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Crime Preventions Technique

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Abstract— Face is the prime concern in criminal identification. The face is our primary focus of attention in social life playing a major role in conveying identity and emotion. There is an abnormal increase in the crime rate and also the number of criminals is increasing, this leads towards a great concern about the security issues. Crime preventions and criminal identification are the primary issues before the police personnel, since property and lives protection are the basic concerns of the police but to combat the crime, the availability of police personnel is limited. Human ability to recognize face is remarkable. The ability to infer intelligence or character from facial appearance is one of the important steps in criminal identification. Criminal records generally contain personal information about particular person along with photograph. To identify any criminal we need some identity of that person, given by eyewitness. In most cases the quality and resolution of the recorded image segments is poor and hard to identify a face.

Keywords— Face Identification, image processing, Biometrics, Face clippings.

I. INTRODUCTION

Criminal record generally contains personal information about particular person along with photograph. To identify any Criminal we need some identification regarding person, which are given by eyewitness. In most cases the quality and resolution of the recorded image segments is poor and hard to identify a face. To overcome this sort of problem we are developing software. Identification can be done in many ways like finger print, eyes, DNA etc. One of the applications is face identification. The face is our primary focus of attention in social inters course playing a major role in conveying identify and emotion. Although the ability to infer intelligence or character from facial appearance is suspect, the human ability to recognize face is remarkable. Face Identification is a technique that is mainly used to identify criminals based on the clues given by the eyewitnesses. Based on the clues we develop an image by using the image that we have in our database and then we compare it with the images already we have. To identify any criminals we must have a record that generally contains name, age, location, previous crime, gender, photo, etc. The primary task at hand is, given still or video images require the identification of the one or more segmented and extracted from the scene, where upon it can be identified and matched.

Purpose of the Identification System:

This Identification System is aimed to identify the criminals in any investigation department. Here the technique is we already store some images of the criminals in our database along with his details and that images are segmented into many slices say eyes, hairs, lips, nose, etc. These images are again stored in another database record so to identify any criminals; eyewitnesses will see the images or slices that appear on the screen by using it we develop the face, which may or may not be matched with our images. If any image is matched up to 99% then we predict that he is only the criminal. Thus using this Identification System it provides a very friendly environment for both operator and eyewitness to easily design any face can identify criminals very easy.

Identification System objective: This Identification System is intended to identify a person using the images previously taken. The identification will be done according the previous images of different persons.

Identification System scope: The scope of the Identification System is confined to store the image and store in the database. When a person has to be identified the images stored in the database are compared with the existing details.

Overview of the Identification System: this Identification System is aimed to identify the criminals in any investigation department. Here the technique is we already store some images of the criminals in our database along with his details and those images are segmented into many slices say eyes, hairs, lips, nose, etc. These images are again stored in another database record so to identify any criminals; eyewitnesses will see the images or slices that appear on the screen by using it we develop the face, which may or may not be matched with our images. If any image is matched up to 99% then we predict that he is only the criminal. Thus using this Identification System it provides a very friendly environment for both operator and eyewitness to easily design any face can identify criminals very easy.

II. RECOGNITION PROCESS

- **Process of Face recognition**

The face recognition system is comprised of four parts: face image acquisition and detection; face image pre-processing; facial feature extraction; face matching and recognition.

Face image acquisition: Static face images, dynamic face images, face images at different locations, and face images of different expressions…all can be acquired by cameras. When the user is within the shooting range, the camera will automatically search and shoot his/her face image.

Face detection: In practical use, face detection is mainly used for pre-processing, i.e. to accurately mark out the position and dimension of face. Face image contains rich modal features, such as histogram feature, color feature, template feature, structural feature and Haar feature. Face detection is to pick out useful information and detect face. The main stream face detection method is AdaBoost algorithm. It's a classification method, which combines some relatively weak classification methods to get a new and powerful classification method. During face detection, Adaboost algorithm picks out some rectangle features that can best represent face (weak classifier), then constructs the weak classifier to a strong classifier through weighted voting, and finally groups in series several strong classifiers to a cascade classifier, which effectively improves the detection speed of classifiers.

