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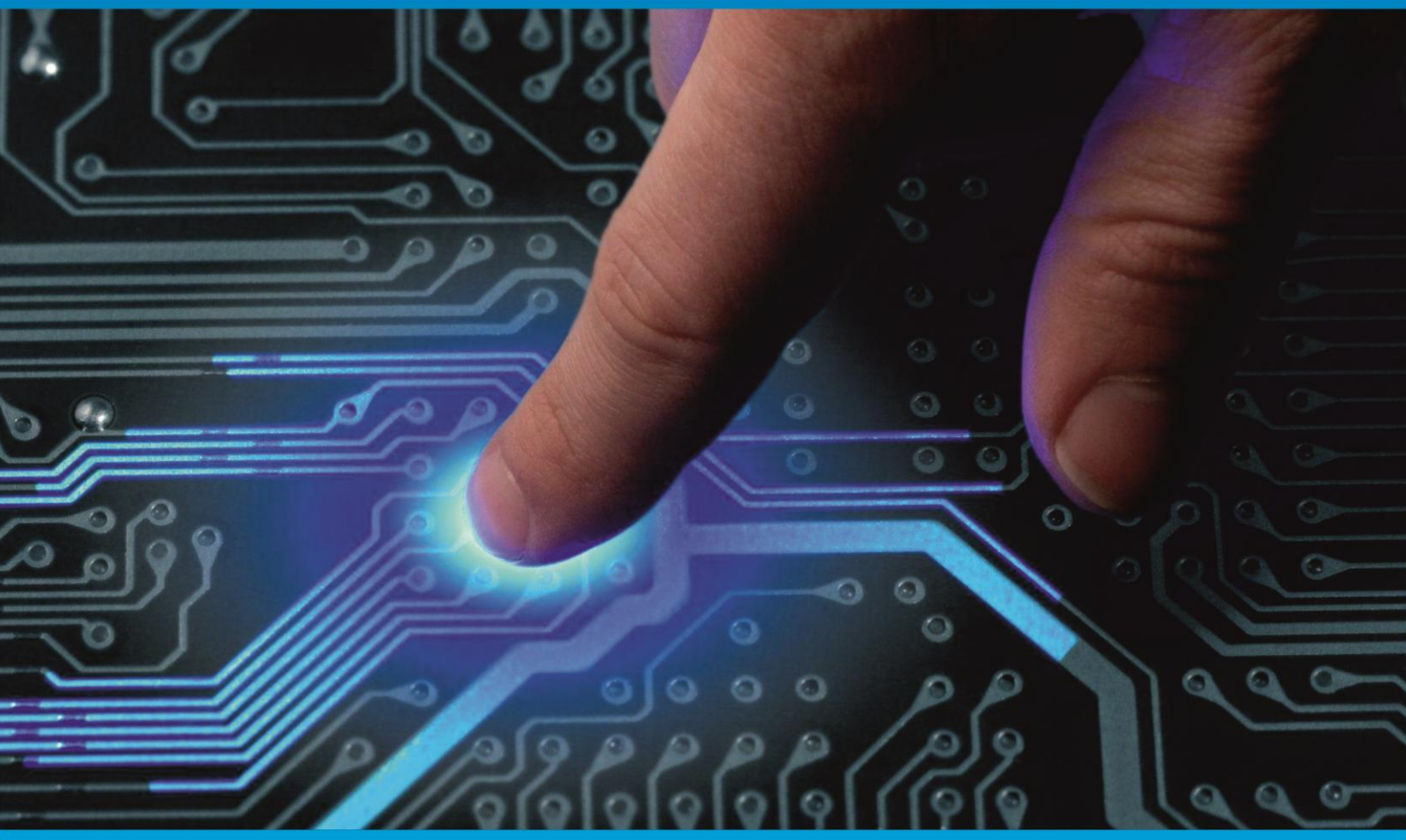

