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# Image Classification of Rice Leaf Diseases Convolutional Neural Network Algorithm

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**ABSTRACT:** The category of rice may be categorized into numerous systems. In this study, image class is second hand to categorise the information set of rice leaf spray bugs, such as; Tan Advert Rice ailment (BSR), Bacterial Leaf Blight ailment (BLB), that is the rice leaf spray bugs with excessive outbursts about Thailand. Besides, image dispensation era with inside the cataloguing kinds of rice leaf illness, such as Random woodland type procedure, Conclusion tree typeprocedure, Incline Boosting organization algorithm and Naive-Baye classification procedure, which is restrained by the accurateness, precision in additionre collection of each algorithms. The complete result of presentation in the image cataloguing of rice leaf diseases is CNN equivalent to 69 percent.

## I. INTRODUCTION

Itgoal is to discovery the characteristicland scapes of each copy into class. By using exactideologies and figures to generate a perfect to controldifference in landscapes of the copyidea, this is thecomparison of copyidea to the equal class. The infosortingtechnique is separated into two methods, Supervised Learning Classification and Unsupervised Learning Classification. This investigate aims to excerpt the features from copyinformation. The info is cast-off to detectlesson of pictures by supervised learning algorithm. Education of picturebuilt on info and label, using the data removalprogression. We canacquire from the features of copy arrangement. Evenwe can spread onaarrangementtypical for new images to predictthe class of data.

### 1. Problem Statement

The problematic of rice bug round the sector make to harm and fall right mad about a big quantity of rice,triggered by many of categories, such as Fungi, Bacteria and Diseases. Which are the keyroots of rice illness affected to farmers rice plants.

### 2. Scope

Presently,our project is build for following points.

1. This project is based for identify disease on leaf, from this we can predict actual disease.
2. We can Identify the actual type of disease.
3. High percentage profit can be earned.
4. Before getting the crop damaged , we can stop the spread of disease.
5. This project can be implement in governments big projects for farmers.

## II. RELATED WORK

### CNN (Convolutional Neural Networks)

The CNN model utilized used in this study consists of 5 convolutional layers(conv), 2 Max-Pooling layers and 2 fully connected layers. For the classification ,input image of size 32\*32 were chosen. The architecture of the trained CNN model is depicted in fig . The initial two convolutional layers (conv&conv2) are comprised of 32 kernels measuring 3\*3 ,followed by the RELU activation function. The neurons are encouraged to produce positive value & Max-pooling is applied using a filter size 2\*2 and stride 3.The third convolutional layer(conv3) consists of 64 kernels measuring 4\*4 also followed by Relu activation function & he max pooling layer uses a filter size of

2\*2 and stride 2. The last two convolutional layer (conv4&conv5) are composed of 128 filters measuring 3\*3, again followed by Relu activation function, the max-pooling layer uses a filter size of 2\*2 and stride 2. Each of the two fully connected layers contains 1024 neurons. Relu activation and dropout techniques were applied after each fully connected layers with 25% probability for the first Dropout & 50% probability for the second Dropout. The softmax output classification was utilized to determine the probability distribution of the symptom images among 5 classes,

**Feature Extraction**

The convolutional layers of the network act each as a feature extractor. The PyTorchAlexNet model is split into a feature extractor stage and a classifier stage. The feature extractor consists of the convolutional layers, and the classifier contains of the fully linked layers. The convolutional layer extracts the important features from the input. The first convolution layer extracts low-level features like edges, lines, and corners. Higher-level layers extract higher-level features.

