DESIGN AND DEVELOPMENT OF CHOLESTEROL DETECTION USING HAND PRINT IMAGE

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ABSTRACT

Heart disease is a cardiovascular disease (CVD) is difficult to diagnose due to a number of contributing risk factors, including high blood pressure, diabetes, abnormal pulse rate, high cholesterol and several other factors. Heart disease is a condition when plate like on arterial walls can block the flow of blood and cause a heart attack or stroke and also several risk factors that can lead to heart disease include unhealthy diet, excessive use of tobacco and alcohol, and physically inactive. There are several different methods used to classify the severity of heart disease, including neural networks using heart rate time series and this includes Right bundle branch block (RBBB), Left bundle branch block (LBBB). Machine learning based clinical decision making have been recently applied in healthcare area and deep learning

An original recognizable proof and recognition of cholesterol in the human body by painless technique utilizing picture handling is introduced in this paper. Different examples of pictures with and without cholesterol are taken for the review. These pictures are examined involving mean calculations in picture handling to identify the cholesterol levels. The picture of the patients' finger locale is taken as test pictures, alongside their lab tried upsides of cholesterol. An information base of various scopes of cholesterol values is made utilizing these pictures. The example pictures of various age bunches are gathered with the end goal of simple picture examination and precision. In picture handling, the picture examination is finished in different techniques like mean calculation, middle, standard deviation, histogram examination, dim cutting strategy, and so forth. It was observed that the mean calculation is reasonable for the harmless strategy for identifying the cholesterol levels. The mean worth of the test picture is then contrasted with the mean worth of the pictures in the data set to decide the cholesterol esteem. From the outcomes it is found that the cholesterol mean qualities are relative to the research facility values. In this way the connections table is figured out.

Keywords: Digital Image Processing, Image file sizes, Image Acquisition**,** Image restoration

1. Introduction

The skin test for cholesterol distinguishes the early indications of coronary illness. Estimating the sum and sorts of cholesterol in the body is vital in forestalling and distinguishing coronary illness. Assuming the body has more cholesterol than it can use to make chemicals and construct cells, this reserve in course walls to frame plaque. This plaque keeps the blood from moving appropriately through the body and the gamble of a respiratory failure or stroke becomes serious[1].

The process of identifying objects in an image would likely begin with image processing methods like noise removal, then move on to (low-level) feature extraction to find lines, regions, and perhaps places with certain textures. The clever part is to see groups of these forms as separate objects, such as automobiles on a road, boxes on a conveyor belt, or malignant cells on a microscope slide. An object might appear considerably differently when viewed from different angles or in varied lighting conditions, which is one reason this is an AI problem. Identifying whether details are background or

shadows, etc., and which belong to specific objects is another issue. The majority of these actions are carried out subconsciously by the human visual system, but for a computer to match human performance; skilled programming and enough of processing power are needed. There are various methods that can be used to manipulate data such that it appears as a picture. The most common patterns used to depict images are those of a photographic print, slide, television, or movie screen. An image is typically understood as a two- dimensional array of brightness values. A computer can optically or digitally process a picture[2].

2. Literature Survey

Melvin Daniel etel[3] proposes a cholesterol detection system based on the iris image processing using Gray Level Co-Occurrence Matrix (GLCM) and Support Vector Machine (SVM). The image's features are extracted using GLCM, and the features' classification is handled by SVM. In addition to GLCM and SVM, this work also develops a preprocessing procedure that entails scaling the image, segmenting it, and converting the iris image's colour to grayscale. Cholesterol is a complex fat compound, which is produced from the body and food substances. Cholesterol is needed by the body for the formation of cell walls and as a raw material for several hormones. But if the cholesterol content in the blood is excessive, it will cause the disease. To find out cholesterol levels in the blood, a laboratory check is usually done by taking blood samples. However, in the world of iridology, a technique for analyzing disease and weakness in the body is based on the shape and structure of the iris. One of the diseases that can be analyzed through the iris is cholesterol. Because everyone has a unique iris structure that makes it difficult to identify a person, the cholesterol ring in the eye is difficult to see. The goal of this study was to develop a technique for assessing cholesterol levels through ocular pictures that would make it easier for a person to identify cholesterol levels early. The process starts from taking 60 training eye images and 30 test eye images using a mobile camera. The results of the measurement model will be used to determine cholesterol levels. The results in this study are still quite large at 38.28 with a computational time of 11 seconds for each test image. This study was done by Shafira Nur Andana etal[4].

Arcus senilis is a greyish or whitish bow shaped or ring shaped deposit in the cornea. It is associated with coronary heart disease (CHD). It is also recognized as a sign of hyper lipidemia. Iridology is an alternative medicine to detect diseases using iris's pattern observation. The appearance of a greyish or whitish deposit on the iris, according to iridologists, indicates the presence of cholesterol or Arcus senilis illness. Sarika G. et al[5]. created a straightforward, non- invasive automation method to identify the presence of cholesterol utilising image processing's iris recognition algorithm.

