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Skin Disease Recognition Using Texture Analysis

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ABSTRACT

Skin is the primary part of our body, one of the major issues we are facing presently days that's skin illness due to high air pollution. Here, we are trying skin illness recognition by using Neural Network which is based on texture analysis. There are many skin infections like Eczema, Acne, Hives, rosacea, psoriasis, etc. In common, these diseases have similarities in the design of contamination and side effects such as redness and rash. Diagnosis and recognition of skin illness take a really long time to handle.The infection determination and recognition get to be troublesome as the complexity and number of highlights of the infection increases. Thus, a computer helped diagnosis and recognition system is presented. Computer algorithm which contains few steps that are image processing, image feature extraction, segmentation, and classification of information has been executed with the assistance of a Convolutional neural network (CNN). The CNN can learn designs of side effects of specific infections and makes it speedier.

Keywords:- skin Disease Recognition Using Texture Analysis

I. INTRODUCTION

Composed of epidermis, dermis and subcutaneous tissues, skin is the biggest organ of the human body, containing blood vessels, nerves and muscles, which can sweat and see the outside temperature and secure the body. Covering the complete body, the skin can protect multiple tissues and organs within the body from outside attacks counting manufactured skin harm, chemical harm, and people resistant system. Besides, skin can moreover maintain a strategic distance from the loss of lipids alongside water inside epidermis and dermis so that skin boundary work can be sterilized. The skin itself can be isolated into three distinctive layers which are epidermis, dermis and subcutaneous. The two layers that make up the human skin is known as epidermis. In the interim, dermis is the thick layer of living tissues underneath the epidermis that shapes the genuine skin and contains a part of imperative structures such as blood capillaries, nerve endings, sweat organs and other structures. Recognition of human skin is a critical task for both computer vision and graphics. For computer vision, exact recognition of skin surface can significantly help algorithms for human face recognition or facial feature tracking. In computer graphics, facial movement is a critical problem which requires solid skin surface recognition. In expansion to computer vision and graphics, skin recognition is valuable in dermatology and a few industrial areas. In dermatology, the skin acknowledgment can be utilized to create strategies A lot of observations can be made regarding the nature of the skin just by analyzing the skin texture and the color of the skin. In order to design the system for the recognition of the skin disease, there are a few steps that must be taken which are including image processing, segmentation of the image, image feature extraction and data classification using neural network. The most difficult part in designing the skin disease recognition system is to identify the disease itself. This difficulty is due to the huge similarities between different classes. In addition, the common symptoms shared by these skin disease leads to the confusion in detecting and recognizing the exact type of skin disease faced by the patients.

II. LITERATURE REVIEW

Skin Disease Recognition using Texture Analysis

There are many skin diseases that have the similar symptoms which can be recognizedusingneuralnetworkwhichisbasedonthetextureanalysis.Themany diseases like Measles, German measles and Chickenpox etc. shares the similar pattern of infection and symptoms such as redness and rashes. Diagnosis and recognition of the skin disease is the very difficult job since it requires the details of patient's history, physical examination and the laboratory results. Since many skin diseases share the similar symptoms, it is very difficult to diagnosis andrecognize theskindisease.Hence,acomputeraideddiagnosisandrecognitionof skindiseasesystemisintroduced.Imageprocessing,imagefeatureextractionand classification are the few steps involved in computer aided algorithm. Classification of the data has been done with the help of the classifier such as artificial neural network (ANN). The ANN can learn patterns of symptoms of particular diseases and provides faster diagnosis and

recognition than a human physician. Hence based on the symptoms detected the patients can be treated immediately using skin disease recognition by texture analysis. [7][13][14][16][17]

Digital Dermatology Skin Disease Detection Model using Image Processing

This paper proposes a skin disease detection method based on image processing techniques. The method is mobile based and hence very accessible even in remote areas and it is completely non invasive to patient's skin. The patient provides an image of the infected area of the skin as an input to the prototype. Image processing techniques are performed on this image and the detected disease is displayed at the output. This type of detection is highly beneficial in rural areas where access to dermatologists is limited. [4][6][9][10][11][18][20][23][24]

