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# Black Fungus Detection Using Machine Learning

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## ABSTRACT

Fungus is extremely disreputable and dangerous for human health and cause various life-threatening disease to humans. Thousands of different fungus species exist in the world and spores always present in environment. Its sign and symptom are non-specific. Mucor mycosis also known as black fungus is a fungal infection that causes discoloration over nose and eye, blurred or double vision, chest pain, breathing difficulties, fever and cough.

The main aim of this project is to analyses and predict the infection probability based on black fungus images with the help of fungus detection system and algorithms to make automatically detects fungus using machine learning techniques. We are using in project CNN algorithm. The dataset used is raw data based on the pulmonary Mucor mycosis symptoms.

## 1.INTRODUCTION

Black fungus, formally known as Mucor mycosis, a potentially deadly fungal infection caused by a group of molds called mucoromycetes. It is more likely to affect people who having diabetes, HIV or aids, cancer and organ transplant that means having compromised immune systems cases of Mucor mycosis have been found in patients who are recovering from coronavirus. As coronavirus leaves its patient's immune systems in a weakened situation, they are more susceptible to Mucor mycosis. However, this rare infectious disease is spiraling out of control in India. As of 21 June 2021, 31216 cases of infection and 2019 deaths due to black fungus have been reported. While almost 71% of the global cases of Mucor mycosis have been reported in India. Black fungus is a serious fungal infection that has become a growing concern during the COVID-19 pandemic. This infection is often associated with high mortality rates, and early detection is critical for effective treatment. Machine learning algorithms. Specifically convolutional neural networks (CNN), have shown promise in the detection of black fungus through analysis of medical imaging data. CNNs are a type of deep learning algorithm that can extract features from images by applying a series of filters to identify patterns and structures. This makes them well-suited for medical image analysis, as they can identify subtle changes and abnormalities that may be missed by human interpretation. By training a CNN on large dataset of medical images, the algorithm can learn to distinguish between healthy tissues and the characteristic features of black fungus infection.

## 2.BLACK FUNGUS

Black fungus, also known as Mucor mycosis or zygomycosis, is a rare but serious fungal infection that can affect different parts of the body, including the sinuses, lungs, skin, and brain. It is caused by a group of molds called as mucoromycetes, which are commonly found in the environment and in decaying organic matter such as compost, soil and rotten wood.

In recent times, there have been reports of an increase in the number of cases of black fungus among COVID-19 patients in India. The exact reason for this surge is not yet clear, but it is believed to be linked to the use of steroids to treat the COVID-19, which can weaken the immune system and make people more susceptible to fungal infections.

Symptoms of black fungus depend on the area of the body that is affected, but can include fever, headache, nasal congestion, eye pain, skin discoloration, and black lesions in the affected area. If left untreated, black fungus can be life-threatening, especially in people with weakened immune systems.

## 3.EXISTING SYSTEM

In existing methods image content-based techniques were mostly used because those are related to skin. Three computer vision-based techniques were developed for the detection of fungus spores. one of them used HOG based features and achieved convincing results. Other techniques consisted of fusion of Fourier transform and SIFT features to achieve promising results. Third method based on super pixel and handcrafted features. The results of all these techniques encourage for the possibility of early detection of fungus spores from dirt particles.

### Disadvantages

Numerous traditional techniques were applied to meet the challenges of early detection of fungus but all are costly, laborious, time-consuming and required skilled staff.

This revolutionary era emphasizes the need for novel, simple, automatic fungal detection system to control the devastation caused by fungal species.

## 4.PROPOSED SYSTEM

We develop a fungus detection system and algorithms to automatically detect fungus. We use machine learning algorithms like CNN to predict fungus from given input values. Black fungus detection from symptoms is first of this kind of developer based on test values from dataset. We train dataset and predict results based on give input.

### Model initialization:

This stage involves loading the CNN model with the needed parameters, fitted trained features and labels to the algorithm, and saving model.

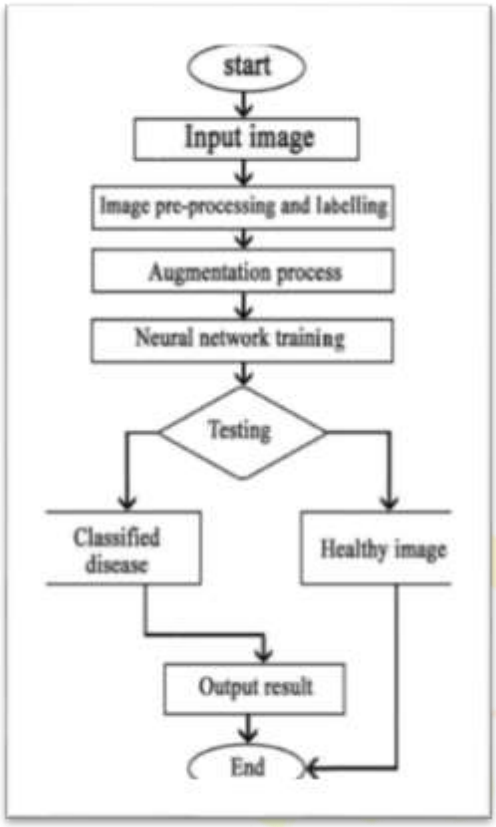
### Prediction:

The user enters black fungus disease data into the online application and compares it to the model's prediction.

### Advantages:

Prediction process is automatic which is based on trained model. Accuracy of the model is calculated with test sets. Algorithms with better accuracy is used for predictions.

# 5.METHODOLOGY




## Data collection:

The large dataset of medical images will be collected.

## Image preprocessing and labelling:

The collected medical images may need to be preprocessed before feeding them into the CNN algorithm. This may include standardizing the images to a consistent size, normalizing the intensity values, and removing any noise or artifacts.

## Augmentation:

To increase the size and diversity of the dataset, data augmentation techniques can be used, such as flipping, rotating, or cropping the images.

## Neural network training:

The model is trained using the preprocessed images. We employed the deep CNN technique to distinguish diseased image from healthy image.

## Model development:

A CNN model is trained using preprocessed images to learn the characteristic features of black fungus infection. The architecture of the model can vary, but commonly used models for medical image analysis include VGG, ResNet and Inception.

## Testing:

The final step is to test the performance of model on the test sets of images.

The full method of utilizing deep CNN to create a model for black fungus diagnosis is detailed here.

**CNN ALGORITHM:** CNN stands for Convolutional Neural Network, which is a type of artificial neural network that is commonly used for image recognition, object detection and classification tasks. The Convolutional neural network (CNN) works by getting an image designating it, some weightage based on different objects of the image and then distinguish them from each other. CNN requires very little preprocess data as compared to other deep learning algorithms.

# 6.FUTURE SCOPE

The future scope for black fungus detection using CNN algorithm is vast and promising, and it has the potential to revolutionize the diagnosis and treatment of the disease. This can enable the development of an automated system that can detect black fungus in real time. Telemedicine can used to remotely monitor the patients for early signs of black fungus infection. There is a need to increase

public awareness about black fungus and its symptoms, as well as the importance of early detection and treatment.

## 7.CONCLUSION

There is a significant need for better detection methods for black fungus. Black fungus is also called Mucor mycosis. It is a rare but serious fungal infection that can affect individuals with weakened immune systems. The early detection of black fungus is crucial for effective treatment and recovery. CNN is an efficient way of carrying out images for detecting black fungus.

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