Skin Disease Diagnosis System Using Image Processing

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ABSTRACT

Now a days skin disease are mostly found in animals, plants and humans. Almost in all ages of human beings infections related to Skin diseases can occur. The various diseases like alopecia, ringworm, yeast infection, brown spot, allergies, eczema etc. have very harmful effects towards skin and keep on spreading over the period of time. So, it becomes necessary to identify these diseases at the very primary stage to control it from spreading. In proposed system image of the skin disease will be captured using smart-phone camera. After capturing image Preprocessing and segmentation will performed on the captured image. Feature extraction method is used to capture basic features such as color, texture and shape or Domain specific features from image for indexing and retrieval. After feature extraction, classification of features can be done. In Feature Extraction, the system will compare the captured image with the training data set using Optimization image processing techniques and decides whether a skin suffers from diseases or not. If there is disease, then the system will give medical advice and it will also provide list of various dermatologist through Desktop application.

Keyword: *Preprocessing, Segmentation, Feature Extraction, Feature Classification*

1. INTRODUCTION

Skin is the largest organ present in the human body. Skin disease doesn't just affect the skin. It can have a huge impact on person's day-to-day life, crush self- confidence, restrict their movement, and lead to depression and even ruin relationship. So it is needed to take skin disease seriously. Skin diseases are very common among people of all age groups. Early diagnosis of melanoma is crucial and could lead to successful treatment in real-life, a well-trained dermatologist could reach approximately 80% accuracy of diagnosis through visual inspection with specificity and sensitivity.

So, to reduce this treatment time a diagnosis system is proposed which will enable users to detect and recognize skin diseases with the help of image processing and data mining techniques and based on the result obtained in a shorter time period than the existing methods, along with this the system will provide the user advises or treatments. The system will work primarily on the size, shape, color and local parameters of lesions with some additional Consideration of the lesion edges. The GA is also applied to identify the most discriminative feature subsets to improve classification accuracy. The proposed method works on color images by taking the HSV component and preprocessing is performed. A robust segmentation procedure is performed for the accurate detection of the lesion. For detection purpose, the morphological features like asymmetry, border irregularity, color variation and diameter are used. These extracted features help to identify the malignant lesions from the non-malignant ones.

2. LITERATURE SURVEY

Now day's diagnosis system for skin diseases is computerized. There are few solutions available which are still under research developments. Certain limitation and drawbacks are identified in those hence this solution tries to overcome the existing problems with different approach.

R.S. Gound et. al[1], has proposed system which considers a train of images that will be obtained from the user and preprocessing and segmentation will be performed on each image. Then feature extraction is done on each image to extract features that can be used to create classification model. With this classification model, system finally can predict the disease for a new image of a skin disease which will be obtained by the user through Android application. And based on this predicted disease, system will ask question from the user and based on answer, system will decide disease type. Finally, our system suggests medical treatment or the advice based on predicted skin disease result.

Er. Shrinidhi Gindhi et. al[2], constructed a diagnosis system based on the techniques of image processing and data mining. Matlab software is used to perform the pre-processing and processing of the skin images which will be obtained from the given data set.

Nisha Yadav et.al[3], presents a survey of various skin disease diagnosis systems using image processing techniques in recent times. A comprehensive study of a number of skin disease diagnosis systems are done in this paper, with different methodologies and their performances.

Seema Kolkur et. al[4], presents a comprehensive survey of texture based feature extraction for detection of skin diseases and proposes a system based on the findings.

Jyothilakshmi K.K et. al[5], proposed method works on color images by taking the HSV component and preprocessing was performed. A robust segmentation procedure is performed for the accurate detection of the lesion. For detection purpose, the morphological features like asymmetry, border irregularity, color variation and diameter are used. These extracted features help to identify the malignant lesions from the non-malignant ones.

