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An Automated Medical Support System based on Medical Palmistry and Nail Color Analysis

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***Abstract*— In an Automated Medical Palmistry System (AMPS) as an application of digital image processing and analysis technique can be useful in healthcare domain to predict diseases for human being. The proposed work is based on design and implementation of an automated system to detect various health conditions of patients. The images of human palm and nails will be the input to the system. By applying digital image processing techniques on input images, certain features in the image will be identified. The knowledge base of medical palmistry will be used to analyze certain features in images and prediction probable disease.**

Keywords— *Automated Medical Palmistry System* **(AMPS);** *Image Processing***;** *Palmistry***;** *Prediction***.**

I. INTRODUCTION

Palmistry is in itself a complete science which can predict the future of an individual authentically. Medical science has progressed in great ways and has developed numerous methods for identified of diseases in human body. There are many things in human body through which we can identify the human health like, eyes, tongue, skin, human palm, palm color, human palm nails etc. There are numerous testing techniques for diagnosis of diseases which are followed by medical practitioners using pathological tests. Mostly these test involves taking blood samples, urine samples etc. which are very costly and requires the patient to be present physically [1].

Medical palmistry is one part of palmistry, which works on predict of probable diseases by scrutinizing nails of hands and identify human palm to indicate certain diseases, based on their position on mounts, lines, and symbols on specific area of the palm and fingers. One can predict probable disease through nail on the basis of different colors of nail. According to principles of medical palmistry, there are some symbols like Iceland, cross, star, square, grill, spot, and circle. If one or more of them is/are found on specific region of palm, or on specific line of palm, it indicates probability of disease of respective organ of body[2].

Apart from symbols and nail color , color of palm and texture of palm plays crucial role in identifying human health. The color of palm, texture and nail is rigorously used to find out physical condition of human health by several doctors to get help in unwellness identification. It is very subjective to human eye to observe color of palm and nail by naked eyes. Computer vision helps United States to work out this color

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The proposed work is focused on symbols, texture and color of palm, color of nails. On the basis of this 4 parameter, the system predict the human health condition. To handle the unknown patterns of the parameter, Neural network is used here. The use of neural network offers a solution to handle uncertain and definite information.

SYMBOLS IN HUMAN PALM THAT INDICATE CERTAIN DISEASES [2]

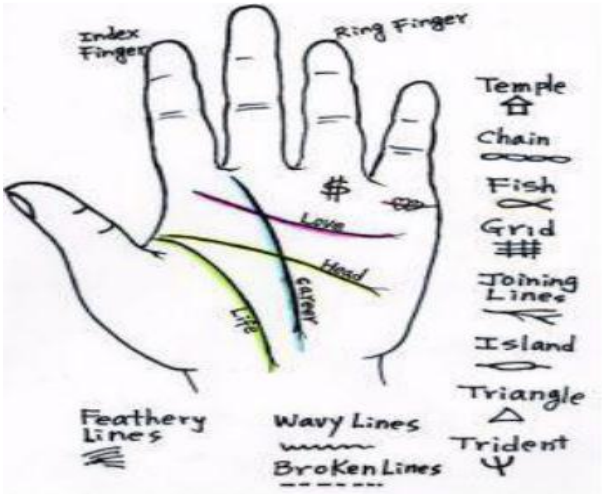

Fig.1 List of symbols on Human Palm

Table 1. lists the symbols in human palm and describes prediction of diseases for the given symbol [2].

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
Island	Inherited heart disease, headache, dissipation of energy
Star	Star on the mount of moon indicates probability of ascites, or urinal diseases
Grille	On the mount of venues indicates probability of problems with reproductive system
Traverse line	Obstacles and failures in one's career

The paper is organized as follows: Section 2 presents Literature Review. Section 3 presents the Proposed System and final conclusion is given in section 4.