Face image pre-processing: Based on the detection result, face images are pre-processed to meet the feature extraction needs. Due to various restrictions and occasional interventions, original image acquired are usually unusable, but require gamma correction, noise filtering and other pre-processing measures. Pre-processing of face image mainly includes light compensation, grey scale transformation, histogram equalization, normalization, geometric correction, wave filtering and sharpening.

Feature extraction: Features used by the face recognition system include visual feature, pixel statistics feature, face image transformation ratio feature, and face image algebraic feature. Exaction is based on some features of face. Facial feature extraction, also known as face characterization, is a modeling process of facial features. Facial feature extraction methods can be classified into two categories: the characterization method based on knowledge; the method based on algebraic features or statistical learning.

The characterization method based on knowledge is to acquire feature data helpful for face classification according to the shape description of face organs and the distance feature among them. Its characteristic components usually include the Euclidean distance between characteristic points, curvature and angle. A face is constructed by eyes, nose, mouth, chins and etc. The geometric description of these parts and the structural relationship among them can be used as the important features for recognition. These features are called geometric features. The method based on knowledge mainly includes the method based on geometric features, and the template matching method.

The basic principle of algebraic feature-based method is to transform high-dimensional description of face in spatial domain to low-dimensional description in frequency or other domains. This characterization method is divided into linear Identification Systemion method and non-linear Identification Systemion method. The former is further divided into principal component analysis (or K-L transform), independent component analysis and Fisher linear discrimination analysis. The latter has two important branches: feature extraction technology based on kernel, and feature extraction technology oriented by manifold.

Matching and recognition: Facial feature data extracted are matched with the feature template stored in database. A threshold is set. When similarity exceeds this threshold, the matching result is outputted. Face recognition is to match the facial features to be identified with the feature template, and determine the identity information based on the degree of similarity. There are two different recognition processes: one is to verify (a one-to-one matching process), and the other is to identify (a one-to-many matching process).

- **Process of Iris Recognition**

Iris recognition system mainly includes four parts, namely iris image acquisition, iris image pre-processing, iris image feature extraction and encoding, and iris image matching and recognition. The part of iris image pre-processing further includes iris positioning, normalization and image enhancement.

Iris image acquisition: Iris image acquisition is the first step in iris recognition. Iris is a very small organ, around ten-odd millimeters in diameter. Different races have greatly different iris colors. The yellow race normally have irises in dark brown, which have very obscure texture; therefore a special iris image acquisition device must be used to take iris images with rich texture. At the time of acquisition, the user has to stand in a range of 10-50 cm from the acquisition device and stare at the acquiring window with eyes widely open so that a clear iris image can be acquired.

Iris positioning: As the most important step in the whole iris recognition process, iris positioning is to accurately determine the inner and outer boundaries of an iris and ensure the iris area in which the features are extracted each time from similar area and there is not too much deviation; positioning speed and accuracy determine he practicability and feasibility of the entire iris system. Iris boundary positioning methods are mainly divided into two types. One is positioning algorithms based on round iris, including the positioning method based on grey gradient, for example calculus method, and the method based on binary boundary point, such as least square method and Hough transform; the other is positioning algorithm based on non-round iris, including ellipse fitting method and dynamic contour method.

Iris normalization: In the process of iris image acquisition, images obtained are not only different in size but also appear rotated or translated under the influence of factors like focal length, human eye size, eye translation and rotation and pupil contraction. For ease of comparison, an iris recognition system will normally give normalization processing to an iris for the purpose of adjusting each original image to a same size and corresponding position and thus eliminating the effect of translation, contraction/enlargement and rotation on iris recognition.

Iris image enhancement: Some cause of the acquiring device itself renders iris images unevenly illuminated; this can be treated normally through histogram equalization. The interference of various noises is also present in the acquisition process; noise interference due to, for example, reflection of light is usually removed through homomorphic filtering. If the acquired image for iris recognition is dim and unclear, the recognition capability of the iris recognition system will be

greatly affected; a reconstruction based super-resolution method is usually used to improve the iris image. In a word, image enhancement is intended to reduce the effect of factors like uneven illumination and various noises on the recognition capability of an iris recognition system.