**System Architecture**

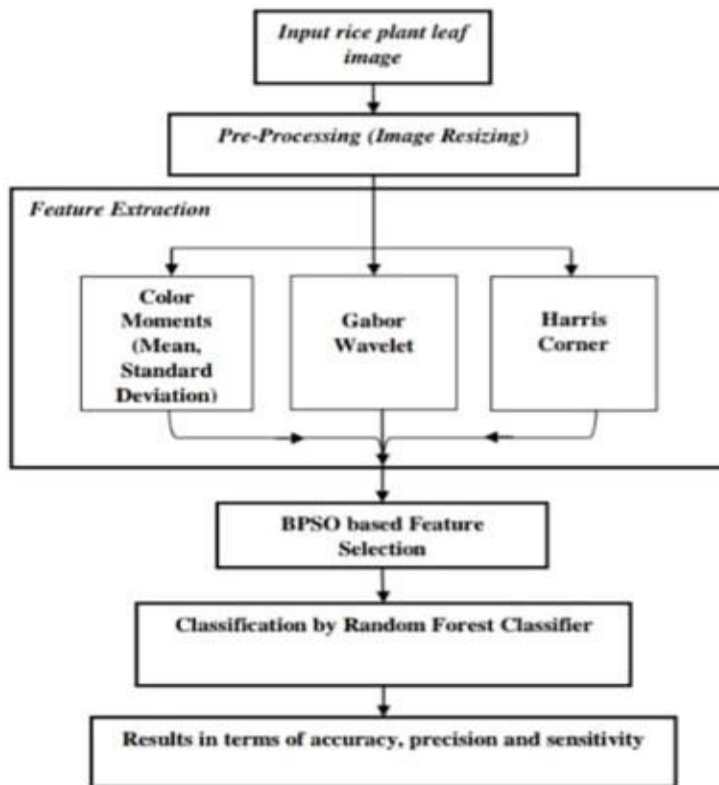
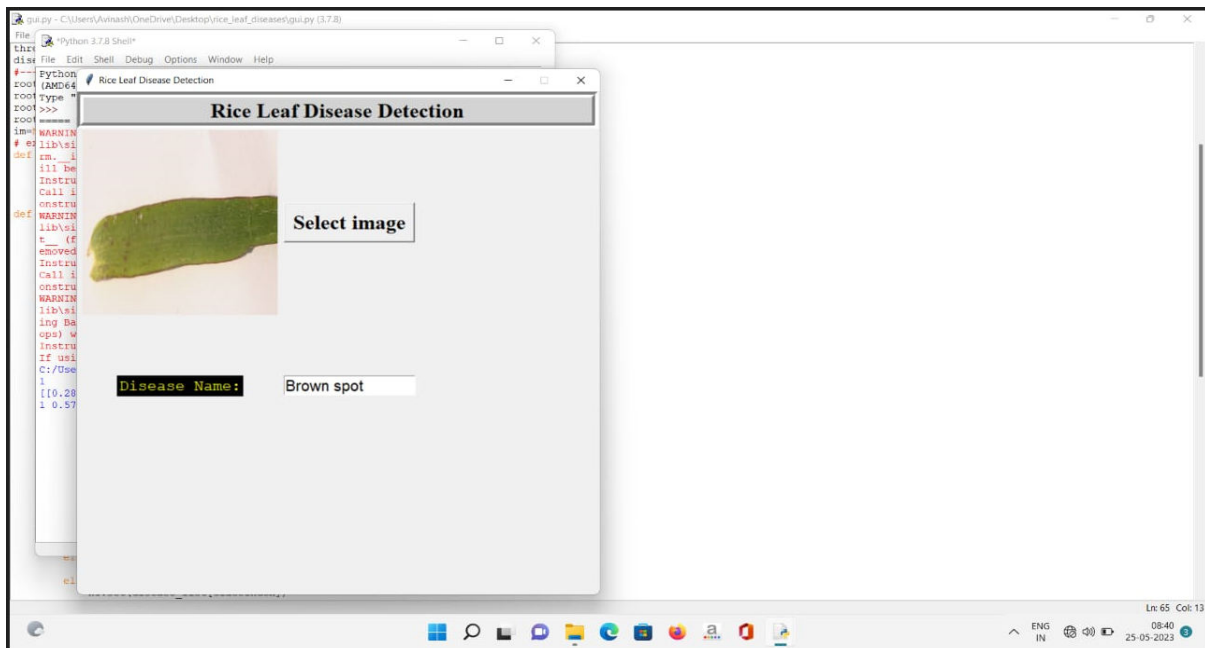