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Skin Disease Classification

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ABSTRACT: Medical data growth is in healthcare communities, accurate analysis of medical data benefit early disease detection, patient care and community services. However, the analysis of patients is depends on accuracy of diagnosis and then treatment as well. The wrong diagnosed patients lead to deaths in chronic type diseases. So the high risk of diagnosis there is need of accurate diagnosis aid for chronic diseases. So we are proposing diagnosis system based on machine learning for giving promising solution with high accuracy. The proposed system consists of many diseases such as Atopic Dermatitis, Nail fungus disease, Psoriasis disease detections and Ringworm disease stages predictions. High rate of deaths due to chronic diseases such as Dermatitis, Nail fungus disease, Psoriasis disease detections and Ringworm disease need to develop proper diagnosis system which helps to doctors. The wrong diagnosis leads to human deaths so we need to work on accurate diagnosis of multiple skin diseases. Many works is already carried out for different diseases but there is not any promising solution found that gives accurate diagnosis for all in one. The proposed system consists of many diseases such as Dermatitis, Nail fungus disease, Psoriasis disease detections and Ringworm disease detections and stages predictions. We are trying to develop system for multi disease detection and stages predictions gives early detection and saves lots of life's by reducing death rate by skin diseases.

KEYWORDS- Multi Disease Detection, Convolutional Neural Network, Neural Network, Deep Learning,

I. INTRODUCTION

A skin that has deficient melanin is introduced to the risk of burns from the sun and moreover, terrible bright radiates from the sun. Examiners affirm that the disease requires early intercession with a particular ultimate objective to have the ability to recognize right results that will simplify it for the clinicians and dermatologists to turn away it. This issue has been wound up being eccentric. It is portrayed by the headway of wounds in the skin that vary alive and well, size, concealing, and surface. Medical data growth in healthcare communities, accurate analysis of medical data benefit early disease detection, patient care and community services. However, the analysis of patients is depends on accuracy of diagnosis and then treatment as well. The wrong diagnosed patients lead to deaths in skin type diseases. So the high risk of diagnosis there is need of accurate diagnosis aid for skin diseases. An impressive parcel of skin sicknesses, for instance, skin break out, alopecia, ringworm, and dermatitis, furthermore impact the look. Along these lines, the security of skin from ailments is the basic and muddled work in drug. Nowadays, remedial field relies more upon PC upheld investigation. Profound neural organization is a feed-forward neural network that has more than one secret layer between the info and yields. The interaction of DNN is to gain proficiency with the highlights and afterward to characterize the source information as typical or unusual. DNN performs better contrasting with other arrangement calculations in discourse acknowledgment and anomaly location, etc. The effectiveness of skin sickness location has been improved utilizing later improvement in AI draws near, however the exactness has not been improved with regards to the grouping of skin illnesses

1.1 Motivation

Reducing death rate by wrong diagnosis using giving accurate diagnosis. To provide diagnosis system this helps to doctors.Motive behind proposed work is to achieve higher accuracy over existing work by using machine learning. The desire to provide a better and accurate diagnosis.

The problem with knowledge engineering method is that it requires constant updating of rules for classification which is very difficult. Over the last two decades, the application of Machine learning approach is increased due to various reasons like availability of large amount of data and the necessity of handling them in an efficient way.

1.2 Need

To develop a system that detects skin diseases with maximum precision and with minimum processing timeto help in the medical field.

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II. LITERATURE SURVEY

K.Melbin, Dr.Y.Jacobet al. [1] Stated that In this paper, we have proposed a proficient skin illness ID approach utilizing upgraded profound neural organization model. The information base pictures are divided utilizing improved level set methodology based division. Highlight extraction is done for every one of the pictures to recover the component vector utilizing GLCM. At last, dragonfly improvement based profound neural organization is used for the grouping of skin illnesses. The framework is carried out in the functioning foundation of MATLAB, and the proposed dragonfly based DNN is assessed utilizing existing strategies, for example, SVM, ANN for various assessment measurements like precision, affectability, and particularity to show the framework effectiveness

Gavrilov, D. A., A. V. Melerzanov et al. [2] proposed that Melanoma is quite possibly the most risky kinds of disease. The precision of visual conclusion of melanoma straightforwardly relies upon the experience and forte of the doctor. Current advancement of picture handling and AI advances permits frameworks dependent on fake neural convolutional organizations to be made, these being superior to people in object characterization assignments, including the diagnostics of dangerous skin neoplasms. Introduced here is a calculation for the early diagnostics of melanoma dependent on counterfeit profound convolutional neural organizations. This calculation can separate considerate and harmful skin tumors with an exactness of at any rate 91% by assessment of dermatoscopy pictures.

