International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 06 | June 2020 www.irjet.net p-ISSN: 2395-0072

Skin Disease Detection using Image Processing Technique

Prem J. Patil[1], Sagar J. Buchkule[2], Varsha S. More[3], Sanket G.Abhale[4]

[1-4]*Student, Dept. of Computer Engineering, S.N.D College, Yeola, Maharashtra, India*

Abstract - *Skin diseases have become one of the most common diseases all over the world. Most of the time changes in climatic conditions give more impact on the skin which results to some issues. Painful effects of skin disease hamper the mental condition of patient. We propose approach to skin disease detection method based on image processing techniques. This approach has been developed for diagnosis skin disease. It helps to proper diagnosis of affected skin portion, assisting senior expert, suggestion for doctor nearby available, remedies and precautions for particular disease. This project aims to develop skin diseases diagnosis system with a mobile interface, the system is built on a machine learning model to classify the infected images using Bag of Features extraction and develop an ANDROID interface application to capture the images, the designed model has successfully able to classify the infected images of 4sample classes with accuracy of cross-validation method.*

***Key Words*: 1. Image processing. 2. Feature extraction. 3. Skin disease.**

1. INTRODUCTION

In the age of apparatuses, machine learning is finding its application in all fields and clinical diagnosis is the newest calculation to it. Emerging ML based analytical tools are quite interesting to develop and it is imperative to choose the right decision-making algorithm to achieve a better diagnostic accurateness. Hence, it is equally imperative to choose the right feature and machine learning algorithm to find the peak diagnostic precision. Image processing and machine learning based studies are being used in numerous areas such as face appreciation, fingerprint recognition, tumor discovery and segmentation. According to literature, diverse ML algorithms are used for the classification tasks in these areas. The usually used ML algorithms are K-Nearest Neighbour (KNN) and k-means algorithms. The selection of input feature is vital in any classification task, using ML algorithms. We find that in preceding studies, investigators have used different types of features, liable on the specific classification tasks. In ordering images of skin diseases, different types of colour and texture features were used with KNN algorithms and obtained good exactness.

1.1 The Image Analysis in Medical Science

The Image examination techniques are broadly useful to medical science, and it has great use especially in the skin protection field. Image analysis can be functional for the following drives:

A. To notice patch on body.
B. To quantify precious area by disease.
C. To find the boundaries of the precious area.
D. To fix the color of the affected area.
E. To determine size & shape of diseased portion.
F. To identify the portion correctly.

1.2 Purpose of Proposed System

1. Emerging a user-friendly system for users.
2. Recognizing diseases exactly from input images.
3. Providing remedial and preventive measures for the detected illnesses

1.3 Flow of System

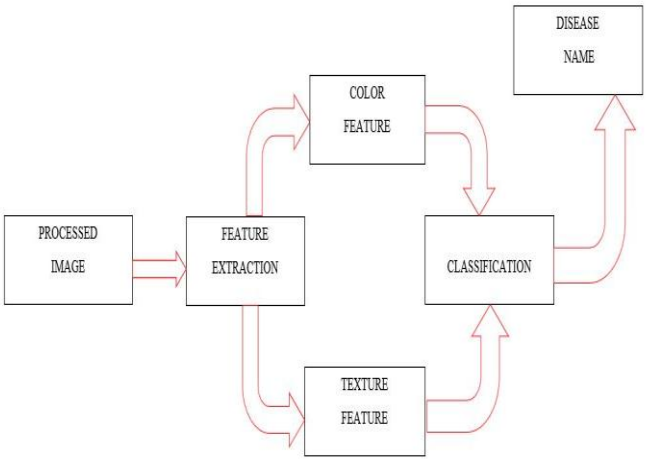

Fig1:- Flow of System

2 .EXISTING SYSTEM

The existing system mostly depends upon doctor. And this is a very slow process. Many of people not get proper treatment for the skin problem. Some skin problem looks like simple but in future they were cause you serious damage. In rural area of India people not have skin specialist doctor. And treatment also costly for poor people. Sometimes skin disease is not properly detected by the doctors. These are the problem of existing system.

