

Enhanced Approach for Disease Detection and its Prescription

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Abstract: According to the world health organization there should be a minimum ratio between doctors and patients which is one as to one thousand respectively. In India this ratio is one as to one thousand and seven hundred so there are seven hundred citizens in India who do not get a proper medication. Union health ministry of India claims that India would need four lakh more doctors up to 2020. To fill up this deficiency I proposed a prototype which will detect the disease and prescribe a proper medication for that particular detected disease. Medical professionals detect most of diseases on the basis of symptoms and signs of that disease. So collecting the symptoms of various diseases from an experienced doctor we can easily detect the disease. We cannot use only one method for detection. To pinpoint the exact disease which is acquired by the patient we have to use multiple methods.

Keywords: ANN, Feature extraction, Image processing, LPC2148.

I. INTRODUCTION

The population density of India has increased from 325 person per square kilometer to 382 person per square kilometer according to the census of 2011. As compared to the other nation this population density is quite high which create multiple problems for developing India. One of those problem is providing proper medication or proper medical treatment to all the population of India. As I mentioned earlier that India is facing a big problem regarding to the deficiency of doctors. Nearly two million children under five die every year in slums of India due to lack of doctors. So I designed a system which will provide a helping hand for patients as well as medical professionals. Mostly doctors use symptoms and signs to detect any type of disease. So the designed system collects and extracts the different features from the patients and narrow down the disease.

As I have not used singular method for the feature extraction the accuracy of the system increases exponentially. As the accuracy increases system programming becomes more complicated. To solve this problem I have used ANN for programming. All the symptoms are processed and given input to the ANN. In ANN all the data about different diseases and its prescription is stored, According to that data and processed input data ANN detects which disease does patients have according to that disease it prescribe the medication for that.

II. LITERATURE SURVEY

India's rising status as an economic superpower is masking a collapse to stem a shocking rate of infant deaths among its poorest people. almost two million children under five die every year in India – one every 15 seconds – the highest number anywhere in the world. further than half die in the month after birth and 400,000 in their first 24 hours. A overwhelming report by Save the Children,

reveals that the poor are disproportionately affected and the charity accuses the country of failing to provide satisfactory healthcare for the impoverished majority of its one billion people. Neonatal diseases, Malnutrition, diarrhea and pneumonia are the main causes of death. Rural states are mainly affected by a lack of health resources. But still in the capital, Delhi, where an predictable 20% of people live in slums, the infant death rate is reported to have doubled in a year.

There is single doctor per 1,700 citizens in India; the WHO tells a minimum ratio of 1:1,000. the Union Health Ministry figures claim that there are about six to seven lakh doctors available, India will be needing about four lakh more by 2020—50,000 for PHCs; 0.8 lakh for community health centers ; 1.1 lakh for 5,642 sub-centers and another half lakh for medical college hospitals.

If shortage of medical professional is one difficulty, their unwillingness to work in the undeveloped area is another, creating artificial lack in the area and high absorption in another, admit Union health ministry officials. In rural areas and tribal areas of the state, there is lack of doctors and specialist professionals besides an acute shortage of well-trained medical staff, as well as nurses. In 1,709 PHCs and 186 CHCs in Andhra Pradesh, there was 140 band 322 vacancies respectively [3].

The government admits the grim images in the rural areas, regardless of the success of the National rural health mission (NRHM). Shortage of human resources is a upsetting feature of India's healthcare services. Even the Planning Commission has accepted that availability of health care services is quantitatively inadequate. According to Union health ministry data, the current doctor to population ratio is 0.5: 1,000 and the target by 2025 is 0.8: 1,000. In the current scenario of doctor to population ratio, the quantity of doctors required in the

rural areas was large and target of one doctor for 1,000 populations cannot be achieved before 2020. After detailed inputs from various working groups, the MCI came to a consensus that the targeted doctor-population ratio of 1 per 1000 would be achievable by the year 2031. According to the 12th Plan document, 6, 91, 633 physicians were available during the 11th Plan and expected availability for the 12th Plan by 2017 is 8, 48, 616 at one year capacity of 42,570 doctors.

