ANALYSIS ON COLOR HISTOGRAM-BASED IMAGE RETRIEVAL METHODS FOR THE DETECTION OF ANEMIA AND DIABETIC RETINOPATHY

Dr. S. Swapna Rani, Associate Professor, Department of ECE, Maturi Venkata Subba Rao (MVSR) Engineering college, Hyderabad : sswapnarani_ece@mvsrec.edu.in

ABSTRACT:
This research proposes to the Diabetic Retinopathy (DR) is the most serious and frequent eye disease. In the early hours detection of DR is the greatest way to avoid this disease. This study suggests an Image Retrieval approach for searching and retrieving query images as of a retinal database. Anemia develops when there are insufficient healthy red blood cells to transport oxygen to your organs. Having anemia, also known as a low hemoglobin level in a person's body. Tiredness, weakness, exhaustion, dizziness, shortness of breath, headaches, and a diminished capacity to exercise are common symptoms of anemia. Anaemia can be so mild at first that you don't notice it. However, when anaemia worsens, symptoms worsen.
Keywords: Diabetic Retinopathy, Anaemia, Image Retrieval Technique, Query Image

Introduction:
Assisting users locate the multimedia content they need quickly and effectively is currently a hot research subject due to the rapid advancement of digital image processing. The subject of retrieval of data greatly benefits from image retrieval, which is a key element of multimedia information retrieving technology and one of the fundamental theories of video data retrieval.

The process of retrieving an image from a dataset of images is called image retrieval, and it is dependent on the query requests made by users. Initially in the 1990s, the Minority-based image retrieval method was suggested. Utilizing simple qualities that can constitute a picture, such as color, texture, and shape, this method retrieves images.

Colors are a crucial visual signal for retrieving images and identifying objects. Because of their invariance to scale and orientation, color histograms are far better at classifying images. Picture retrieval systems frequently use colors histogram-based picture retrieval since it is straightforward to construct.

Compressed color instances, the color consistency vector, and the colorcorrelogram are a few of the frequently employed color descriptions. One of an image's most crucial qualities is its texture. The use of texture features in image systems for retrieval is very common. The Tamura appearance feature, the Markov arbitrarily field model, Gabor filtering, and binary local patterns constitute a few of the techniques that were developed for texture assessment. These algorithms, which depend on research on human visual psychology, propose various ways of describing the texture feature, Line appearance, consistency, roughness, contrasting and directionality of coarseness, etc.

Shape attributes, together with color and texture, are the most crucial aspects of depicting objects. But describing it is also extremely challenging. The physical appearance of the object is its most important characteristic. The Fourier transformation's coefficients and a histogram of oriented gradients (HOG) are two traditional shape descriptors. The visual characteristics of the retrieved image are extremely complicated making it more challenging for a single feature extraction technique to convey them. In order to fully represent the content of the retrieved image, our objective is to create a feature extraction technique that employs numerous characteristics.

OBJECTIVE
Image retrieval method for diabetic retinopathy using a colour histogram:
The most serious and prevalent condition affecting the eyes is diabetic retinopathy (DR). The greatest way to avoid this disease is to find DR early on. This research suggests a method for searching and retrieving the requested image through a retinal database. A retrieval procedure will be created by obtaining the colour histogram characteristic and changing the histogram's amount of bins to obtain the vector of features of the appropriate size.

Image retrieval method based on a colour histogram for the identification of anemia:

The primary reason of anaemia, which has a high beginning throughout pre-adolescence and occurs when the blood's ability to carry oxygen is inadequate to satisfy the body's requirements, is a decrease in the amount of red blood cells. It is a huge public health issue that affects people all around the world and calls for early detection tools. For the adult population, the lower recognized threshold for hemoglobin content in the blood is: 13.0 g/dL for males and 12.0 g/dL for women; tolerance levels due to varied age and race should be taken into consideration. The establishment of remedies intended at bolstering diagnostic concerns is the purpose of the research discussed in this article.