3. LITERATURE SURVEY

i. Title: - Automatic Detection of Melanoma Skin Cancer using Texture Analysis.

Author: - Mariam A.Sheha Cairo University Mai S.Mabrouk MUST University Amr Sharawy Cairo University.

Definition: - This paper presents an automated method for melanoma diagnosis practical on a set of dermoscopy images. Topographies quarried are based on gray level Co-occurrence matrix (GLCM) and Using Multilayer perceptron classifier (MLP) to classify among Melanocytic Nevi and Malignant melanoma. The first practise, Automatic iteration counter is faster but the second one, Default iteration counter gives a better precision, which is 100 % for the training set and 92 % for the test set.

ii. Title: - Dermatological disease detection using image processing and artificial neural network.

Author: -Rahat Yasir, Md Ashiqur Rehman, Nova Ahmed.

Definition: - Skin diseases are among the most common health problems worldwide. In this article we future a method that usages computer vision-based methods to detect various kinds of dermatological skin illnesses. The system works on two phases- first pre-process the colour skin images to extract significant features and later identifies the diseases.

iii. Title:- Artificial Neural Network Models based Cardiac Arrhythmia Disease Diagnosis from ECG Signal Data.

Author: - Shivajirao M. Jadhav Sanjay L. Nalbalwar Ashok A. Ghatol

Definition: - In this paper we planned an Artificial Neural Network (ANN) based cardiac arrhythmia disease judgement system using standard 12 lead ECG signal recordings data. In this study, we are mainly interested in categorizing illness in normal and abnormal classes. ANN models are skilled by static back propagation algorithm with momentum learning rule to examine cardiac arrhythmia.

iv. Title: - Automating Skin Disease Diagnosis Using Image Classification.

Author: - Damilola A. Okuboyejo, Oludayo O. Olugbara, and Solomon A. Odunaike

Definition: -In this paper they study would focus on designing and examine system that will collate past Pigmented Skin Lesion (PSL) image results, their analysis, corresponding observations and assumptions by medical experts using prototyping methodology. Skilled medical personnel in a remote location can use mobile data gaining devices (such as cell phone) to generate images of PSL, supply such images as input to the planned system, which in turns should perceptively be able to specify the malignancy (life threatening) or benign (non-threatening) status of the imaged PSL.

v. Title: - Performance Comparison of Min-Max Normalisation on Frontal Face Detection Using Haar Classifiers.

Author: - Subrat Kumar Rath, Siddharth Swarup Rautaray**.**

Definition: - In This paper they focus on evaluating the ability of Haar classifier in detecting faces from three paired Min-Max values used on histogram stretching. Min-Max histogram stretching was the selected method for implementation given that it appears to be the appropriate technique from the observation carried out. Experimental results show that, 60-240 MinMax values, Haar classifier can accurately detect faces compared to the two values.

vi. Title: - Plaque Lesion Classification Fuzzy Model Based on Various Color Models

Author: - Yuslinda Wati Mohamad Yusof, Hadzli Hashim, Khairul Anam Sulaiman, Suhaila Subahir, Noor Ezan Abdullah and Fairul Nazmie Osman

Definition: - This paper investigates discrimination of plaque lesion from other types of psoriasis lesions using fuzzy logic technology. The proposed intelligent model can aid dermatologist in doing pre-diagnosis of psoriasis lesion particularly in hospitals that are scarce of expert persons. Skin lesions can be represented in terms of enhanced image pixel indices from various color models such as RGB, HSV and YCbCr.

vii. Title: - Dermatological disease detection using image processing and machine learning.

Author:- Vinayshekhar Bannihatti Kumar, S. Selvin Prem Kumar, Varun Saboo.

Definition: - In this research paper, we provide an approach to detect various kinds of these diseases. We use a dual stage approach which effectively combines Computer Vision and Machine Learning on clinically evaluated histopathological attributes to accurately identify the disease.

viii. Title: - Dermatological Disease Detection using Image Processing and Neural Networks

Author: - Mrs. S.Kalaiarasi, Harsh Kumar, Sourav Patra.