Nida, Nudrat, AunIrtaza et al. [3] proposed that Melanoma is a hazardous type of the skin malignant growth answerable for a large number of passings consistently. Early discovery of melanoma is conceivable through visual examination of pigmented injuries over the skin, treated with basic extraction of the dangerous cells. Notwithstanding, because of the restricted accessibility of dermatologists, the visual assessment alone has the restricted and variable exactness that drives the patient to go through a progression of biopsies and confounds the treatment. In this work, a profound learning technique is proposed for mechanized Melanoma area division utilizing dermoscopic pictures to defeat the difficulties of robotized Melanoma district division inside dermoscopic pictures.

Milton, MdAshrafulAlam [4] stated that In this paper, they concentrated broadly on various profound learning based strategies to distinguish melanoma and skin injury malignancies. Melanoma, a type of dangerous skin malignancy is extremely threatening to wellbeing. Appropriate analysis of melanoma at a prior stage is urgent for the achievement pace of complete fix. Dermoscopic pictures with Benign and dangerous types of skin malignant growth can be dissected by PC vision framework to smooth out the interaction of skin disease recognition. In this investigation, we tried different things with different neural organizations which utilize late profound learning based models like PNASNet-5-Large, InceptionResNetV2, SENet154, InceptionV4. Dermoscopic pictures are appropriately prepared and expanded prior to taking care of them into the organization. They tried our techniques on International Skin Imaging Collaboration (ISIC) 2018 test dataset. Our framework has accomplished best approval score of 0.76 for PNASNet-5-Large model. Further improvement and streamlining of the proposed techniques with a greater preparing dataset and deliberately picked hyper-boundary could improve the exhibitions.

JaineshRathod, Vishal Waghmode et al. [5] stated that the Dermatology is one of the most unpredictable and difficult terrains to diagnose due its complexity. In the field of dermatology, many a times extensive tests are to be carried out so as to decide upon the skin condition the patient may be facing. The time may vary from practitioner to practitioner. This is also based on the experience of that person too. So, there is a need of a system which can diagnose the skin diseases without any of these constraints. We propose an automated image based system for recognition of skin diseases using machine learning classification. This system will utilize computational technique to analyze, process, and relegate the image data predicated on various features of the images. Skin images are filtered to remove unwanted noise and also process it for enhancement of the image. Feature extraction using complex techniques such as Convolutional Neural Network (CNN), classify the image based on the algorithm of softmax classifier and obtain the diagnosis report as an output. This system will give more accuracy and will generate results faster than the traditional method, making this application an efficient and dependable system for dermatological disease detection. Furthermore, this can also be used as a reliable real time teaching tool for medical students in the dermatology stream.

III PROPOSED METHOD AND ALGORITHM

A. Proposed Methodology:

In a proposed system, we are proposing experiment on skin diseases like atopic Dermatitis, Psoriasis, Ringworm and Nail fungus diseases with limited set of supervised data.

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We propose a Convolutional neural network based multimodal disease risk prediction model for limited skin diseases with higher accuracy. We are going to solve accuracy issue in diagnosis of Psoriasis with accurate stage predictions. We also work on ringworm detections by machine evaluations depends on sizes in mm. Nail fungus and atopic dermatitis detection depends on diagnosed dataset.

