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Face Recognition using Edge Detection of Layer

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ABSTRACT

Face recognition of people in a crowd is a challenging issue that received much attention during recent scenario attributable to its numerous applications in different fields. The analysis of human crowds has widespread uses from law enforcement to urban engineering and traffic management. Face recognition in a heavy crowd is one of those challenging problems and till ages no proper solution has been derived, there is no technique that provides a robust solution to all. This paper presents a new technique for human face recognition in a crowd in metropolitan cities.

Keywords: Face recognition, discrete cosine transform, Kohonen Rule, Euclidean distances.

I. INTRODUCTION

The face recognition system is a computer based application for automatic identification or verification of a person through a digital image or a video source .There are numerous ways to perform this identification or detection. One of the ways is by comparing selected facial features from the image and a facial database. This is frequently used in security systems and has a flexibility be compared with other biometrics such as eye iris or fingerprint recognition systems.

The facial recognition algorithm identifies facial features by extracting features, from an image of the subject of interest. Few algorithms normalise a gallery of face images from a complete set and then compress the face data, this saves only the data in the image that is useful for face recognition. The acquired image is then compared with the face data.

II. METHODS AND MATERIAL

MOTION DECTECTION PROCESS

The proposed real-time motion detection algorithm is based on the construction of a structural model of the background [Vannoorenberghe 1995]. This model is composed of all stationary edges in the scene. Moving edges are detected by means of a comparison between edges found in the current image of the sequence and those present in the background of the scene. The background reference image is derived from the images of the sequence. There are several advantages in creating an image of the background edges for the detection of moving objects [Karmann 1990]. The first one is that edges are features rather insensitive to variations of lighting conditions which characterise outdoor scenes. Another advantage of this approach, based on a low level analysis, is that it is independent of the shapes and the number of moving objects. We present in this section the principle of the motion detection algorithm.

A. Principle of the algorithm

Let $I^k(P)$ be the value of the grey level function at a pixel P in the K^{th} input image of the sequence for K € [1,….,N].A simple gradient operator is applied to each input image l^k .Let G^k denote the resulting current edge image whose magnitude $G^k(P)$ at a pixel P indicates the likelihood that the pixel P is part of an edge of the current edge image. This current edge magnitude of the image at pixel P. The construction of this reference edge image is presented in details in the next section. The main idea behind the proposed algorithm is to compare the current edge image to this reference edge image which is constructed as to contain only static edges of the background and capture the layout of the faces and

scan with the target layer to match the face so it makes easy and faster way to scan the crowd. Here we use the Canny edge detection. It is a unique edge detection technique that uses a multi-staged algorithm to detect a wide range of distinct edges in images with great precision.

Consider the input to the system is Fig.1 and a person's face is to be detected. The Fig.2 is the resultant image obtained after the application of grey level canny algorithm. The initial image assumed for the operation is mostly a image with more than two faces. It can be exactly two persons in the image out of which one has to be recognised or in other sense it can also be more than two, but the minimum number of possible faces required is two. The maximum number of faces in the image that is to be operated depends on the resolution of the image. It may vary from one resolution to other. Fig.2 is the selected portion of interest. These pictures are matched with the database and the resultant out is matched specifically.

Figure 1. Original Image

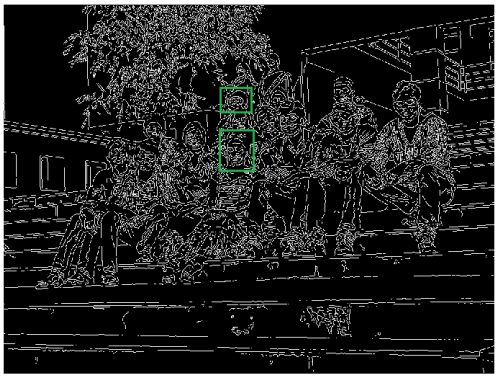

Figure 2. Crowd edge scan image

Figure 3. Selected images

Figure 4. Output Obtained

III. RESULTS AND DISCUSSION

FACE DETECTION BLOCK DIAGRAM

The Basic block diagram of the Face Detection and recognition system consist of six major blocks in it. Prior the major block is the input block. Here the surveillance camera acts as the input accumulator in the total system. Surveillance means monitoring of activities, behaviour or other altering information, generally of people for the purpose of managing, directing, or safeguarding them. This can include observation from a distance by using of an electronic device or interception of electronically transmitted information and it can include simple, relatively no- or low-technology operation such as postal interception and human intelligence agents. The word surveillance was derived from a French phrase for "watching over".

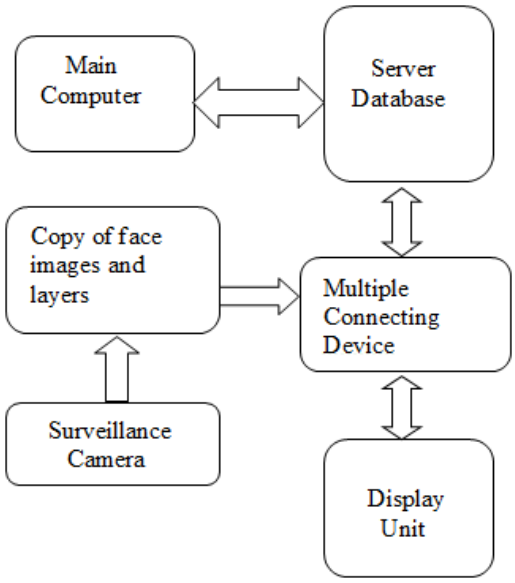

Figure 5. Block diagram of Face Detection System

The main heart of this block diagram is Server Database System. A database system is a collection of information that is managed so that it can easily be managed, accessed and updated. In one words, databases can be classified according to types of information it holds like: full-text, numeric, and images etc.., There is another block that acts as the memory element in this operation that is it stores copies of layers of images. Display unit is an output device.

IV. CONCLUSION

Thus a system that can detect and identify a person from a crowd can be designed using a canny edge detection algorithm. This system is quite efficient when the crowd size is vast. The crowd image recognition can be used also in military applications.

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