To overcome this problem I have designed a system that uses different disease detection technique and also prescribes medication on that disease. B.sarita (2013) [2] presented God's algorithm for tongue feature extraction for detecting disease related with different portions of body. the advantage of using this system is we can pinpoint exact disease related to specific part of the body.

III.SYSTEM FLOW

The overall system works on three important processes which are mentioned below:

A. Extracting the symptoms from patients

A series of questions is asked by the system to the patient. Questions about headache, shivering, joint pain, loss of appetite, fatigue etc. When patient gives answers of these questions the binary data is generated in ANN. According to that the body temperature, Heart rate of the patients is also calculated by using respective sensors.

B. Tongue feature extraction

The feature extraction of tongue is very important part in this system just looking at the colors of different part of tongue we can figure out exactly where is the problem lies in patients body. For the feature extraction I used algorithm which is mentioned below:

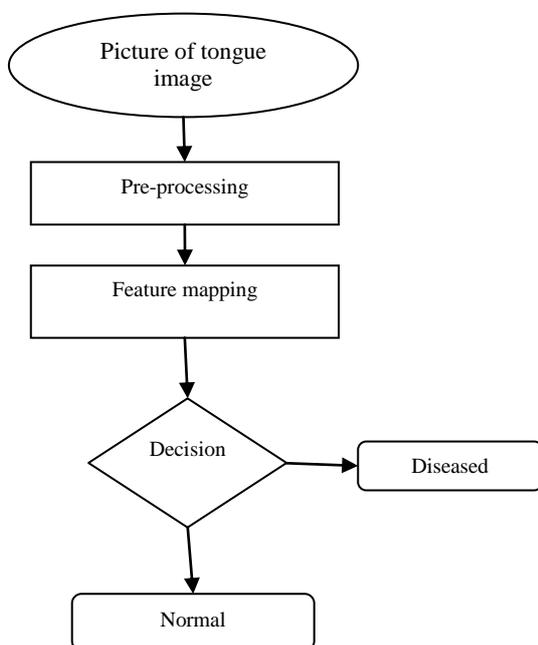


Fig1. Flowchart of tongue feature extraction

Step 1: from the camera it captures the image of tongue.

Step 2: it pre-process that captured image and make it ready for feature extraction

Step3: in this step actual feature mapping takes place redness of tongue is extracted

Step 4: on the basis of extracted feature the decision is made.

C. ANN

In this step the all the information which is acquired from the above two steps is collected and processed, according to the stored data which is acquired from the experienced doctor it will detect the exact disease acquired by the patient.

IV. SYSTEM DESCRIPTION

The system requires some inputs from the patient such as tongue feature, body temperature of the patient; heart rate and some of the questions asked by the system are to be answered by the patient. After processing these inputs are given to ANN where doctor's database is already stored. Here after all the information provided, the system displays the disease from which the patient was suffering from, and the prescription is also been displayed on the screen. This is done by ANN, it looks for correct disease by matching with the symptoms and signs of the patient and thus output is produced.

It becomes easier for ANN to find the symptoms in binary format, for example let us consider the disease 'Common Cold' as shown in the table beneath; so when ANN detects '01010010' this binary stream it becomes easier to find out the exact disease, in this case it is common cold. Component of the systems are mentioned below:

TABLE I

Disease	symptoms							
	Headache	Cough	Indigestion	Nasal discharge	Shivering	Fatigue	Watery eye	vomiting
Common cold	0	1	0	1	0	0	1	0

A. LM34

It is temperature sensor which is used to measure temperature in Fahrenheit. LM34 is interfaced to the LPC2148 for processing the signal and this information is given to the ANN. LM34 is used because doctors counts body temperature in Fahrenheit scale which is more accurate and having the large range.

