

Internet of Things For Healthcare In SkinDisease

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Abstract: - The system can be organized by a machine intervention in dissimilarity to human interposition into the conventional medical personnel based ideal of on diagnosing the disease. The system passes on two dependent steps - the first detects skin anomalies and the after identification the diseases to be infected. The system operates on visual input i.e. high resolution color images and patient background. In the form of machine intervention, the system uses color image processing having a ability, k-means clustering and color gradient method to finding the diseased skin. For classification ,we used the public cloud networks.

Keywords: - *IOT, Robert, Prewitt, Sobel, MD5*

I. INTRODUCTION

Human skin is one of the most unpredictable and difficult to automatically analyze. Even though there have been various innovations conducted to detect and model person skin using Computer techniques that can be vary .less amount of human have attention on the medical paradigm of the problem.Actually there have been various innovation organized to detect and model human skin using Computer Vision techniques, very small amount have to be focus on the medical paradigm of the problem. Expert diagnostic systems that allocated with dermatological symptoms are hard to find or detecting in the maturity area of Intelligent and the systems can be specialized

II. DESIGN/METHODOLOGY/APPROACH

IOT can detect the skin disease using the camera image which can be proposed. In this paper we can apply the k-means algorithm for edge detection .Edge detection can be carried by 3 approaches as: Robert edge detection, Prewitt edge detection, Sable edge detection on image processing. We can use the cloud on this project that may be either public or private. This paper is a part of an automated dermatological disease diagnostic system. Security can be also provided, we can use the technique for that security is MD5.This project can be user friendly.

III. PHASES

In our system we use the 5 phases as follows,

1.1 Image Processing

An image may be defined as a double dimensional function i.e. $f(x,y)$, where X & Y are the plane co-ordinates & the amplitude of f at any particular pair of co-ordinates(x,y) is called intensity of gray level of the image.Digital image is defined a fixed no. of elements, every pair of which has a particular location & value.These elements are called picture element, image element & pixels. Pixel is the term used mostly to denote the elements of a digital image.

1.2 Edge Detection

Edge detection is general image processing methods designed to predicting edge pixels. A line should be viewed as an edge detected segment in which the intensity of the surrounding on other side of the line is either higher & lower than the intensity of the line pixels.

In 3 ways we can find the detected edge,

1.2.1 Robert Edge Detection

The Robert operator is performing a simple, unique & quick to be proposed in 2D spatial gradient

measurement on an image.

Gradient magnitude is given by

$$|G| = \sqrt{GX^2 + \sqrt{GY^2}}$$

Although eventually an approximate magnitude is proposed using

$$|G| = |GX| + |GY|$$

This is faster to compute using

$$GX = \frac{\partial}{\partial x} (Z9 - Z5)$$

$$GY = \frac{\partial}{\partial y} (Z8 - Z6)$$

1.2.2 Prewitt Edge Detection

Prewitt detection is used for edge detection on image. Detection can be done using two types of edges

a. Horizontal Edges

b. Vertical Edges For

horizontal edges,

$$GX = \frac{\partial}{\partial x} (Z7 + Z8 + Z9) - (Z1 + Z2 + Z3)$$

For vertical edges,

$$GY = \frac{\partial}{\partial y} (Z3 + Z6 + Z2) - (Z1 + Z4 + Z7)$$

1.2.3 Sobel Operator

The gradient of an image is calculated for each pixel position in the image. The sobel masks is 3*3 matrix, where Gx is for X direction & Gy is for Y direction.

$$GX = \frac{\partial}{\partial x} (Z7 + 2Z8 + Z9) - (Z1 + 2Z2 + Z3)$$

$$GY = \frac{\partial}{\partial y} (Z3 + 2Z6 + Z9) - (Z1 + 2Z4 + Z7)$$

1.3 K-MEANS ALGORITHM:

K-means algorithm is a heuristic method, find a partition of k clusters to optimize the chosen partitioning criterion i.e. cost of the function. Every cluster is performed by the center of the cluster & algorithm converges to stable centroid of the clusters. K-means algorithm is the simplest & easy to partitioning method for clustering analysis.

