

# Footprint-Based Health Monitoring Database using Raspberry PI



C. Lavanya, S. Christy

**Abstract-** *The health monitoring of the person can be done in the different ways. The health of the patient can be determined by the image processing technique. The biometric parameters can gather the details of the health condition of the patient. The digital image processing can be applied in the various filed such as medical, geology, research etc., In this paper they proposes the foot print technology this can capture the foot print of the patient by using the web cam. The captured image can be analyzed by using the shape and the dimension analysis. The foot print can reads the each person identity. Based upon the identity and the numbers the image processing system is implemented. It uses the raspberry pi as the main part. The data which is captured by the web cam can be stored in the SD card. The data allocation is done in the memory path. The classification of the data is takes place by using the data separation algorithm. The color analysis can takes place a significant place based upon the color we can able to classify the foot print and makes it for further analysis. There are several steps can be took place the image acquisition, edge detection, feature extraction, pattern recognition, pattern matching. The matched image can be provided as the better result. Based upon the result the health condition can be predicted. This method is highly effective and accurate when compared to other method.*

**Keywords-** *Pattern Recognition, Pre processing, Signal to Noise Ratio, Pixel Matching.*

## I. INTRODUCTION

The scientific technology is in minimum scale in the developing countries in before years. But now the technology development is same for the developed and the developing countries like India, china etc. If we need a product we want to go to the website and search for the particular product that shows the content of the product. But in now the research has been goes on detecting the product with the help of the image which shows that particular product and the related product which are selling in the market. The image comparison is takes place in the each section of the image divider. Image which is get focused through camera it is stored in the database which can done with the help of the SQL language.

After the image gets capture it gets divided into several partition layer. Each layer has the particular dimensions and thickness the adjustment of the dimension is made through the mathematic divider algorithm. Image which is get compressed into partition layers which is gets converted into duplicate image that maps the outer path of the image and the view is mounted in the another layer which can be directed to the next section of treatment.

The saliency integration which can increase the quality of the image which is get portioned. After some time selection has been made among the different portioned images in the various part of dimensions. In the increased pixels image the dark outline has been made which is gets recorded. In the final stage the saliency and the mapped image gets combined to give the original structure of the image. Sensed image is get compared with the images in the dataset if the image gets matched it provides the required output what the customers searched. The machine learning has been used in the image processing technique. The image comparison is takes place in the each section of the image divider. . The saliency integration which can increase the quality of the image which is get portioned. After some time selection has been made among the different portioned images in the various part of dimensions. The neural network algorithm has been implemented in the each section of the image they can compare the various parts with the other images which is get allocated in the data stack path. The path provides a neurological way of comparison and the deep learning technique has been implemented to get the accurate result without the data loss. The artificial intelligence plays a major role in the future and it does all the work where the human can do it reduces the thinking power of the human. In current google has launch the lens which can capture the particular object and it shows the results of the object which is same and the related object that can be available in the market.

## II. LITERATURE SURVEY

T. Kuragano Meisei et., al., proposed nowadays the health monitoring of the patient can be examined by various ways. The disease can affects the patient due to the lack of nutrition contaminant or the genetic disease. In this project they can defined the disease affected human by its way of walking. The disease person whose walking manner can be varied from the normal walking stage. The initial stage of the disease the patient is unstable in their walking behavior. Due to the unstable of walking the foot print image can be changed. The change in the image can be predicted by using the mathematical calculation. In Japan, many health care providers evaluate the recovery status of patients by observing a change in the patient's manner of walking.

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In the initial stage of rehabilitation, the patient's manner of walking is unstable. Due to the unstable of the walking the patient foot print image is changed. This change in the image can be predicted by the mathematical calculation. The Discrete Fourier transform is used to detect the image of the foot print which can undergoes noise reduction and detect the edges of the foot. The foot edges can be compared with the normal foot structure.

The images can be patterned into various sets of layers. Each layer can be separated to form a perspective view to analyze the foot fetching data. By using the small technique the similar giant set of health issues can be predicted by this method. This method can be useful to analyze the health issues in the initial stage and provides the preventive measures to cure the disease. [1]

Wanlop et., al., proposed the disease can be diagnose by the use of the foot analysis method. In which it uses the image processing technique to capture the images of the foot print. The print of the foot can be differing from one person to person to from the accurate result. The foot print of the particular person can be capture and store in the database. After capturing the foot data the several process may involves the data acquisition, Data gathering, Foot structure prediction, data analysis. The use the indication for the data separation. Each method can use the various type of indication. Normally the satheli arc index, clerk's angle index, chippaux- Smirak index these various method that can capture the foot print and predict the health issue. This paper mainly proposes the classification of the images based upon the indication. The indication range can be helps to separate the right and the left foot. The data set which can be gathered nearly 145 images of footprint. When they want to compare the images with the database they use the indicators to compare and predict the accurate image. Based upon the experimental result the satheli arc index can show the accuracy of about 92% and the clerk's arc can show the accuracy of about 84% and the chippaux-smirak can show the accuracy of about 78%. [2]