Iris feature extraction and encoding: A relevant algorithm is relied on to extract a distinct detail feature from an iris image and a proper feature recording method is taken, so as to form iris encoding and finally create a feature template or modality template. This step, good or bad, relates directly to the accuracy rate of iris recognition. From the point of view of feature extraction, methods now available can be divided into three types: phase analysis based methods, such as Daugman's phase encoding method, zero crossing detection based methods, such as Boles' 1D wavelet zero-crossing encoding method, and texture analysis based methods, such as Wildes' Laplacian pyramid algorithm.

Matching and identification: Iris recognition is a typical matter of modality matching, i.e. matching of the feature of an acquired image with the iris image feature template in the database to judge if the two irises belong to a same type. Modality matching algorithms normally relate to feature extraction algorithms; main matching methods include Hamming distance and Euclidean distance. The matching process of an iris recognition system can be divided into two modes. The first is identification by matching the feature to be recognized with all feature templates stored and spotting the modality to be recognized from a number of types; hence a matter of one-to-many matching. The second is verification by matching the feature to be recognized with the identity template declared by the user, judging according to the matching result if they belong to a same modality, and finishing one-to-one matching. With respect to identification, verification has a much smaller range and much higher speed.

III. PROBLEM DESCRIPTION

The Identification System is aimed at identifying the criminals with the help of eye witness. There are mainly four modules in our Identification System. They are adding, deleting, updating and identifying the criminals. There are mainly three roles in our Identification System. They are:

- Administrator
- Operator
- Eyewitness

The administrator is responsible for providing user id's and passwords. He provides authentication to the users. He creates deletes and updates the user ids and passwords. The operator, who belongs to the investigating department, is responsible for entering the criminal details and maintains them. He adds, deletes and updates the criminal details. He also constructs the criminal face with the help of eye witness.

The eyewitness identifies the criminals with the help of cropped parts stored in a different database by the operator. The eyewitness selects a cropped part from the database and that cropped part will be freeze by the operator in this way, complete face of the criminal is constructed and the details of that criminal is retrieved from the database. We can also construct a new image from those cropped parts which we consider as an imaginary face of the criminal. The first step in developing anything is to state the requirements. This applies just as much to leading edge research as to simple programs and to personal programs, as well as to large team efforts. Being vague about your objective only postpones decisions to a later stage where changes are much more costly. The problem statement should state what is to be done and not how it is to be done. It should be a statement of needs, not a proposal for a solution. A user manual for the desired system is a good problem statement. The requestor should indicate which features are mandatory and which are optional, to avoid overly constraining design decisions. The requestor should avoid describing system internals, as this restricts implementation flexibility. Performance specifications and protocols for interaction with external systems are legitimate requirements. Software engineering standards, such as modular construction, design for testability, and provision for future extensions, are also proper.

Many problems statements, from individuals, companies, and government agencies, mixture requirements with design decisions. There may sometimes be a compelling reason to require a particular computer or language; there is rarely justification to specify the use of a particular algorithm. The analyst must separate the true requirements from design and implementation decisions disguised as requirements. The analyst should challenge such pseudo requirements, as they restrict flexibility. There may be politics or organizational reasons for the pseurequirements, but at least the analyst should recognize that these externally imposed design decisions are not essential features of the problem domain. A problem statement may have more or less detail. A requirement for a conventional product, such as a payroll program or a billing system, may have considerable detail. A requirement for a research effort in a new area may lack many details, but presumably the research has some objective, which should be clearly stated.

Most problem statements are ambiguous, incomplete, or even inconsistent. Some requirements are just plain wrong. Some requirements, although precisely stated, have unpleasant consequences on the system behavior or impose unreasonable implementation costs. Some requirements seem reasonable at first but do not work out as well as the request or thought. The problem statement is just a starting point for understanding the problem, not an immutable document. The purpose of the subsequent analysis is to fully understand the problem and its implications. There is no reasons to expect that a problem statement prepared without a fully analysis will be correct. The analyst must work with the requestor to refine the requirements so they represent the requestor's true intent. This involves challenging the requirements and probing for missing information. The psychological, organizational, and political considerations of doing this are beyond the scope of this book, except for the following piece of advice: if you do exactly what the customer asked for, but the result does not meet the customer's real needs, you will probably be blamed anyway.