Definition: - In this paper the proposed system deals with the creation of an application that helps in diagnosis of Skin disease. It uses image processing and machine learning technology to detect diseases.

ix. Title: - Comparison of Machine Learning Algorithms for Skin Disease Classification Using Color and Texture Features.

Author: - Parameshwar R. Hegde, Manjunath M. Shenoy, B.H. Shekar.

Definition: - Machine learning algorithms are being used generally in biomedical fields for segmentation and diagnosis. So, selecting proper feature extraction methods combined with suitable machine learning (ML)algorithms is very vital to achieve good classification accuracy.

4. PROPOSED SYSTEM

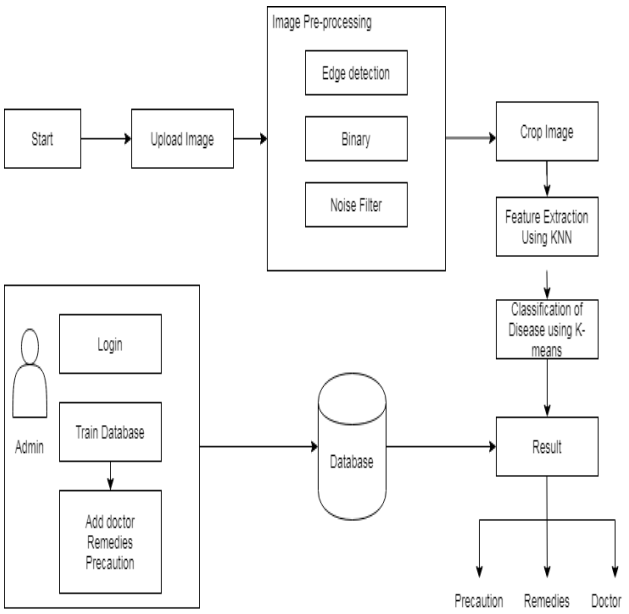

Fig -: Proposed System

The method that will be used in this research, in order to identify and understand types of skin diseases as well as study and sensed using numerous algorithms. The sequence of steps is as follows:
Step 1: Input skin bug image and read the factor of image
Step 2: Image segmentation is done active delineation method.
Step 3: Feature extraction through mathematical equation.
Step 4: ROI feature extracted in this step.
Step 5: Then by using classifier classification the disease.
Step 6: Decision takes place in this step that which type of disease is found in the infected skin image.

4.1. Proposed Algorithm

The proposed algorithm contains the some of the image processing steps.

1. The User will upload the skin image.

2. After Uploading image it will be processed by the application. In processing the image various functions will be conducted such as Grayscale conversion, Image Cropping, Noise Filter.

3. Next is Feature Extraction which includes extraction like Color Extraction, Texture Removal and combination of both

4. After Feature Extraction is Cataloguing of Disease for the User for eg. Acne, Psoriasis.

5. Step 5 comprises providing results on the basis of clarification of disease with their severity, defences to be taken and Indorsing Doctors for the Disease.

5. ALGORITHMS

- K-Means Clustering

The procedure for K-Means Clustering is given below:
1) Classify the images into K number of groups where K should be known.
2) Mark K points at randomly in cluster centroid.
3) Mapping stuffs to their closest bunch centroid.
4) Calculate the mean, centroid or perimeter of all images in each cluster.
5) Repeat steps 2, 3 and 4 until the equal points are mapped to each group.

- KNN (K-Nearest Neighbour).

In K means algorithm, for each test data point, we would be observing at the K nearest training data points and take the most regularly happening classes and allocate that class to the test data. Therefore, K characterizes the number of training data points lying in nearness to the test data point which we are going to use to bargain the class.

K Nearest Neighbors — Pseudocode

1. Load the training and test data

2. Choose the value of K.

3. For each point in test data:

- find the Euclidean distance to all training data points.

- store the Euclidean distances in a list and sort it.

