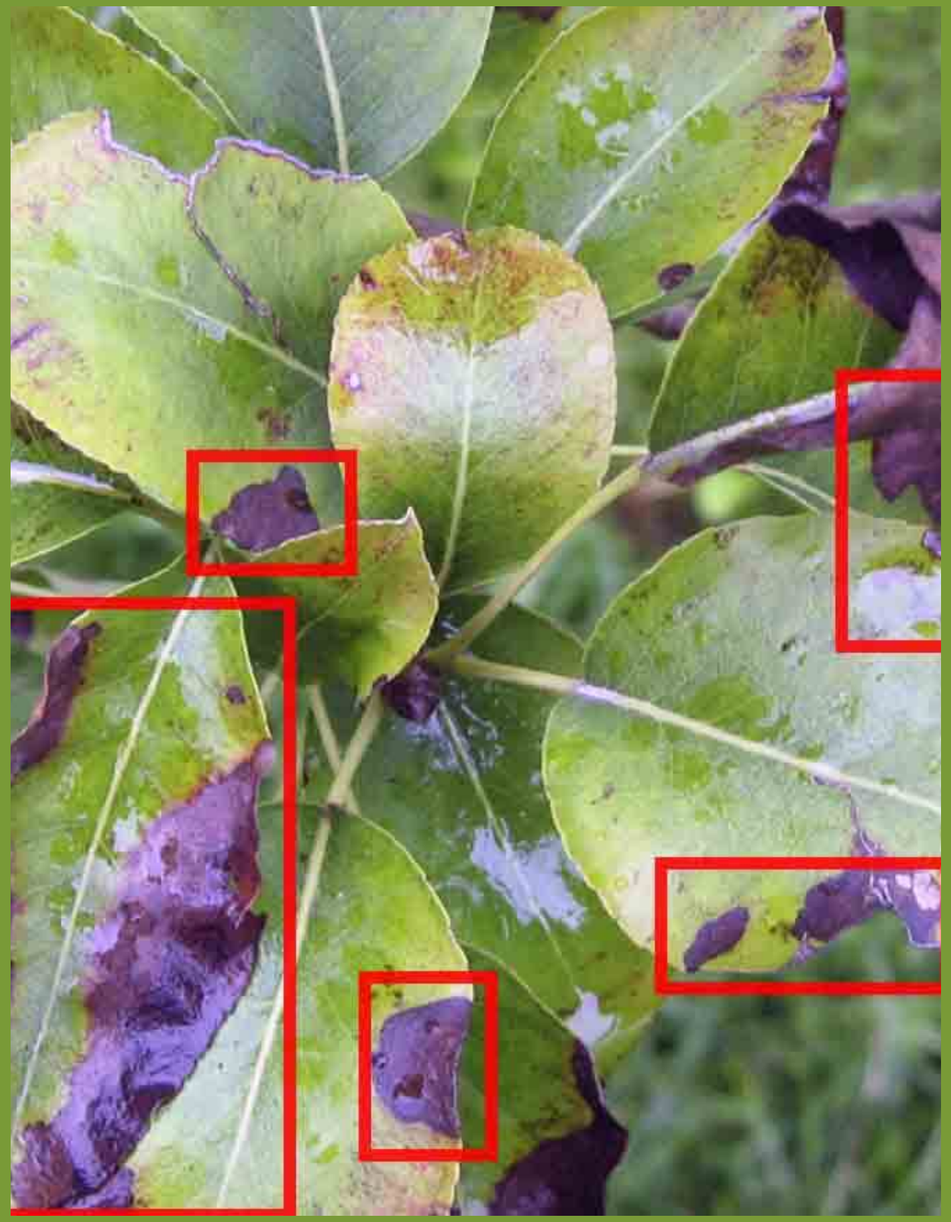
ML MODELS ACCURACIES





RESGRAPHICAL USER INTERFACENET-50





CONCLUSION

- The utilization of the ResNet50 algorithm in crop disease prediction marks a significant advancement in agricultural technology. Throughout this exploration, we've outlined the effectiveness of ResNet50 in capturing intricate patterns and features from crop images, thereby enhancing the accuracy and reliability of disease prediction models.
- The proposed system with ResNet50 offers a promising solution for early detection and management of crop diseases, thereby contributing to increased agricultural productivity and food security.
- Moving forward, continued research and development in this field hold the potential to revolutionize farming practices, paving the way for sustainable agriculture and global food resilience.

REFERENCES

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THANK YOU