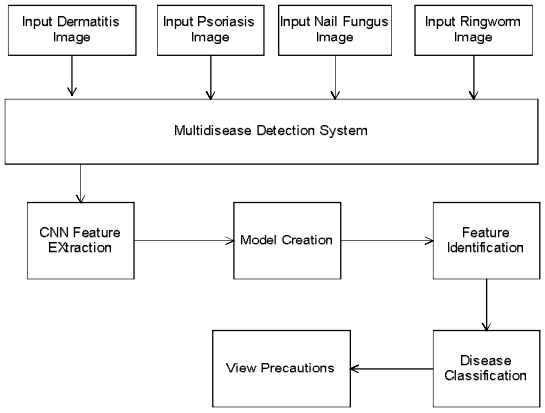

Fig1. Proposed Architecture

B. Algorithm

Convolutional Neural Networks(CNN)

Convolutional Neural Networks (which are additionally called CNN/ConvNets) are a kind of Artificial Neural Networks that are known to be tremendously strong in the field of distinguishing proof just as picture order.

Four main operations in the Convolutional Neural Networks are shown as follows:

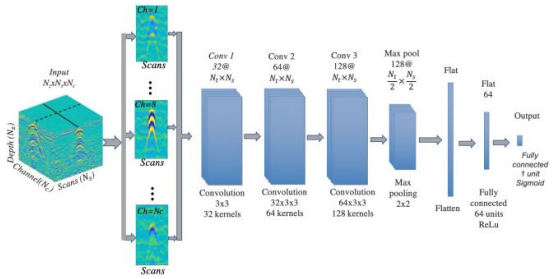

Fig 2. CNN Architecture

(i) Convolution

The principle utilization of the Convolution activity if there should be an occurrence of a CNN is to recognize fitting highlights from the picture which goes about as a contribution to the primary layer. Convolution keeps up the spatial interrelation of the pixels This is finished by fulfillment of picture highlights utilizing miniscule squares of the picture. Convolution equation. E very picture is seen as a network of pixels, each having its own worth. Pixel is the littlest unit in this picture grid. Allow us to take a 5 by 5(5*5) framework whose qualities are just in twofold (for example 0 or 1), for better agreement. It is to be noticed that pictures are by and large RGB with upsides of the pixels going from 0 - 255 i.e 256 pixels.

(ii). ReLU

ReLU follows up on a rudimentary level. All in all, it is an activity which is applied per pixel and overrides every one of the non-positive upsides of every pixel in the component map by nothing.

(iii). Pooling or sub-sampling

Spatial Pooling which is likewise called subsampling or downsampling helps in lessening the elements of each element map yet even at the same time, holds the most important data of the guide. Subsequent to pooling is done, in the long

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run our 3D element map is changed over to one dimensional component vector.

(iv) Fully Connected layer

The yield from the convolution and pooling activities gives noticeable highlights which are removed from the picture. These highlights are then used by Fully Connected layer for consigning the info picture into various classes predicated on the preparation dataset.

IV. RESULTS OF THE SYSTEM

In our experimental setup, as shown in table 1, the total numbers of 4218 of trained images for four diseases and 1061 new images were tested. These images go through CNN framework by following feature extraction using our image processing module. Then our trained model of classification of diseases get classifies the image into specifies disease.

Sr. No.	Category	Number of Images
1	Positive Images	4218
2	Negative Images	126

Table 1: Classification of Images

Figure3: Output Images

In our experimental setup, we are shown in table, the total numbers of images were 4218. These images were then divided into Two subcategories; among which 4092 predicted and 126 not predicted respectively. The figure shows predicted disease and recommend the precautions for it. We classified images data into predicted and not predicted categories based on accuracy factor which is our main motive.

V. CONCLUSION

We have invented multi disease detection system over machine learning and CNN techniques which solves existing accuracy problem as well as reduce death rates by skin type diseases like Psoriasis detection, Ringworm detection, Atopic Dermatitis and Nail Fungus. After detection of disease inform to users that how to prevent from a disease. For future work, we can implement this technique on some more skin diseases with rich dataset. Increasing the number of diseases and dataset used for the process can improves the accuracy.

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