Existing system:

This system is manual system only. Here, have a facility to store the criminal images. If you want to compare the criminal images with the existing images it is manual process. This process is very slow to give the result. It is very critical to find the criminal images.

Proposed system:

To overcome the drawbacks that were in the existing system we develop a system that will be very useful for any investigation department. Here the program keeps track of the record number of each slice during the construction of identifiable human face and calculate maximum number of slices of the similar record number. Based on this record number the program retrieves the personal record of the suspect (whose slice constituted the major parts of the constructed human face) on exercising the "locate" option.

Overview:

Addition, Clipping, Construction and updating of the criminal record and face. Comparing the image with the faces that are there in our database. If any new images are found then it should be entered into our database by add image module and then it should be segmented into different slices.

IV. THE PROPOSED SYSTEM AND IMPLEMENTATION

Feature extraction domain has plenty of collection of generalized face features from several images of the same subject. Then, each face image is processed, features are extracted and the collection of features are analyzed and combined into a single generalized features collection, which is written to the database. The face is our primary focus of attention in social inter course playing a major role in conveying identification and emotion. Although the ability to infer intelligence or character from facial appearance is a guess but still the human ability to recognize faces is remarkable. This analogy would give us enough scope to envisage a new algorithm. There are mainly three important ways in construction of the face i.e., by using the eyewitness function, adding details and clipping image. This offers us a face as finally identification parameter to know who has committed the crime.