- assign a class to the test point based on the majority of classes present in the chosen points

4. End.

6. RESULT & ANALYSIS

The goal of this application is to develop a system which

recognizes skin diseases and displays user the results as detected disease, remedies recommended and for that user have to upload an image then, Image dispensation starts with the digitized color image of the diseased part. Finally by smearing the KNN skin disease can be forecast. The dataset covers types of diseased skin images and also Healthy skin images. The training dataset trains the data where as testing dataset match the images. The accuracy of training is 80% whereas the accuracy of testing is 89%.

Disease name	Pixel size of image	Accuracy	Pixel size X Accuracy
Acne	256	79.1%	202.496
Amyloidosis	256	82.2%	210.432
Cherry-Angioma	256	80.2%	205.312
Eczema Lids	256	82.5%	211.2
Halo-Nevus	256	85.6%	219.136
	1,280		1048.576
Accuracy (using above 5 sample) =1048.576/1280*100=81.92%			

TAB1: - Table of Accuracy

7. CONCLUSION

A System has been successfully implemented for the identification of correct skin disease correct classification algorithm must be choose. Result accuracy will increase with image quality, and feature combinations. In this study, we compared two features for identification of disease. they are color, texture. and they classify in three different combinations with three classification algorithms. We have obtained following results: (a) KNN (b) K-Means. In future, classification algorithm can be tested with different image quality, quantity and features to achieve better identification of disease.

ACKNOWLEDGEMENT

It is ours privilege to have been associated with our guide Prof. Chandgude A.S. And also, our Prof. Chandgude A.S. Head Department of computer engineering during this project stage we work. We thankful to him for his constant inspiration and valuable guidance, carefully reading and editing our work and always boosting our confidence to complete ours work. And we too would like to thank all the staff members of the department of their continues support. We are grateful thanks to our Principal Dr. Kudal H.N. We would be failing in our duties if we do not make a mention of our family members including ours parents for providing a moral support, without which this work would not have been completed.

REFERENCES

[1] M. A. Sheha, M. S. Mabrouk, and A. Sharawy, "Automatic detection of melanoma skin cancer using texture analysis," International Journal of Computer Applications, vol. 42, no. 20, pp. 22–26, 2012.

[2] R. Yasir, M. A. Rahman, and N. Ahmed, "Dermatological disease detection using image processing and artificial neural network," in 8th International Conference on Electrical and Computer Engineering: Advancing Technology for a Better Tomorrow, ICECE. Pan Pacific Sonarga on Dhaka, 2014, pp. 687–690.

[3] S. M. Jadhav, S. Nalbalwar, and A. Ghatol, "Artificial neural network based cardiac arrhythmia classification using ecg signal data," in Electronics and Information Engineering (ICEIE), 2010 International Conference On, vol. 1. IEEE, 2010, pp. V1–228.

[4] Okuboyejo, Damilola A, et al. —Automating"Skin Disease Diagnosis Using Image Classification". Proceedings of WCECS 2013, October 23 - 25, 2013, San Francisco, USA, IAENG Open Access Publication, 24 Oct. 2013, www.iaeng.org/publication/WCECS2013/.

[5] Mrs. S.Kalaiarasi1, Harsh Kumar2, Sourav Patra3 "Dermatological Disease Detection using Image Processing and Neural Networks".

[6] Vinayshekhar Bannihatti Kumar, S. Selvin Prem Kumar, Varun Saboo "Dermatological disease detection using image processing and machine learning".

[7] Yuslinda Wati Mohamad Yusof, Hadzli Hashim, Khairul Anam Sulaiman, Suhaila Subahir, Noor Ezan Abdullah and Fairul Nazmie Osman " Plaque Lesion Classification Fuzzy Model Based on Various Color Models".

[8] Subrat Kumar Rath, Siddharth Swarup Rautaray "Performance Comparison of Min-Max Normalisation on Frontal Face Detection Using Haar Classifiers".

[9] "Comparison of Machine Learning Algorithms for Skin Disease Classification Using Color and Texture Features". Parameshwar R. Hegde Department of Dermatology and Yenepoya Research Center Yenepoya, Manjunath M. Shenoy Department of Dermatology Yenepoya, B.H. Shekar Department of Computer Science Mangalore University Mangalore, Karnataka, India.