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Comparison of Images using MIAC Algorithm

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Abstract- **The world of the computer graphics is evolving rapidly every day. The market is full of image processing applications. Digital Image processing encompasses a wide and varied field of application, such as to identify the person, for security purpose, to mark attendance etc. This paper discusses an algorithm Matching Images According to Coordinates (MIAC) based on the methodology of pixel by pixel comparison of two digital images. The comparison time of images is also calculated in this paper. In our observation when the comparison are allowed we found an excellent performance. It gives the result of different size of images, black & white images, colored image and the images which are of the same objects in different position. The main aim of this paper is to increase the accuracy of two similar objects' images which are clicked on different location and in different position.**

Keywords- **DIP, Image Compression, Pattern Recognition.**

I. INTRODUCTION

A digital image is a discrete two-dimensional function. f (x. y), which has been quantized over its domain and range. Without loss of generality, it will be assumed that the image is rectangular, consisting of Y rows and X columns. The resolution of such an image is written as X×Y. By convention, f (0, 0) is taken to be the top left corner of the image and f (X-1, Y-1) the bottom right corner [1].

Digital Image processing encompasses a wide and varied field of application, such as area of image operation and compression, computer vision, and image analysis (also called image understanding). There is the consideration of three types of computerized processing: low level processing is characterized by that both its inputs and outputs are images; mid-level processing on images is characterized by the fact that its inputs are images, but outputs are attributes extracted from those images, while higher level processing involves "making sense" of an ensemble of recognized objects as in image analysis, and performing the cognitive function associated with human vision.

Digital Image Processing (DIP) refers to processing a digital image by mean of a digital computer, and the study of algorithms for their transformation. Since the data of digital image is in the matrix form, the DIP can utilize a number of mathematical techniques. The essential subject areas are computational linear algebra, integral transforms, statistics and other techniques of numerical analysis. Many DIP algorithms can be written in term of matrix equation, hence, computational method in linear algebra become an important aspect of the subject.

An image is digitized to convert it to a form which can be stored in a computer's memory or on some form of storage media such as a hard disk or CD-ROM. This digitization procedure can be done by a scanner, or by a video camera connected to a frame grabber board in a computer. Once the image has been digitized, it can be operated upon by various image processing operations.

In particular, digital image processing is the practical technology for area of:

· Image compression
· Classification
· Feature extraction
· Pattern recognition
· Projection
· Multiscale signal analysis

This is all about the digital image, pixels and all the basic keys which are used in digital image processing.

The correlation coefficient often fails to find differences in images that are widely disparate. In the case of a security system utilizing. The correlation coefficient, an adversary can modify an object or scene quite dramatically and yet still go undetected, especially if he approximately preserves the local intensity mean and/or intensity histogram. Of particular significance for security applications, the coefficient often fails to detect missing objects within images. Performance often improves only modestly if the correlation coefficient is computed for subset windows of the entire image.

Even when the correlation coefficient does perform acceptably, there are usually better algorithms for image comparison. Typically, the optimum choice of algorithms

depends critically on general characteristics of the relevant images, and detail of the application. One fact often overlooked is that the use of human vision with a blank comparator can often dramatically outperform even very sophisticated computer algorithm.

Eugene K. Yen [2] discusses the limitation of correlation technique. Correlation technique is not good for images that have great dissimilarities. The correlation coefficient, an adversary can modify an object or scene quite dramatically and yet still go undetected, especially if he approximately preserves the local intensity mean and/or intensity histogram. Of particular significance for security applications, the coefficient often fails to detect missing objects within an images. Performance often improves only modestly if the correlation coefficient is computed for subset windows of the entire image.

Kwant-Fu Li et. al. [3] proposed Image comparison Search Engine (ICSE). This is used to search the contents based on image comparison using fractal image processing. When users input an image query, this system will generate image eigen value data, compare this with the data in the database of image eigen value, and output the results. Based on our experimental results, ICSE cannot only find the exact input image for the source image, but also find the "right image" when the source image is rotated and misty, and contains impurities. Hence, the proposed ICSE technique provides flexibility and is practical for use in real life.

Daniel P. Hutttenlocher et. al. [4] The Hausdorff distance measures the extent to which each point of a "model" set lies near some point of an "image" set and vice versa. Thus, this distance can be used to determine the degree of resemblance between two objects that are superimposed on one another. This paper provide efficient algorithms for computin the Hausdorff distance between all possible relative positions of a binary images and a model. This paper focus primarily on the case in which the model is only allowed to translate with respect to the image.

Bogdan Adnan HAIFA et. al. [5] discusses possibility of correlating the measurement from the Spectrophotometer with raw data from digital image acquisition instruments. Materials and Methods: Because the result will be used in protein electrophoresis, we prepared a set of plates with blood serum in different dilutions, stained with Coomassie Brilliant Blue. The absorbance of the resulting plates has been measured using a spectrophotometer and after that, the plates were scanned with a regular office scanner.

R. VeDkataRamaDa Chary et. al. [6] discuss that processing is done through the image clustering method which is used for feature extraction which is taken place. For retrieval of images, mean values are calculated between Query image and database images and all clustered mean values are considered as a sorted order. When the comparisons are allowed between the images, in our observation we founded excellent performance and similarities in between images. The main aim of this work is to extract images with good similarity when the images are retrieved based on query image.

