Automated Prediction System For Various Health Conditions By Analysing Human Palms And Nails Using Image Matching Technique

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Abstract— In recent years, palm print identification technology has been widely carried out and used in fields such as identity recognition. At the same time, some features of palm and skin vividly reveal information about diseases and health condition of the human body. We can research the application of palm diagnosis in traditional Chinese medicine with the help of digital image processing technology. In the field of medical science, practitioners observe nails and palm of patient to get assistance in diagnosis of the disease. Also human eyes have some limitations in case of minute observations. A branch of palmistry, known as medical palmistry is one branch where scientific study of human palm and skin is done to identify or predict the diseases. It has been found that today computers are used in healthcare domain for storage purpose but not for taking decision regarding diagnosis or prediction of diseases, i.e. the experts, who can predict or identify the disease by observing color of nails and palms, do not have support of computer system. To bridge this gap, the model of decision support system for healthcare based on medical palmistry using the techniques of digital image processing and analysis is designed and implemented to identify or predict the disease.

Index Terms—Back propagation Neural Network, Digital Image Processing Technique, DDS, Medical Palmistry, Nail Color and Diseases, Palm Textures, Skin Type

I. INTRODUCTION

Palmistry is a branch of science which can forecast the future of an individual authentically. Medical palmistry is a branch of palmistry, which helps in the identification of some diseases by observing nails colors and palm textures to indicate specific diseases, based on their position on lines, mounts and fingers. According to some principles of medical palmistry, there are symbols like Iceland, cross, star, square, spot, and circle.

If one or more of them is/are found on specific region of palm it indicates that there occurs a probability of disease of respective organ of body[1] [2].

Apart from symbols, color of nails and skin type also plays an important role in making decision. The color of nails is observed by many doctors to get assistance in disease identification. It is possible to observe color of nails by naked eyes, but it may become subjective. Computer vision helps us to determine this color without any subjectivity[3].Usually, pink nails indicates good health. But, some color of nails indicates certain diseases. For example, (i) a faded pink color of the nails indicates anemia, heart failure, malnutrition, and liver disease. (ii) white nail with dark edges indicates problems with the liver, such as hepatitis. Apart from these examples, different colors of nails indicate particular diseases which are studied in medical science.
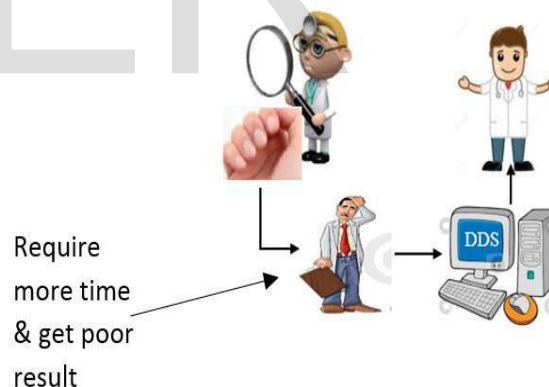1][2].

Fig. 1 Need Of Project

In Traditional System there are doctors who can predict the diseases based on the nails but they require more time & also they get poor result So to overcome that problem we design new system called Disease Detection System(DDS) it will give better result in less time. The system uses digital image processing and analysis techniques to identify such colors of nails. This paper presents an approach towards diagnosis of diseases based on palmistry. DDS increases accuracy of such observations of palm and nails.DDS applies digital image processing techniques on input palm images to identify certain features in the image using MATLAB. By using knowledge base of medical palmistry it analyzes certain features in image and predicts probable diseases and provides preventive measures for the same.

II. RELATED WORK

This section gives idea about existing decision support systems in medical science and prior work done in the area of digital image processing for medical science domain.

An algorithm is proposed which is used to identify the color of nail, without manual interruption. To start the process, the human palms are scanned i.e. left and right,from front and back side, using scanner. The model separates the palm from its background using model for extracting a portion of given image using color processing[4].