3. Implementation Process

3.1 System Design

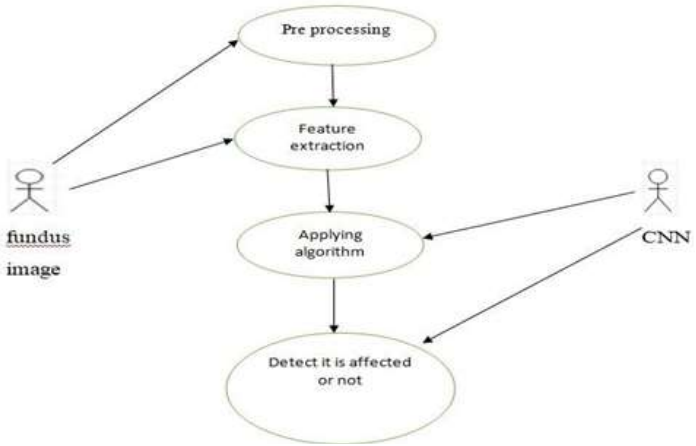

Fig: 1 Sequence diagram

3.2 Requirement Specifications

Hardware Requirements

- ✓ system
- ✓ 4 GB of RAM
- ✓ 500 GB of Hard disk

Software RequirementsPYTHON:

Python is an interpreted high-level programming language for programming Python offers multiple options for developing GUI (Graphical User Interface). Out of all the GUI methods, tkinter is most commonly used method. It is a standard Python interface to the Tk GUI toolkit shipped with Python. Python with tkinter outputs the fastest and easiest way to create the GUI applications. Creating a GUI using tkinter is an easy task.

3.3 Pre-processing:

- ➢ Image The lowest level of picture operations are referred to as pre-processing. Images of intensities are used as both input and output.
- ➢ Pre-processing aims to improve the image data by reducing undesirable distortions or enhancing certain elements that are crucial for subsequent processing. Image restoration is the process of estimating the original, clear image from a corrupted or noisy image. Motion blur, noise, and camera focus issues are just a few examples of corruption.
- ➢ Image enhancement differs from image restoration in that it emphasises aspects of the image that make it more aesthetically acceptable to the viewer rather than necessarily producing data that is realistic from a scientific perspective.
- ➢ The "Imaging packages"' image-enhancement methods don't use any kind of pre-existing model of the image-creation procedure. With picture enhancement, noise can be reduced effectively by lowering resolution, but this is not acceptable in many applications.
- ➢ The z-direction resolution in a fluorescence microscope is already poor. To recover the item, more sophisticated image processing techniques must be used. A technique for restoring images is de-convolution. It can increase resolution, particularly in the axial direction, reduce noise, and boost contrast[6].

3.4 Feature Extraction:

Texture analysis

Texture is one of the most important defining features of an image. It is characterized by the spatial distribution of gray levels in a neighbourhood [8]. The spatial dependency of gray-level values, which affects how texture is perceived, is captured by using a two-dimensional dependent texture analysis matrix. This two-dimensional matrix is obtained by decoding the image file; jpeg,bmp, etc.

CNN (CONVOLUTIONAL NEURAL NETWORK):

The ability of artificial intelligence to close the gap between human and machine skills has dramatically increased. Both professionals and amateurs focus on many facets of the field to achieve great results. The field of computer vision is one of several such disciplines. The goal of this field is to give computers the ability to see and understand the world similarly to humans do. They will then be able to use this understanding for a variety of tasks, including image and video recognition, image analysis and classification, media recreation, recommendation systems, natural language processing, etc. The improvements in Computer Vision with Deep Learning have been built.[7]

