SKIN DISEASE CLASSIFICATION

A Project Report

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# ***ABSTRACT***

# Dermatological disorders are one of the most widespread diseases in the world. Despite being common its diagnosis is extremely difficult because of its complexities of skin tone, color, presence of hair. This paper provides an approach to use various computer vision based techniques to automatically predict the various kinds of skin diseases. The system uses three publicly available image recognition architectures namely Inception V4, densenet , vgg , lesions with modifications for skin disease application and successfully predicts the skin disease based on maximum voting from the three networks. These models are pretrained to recognize images in various classes like Melanocytic, Vascular lesions etc. The architectures are published by image recognition giants for medical usage for various applications. The system consists of three phases- The feature extraction phase, the training phase and the testing /validation phase. The system makes use of models to train itself with the various skin images. The main objective of this system is to achieve maximum accuracy of skin disease prediction.

# ***INTRODUCTION***

# The Dermatology remains the most uncertain and complicated branch of science because of it complicacy in the procedures involved in diagnosis of diseases related to hair, skin, nails. The variation in these diseases can be seen because of many environmental, geographical factor variations. Human skin is considered the most uncertain and troublesome terrains due to the existence of hair, its deviations in tone and other mitigating factors. The skin disease diagnosis includes series of pathological laboratory tests for the identification of the correct disease. For the past ten years these diseases have been the matter of concern as their sudden arrival and their complexities have increased the life risks. These Skin abnormalities are very infectious and need to be treated at earlier stages to avoid it from spreading. Total wellbeing including physical and mental health is also affected adversely. Many of these skin abnormalities are very fatal particularly if not treated at an initial stage. Human mindset tends to presume that most skin abnormalities are not as fatal as described thereby applying their own curing methods. However if these remedies are not apt for that selective skin problem then it makes it even worse. The available diagnosis procedure consists of long laboratory procedures but this paper proposes a system which will enable users to predict the skin disease using computer vision.

# ***Data Set***

# In this study, a sample data from the complete dataset employed to train the system model is presented in images. The database is split into; training set, validating/testing set. A training set is adopted for learning to fit the parameters and is specifically applied to alter the varying weights and errors of the system in each training run. Validation/testing set tunes the parameters and is used only to assess the effectiveness and efficiency of the system.

# ***Computer Based Diagnosis of Skin Disease***

# With the increase in medical technology the concept of computer being used for the diagnosis of skin diseases has been around recently. Use of computer technology can make it simpler to detect the diseases just from the images of the infected skin image and could assist the human’s ability to analyze complex information. Artificial Intelligence is taking up automation in all fields of application even in the healthcare field.

# ***Methodology***

# Development of a widespread plan to test the special features and general functionality on a range of platform combination is firstly initiated by the test process. The procedures used are strictly quality controlled. The method involves use of pre-trained image recognizers with modifications to identify skin images.

# The process verifies that the application is bug free and it meets the requirements stated in the requirements document of system.10 The following are the considerations used to develop the framework from developing the testing methodologies.

# Module Design Are

# Feature extraction module.

# Training module.

# Validation/ Testing phase.

# densenet is considered to have light weight architecture and fast model, more preferred for mobiles and embedded application. With small size, they are based on streamlined architecture that uses deep-wise separate convolutions. Though these process same as inception these have light weights. The other two networks used are Inception V3 and Inception Resnet V2

# Inception involves two fragments

# Feature extraction part with a convolutional neural network.

# Classification part with fully-connected layer.

# The pre-trained Inception V3 model attains advanced accuracy in recognition of general materials with 1000 classes, like Zebra, Dalmatian and Dishwasher etc. The model extracts several features from the input images in the feature extraction part and then classifies them established on those obtained features.

# In transfer learning, when a new model is built to categorize an original dataset, the feature extraction and classification parts are reused and retrained respectively with the dataset. In transfer learning the last layer of the model is trained again with the new dataset so that the model can learn about the application.

# A DenseNet is a type of convolutional neural network that utilises dense connections between layers, through Dense Blocks, where we connect all layers (with matching feature-map sizes) directly with each other. It was developed specifically to improve the declined accuracy caused by the vanishing gradient in high-level neural networks. In simpler terms, due to the longer path between the input layer and the output layer, the information vanishes before reaching its destination.

# Diagram Description automatically generated

# ***LITERATURE SURVEY***

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# ***RESULTS***

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Figure Model-Densenet

A picture containing text, plaque

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Text

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Figure Model-resnet

Chart, line chart

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Figure Validation Accuracy and loss

# ***CONCLUSION***

# Dermatological disorders are one of the most widespread diseases in the world. Despite being common its diagnosis is extremely difficult because of its complexities of skin tone, color, presence of hair. This paper provides an approach to use various computer vision based techniques to automatically predict the various kinds of skin diseases. The system uses three publicly available image recognition architectures namely Inception V4, densenet, vgg, lesions with modifications for skin disease application and successfully predicts the skin disease based on maximum voting from the three networks. These models are pretrained to recognize images in various classes like Melanocytic, Vascular lesions etc. In this project when compared to the three remaining models densenet is the one with the highest accuracy compared to remaining models so we choose densenet for classifying the skin diseases.

# ***REFRENCES***

# Automating Skin Disease Diagnosis Using Image Classification by Damilola A. Okuboyejo, Oludayo O. Olugbara, and Solomon A. Odunaike.

# A Benchmark for Automatic Visual Classification of Clinical Skin Disease Images by Xiaoxiao Sun, Jufeng Yang, Ming Sun, and Kai Wang.

# A machine learning model for skin disease classification using convolution neural network by Viswanatha Reddy Allugunti.