Different regions of our palms reflect different organs' condition. If corresponding pathological palmprints appear on certain visceral reflex region, or the color of the region's palm skin changes, for example, it turns red or other abnormal colors, you might have problems with your corresponding viscera. Here is an example of a certain disease: cross shape palm print appears in Heart Region and there are cyan vessels and red color spots around the cross shape palm print. Eighty percent of people with these symptoms have arrhythmia. In the palm diagnosis, doctors who master the diagnostic criteria can get information from your palms[5].

ROI (Region of Interest) is usually chosen the center area of the palm, reducing unwanted noise and the complexity of follow-up matching algorithm to achieve orientation independence of the match and to ensure the accuracy and the effectiveness of identification systems[6].

An Automated Medical Palmistry System (AMPS) as an application of digital image processing and analysis technique. This can be useful in healthcare domain to predict diseases for human being. The images of human palm form input to the system. Then, the system applies the digital image processing techniques on input images to identify certain features in the image and by using the knowledge base of the medical palmistry it analyzes certain features in image and predicts probable diseases.[7].

III. REVIEW OF EXISTING SYSTEMS

Since historical past, people form different civilizations like Indian, Chinese, Roman and Greek, used to get an idea about their present and future with the help of Palmistry. "Palm Reader", who is a human being used to predict attributes of human, like: health, psychology, intelligence, and lifestyle and other related entities based on his/her knowledge[8].

Various web applications have being developed for palmistry. Here it is possible that image may be degraded during file transfer. Also human perception has some limitations in case of image resolution, object identification and color perception[8].

Coming to Mobile Application based applications, in this sample images of palm are displayed and users have to compare their own palm with the most accurate sample image. Predictions are displayed based on the selection of image by user. The user is responsible to identify the nearest matching image. It is difficult task for user to compare the sample image with his/her palm, because each person has different set of symbols and lines on palm. If user fails to select the corect image, then wrong predictions may be generated. Using Image Processing and Analysis (IPAA) techniques, a system can be developed to overcome these limitation, and predict the diseases based on medical palmistry automatically[9].

IV. MEDICAL PALMISTRY

The hand is the part of human body, the main agent of the passive powers of the entire body. Among all branches of the study of human nature, hand has the most powerful claim. By it one can not only detect the faults in mankind, but the way in which those faults may be redeemed. Palmistry should really mean the study of the hand in its entirety. It is divided into two sections: the twin sciences of cheirognomy and cheiromancy. The entire study of palmistry includes observation of palm type, nail type, nail color, skin color, palm surface, palm muscles, lines in the palm, presence of certain symbols and their position in the palm, mounts in the palm, fingers, and thumb.Here we mainly focused on color of the human nails & textures on the human palm.
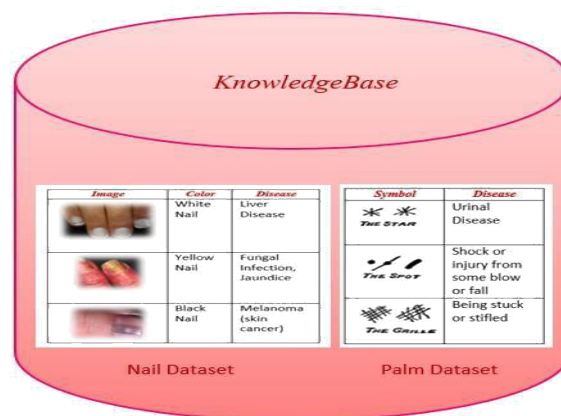