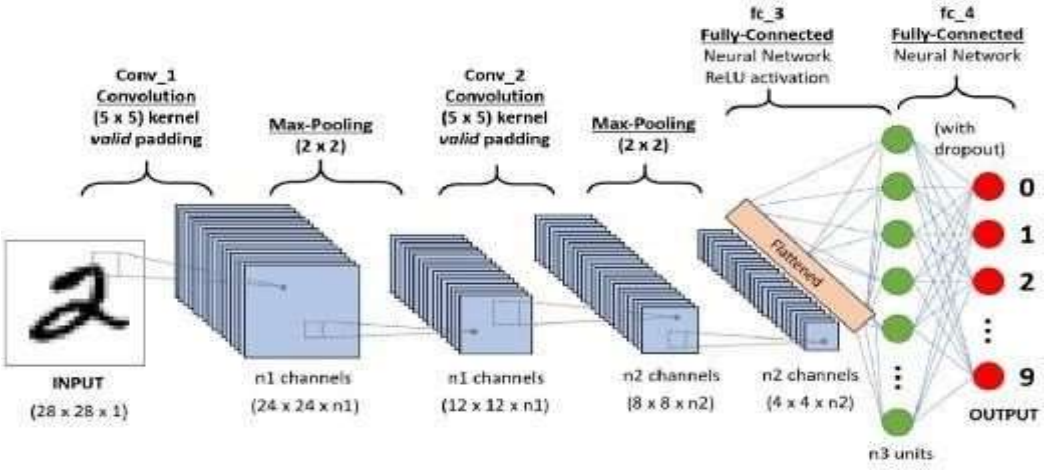

Fig 2: Categorization of handwritten digits by using CNN

4. Results and Discussions

In the present work an artificial intelligent model was created which calculates the cholesterol using with hand pattern images with deep learning technique. The main steps involved in the model are Data Analysis, Dataset Pre processing, Training the Model, Testing of Dataset[8]. The input image should be changed to a format that is appropriate for our Multi-Level Perception before being flattened into a column vector. Following each training iteration, back propagation is used to transmit the flattened output to a feed-forward neural network. The model is able to classify images using the Softmax Classification method over a number of epochs by distinguishing between dominant and specific low-level features in the images[9].

```
otlib.image as mpimg
otlib.pyplot as plt

low.keras.preprocessing import image

read('C:/Users/Bhargavi/Pictures/cholesterol detection using hand pattern image/dataset/cholestrol/Hand_0000530.jpg')
t.imshow(img, interpolation='none')
 image.load_img('C:/Users/Bhargavi/Pictures/cholesterol detection using hand pattern image/dataset/cholestrol/Hand_0000530.jpg',

 image.img_to_array(test_image)
 np.expand_dims(test_image, axis = 0)
el.predict(test_image)
)
:
normal')

cholestrol')
```

Fig 3: Steps for detecting Cholesterol in Hand print

```
1/1 [==============================] - 0s 47ms/step
[[-607.89557]]
cholestrol
```

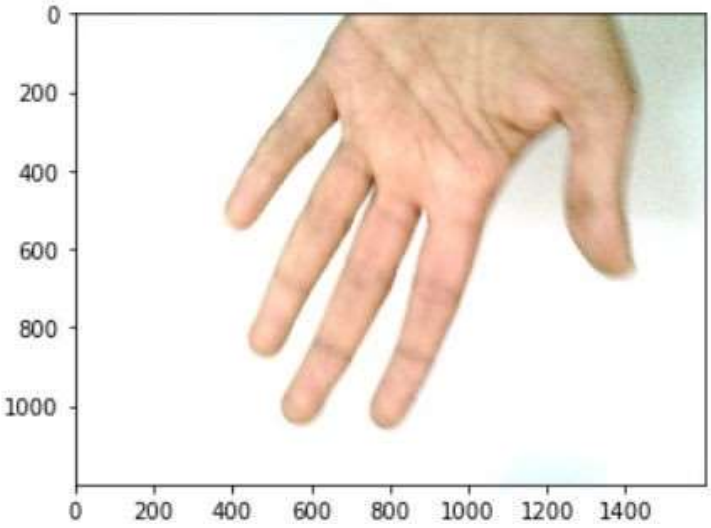

Fig4: Hand print with Cholesterol

```
1/1 [==============================] - 0s 31ms/step
[[2432.2742]]
normal
```

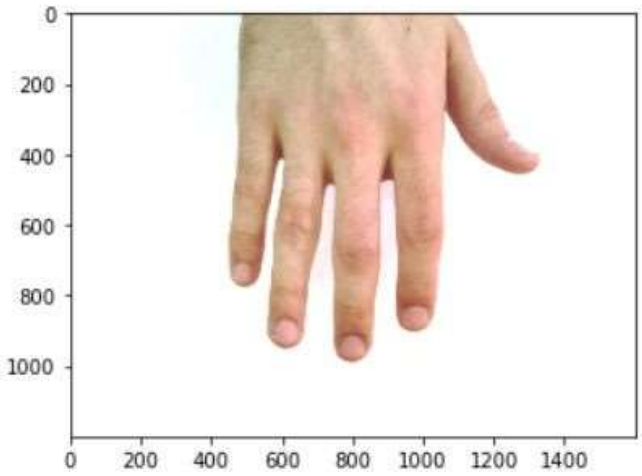

Fig5: Normal hand print without Cholesterol

5. Conclusion

The purpose of the present work is to detect the rate of cholesterol in a person body using both artificial intelligence and deep machine learning. It is an upcoming technology for the advancing in the medical fields. Most of the past researches were based on the Iridology, but this concept is based on the hand pattern images.

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