Sreedevi S. [7] proposed a method of improvement to the existing system by using a new method based on evaluation of user satisfaction level. The system is made more user-friendly by revising the database continuously, deleting irrelevant images. The new method increases the efficiency of the system, although the unpredictability of GA causes random variations in the result. Here, 4 classes of images are compared. Each method is repeated up to 8 times. The first column of each image class represents the results from IGA-based retrieval and the second column corresponds to the proposed method.

Pradyumna Deshpande [8] discussed classification of Image forgery detection techniques and the two important techniques for pixel based forgery detection are discussed. A technique for copy-move forgery detection is discussed. But this approach takes into account only shifting of copied regions. So another technique is discussed for fast-copy-move detection. Then both the approaches are analyzed and compared. It compares both techniques.

In this paper we discuss an algorithm Matching Images According to Coordinates (MIAC). The novelty of this algorithm is to compare the two images without concerning their sizes and background. It gives better result when comparing result on different facial expression.

In this algorithm the comparison between two images is done according to each coordinates. The coordinate of first image is compared with the same coordinate of second image.

If the size of the images is different then we will compare the small size image with the large size image. So the number of coordinate which are compared will equal to the number of coordinate of small size image.

Number of coordinates compared=Number of coordinates of small size image

II. MIAC ALGORITHM

Matching Images According to Coordinates (MIAC) algorithm compare the two images without concerning their sizes and background. This algorithm compares different size of images. This algorithm gives an efficient comparison result on different facial expression and on different facial position of the same person. In this algorithm the comparison between two images is done according to each coordinates. The coordinate

of the first image is compared with the same coordinate of second image and so on.

Steps of MIAC algorithm are:

- Initially, first we take the two images taken at different position or may be of different sizes.
- Now get the height and width of both images.
- Find the smallest image.
- It compares the image pixel by pixel.
- At last percentage of similarity is calculated.

Implementation steps of MIAC algorithm is given in Figure 1.

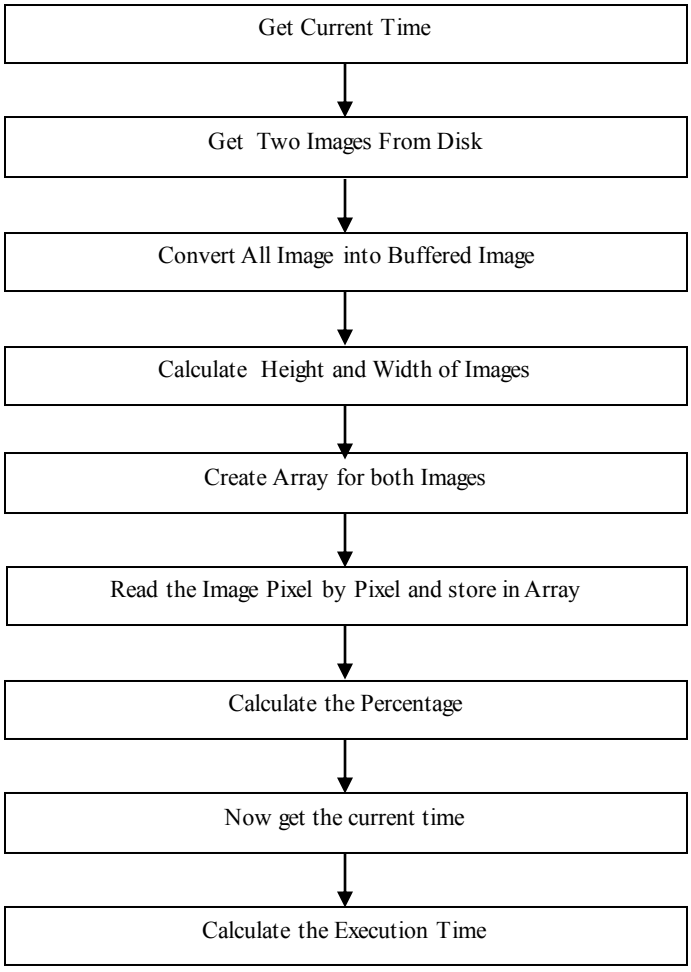

Figure 1: Implementation of MIAC

III. COMPARISON BETWEEN MIAC AND CORRELATION

We have studied many techniques for image comparison. When we compare these techniques with our technique on the basis of effectiveness, performance, accuracy, computational time and cost then we found that MIAC is more efficient then other algorithm.

When we Compare these two images with MIAC then we find the percentage of similarity 43.36800% and if we compare with corelation then we find the percentage of similarity 0.5685%.

The existing techniques are comparing images of same size. But our technique can compare images of different size.

We have developed an algorithm MIAC which is capable to find up to 30% similarity of two images. We have shown comparison of images of same person but with different expression and in different position which gives more accuracy than the other technique.

We have also shown the comparison of different person's images which gives the 0% output. It is efficient to implement than any other technique. And we have also compared all techniques according to effectiveness, performance, accuracy, computational time and cost. Another technique can be implemented in future which will be effective to calculate the similarity of two images of a same person taken at different age.

III. CONCLUSION AND FUTURE WORK

We have studied many techniques for image comparison. We have developed an algorithm MIAC which is capable to find up to 30% similarity of two images. It is efficient to implement than any other technique. And we have also compared all techniques according to effectiveness, performance, accuracy, computational time and cost.

The MIAC Algorithm which we have developed can be used in future to develop an attendance monitoring system etc. It becomes easy to mark attendance or to make entry in any organization through the computerized system. It is very secure and protect from unauthorized entry in the organization.

Another technique can be implemented in future which will be effective to calculate the similarity of two images of a same person taken at different age.

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