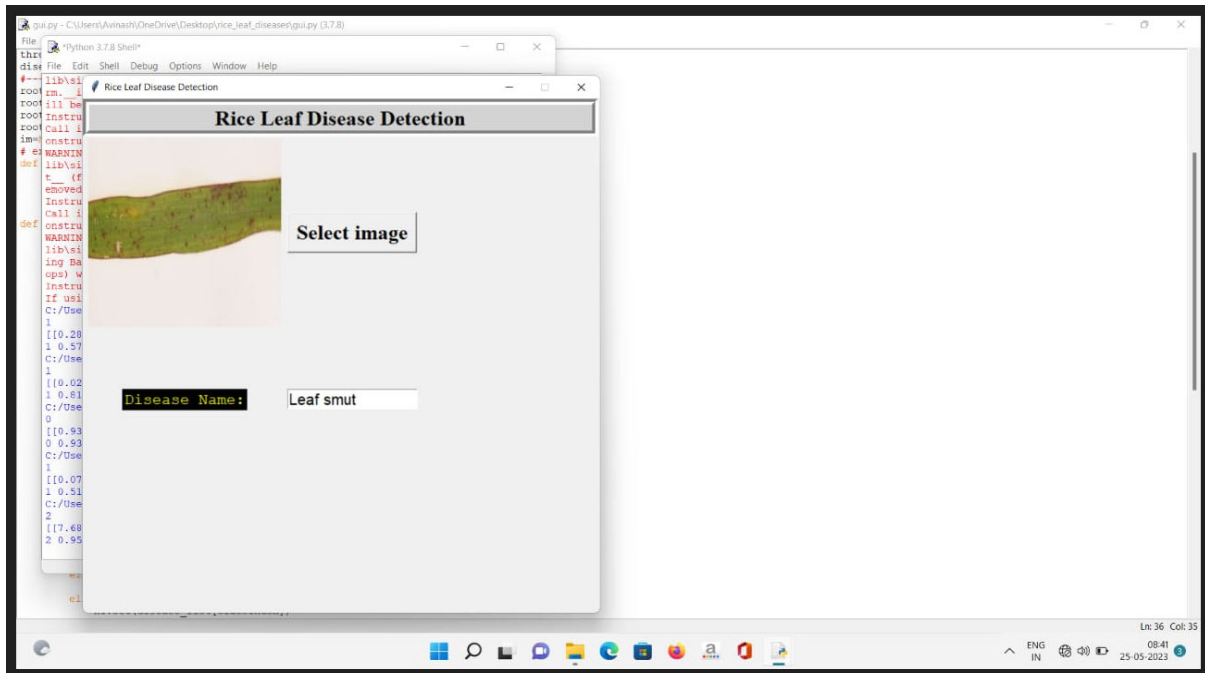
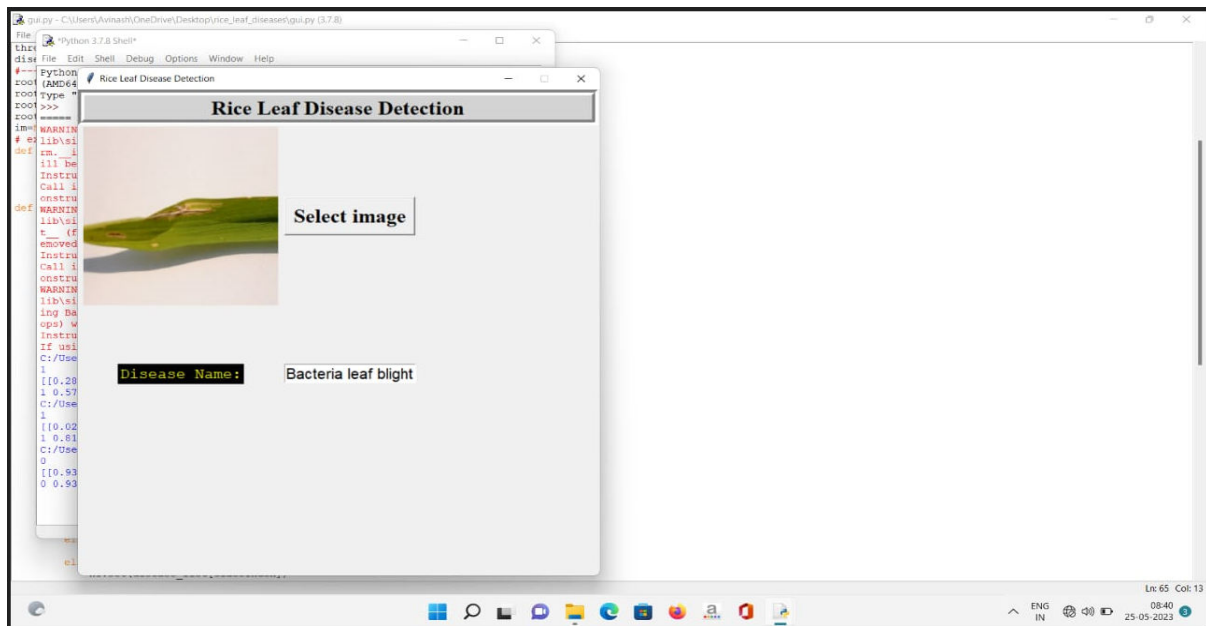