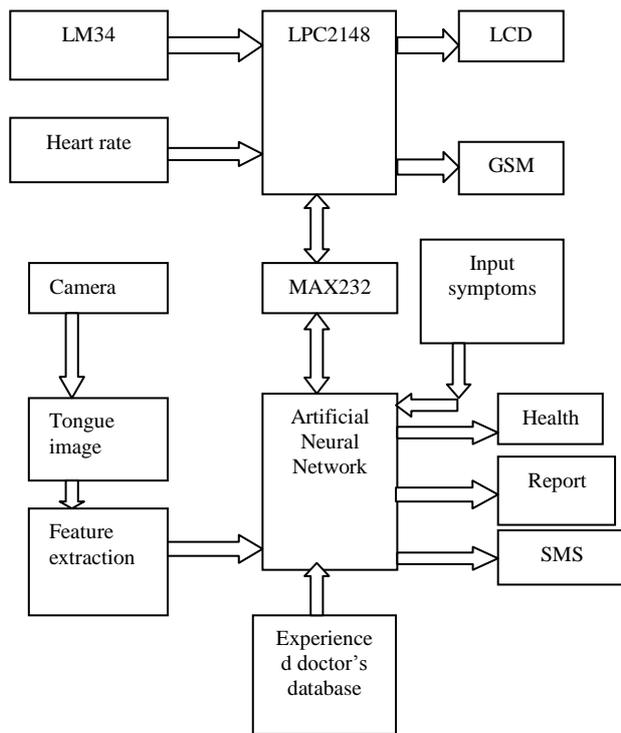


Fig.2. Block Diagram of System

B. Heart Rate Sensor

It is used to measure the heart bit of the patient, by putting the finger on it. Basically it is a comparator, whenever fluctuations happens in the blood stream due to heart bit it count that.

C. Camera

Camera is used for the tongue feature extraction and for taking the picture of the patients.

D. LPC2148

Here LPC2148 processor is used for interfacing the various component like temperature sensor LM3a, heart bit sensor etc. It also provides ease for processing the data.

V. SYSTEM FLOWCHART

Various steps involved in system are explained below:

- Step 1: In this step some questions are asked by the prototype to which patient have to answer.
 - Step 2: In this step input stimuli of the patient is taken such as temperature of the patient, heart rate etc. and all this information is given to ANN.
 - Step 3: The data from the patient and from tongue feature extraction is given to ANN to find out the disease.
 - Step 4: ANN judge against the database if disease is detected then it prescribe the medicines for that disease, if not then it stops
 - Step 5: SMS is sent to medical professional about symptoms of the patients, detected disease and prescribed medicines to check whether it is right or not.
 - Step 6: History of all checked patient is stored.
- The flowchart of the system is shown below:

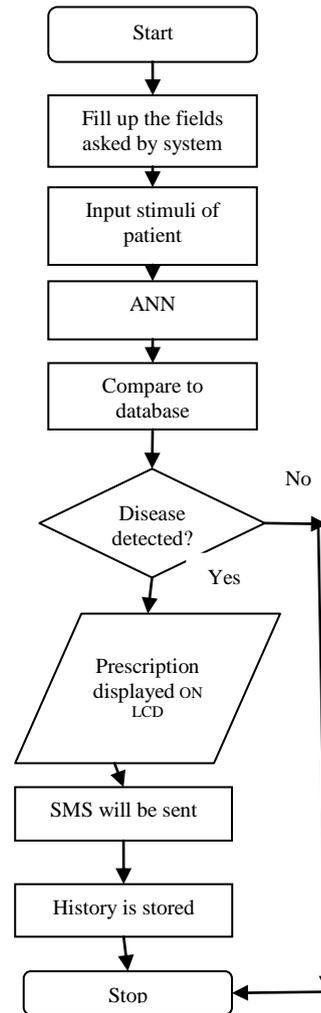


Fig 1 Flowchart of system

VI. RESULT

When a patient come for diagnosis and complete all the initial steps, system goes through the data and shows if that patients is diseased or not by opening following window. Prescription is displayed after initial window if patient is diseased.



Fig.4. Diagnosis result of normal patient

Figure 4 and figure 5 shows the diagnosis result of normal and diseased patient respectively.



Fig.5 Diagnosis result of diseased patient

VII. CONCLUSION

In this paper, we have designed and implemented a distinct computerized system which helps to improve disease detection of patients in the Hospitals. With the help of this system it becomes very easy to provide the preliminary aid to patients in the emergency medical cases. If there is a huge rush of patients in the Hospital for digenesis the system can reduce the rush of patients. Generally this condition occurs when there is any natural calamity, terror attacks etc. Also the scarcity of doctors is fulfilled in rural and urban areas.

This will undoubtedly boost modernization process after traditional preliminary checking and diagnosis of patients; more importantly shorten the gap between diagnosis and clinical application.

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