

REPORT

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Paper Title:

Rice Blast Disease Detection and Classification Using Machine Learning Algorithm

1 Summary

Rice blast disease is the most significant agricultural concern on a global scale. Early detection of this disease will spare the farmer a catastrophic financial loss. This article presents an algorithm for machine learning that identifies the indications of a disease in rice plants. Phytopathogen disease detection is performed automatically via a machine learning algorithm. For the proposed system, images of healthy and blast disease-affected foliage are captured. The characteristics of the diseased and healthy portions of the rice leaf are extracted. The 300-item total data set has been partitioned for the objectives of training and testing. The images undergo processing utilizing the proposed methodology classifies the leaf into two categories: contaminated or healthful. The outcomes of the simulation offer 99% precision for images infected with explosion and 100% precision for the images that are typical during the instruction phase. A phase accuracy of 90% is observed, with the infected achieving 86%. and images of good health, correspondingly.

1.1 Motivation

Most farmers in our country don't know much about plant diseases. There are times when an epidemic spreads over a big area and the farmers have no idea what's going on. They don't want to talk to an agriculturist about their crop because they don't know how, which is a big problem for farms in rural areas. The main point of this paper is to look into whether or not pictures can be used to find diseases on rice leaves. Even though farmers won't need to know much about plant diseases to find diseases on rice leaves. This will also cut down on the time it takes to find diseases because there will be no need to wait for an agriculturist to visit in person.

1.2 Contribution

Libo Liu et al. (2009) came up with the idea of using a BP neural network algorithm to tell the difference between the unhealthy and healthy parts of rice leaves. Brown spot is the sickness that is being talked about here. The results show that both picture analysis and BP neural networks can correctly find diseases that cause brown spots on rice.

The author M. Jhuria et al. (2013) suggested using neural networks to find and keep an eye on diseases in fruit trees from the time they are planted until they are picked. There are three traits

vectors that were extracted: color, shape, and texture. Compared to the other two vectors, the morphology features give 90% of the right answers.

The author H. Q. Cap et al. (2018) came up with the idea of using computers to find plant diseases. The study by B. S. Ghyar et al. (2017) suggested using computer vision to find diseases in rice crops that are caused by bugs. For the diseased part of the leaf, three traits were taken out. A genetic program is used to pick out the important parts. It uses ANN and SVM classification, which are 92.5% and 87.5% accurate, respectively.

1.3 Methodology

Image processing is a standard method for identifying different illnesses on rice plants. It is also concluded that digital camera capture is routine and excellent for early research. Automatic plant disease detection is needed to boost agriculture production today. Machine learning is used to automatically detect disease in this article.

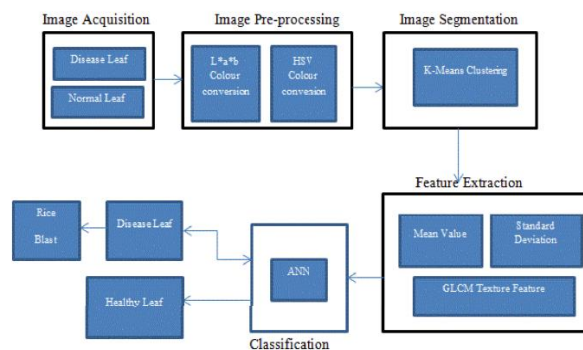


Fig. Proposed Blast Disease Detection Method

1.4 Conclusion

Based on the machine learning method, the suggested system can correctly find the disease in the rice crop. The area of leaves was taken from 25 cm away in the viewable range. The normal and diseased parts of the leaf were taken with a high-pixel-count camera. The above method can help farmers keep their crops healthy and free of illnesses. This method keeps the surroundings free of diseases and makes the crop more productive. Finally, farmers should use this method to stop the disease from spreading during the growing season. They can also choose at any time to increase the crop growth and make more money.

2 Limitations

2.1 First Limitation

Images are captured using Phone Camera with high resolution and then resized into 256x256 pixels. If they use a high-resolution camera better results can be obtained.

3 Synthesis

In the future, this study could be used to help find diseases in rice plants. Using this model, you can make different mobile apps for finding diseases and pests in rice. By just taking a picture, farmers can tell if the plant is sick or not. A lot of rice can be saved if the disease is found quickly. If apps can be made, there will be less need for agriculture experts to go to the infected area. This can save a lot more time and help the sick plants stay alive.