II. Related Work

Disha Desai, Mugdha Parekh, Devanshi Shah, Prof. Vinaya Sawant, Prof. Anuja Nagare et al [2].
In this paper, an Automated Medical Palmistry System (AMPS) is used as an application of digital image processing and analysis technique. This system can become very useful for human being to predict probable disease. The images of human palm form input to the system. Then, system applies digital image processing techniques on input images to identify certain features in the image and by using knowledge base of medical palmistry it analyzes certain features in image and predicts probable disease**.** prediction is made on several symbols (see Table 1) for 100 palm images. The experimental results demonstrate that AMPS is reliable if the images represent a distinct view of the palm and are of 300dpi resolution or more.

Hardik Pandit, Dr. Dipti Shah et al [4]. This paper discusses a model of nail color analysis for prediction of diseases using digital image processing. The model is a prototype which observes the color of nails of human palm on the basis of the principles of medical science, and predicts probable diseases, if any. Medical practitioners often observe nails of human palms to get assistance in prediction of diseases. The proposed model does the same job without any human intervention. The model gives more accurate results than human vision, because it overcomes the limitations of human eye like subjectivity and resolution power. This paper demonstrates the model developed for nail color analysis. This fully computerized model works successfully. It is quite useful to avoid human eye limitation as mentioned earlier for analyzing color of nails of human palm. Doctors can use this model to have assistance in disease identification. Other users can also get advantage of this model as a type of routine checkup.

Dr. Hardik B. Pandit and Prof. Dipti Shah et al [5]. This paper explains a prototype based on digital image processing and analysis in field of healthcare. In medical science, color of human palm is carefully observed by doctors to get primary idea about health of the patient. Different colors of palm specify certain diseases. Human eye has limitation in identification of colors and resolution. Computer can help here to analyze color of human palm using digital image processing techniques. The working prototype is fully automatic, i.e. there is no human intervention in the process of color analysis. The prototype is working successfully to analyze palm color. It gives results which are easy to understand by the user. Thus, using this prototype it is easy to overcome the limitations of human eye for color identification and getting better assistance in decision making activity by medical practitioners.

Vipra Sharma and Manoj Ramaiya et al [1].In this paper we are elaborating the concept of disease detection in the human body using the nail image of human fingers and analyzing the data from the image on the basis of nail color and texture. Fingernail has to be detected from the entire hand region using distribution density of the nail color pixels on the surface of nail. The methodology for creating a finger nail detection system involves removing the skin area from shiny/glossy nail portion; this is known as image segmentation concept that separates the specific object. Image segmentation is the method of dividing the image pixels into homogenous region. Nail Color and Texture analysis that are performed using Matlab tools can be regarded as the basis for determining the kind of disease that is present in the human body.

Noriaki Fujishima, Kiyoshi Hoshino et al [6].In this paper, some fingernail areas cannot be extracted as nail candidate areas if they don't reflect enough light toward the camera. The authors found it a key to solve this problem to use the distribution of colors. The authors propose a new nail area extraction using this. They evaluated the entire system and compared with the previous system [2]. As a result, They confirmed that the system using the proposed method could detect only fingernails at least 85% from -90 to -50 degrees and from 50 to 90 degrees and worked well from -50 to -30 degree compared with previous study.

Following table 2 shows study of five papers related to Disease Prediction systems:

Table 2. Survey Table

Sr. No	Paper Title	Techniques	Advantages	Disadvantages
1	Application Of Digital Image Processing and Analysis in Healthcare Based on Medical Palmistry(2011)	IPAA (Image Processing and Analysis)	Use to Predict some major diseases	More Processing time and consider only 5 symbols
2	Automated Medical Palmistry System based on Image Processing Techniques. (2015)	AMPS (Automated Medical Palmistry System)	Considered 15 Symbols And Increase in speed	Captured Image must have High Resolution
3	The Model of nail color analysis – An application of Digital Image Processing. (2013)	Digital Image Processing	Overcome the limitation of human eye like subjectivity	Don't consider thumb Nail
4	Fingernail Area Extraction Using Distribution of Colors.(2014)	Nail Area Extraction	It gives Smooth Image	-
5	Nail Color and Texture Analysis for Disease Detection. (2015)	image segmentation	It can easily classify more than 16 million colors.	Polished Nail will not be considered for analysis

The above table shows the Literature review of the existing papers. All this Papers have different parameter to predict health condition of human. By doing survey of all this papers, We are going to proposed an idea which is more relevant to predict human health condition. Above paper separately considered the parameter but in this paper all the parameter are considered combine. Due to this the accuracy of predicting diseases are increases. Medical field require more accuracy so this system is very useful for Doctors and users.