Fig. 2 Knowledgebase of Nail & Palm

A. Symbol In Human Palm That Indicate Certain Diseases

Fig.3 shows the list of Symbols on human palm which indicate specific diseases, based on their position on lines, mounts and finger's Island[1-3].
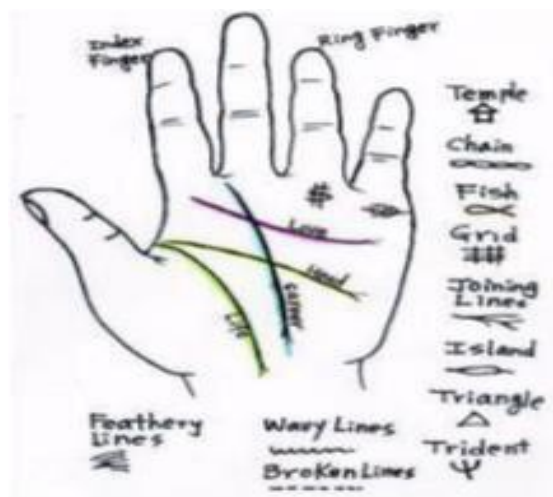

Fig. 3 List of symbols on Human Palm

TABLE I: SYMBOLS IN HUMAN PALM & PREDICTION

Symbols	Prediction
Chain	Lack of concentration, fluctuating alternation
Spot	Bright red spot on the line of head indicates a shock or injury from some blow or fall
Triangle	Creative, success in scientific research
Feathery line	Anxiety and worry
Square	Detention or incarceration
Island	Inherited heart disease, headache, dissipation of energy
Fish	Sinusitis type of problem, incident of drowning
Star	Injury on head, sudden death, poisoning at age specified
Grid	Being stuck or stifled
Broken lines	Disappointment and rejection, injury to head
Dot	Acute illness or accident
Tassel	Weakening of mental clarity, deteriorating heart condition
Traverse line	Obstacles and failures in one's career
Grille	On the mount of venues indicates probability of problems with reproductive system
Star	Star on the mount of moon indicates probability of ascites, or urinal diseases.

In additions to these symbols/marks there are some other patterns like cross, circle, etc. They are more related to nature and psychology of a person rather than physical characteristics[10].Above these methods there are some neural network back propagation Algorithm used to bring out the efficiency to 90-95 of the whole disease prediction system[11].

B. Colors Of Human Nails That Indicate Certain Diseases

Usually, pink nails are indicators of good health. But, certain color of nails indicates certain diseases.

TABLE II: COLOR OF HUMAN NAILS & PREDICTION

Nail Color	Prediction
Blue nails	Represent a high level of an abnormal form of hemoglobin in the circulation.
Black nails	Signs of Anemia, bacterial infection, liver disease.
White fingernails	Signal a protein deficiency.
Grey nails	Arthritis problems, malnutrition, lung problems
Green nails	Bacterial infection such as Bacillus infection.
Yellow nails	Problems with the lymphatic system, respiratory disorders, diabetes or liver.
Purple nails	Oxygen deprivation, circulatory problems, congenital problems.
Red fingernails	Possible Brain haemorrhage, heart disease, high blood pressure
Darkening of nails	Kidney disease
Dull nails	Deficiency of vitamins

Apart of these examples, different colors of nails indicate particular diseases which are studied in medical science.

V. PROPOSED SYSTEM

In Traditional System, doctors can predict diseases by analyzing human palms because Palm prints are changing, these changes are related to physical condition changes caused by diseases or psychological and environmental factors but they require more time for that & also they get less efficient result.So with the help of proposed system doctors can predict diseases by analyzing human palm and nails because different nails colors & textures on the palm also can be indicate different diseases.The proposed system is not going to replace doctor but it can become supporting system for doctors to handle the patients.