A Method of Skin Disease Detection Using Image Processing and Machine Learning

Skin diseases are more common than other diseases. Skin diseases may be caused by fungal infection, bacteria, allergy, or viruses, etc. The advancement of lasers and Photonics based medical technology has made it possible to diagnose the skin diseases much more quickly and accurately. But the cost of such diagnosis is still limited and very expensive .So ,image processing techniques help to build automated screening system for dermatology at an initial stage. The extraction of features plays a key role in helping to classify skin diseases. Computer vision has a role in the detection of skin diseases in a variety of techniques. Due to deserts and hot weather, skin diseases are common in Saudi Arabia. This work contributes in the research of skin disease detection. Author proposed an image processing-based method to detect skin diseases. This method takes the digital image of disease effect skin area, then use image analysis to identify the type of disease. Here the proposed approach is simple, fast and does not require expensive equipment other than a camera and a computer. The approach works on the inputs of a color image. Then resize the image to extract features using pertained convolution neural network. [1][2][3][5][8][12][15][19][21][22]

Summary of Literature Analysis

Ref No	Title	Concept Details	Future Scope
[1]	Multichannel Texture Analysis Using Localized Spatial Filters	TEXTURE can be used in the analysis of images. Segmentation of scenes into distinct objects and regions, in the classification or recognition of surface materials, and in the computation of surface shape.	The development of fast algorithms and architectures for filtering an image by a large (complete) set of Gabor filters
[2]	Statistical and structural approaches to texture	Author identifies statistical approaches of autocorrelation function, optical transforms, digital transforms, textural edgeness, structural element, gray tone co occurrence, run lengths, and autoregressive models. Here author discuss and generalize some structural approaches to texture based on more complex primitives than gray tone.	—
[3]	Auto covariance- based perceptual textural features corresponding to human visual perception	In various texture analysis concept, author is interested in dealing with human visual perception.	applying these perceptual features in image retrieval.

[4]	An Enhanced Model for Skin Disease Detection using Dragonfly Optimization based Deep Neural Network	A enhanced deep neural network model. The database images are segmented using enhanced level set approach-based segmentation. Feature extraction is carried out using GLCM	___
[5]	Image based skin disease detection using hybrid neural network coupled bag-of- features	A neural based detection method of two different skin diseases using skin imaging. Skin images of two diseases namely Basel Cell Carcinoma and Skin Angioma are utilized. SIFT feature extractor followed by a clusteringphase on feature space in order to reduce the number of features suitable for neural based models. The extracted bag-of-features modified dataset is used to train metaheuristic supported hybrid Artificial Neural Networks to classify the skin images in order to detect the diseases under study. A well-known multi objective optimization technique called Non-dominated Sorting Genetic Algorithm - II is used to train the ANN (NN-NSGA-II).	SIFT based bag- of-feature method can be employed in different modality of bio-medical image analysis as well as other domains like satellite imaging etc. Other metaheuristc methods can be integrated to train the artificial neural network.

III. PROBLEM DEFINATION

Now a day's people are suffering from skin diseases. More than 125 million people suffering from Psoriasis. Also skin cancer rate is rapidly increasing over last few decades specially Melanoma is most diversifying skin cancer. Dermato phytosis rate is high specially at rural areas. If skin diseases are not treated at earlier stage, then it may lead to complications in the body including spreading of the infection from one individual to the other .The skin diseases can be prevented by investigating the infected region at a nearly stage. Skin diseases have a serious impact on peoples life and health. It is necessary to develop automatic methods in order to increase the accuracy of diagnosis for multi-type skin disease .Here we are trying specify three type skin disease such as herpes, dermatitis and psoriasis skin disease with our new recognition method. Initially, skin images were preprocessed to remove noise and irrelevant background by filtering and transformation. Then the method of grey-level co-occurrence matrix(GLCM) was introduce to segment images of skin disease. The texture and color features of different skin diseases could be obtain accurately. Finally, by using the support vector machine(SVM) classification method, three type of skin diseases were identified. The experimental result demonstrate the effectiveness and visibility of the proposed method.