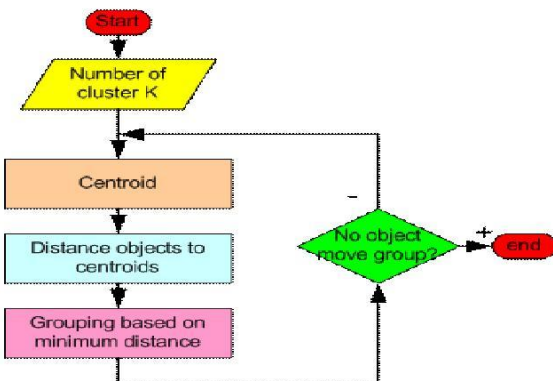


Fig. 1.k-means working

1.3 NETWORKING:

In our technology networking is the builds, designing & use of a network, including the physical attachment such as hub, bridge, switch, router & so forth. The selection & use of telecommunication protocol & computer software for managing the network & the established the operation of terms & procedures co-related to the network.

1.3.1 Cloud Computing:-

Cloud computing is a basic idea of the delivery of provided services over the internet. Cloud computing enables to consume companies for compute resources as a utility just like electricity, either used to be in having to build & maintain computing infrastructure in house.

1.3.2 Types of Cloud Computing:-Cloud

computing comes in three forms-

- a. Public Cloud
- b. Private Cloud
- c. Hybrid Cloud

In our system we used only the public cloud .

1.3.2.1 Hybrid Cloud:-

Hybrid cloud is a cloud computing environment which uses a mix of on premises, private cloud & third-party, public cloud services with orchestration between the two platforms. By allowing work load to move between private & public cloud as computing needs & costs change, hybrid cloud gives businesses greater flexibility & more data deployment options.

1.4 Security:

Security is used for the hashing as follows:

1.4.1 Hashing:

Hashing is the another technique to storing & finding for values. this technology is called as hashing. it has a worst case behaviour that is sequential or parallel for finding a target but with some care hashing can be greatly speed up in the average case.

Main type of hashing used in our system is **MD5**

1.4.1 MD5:-

It is used in Linux & the other similar operating system length: 34 characters. The hash begins with the \$/\$ signature, then there goes the salt. algorithm: actually that is a one type of cycle which we can called the MD5 algorithm 2000 times.

1.4.2 Where hashing is helpful?

Anywhere from schools to department stores or manufactures can use hashing method to simple & easy to insert & delete or search for a particular record.

1.4.3 Why MD5 is best for hash?

cryptographic algorithm called MD5, it is very simple & easy to follow manner. MD5 stands for message digest algorithm 5 is a mostly used in cryptographic MD5 function this algorithm is to take up a random data as an input & generate a fixed size "hash value" as the been fixed. The raw data can be any randomly selected the size or length but the output hash value size is always fixed.

IV. OVERALL PROCESS

- Find the any skin disease of high definition original image.
- Show the color gradient of the original image.
- applied filtering over that image.

- Binary Mask by thresholding and clustering on the image
- labeling the region of the interest
- This is our defected skin

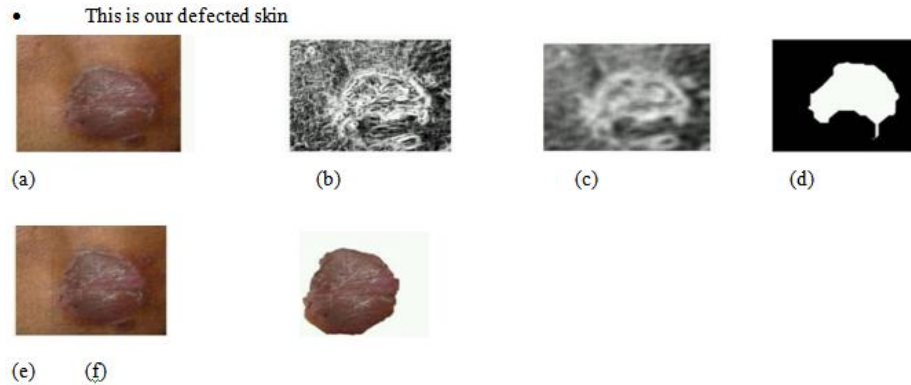


Fig 2. Overall process

This system is based on color image processing dissimilarity, k-means clustering and color gradient techniques to predicting the particular infected skin. The system identifying a diseased skin detection & can be finding the accuracy of detected part of skin, whenever the captured image is detected, then we crop the infected part of skin. We can analyze that infected part & finding disease whatever should be caused.

Infected part accuracy is about 95.99% and disease identification accuracy is about 94.016% while we can be testing the more no of disease in different areas. We can tally approximately about the various diseases in different areas.

V. CONCLUSION

In this paper we can find the infected part of the skin from the original image of the skin what is to be captured. We can use the k-means algorithm for finding the infected part .this is done with the help of the edge detection method i.e. sobel,Robert & prewitt edge detection

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