Accessible Melanoma Detection using Smart Phones and Mobile Image Analysis

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Abstract:
Smart phones are used by billions of people every day. This paves the way to design many mobile applications. Now a days health issues are a major threat to human being. So many mobile applications are being developed for health care. We have developed an application for detecting the abnormalities in the skin. In existing system, they made through simple segmentation methods. In proposed design, Resilient Neural Network (RNN) is approached. The quality is improved in this design. Statistical analysis is performed for calculating the depth and area of the affected skin. A morphological study is been developed here for deep understanding of the image features by using MATLAB 7.6.0 (R2017a).

Keywords: Melanoma, Neural Network, Hidden Layer, Preprocessing, RGB Panel, Tumor.

I. INTRODUCTION:

Image Processing is a technique to perform some operations on an image. The steps used in image processing are image scanning, storing, enhancing and interpretation. Image Processing is a method to enhance raw images obtained from various capturing devices for various applications. Image Processing systems are becoming popular due to easy availability of powerful personnel computers, large size memory devices, graphics software's etc. Image processing is photography. In this process, an image is captured or scanned using a camera to create a digital or analog image. In order to produce a physical picture, the image is processed using the appropriate technology based on the input source type. In digital photography, the image is stored as a computer file. This file is translated using photographic software to generate an actual image. The colors, shading, and nuances are all captured at the time the photograph is taken the software translates this information into an image. When creating images using analog photography, the image is burned into a film using a chemical reaction triggered by controlled exposure to light. The image is processed in a darkroom, using special chemicals to create the actual image. This process is decreasing in popularity due to the opening of digital photography, which requires less effort and special training to product images. The field of digital imaging has created a whole range of new applications and tools that were previously impossible. Face recognition software, medical image processing and remote sensing are all possible due to the development of digital image processing. Specialized computer programs are used to enhance and correct images.

II. EXISTING SYSTEM:

In the existing design, two fast segmentation methods was approached. It detected the skin lesion by combining the light weight method for locating the skin abnormality. Early detection is difficult in this method.

III. PROPOSED SYSYTEM:

In the proposed design, Intervals based segmentation is approached. In order to improve the quality of classification, Resilient Neural Network is used for statistical analysis. Early detection is possible. Accuracy is also improved.

IV. SYSTEM ARCHITECTURE:
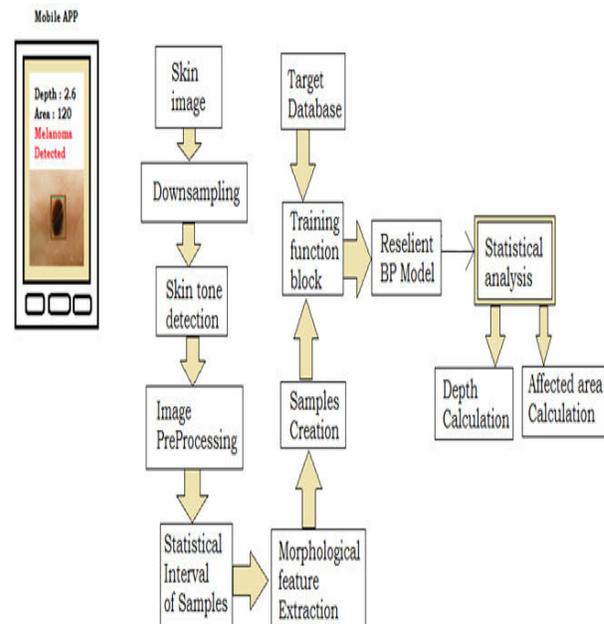
V. SYSTEM IMPLEMENTATION:

I. Preprocessing
If the input images are color images mean we need to convert it to greyscale from that color images. In the complement of a

binary image, zeros becomes ones and vice versa. Black and White are reversed. In the output image, dark areas become lighter and light areas become darker.

II.   Feature extraction and segmentation

It includes morphological feature extraction and sample creation. It relates with the shape and features of an image.

III.   Classification and Android Interface

The image data are stored are being stored in an array and channel values of the images are being compared and stored in temporary arrays. The enhanced values are used to compare the feature extracted images. By using the neural network it will display normal or abnormal. This module consists of Client server interfacing of the MATLAB model in which the android app is interfaced with the MATLAB environment through wireless hotspot.

Neural Network:

It consists of three layers: Input layer, Hidden layer, Output layer.Each pixel is compared with every other pixel in other image.Addition and integration is performed. Neural networks are typically organized in layers. Layers are made up of a number of interconnected 'nodes'. Patterns are presented to the network via the 'input layer', which communicates to one or more 'hidden layers' where the actual processing is done via a system of weighted 'connections'. The hidden layers are then linked to an 'output layer'. It can be used to extract patterns that are too complex to be noticed by either humans or other computer techniques. Neural networks process information in a similar way the human brain does. The network is composed of a large number of highly interconnected processing elements (neurons) working in parallel to solve a specific problem. All the pixels are compared for various iterations. Pixels in each row and column is compared with pixels in other row and column. It is difficult to compare for large number of rows and columns. For that, we use the algorithm of neural network. Neural network performs this comparison faster. There will be greater accuracy.

BASIC PROCESS:

The input image obtained through the application is first preprocessed. Then the image is resized to our convenience by giving appropriate row and column. Resized image is then converted to binary image. RGB image is separately converted to binary image as red panel, green panel and blue panel. This is done separately in order to obtain an image accurately and efficiently. The border is then cleared and then the pixels are filled up as 0.It is then compared with the normal skin image which we have in a database. We use the method of subtraction for obtaining the dissimilarities in the image. The tumor is finally located with that subtracted image. We use Neural Network algorithm for comparing the pixels. Many iterations are performed.

VI. RESULT AND DISCUSSION:

Various conversions and enhancement techniques are done with the captured skin image by using Resilient Neural Network algorithm. The input image is given to the mobile application and the output is also retrieved in the same mobile application.

The detection of abnormality of the skin, to check whether the skin is a normal or abnormal skin is received back in the mobile application after being processed in MATLAB.

VII. CONCLUSION:

We propose an accessible mobile health care solution for melanoma detection, using mobile image analysis. The main characteristics of the proposed system are a K means segmentation scheme suitable for the resource constrained platform a new set of features which efficiently capture the color variation and border irregularity from the smart phone image, and a new mechanism for selecting a compact set of the most discriminative features. In this module the image data are being stored up in an array, and channel values of the images are being compared and stored in temporary arrays. The enhanced values are used to compare the feature extracted images. Finally the resilient neural network is classified whether the given input image is normal or abnormal.

VIII. REFERENCES:

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