The proposed system needs high-resolution images and precision images, so that tiny fills from main lines can be distinguished and colors can be recognized correctly.The system takes an input as human nail image/palm image by using High definition Camera or it can also use scanner to capture the image of nail/palm.Specifically Flat bed scanner is gives better result of image.The image which is capture using the Flat bed Scanner having more accuracy than any other.Once input imge is taken it applies different algorithms as described below to process that image.Fig 4 & 5 describes the steps for processing nail & palm image respectively.
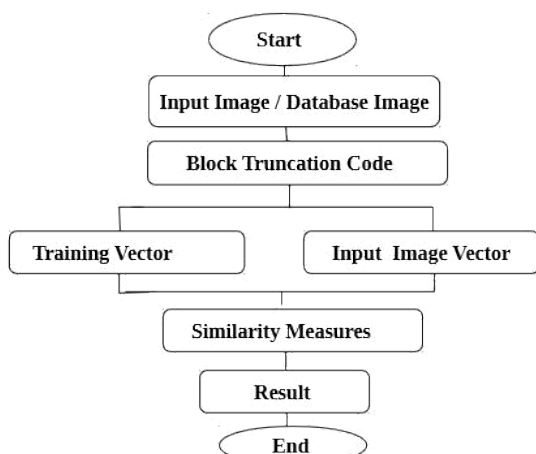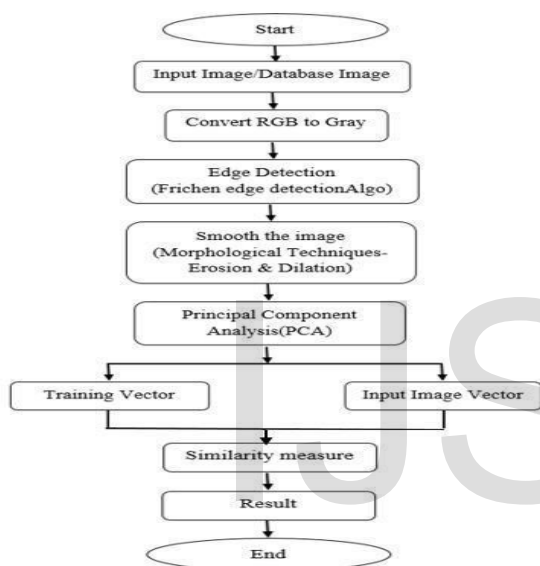
Fig. 4 Steps to process Nail image

Fig. 5 Steps to process Palm image

First of all, convert the RGB images we acquired to gray- level images. We don't need color information when extract palm and nails .from palm images and fingers images ,and the amount of information is reduced in gray-level images, also calculation decreases.We can use average method or weighted method for this conversion.

Input Image   Gray scale image

Fig. 6 RGB to Gray Conversion

It's hard to avoid noise while capturing images, and noise can affect the image processing results in subsequent steps. Most noises of gray-level image are at the edge of the image and edges of the image are at high frequency band, so most noises are high-frequency noises, for this purpose can use morphology techniques.After converting into grayscale image we can apply frie-chen edge detection algorithm on palm images.Principle of component analyses can be use for vector generation then we compare these generated vector (Input image and database image) using similarity measures and obtain the result.we can apply Block Truncation coding on nails images is a type of lossy image compression techniques for grayscale images.It divides original image into block and then uses a quantiser to reduce the number of gray levels in each block .

VI. CONCLUSION

This paper proposes a new approach in the field of Medical Palmistry with the help of Digital image processing and analysis technique. DDS allows users to diagnose the diseases in human body by taking image of users palm & nails as input. Then, system applies digital image processing and analysis techniques and uses knowledge base of medical palmistry on input images to identify certain features in the image. In this paper, prediction is made on several symbols (see Table 1) for palm images & color (see Table 2) for nail images.By using the distinguished characteristics of human palm regarding to nails & palm, the algorithm is designed and implemented, which successfully gives average color of nail of each finger & textures contained in the human palm. Using this algorithm the computer system would be able to predict some specific diseases which could be identified by observing nails & palm, as mentioned in introduction part of this paper. Hence, the system could be useful in healthcare domain, especially in routine checkups. So, the diseases could be caught in their initial stages.

Scope of DDS can be further extended by trying out DDS for images of different type of people, increasing the number of symbols & nail colors to be detected and show the future of an individual along with medical prediction. Also DDS can outspread to embrace numerology and graphology methods for prediction.

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