LITERATURE REVIEW

The researchers having a keen interest for automated detection of diabeticretinopathy in the field of retinal image analysis. In today' world, progress in computer technology provides pattern recognition as well as classification methods for complex digital image analysis There are several approaches for automatic detection of diabetic retinopathy detection in retinal images. These approaches based on image pre processing mathematical morphology, fuzzy C-means clustering, pattern recognition, neural networks, Gabor filter banks, region growing techniques.

Features of diabetic retinopathy can be detected from digital retinal images for diagnosis of diabetic retinopathy. The term "feature" will be used in two separate circumstances, it should be emphasized. The term "feature" describes the constituent parts of a feature set that are employed to categories retinal pictures. On the opposite side, pathological features including blood vessels, exudates, and micro aneurysms and hemorrhages are referred to as DR features. These pathological traits were a requirement for the majority of DR detecting approaches in order to categories retinal pictures as either normal or unusual.

Image pre-processing

In general the first step in computer based retinal image diagnosis is image pre- processing? Image pre-processing comprises different methods like image improvement, brightness or contrast enhancement, segmentation, decolorizing, resizing, image de-noising, etc. [1]

In 2006, Alia, et al.[2] existing a proportional study of dissimilarity development methods for retinal images analysis. The work explored the advantages and disadvantages of the a variety of contrast enhancement techniques.

In 2008, Andrea, et al. [3] proposed a technique to minimize the non-uniform lighting effect. The technique explored is an adaptive histogram equalization technique. For generalization purpose, this technique is not more effective.

In 2008, George, et al. [4] applied derived depend on method for conditions center differentiation. They used convolution of 2D Gaussian kernels by means of the second derivatives of the input image. The key feature of retinal images used here is blood vessel. The drawback of the system is minimum accuracy.

In 2008, Jian, et al. [5] suggested directional field based retinal vessel enhancement technique. The beauty of the work is single step brightness normalization and neighborhood development techniques are used.

In 2008, Multi scale line process depends on blood vessel development is suggested by Farnell, et al. [6].

PROBLEM STATEMENT

India is having considered the second largest population in the world. The World Health Organization(WHO) alert people regarding diabetic retinopathy's symptoms, reasons and severity regarding vision loss. The symptoms of diabetic retinopathy are not found in early stages. When diabetic retinopathy is discovered, it is serious since it could be the beginning of the individual's visual loss. Consequently, it is crucial to identify diabetic retinopathy earlier.

Anaemia is a condition in which there is a loss of red blood cells in the human body. The symptoms of Anaemia are not found easily. The detection of Anaemia at early stages is very important to

improve red blood cells in human body and to avoid the weakness. Therefore Anaemia detection is very important

PROPOSED SYSTEM

The study of picture retrieval remains in its early stages and is still being explored. We were the first to carry out experimental study on the picture retrieval technique. In this study, we create a collection of retrieving photos, a few of that come from our own photography while others are through the internet.

The majority of the searches in these pictures are clad in human body models or retrieval clothing, and some of the pictures are of tiled retrievals. Every ethnic group possesses its own distinctive style, therefore we can tell them apart by their appearance.

Following a number of studies on the features of searches in Yunnan, we selected the six most distinctive ethnic groups as our study object: the nationalities of Bai, Jingpo, Hani, Miao, Bouyei, and Va. We process 100 photos to a size of 128 x 96 or 96 x 128 in JPEG format for every nation.
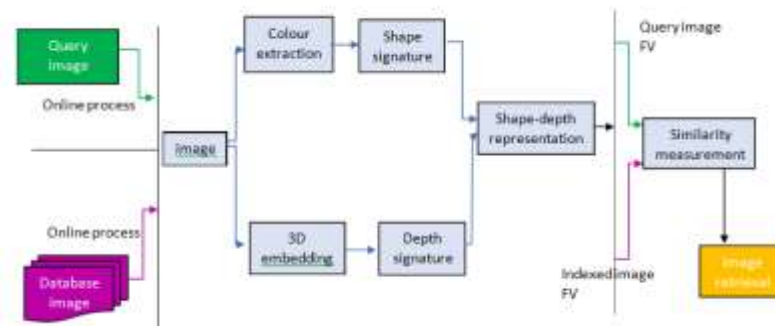
Block diagram