3. SYSTEM ARCHITECURE

The proposed system consists of processes like preprocessing, segmentation and analysis, feature extraction and classification of images.
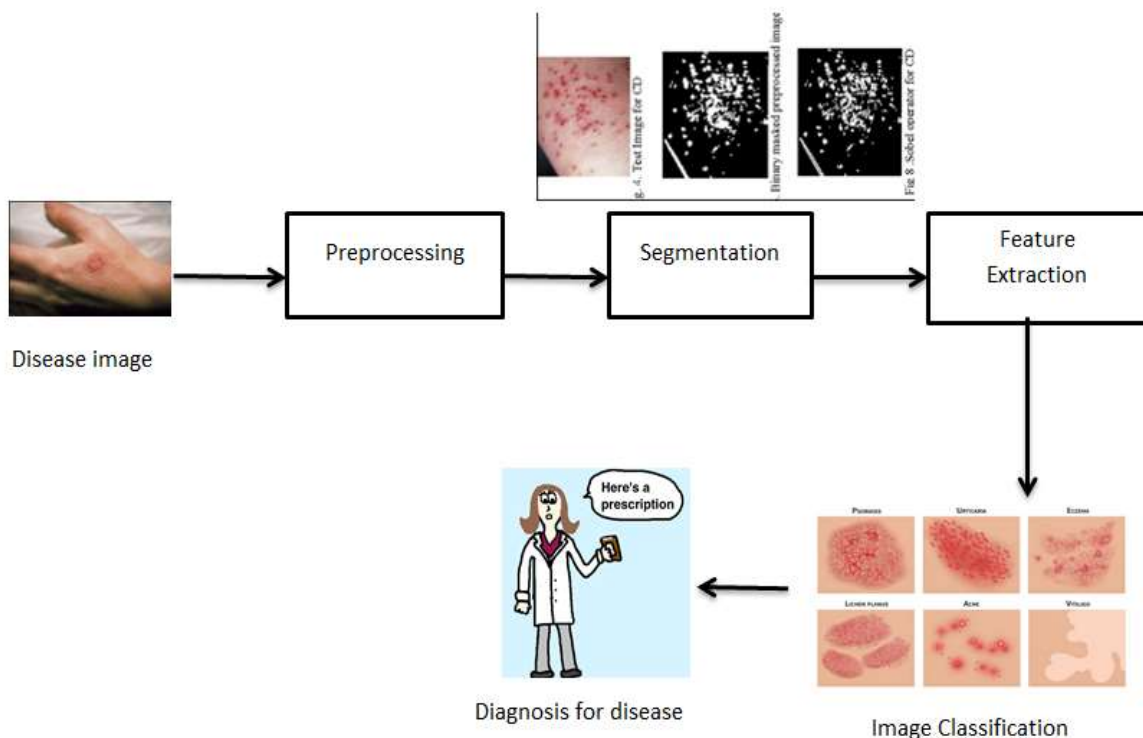

Fig- 1: System Architecture

1.1   Preprocessing

The main purpose of this preprocessing is to improve the quality of skin image by removing unrelated and excess parts in the back ground of image for further processing. The objective of the preprocessing is to perform three process stages i.e. image enhancement, image restoration and hair removal.

1.2   Segmentation and Analysis

Image segmentation is a technique to determine the shape and size of the border. It separates the object from its background based on different features extracted from the image. After removing the noise and hair from the lesion area, the lesion needs to be separated from the skin, and therefore the analysis for diagnosis is conducted purely using the necessary area.

1.3   Feature Extraction

A feature is a piece of information which is relevant for solving the computational task related to a certain application. Feature extraction is the process of extracting this information from an image. Following features can be extracted from the skin lesions i.e. GLCM Features, First-Order Histogram Features, Dermoscopic Features etc.

1.4   Feature Classification

Selected features are used for the recognition and classification of benign and malignant lesions. A wide range of classifiers can be built and used for this purpose. Classifiers such as SVM, C4.5 can be used for this purpose.

4. CONCLUSIONS

The proposed automated skin disease detection system will help the medical society for the early detection of the skin diseases. Along with skin disease detection disease related precautionary advice is also given with the help of desktop application. This early detection of disease is highlighted to help the dermatologists in improving the diagnosis time and the accuracy of their intervention. As a future work, this method can also be tested on a large dataset consisting of use of java to perform the pre-processing and processing of the skin images of the users.

5. REFERENCES

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