DISEASE DIAGNOSIS SYSTEM BY HUMAN NAIL IMAGE PROCCESSING

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ABSTRACT

In this project we are elaborating concept of disease detection of human body using nail image of human fingers and analyzing data from the image of basic of nail color. In this project the procedure of disease detection is as follows:The input to the system is a person nail image. The system will process an image of nail and extract feature of nail which is used for disease diagnosis. Here, first training data is prepared using MATLAB from nail image of patient of specific disease. A feature extracted from input nail image is compared with training data set.In this project we found that color feature of nail image are correctly matched with training set data.

Keywords: Cuticle, ESDD (Early Stage Disease Diagnosis), GUI (Graphic User Interface), Lunula,.

I.INTRODUCTION

Image processing is a method to convert an image into digital form and perform some operation on it, in order to get an enhanced image or to extract some useful information from it. There are five types of image that is TIFF (Tagged Image Five Format), JPEG (Joint Photographic Expert Group), GIF (Graphic Interchange Format), PNG (Portable Network Graphics), Row Image File.

Computer can easily classify more than 16 million colors; whereas eye capability has limitation while identifying color and also same people face the problem such as color blindness. So performing nail color analysis through computer is a superior technique as compared with human eyes. Human eyes have limited resolution , finding deviation in near by pixel intensity are not possible for human eyes, but computer vision can detect every pixel appropriately. Pathological test are complex and painful, patient must be available for pathological test ,while analysis performed by the system is calm. This system would be helpful for the patient, as patient need not to be present in person or if the doctor is not available for consultation purpose therefore just by receiving patient's nail image the doctor can diagnose the symptoms and write appropriate prescription for the disease that is being diagnosed.

The proposed system will extract color feature of human nail image for disease prediction. The system is focusing on image recognition on the basis of human nail color analysis. Many disease could be identified by

analyzing nails of human hand. In this system human nail image is captured using camera. Captured image is uploaded to our system and region of interest from nail area is selected from uploaded image manually. The selected area is then processed further for extracting features of nail such as color of nail .This color feature of nail is matched using simple training data set for disease prediction .In this way the system is useful in prediction in their initial stages.

II.BACKGROUND

There are different ways available in healthcare domain to diagnose the diseases in human body. Analysis of human nail's color is one of the ways to predict or ensure the existence of disease. Human nails plays important role for predicting diseases with nail's color changes, shape changes etc. Pink nails indicate healthy human and a particular color changes in nails indicates certain diseases. There are many diseases which can be predicted by color of nails such as pale nails indicates Anemia,Congestive heart failure, Liver diseases Malnutrition. Human nails provide useful information about disorders or any nutritional imbalances depending upon their shape, texture and color.40

Figure 1: Part of nail

a.Parts of Nail

Lunula: It is the moon shape observed at the base of the nail plate but not always. Cuticle: Over the base of the nail plate the flat of thin tissue is called Cuticle. Nail Root: the proximal end of the nail under a fold of skin. Nail Plate: It is smooth, curved and light pink in color. It is the visible part of the nail.40

b.Nail Color Implications

Pink Nails: Pink color nail indicate healthy nails which in turn indicates good health symptoms.

White Nails: Lack of iron and poor circulation, in which the blood is not reaching the end of your fingers, are resulting into white nails. It indicates anemic conditions. **Red-purple nails:** An upset digestive system caused by over consumption of sugar pharmaceutical drugs, fruits and juices results into red-purple nails. **White Spots:** White spots in nails indicate high content of sugar and lack of zinc which is required in the digestion process.

III.METHODOLOGY

The system which is shown in below gives the disease diagnosis system by human nail using image processing. Matlab is a heart of early stage diagnosis system. The block diagram of system give whole idea of system. In this system we are getting the result with the help of GUI (Graphical User Interface) only for GUI system code is necessary to implement it .
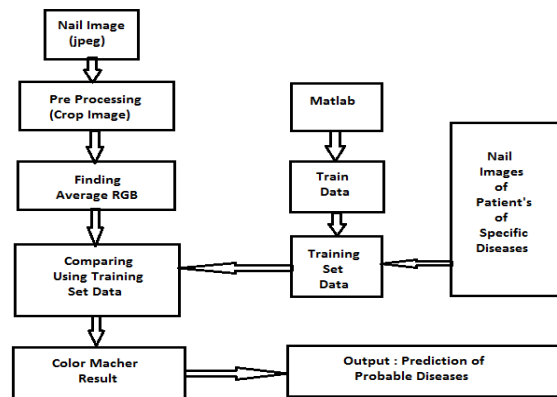
a. Proposed System

Fig 2:ESDD System Architecture

b. System Descriptions:

- Image is captured by digital camera or mobile .This image is considered as input image this image is in any format like jpeg .For processing first we have to crop that image in proper block to extract it's features.