IV. OBJECTIVES

- Literature review of available techniques for skin diseases.
- Preprocessing of skin images to remove noise and irrelevant background by filtering and transformation.
- Method of grey-level co-occurrence matrix (GLCM) to segment images of skin disease.
- Finally, for classification support vector machine(SVM) classification method,

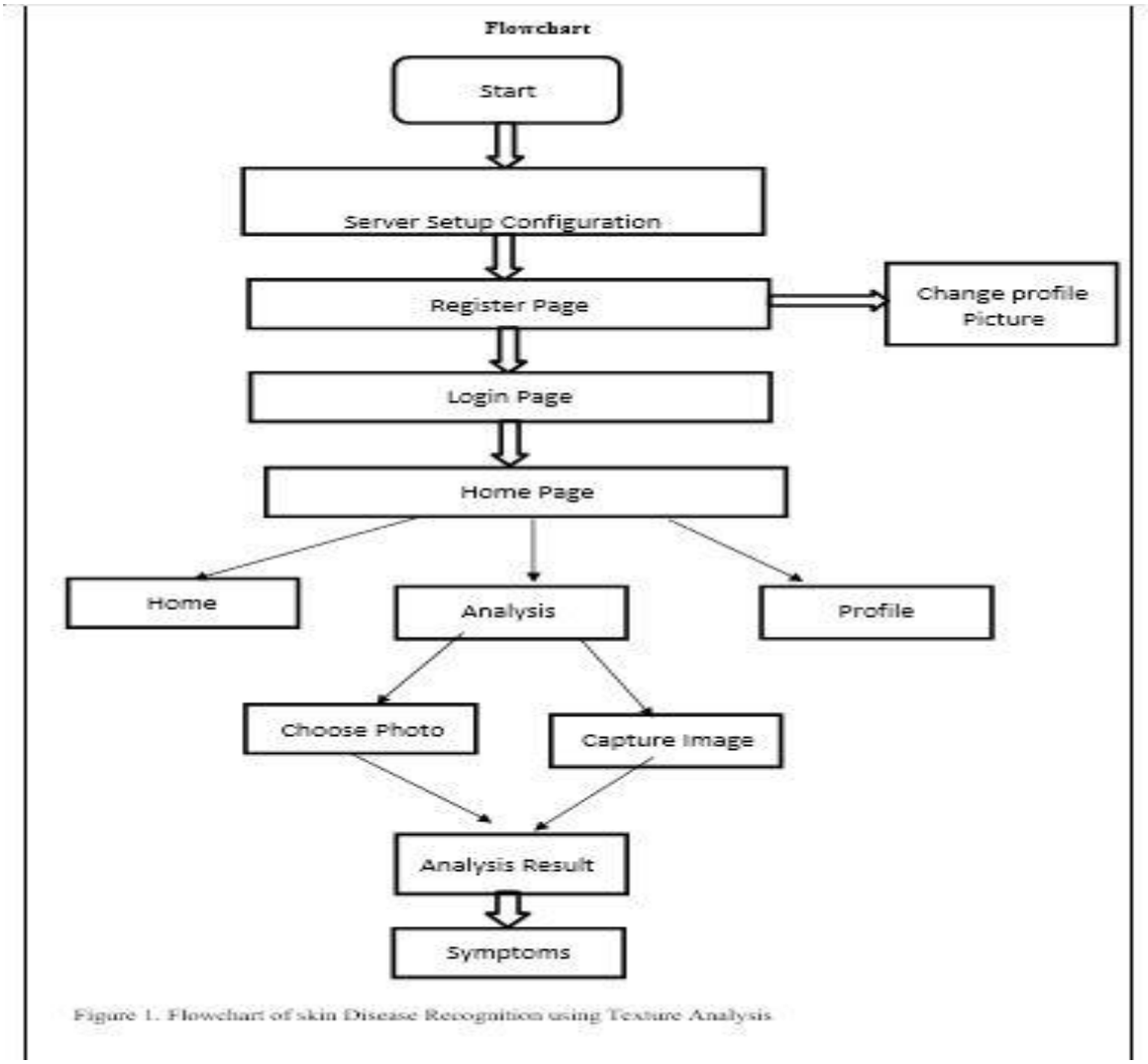

Figure 1. Flowchart of skin Disease Recognition using Texture Analysis

DATA FLOW DIAGRAM

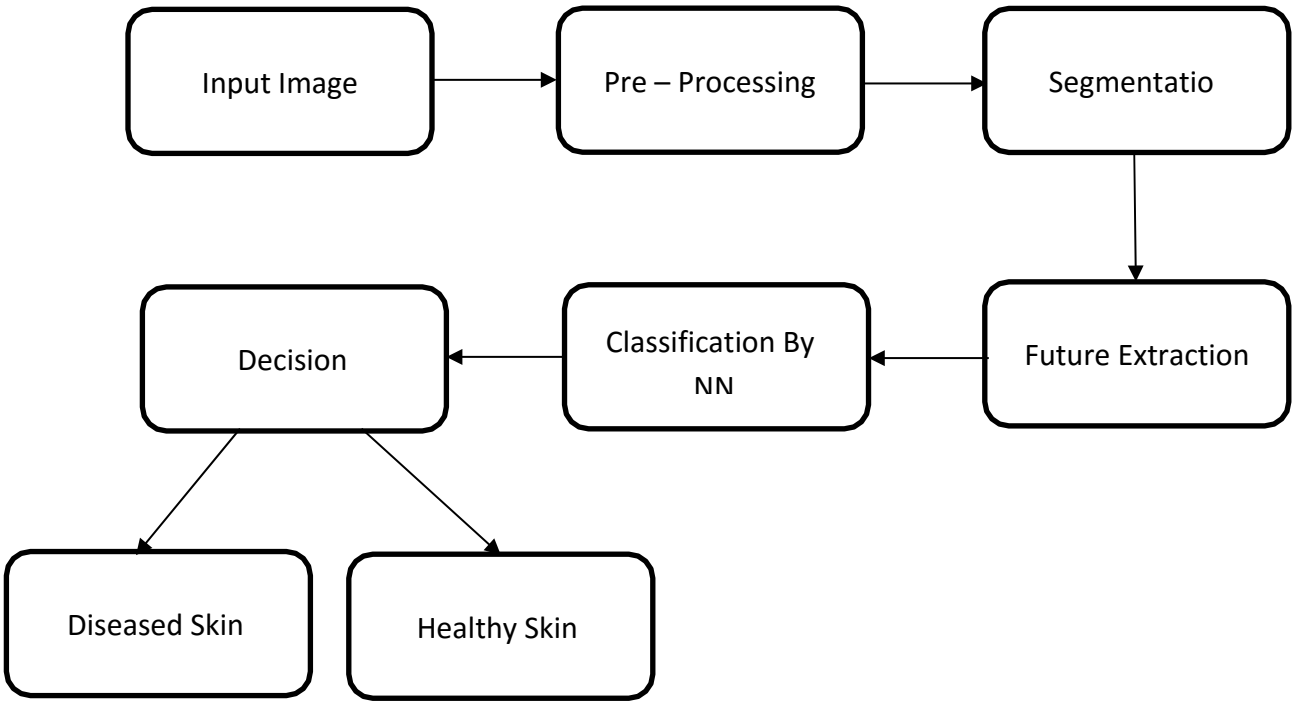

Figure 2. Data flow diagram

V. ALGORITHMS

In this project we use the MobileNet-v2algorithm MobileNet-v2 is a convolutional neural network that is 53 layers deep.

You can load a pretrained version of the network trained on more than a million images from the ImageNet database.
The pretrained network can classify images into 1000 object categories, such as keyboard, mouse, pencil, and many animals.
As a result, the network has learned rich feature representations for a wide range of images.
The network has an image input size of 224-by-224. For more pretrained networks in MATLAB, see Pretrained Deep Neural Networks.
You can use classify to classify new images using the MobileNet-v2 model.
Follow the steps of Classify Image Using GoogLeNet and replace GoogLeNet with MobileNet-v2.
To retrain the network on a new classification task, follow the steps of Train Deep Learning Network to Classify New Images and load MobileNet-v2 instead of GoogLeNet.
Example
net = mobilenetv2 returns a MobileNet-v2 network trained on the ImageNet data set.
This function requires the Deep Learning Toolbox™ Model for MobileNet-v2 Network support package. If this support package is not installed, then the function provides a download link.

net = mobilenetv2('Weights','imagenet') returns a MobileNet-v2 network trained on the ImageNet data set. This syntax is equivalent to net = mobilenetv2.
lgraph = mobilenetv2('Weights', 'one') returns the untrained MobileNet-v2 network architecture. The untrained model does not require the support package.