Figure 1: Block diagram for proposed rice leaf disease detection

**III. RESULTS**

This study shows the importance of plant disease recognition these days. In this work, convolution neural network model is constructed





#### IV. CONCLUSION

The outcomes of this study, Based on the findings of this research, it can be concluded that the CNN algorithm outperforms other classification algorithms like random forest in accurately organizing images. The study demonstrates the effectiveness of the CNN algorithm in classifying different rice leaf diseases, as it successfully displays images of various rice leaf diseases along with their corresponding target and calculation results.

#### REFERENCES

- [1] Archana, K. S., & Sahayadhas, A. (2018). Automatic rice leaf disease segmentation using image processing techniques. *Int. J. Eng. Technol*, 7(3.27), 182-185.
- [2] Bosch, A., Zisserman, A., & Munoz, X. (2007, October). Image classification using random forests and ferns. In *2007 IEEE 11th international conference on computer vision* (pp. 1-8). Ieee.
- [3] Chaudhary, A., Kolhe, S., & Kamal, R. (2016). An improved random forest classifier for multi-class classification. *Information Processing in Agriculture*, 7(4), 215-222.
- [4] Gnanamanickam, S. S., Priyadarisini, V. B., Narayanan, N. N., Vasudevan, P., & Kavitha, S. (1999). An overview of bacterial blight disease of rice and strategies for its management. *Current Science*, 1435-1444.
- [5] Li, P., Wu, Q., & Burges, C. (2007). Mcrank: Learning to rank using multiple classification and gradient boosting. *Advances in neural information processing systems*, 20, 897-904.
- [6] Lu, D., & Weng, Q. (2007). A survey of image classification methods and techniques for improving classification performance. *International journal of Remote sensing*, 28(5), 823-870.
- [7] Mekha, P., Osathanukul, K., & Teeyasuksaet, N. (2016, December). Gene classification of dengue virus type based on codon usage. In *2016 International Computer Science and Engineering Conference (ICSEC)* (pp. 1-6). IEEE.
- [8] Mekha, P., Osathanukul, K., & Teeyasuksaet, N. (2017). Comparison of Gene Classification Methods for Dengue Virus Type Based on Codon Usage. *FEU Academic Review*, 11, 7-7.
- [9] Mekha, P., & Teeyasuksaet, N. (2015, November). Using random forest based on codon usage for predicting Human Leukocyte Antigen gene. In *2015 International Computer Science and Engineering Conference (ICSEC)* (pp. 1-6). IEEE.



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