III. Proposed System

Proposed system is shown in fig.3.This system is use to predict probable disease. In this system user accept the input image as human palm and nail through the flatbed scanner. First it extract the edge of the palm and then try to extract symbols from the edges. According to the symbols it predict the probable disease.
Same processing with Nail image, first region of Nail is extracted and color analysis algorithm is apply for identify the probable color and predict disease through nail color. Palm texture and color is also use to identify the disease.
Neural network is use for the accuracy purpose, it helps for unknown patterns.

Proposed system shown in Fig. 1 consists of the following step.

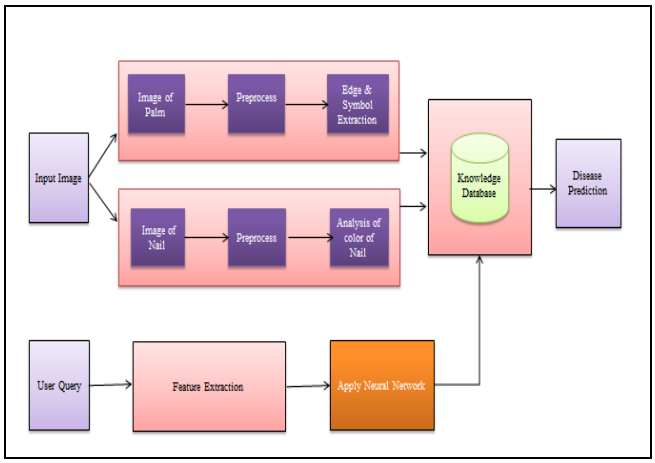

Figure 1: Architecture of Medical Support System based on Palmistry and Nail Color Analysis.

Knowledge Database- Database will be created through Doctors and other from useful websites. First we have collect all the samples of affectect Palm and Nail. Through trial and error we will collect database.

Feature Extraction- In this system, feature of palm and Nail are extracted. Palm feature like edges, symbols, color and texture. And Feature of Nail contain Region of Nail(ROI) and Nail color analysis. Edges are extracted through Edge Detection Algorithm. There are many edge detection algorithm like sobel, Canny, Robert, and Previtt etc.
In this Paper we are going to use sobel Operator for Edge detection. Initially image gradient is calculated in X direction and Y direction and finally gradient magnitude is calculated using the formula shown below,

$$G = \sqrt{G_x^2 + G_y^2}$$

Where, G_x is the image gradient in x direction whereas G_y is the gradient in y direction. G is the gradient magnitude of an image.
Symbol extraction is carried out further. Extraction of symbols like Iceland, cross, star, square, grill, spot, and circle.

Neural Network- This algorithm has neural learning methodology which has desired to provide rules from learn weight.

IV. Conclusion

This paper presents the An Automated Medical Support System based on Medical Palmistry and Nail Color Analysis. To obtain the acuracy of system for disease prediction we apply Digital image processing techniques with Neural network.

In proposed system, different parameter like Palm symbols,Palm color,Palm texture,Nail color and Nail texture are considered to predict probable disease.It first extract the feature of the palm and nail and apply Digital Image Processing technique and Neural Network Algorithm it predict the probable disease.

The knowledge dataset will be created through real time data which will be collected through doctors and natural health care site and many other useful websites. The accuracy of proposed system is obtained through neural network algorithm, because it trains a large database for each iteration.Training the dataset is most crucial part of the system to gives accurate prediction of diseases.A system is useful to the doctor for assistency .It saves cost and time of the user.

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