- Then by extracting it's features find out it's RGB value that is Red,Green&Blue plane value with the help of GUI we are creating the buttons are as follows :

  i.Select Image

 ii.Calculating Parameter

iii.Classify

iv.Exit

- Under this four buttons we are getting our result .In first button we are taking capture the image which is to be cropped in proper manner.Then under this button we are going to write correct code to run this button and show the input Image.

- Then for comparison purpose we have to first calculate the parameters.There are twelve calculating parameters with the help of this we can compare properly.Then next we are collecting data of various patient and also healthy person then give proper   limitation to that disease.

- Then finally compare our train data set with our input image parameters then under classify Button we get the percentage of this image to match the limitation of proper patients diseases.Then under this classify button write proper code to get proper result and show the proper disease which that person has.Then under exit button also write code to exit this process and finish it.

IV.EXPERIMENTAL RESULTS

We are using MATLAB to process our project.The version of matlab is R2014.In that ESDD system tested with more than 100 nail image samples of persons captured by digital camera as well as mobile camera this input image is processed under ESDD system and get proper output

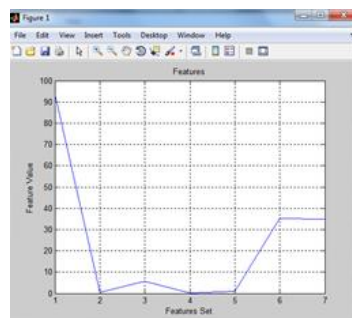a.Input Image : The image is captured by using digital camera as well as mobile camera.
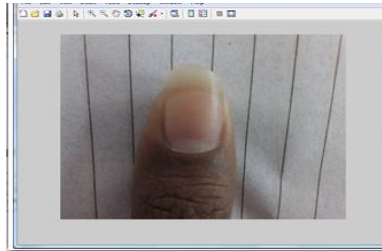
Figure 3: Input Image of nail

b.Crop Image: On the command window we have to write proper code to crop that image
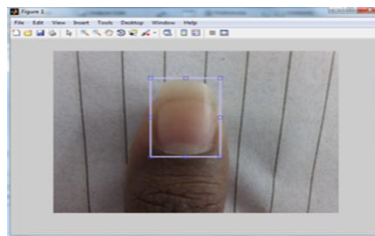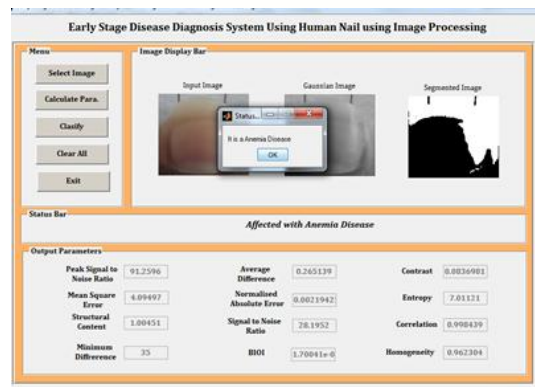

Figure 4: Cropped Image

c.CalculatingParameters: On GUI under the calculate parameters button we have to write code to get these parameter's average.

Figure 5: Graph of calculating parameters

d.Output : Under the classify button on GUI writing code to get proper disease name.

Figure 6: Output GUI on MATLAB

V.CONCLUSION

There are five main parts of nail namely lunula, cuticle, nail root, nail plate, nail lines out of which we used nail plate is used in ESSD system. In presented system, system analyzes the human nail and gives probable disease for person including healthy case. Here, for disease prediction nail color (average RGB) value used as a nail feature. This model gives more accurate results than human eye like subjectivity and resolution power.The human health condition can also be identified by using sense organs like eyes, tongue, skin, toe nail etc. This may give more accurate result for identifying human health condition.

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