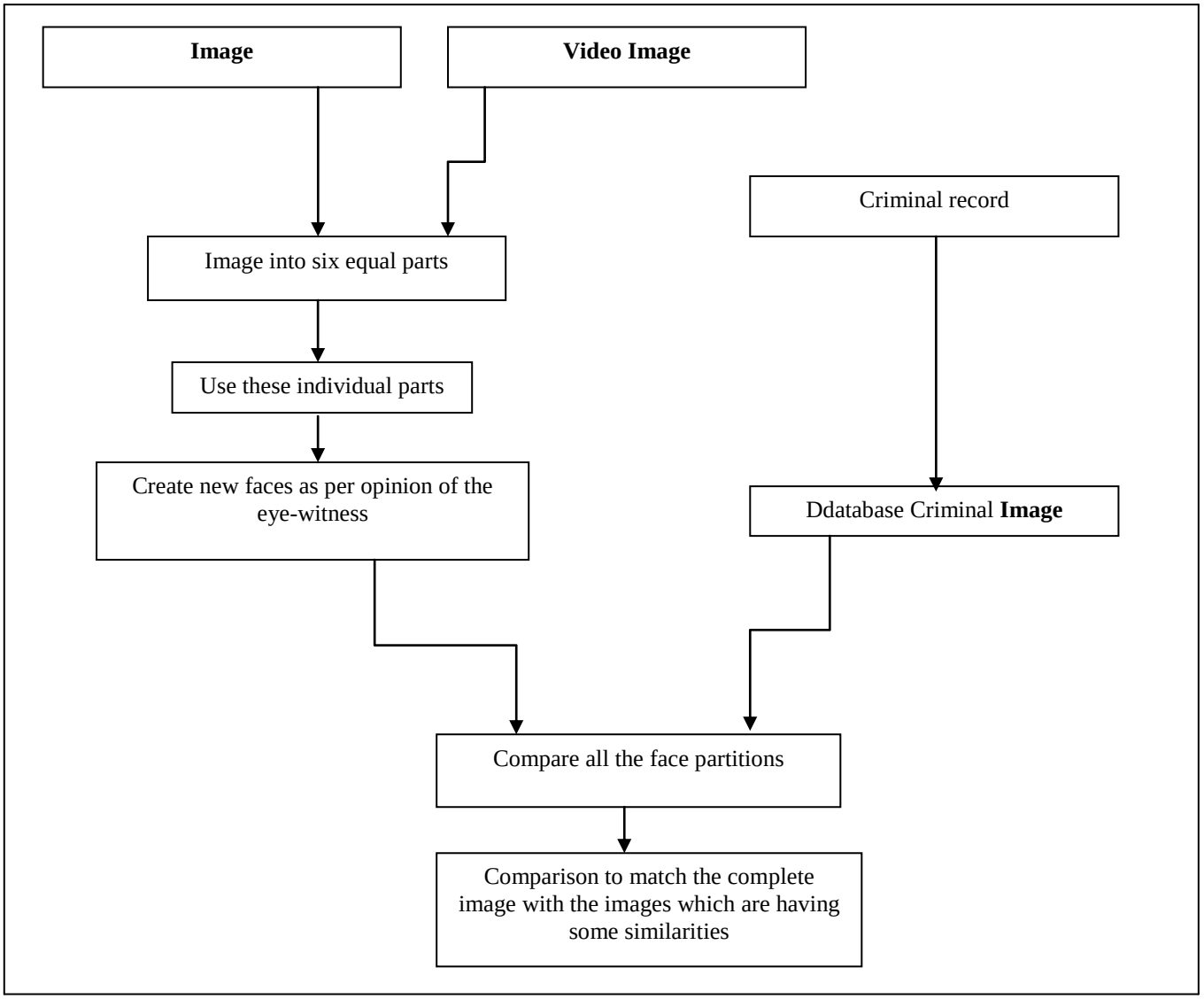

Fig. 1 **Image Partitioning**

The Image Partitioning Algorithm:

Step 1: Split the image into six equal parts as hair, forehead, eyes, nose, mouth, and chin.

Step 2: Now the face has been divided into individual parts, which is an easy way to create new faces and match the criminal with the database.

Step 3: Use these individual parts to create new faces as per opinion of the eye-witness.

Step 4: Compare all the face partitions with the database available. It would generate a list of matched responses from the database i.e. may be more that one.

Step 5: Initiate a process of comparison to match the complete image with the images which are having some similarities so that we could get the most suitable suspect from the available database among all the suspects.

Step 6: Thus with recursive match computations done to all the parts of the image against database images, we would arrive at a particular image which showcases maximum matche. Thus, emerges an image that is a perfect match of the suspected criminal.

V. CONCLUSIONS

software to help police identify suspects through speedy facial recognition analysis. With a database of faces recorded by cameras installed in public areas, the digital video surveillance system can pinpoint suspects by matching facial features with those of people in the database. In which input image is scanned at almost every pixel location and scale, to boost the performance of the detector along with the enhanced accuracy. In this, we have classified image processing operations into three categories, low, medium and high level. Based on the face recognition process under proposed system this work has suggested better approach for identification used in criminal identification. In this work we have taken a pre-captured image and performed processing techniques on it. In future we intend to take a real image and perform "real time image processing" on it.

REFERENCES

[1] Cate H. Fred "Legal Standards for Data Mining" retrieved from the internet on 12-03-2011 http://www.hunton.com/files/tbl_s47Details/FileUpload265/1250/Cate_Fourth_Amendment.pdf

[2] Clifton Christopher (2011). "Encyclopedia Britannica: data mining", Retrieved from the web on 20-01-2011

[3] S. Zhang, C. Zhu, J. K. O. Sin, and P. K. T. Mok, "A novel ultrathin elevated channel low-temperature poly-Si TFT," *IEEE Electron Device Lett.*, vol. 20, pp. 569–571, Nov. 1999.

[4] M. Cole, "Algoritmic skeletons: structured managment of parallel computations," in Research Monographs in Parallel and Distributed Computing. MIT Press, 1989.

[5] E. Komen, Low-level Image Processing Architectures. PhD thesis, Delft University of Technology, 1990.

[6] Bureau of Justice Statistics, U.S. Department of Justice, April (1990), pp. 43-66; SEARCH Group, "Legal and Policy Issues Relating to Biometric Identification Technologies".

[7] D. Serot and J. Derutin, "Skipper: A skeleton-based programming environment for image processing applications," in Proceeding of the Fifth International Conference on Parallel Computing Technologies, 1999.