Syntax
net = mobilenetv2
net = mobilenetv2('Weights','imagenet')
lgraph = mobilenetv2('Weights',' one')

VI. MODULES USER CONTROLLER

Users' controller module consists of login page and register page how to login and register in the app we import pymongo, uuid and from bson.json_util

import dumpsmyclient = pymongo.MongoClient("mongodb://localhost:27017/") mydb = myclient["skin_analysis"] We use this for localhost we take the data form users data base. Email and password form user database, for that we use email, password = request.form.get ('email'),request.form.get('password')this method if the email or password entered wrong then 'Wrong Credentials... Please enter correct credentials' this massage display.

When the email and password correct then 'Successfully log in' display for Register page name, profile, email, password = request.form.get('name'), request.form.get('profile'),

when we already register and repeatedly entered the same email then 'Email Already Exists' this massage display.

VII. ANALYSIS CONTROLLER

In analysis controller we need to import uuid, pymongo, sys, time, numpy as np, os, base 64

In the analysis controller module we send command form mogodb-myclient=pymongo.MongoClient("mongodb://localhost:27017/")

mydb = myclient["skin_analysis"]thenextstepofanalysiscontrollermoduleisinputthe image than the image gets read then the image gets normalized for reading the file we use file_reader = tf.read_file(file_name, input_name) if file_name.endswith(".png") then the float-caster methodcall.

Image get resized then normalized method call after that we got results. in the variable maxid the result call. In symptoms table there is disease data , disease data verify the result by analyzing the data graph and analyzing the data then suggest symptoms according to the image we input.

SOFTWARE REQUIREMENTS
SERVER SIDE
Tensorflow
TensorFlow is a free and open-source software library for machine learning.
It can be used across a range of tasks but has a particular focus on training and inference of deep neural networks.

Python 3.10
Python's design philosophy emphasizes code readability with its notable use of significant whitespace.

Keras
Keras is an open-source library that provides a Python interface for artificial neural networks. Keras acts as an interface for the TensorFlow library.

Flask
Flask is a micro web framework written in Python. It is classified as a micro framework because it does not require particular tools or libraries.

MongoDB

MongoDB is a cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas.

Anaconda
Anaconda is a distribution of the Python and R programming languages for scientific computing (data science, machine learning applications, large-scale data processing, predictive analytics, etc.). That aims to simplify package management and deployment.

CLIENT SIDE

Angular
Angular is a Typescript-based open-source web application framework.
Led by the Angular Team at Google and by a community of individuals and corporations.
Angular is a complete rewrite from the same team that built AngularJS

APPLICATIONS

- Real-time analytics provide doctors with a big picture of what is going on with the patient.
- Calculate what can happen during a critical stage of treatment.
- Says what to expect in certain turns of events.
- Helps in mapping out the treatment of the disease.
- While the patient is being treated, the system also helps in exploring the impact of different factors
- The system is also applied in finding the correlation in the patient's data.

CONCLUSION

The skin disease recognition using texture analyses can be determined using neural system determination of skin illness is achieved through the various steps like image acquisition, feature extraction, classification, very much characterized division and arrangement method.
The numerous images are recorded and determination of skin diseases is using texture analysis.
The collected skin disease images are set to get her gives practical, less demanding and quicker finding for understandable ranges. These helps in identifying the disease earlier and patient can be treated immediately. This also enhance the general productivity and also reduces the computational time.

FUTURE SCOPE

The application of this work with additional detail information will be beneficial for the hospital administrative managers to cut cost and use supply chain budget more effectively.

We can build an effective schedule that will avoid extreme workload and avoid needless down time.

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