Guowei Ma et., al., proposed the foot system is implemented in the robot based on the various structure flat, normal, hemisphere etc., But all the foot structure cannot much inspired to predict the ground surface reaction. Several researches are made on in predicting the ground surface reaction to predict the flat surface are not much provide better outcome. The bionic foot sensor can be installed in the robot leg part are we designed the bionic foot of the robot. This paper mainly proposes the use of the bionic foot system by conducting 3D printing technology method to implement the bionic foot system. This robot can be used in the medical field in which it can sense the bio medical parameters of the human and the surface layer. The bionic equines model is the designer of the single leg system. The method can be used the hemispherical foot and the bionic foot but the bionic foot can be much encouraged to predict the interaction between the surface layer and the foot. The bionic system can makes the walking manner of the robot more stable. This system can be installed in the future robot for the further analysis. [3]

S. Jun et., al., proposed several devices are been introduced to predict the walking manner of the human. If the person is affected by the disease it can be analyzed by

the walking manner. In this paper they propose the ultra wide band foot wearable devices to monitor the foot structure of the human. The data which is get monitored are update through the antenna receiver and transmitter signal. To test the data 3D printing technology system is used in the antenna propagation. The Flux filament fabrication system is utilized for the method. The Ploy lactic plastic is used to for the antennas for the data propagation method. The data input should be in the range of 10db which can be compared with the frequency range of 1.2GHZ – 8.5GHZ. The frequency range can be formulated when the devices is installed in the human body. The simulations are made at the particular frequency range which can provide the exact result. [4]

Samir Boukhenous et., al., proposed all the measuring instrument can be developed in various field. If we consider the medical field the measuring of the human parameters can be done with the help of the sensor. This paper can proposes to predict the foot reaction by using the sensor.. The foot sensor can be designed in such way in which can withstand high constrained strength and the force which can be generated by the human at the time of walking. The sensor function can depends on the Hall Effect. In which the sensor can be coupled with the magnet in a typical elastic polymer. The sensors are connected in the series format in which they aligned in the board. The alignment made on the conducting board. The signals can be detected by the polymer in order to obtain the uniform strain. The generated signal can be send to the amplifier. In which the amplifier can amplifies the signal. The amplified signal can be calibrated. In this the calibration are monitored which can be taken into study and the second thin is the strains in the polymer layer. The dynamic value can be measure at each time of walking in the flat surface. The data can be recorded at every particular time of the calibration. [5]

Ryota Morinaga et., al., proposed the foot print image capture and analyzation can be made using the BPF method. In before method the foot print data can be evaluated using various methods by using the image processing technique etc. In this paper we designed the resonator in which each resonator can be separated by the particular distance and the connection between each resonator can be stronger. They can propose the use of the narrow band pass filter. The wide band pass filter cannot give much attention. By the use of the BPF it can fabricate the constant foot print. The two variables used in the BPF region the Q which is the already present parameter the new K parameter is used as the substitute. The coupling between the resonator can provide the image more accurate and effective. The upper suppression method is also used to improve the BPF characteristics. [6]

Thoralf Kautzsch et., al., proposed a novel based use of the foot sensor at the bottom of the human leg. The foot sensors are also known as the pressure sensor. The sensor as the two layers in which the outer and the inner layer. The sensor can be connected to each other by the external medium. The sensor can consist of the silicon chip in the bottom sides and the electrodes are present. The each sensor can be surrounded by the ventilation channel.

The sensor can be connected to form the bulk chip. The sensor can be designed in the form of the foot in which it is placed in the area under the foot with allowing the ventilation. The chips are placed in the counter dropped region. The sensor sensation can be traveled through the vertical path. When the sensor is get subjected to the pressure they can gives the foot calibrate value.