Fig.1: Block diagram of colour histogram based image retrieval technique

IMPLEMENTATION

We create a retrieval image dataset, where rest of the photographs is ones we took personally and rest are ones we found online. The majority of the retrieves in these pictures are clad in human body models or retrieval clothing, and some of the pictures are of tiled retrievals. Since each ethnic group possesses its own distinctive style, users can identify among them.

One of the most crucial aspects of an image is its color. If color in a live video or in an electronic photograph can be recognized, the findings of this detection may be utilized in a variety of scientific and industrial settings. A matrix of pixel values makes up an image. Because MATLAB treats each input as a matrix, it is an extremely popular platform for creating images. An image is able to be symbolized by means of numerous color representations similar to Gray-scale, RGB, HSV etc.

After extracting the colour and shape from both input image and reference image, the similarity measurement is done. Then after we get the retrieval image where the person can know if he has diabetic retinopathy or anaemia which can be known by red and white blood cells.
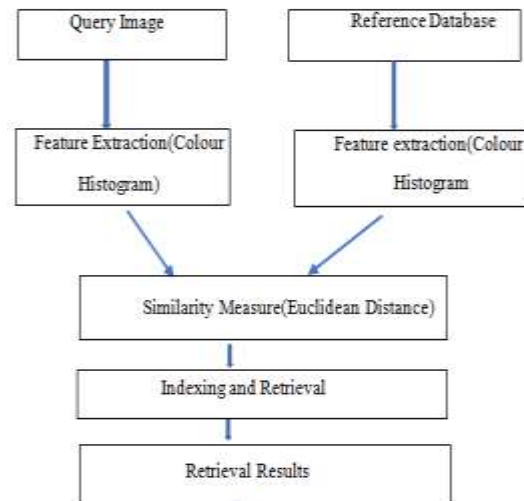
Flow chart

Fig.2: flowchart of the system

Results

In stage 1, Diabetic Retinopathy is detected by using Colour Histogram Based Image Retrieval Technique. The image of the eye is in use as the input and we observe only the affected area of Diabetic Retinopathy as the output.

Fig.3: input &output of stage-1

In stage 2, Anaemia is detected by using Colour Histogram Based Image Retrieval Technique. The image of the eye is in use as the input and we observe only the affected area of Anaemia as the output
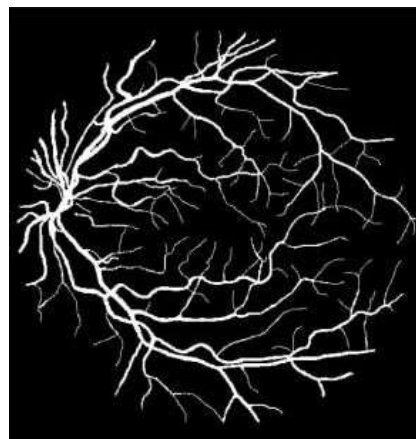

Fig.4: output of stage-2

Conclusion:

Diabetic Retinopathy must be treated in a timely manner in order to slow its progression and avert blindness. The retrieval approach described in this research simplifies the difficult computational effort while also enhancing the detecting procedure.

Anaemia is caused due to lack of red blood cells in the human body. By using Color Histogram Based Image Retrieval Technique we can easily identify the Anaemia affected area by observing the

image of the eye. Hence image retrieval is the fastest and easy way to find out if the person is affected by anaemia or diabetic retinopathy.

FUTURE SCOPE

The future possibility could be to use a Color Histogram retrieval system in HSV Colour space. With the developed method, experts will spend less time analyzing every fundus image and more time focusing on images that are influenced by diabetes, improving diagnostic efficiency.

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