By the help of the foot sensor the layer of the foot print can be evaluated. By the evaluated result and the structure of the foot we can able to analyze the health condition of the patient. The sensors are can be about 50 cm. The ratio of the predicted result can be calculated. [7]

V. Macellari et., al., proposed in above methods we can calculate the foot print analysis here the interaction between the foot and the ground surface can be predicted by using the strain gauge. In this paper they use the strain gauge and the pressure sensor in which it can be connected to each other. These two parts can monitor the foot to floor interaction. The sensor can observed the foot print of the person. The contact path to the sensor and the ground surface can be calculated. With the help of the value at each stage of the locomotion the particular value can be recorded. This value can be used for the future verification when the foot print research is made. This paper can proposed this method because many researches has been going to detect the foot – floor interaction.[8]

Olivier Stasse et., al., proposed in future all the work will be done by the robot it does not need the human power. In this way this paper is proposed to train the robot as the human. To involve the robot in the working field to make the robot like human in all manner. In this method they take over the walking manner. The robot should be walk like a human and it balance the entire external agent at time of balancing. To make the system to implement they use the foot print technology method. Based upon the foot print the robot is trained to perform the entire task. This system can be more in the field of medical and researches. It can do several things which cannot do by the human. [9]

Junghan Kwon et., al., proposed in this paper they designed the soft robotic ankle-foot-orthosis for the patient. It is less weight and low cost. When the patient wears the device they can accurately monitor the ankle movement of the patient. The device uses the 3D printed flexible brace for the accurate prediction of the ankle movement. Based upon the ankle movement the foot structure can be analyzed at each and every position. The data of the each step can be gathered at each section of movement. By using the devices the walking experiment are conducted at each patient which can gives a positive result. The devices can be undergoes some research to add several features to implement in the next level. [10]

### III. PROPOSED METHOD OF FOOTPRINT-BASED HEALTH MONITORING DATABASE USING RASPBERRY PI

To detect the health issues of the patient in before period several test are conducted to predict the result. In this paper they propose the foot print analysis system. The image processing technique has been implemented it can capture the foot print image of the human. The captured image can be undergoes several processing stages data acquisition, data

gathering and foot structure prediction. Based upon the foot print result they can predict the health issues of the patient. In this they use the python language and the raspberry pi kit. This method can provide the exact result of about 78%.

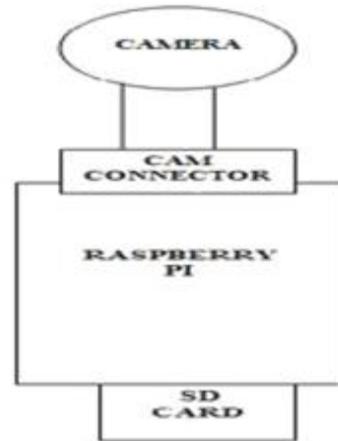


Fig 1: Block Diagram of proposed system

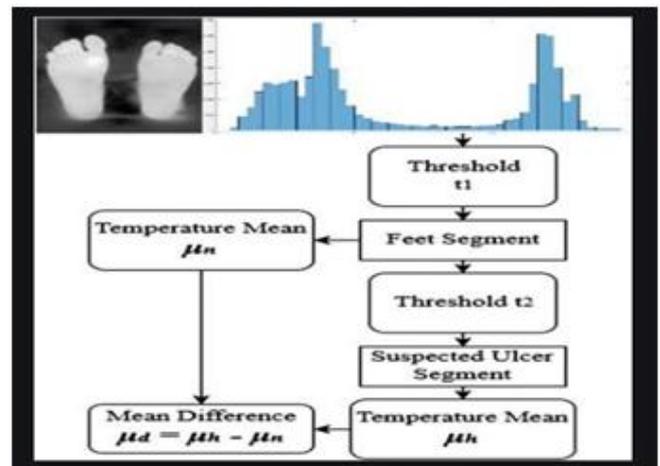


Fig 2: Detection of Foot Ulceration

### IV. RESULTS AND DISCUSSIONS

In our proposed system we are going to analyze the foot print of the persons who are coming for checking their foot ulcer level. The input foot image is taken by the raspberry pi camera which is connected to the system. We already have a set of bench mark data sets which will have both good and ulcered foot. The given input foot image has to undergo pre-processing stage. First the input image will be in RGB format it has to be converted into grey scale. Then resize of the input image takes place. Generally the input image won't be clear as noise presence will be very high. So first we need to remove the noise it is done will the help of median filter. Then the process of matching the input image and the stored images takes place. Then final stages are segmentation and classification stage. In segmentation stage the infected part alone will be segmented and in the classification stage what type of infection will be displayed.

## V. CONCLUSION

Diabetic foot ulceration plays a vital role in all patients who are having. Foot ulceration is really a dangerous infection for a diabetic patient. If Early detection of foot ulceration is not done properly the wound in the foot will Become severe which may results in removal of leg in the extreme stage. Our proposed system will help in detecting the foot ulceration with correct accuracy.

International Journals, out of which many papers are highly Indexed.

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