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Sketch Photosynthesis and Classification using K-Nearest Neighbor Classifier

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Abstract: ***Sketch-photosynthesis approach is sketching the face of the photograph. Sketch-photosynthesis makes use of a strategy of equivalent composite comic strip with photograph. The capabilities are separated and combined to teach the system. In this paper caricature photosynthesis using K-means and K-nearest neighbor classifier is used to sketch the photograph. The K-means algorithm in data mining starts from the primary organization of randomly decided on centroids. It is practiced as the starting point for every cluster because it plays iterative calculations to optimize the positions of the centroids.***

Index Terms - Sketch-photosynthesis, K-means, K-nearest classifier

I. INTRODUCTION

The face photo synthesis is used in many applications such as law enforcement and criminal identification. It takes a major role in advanced criminal identification and biometric technology. Sometimes crimes happen without any clues, however many crimes are supported by the clues provided by eyewitness as well as finger print ,DNA etc. In such cases the eyewitness who had seen the criminal are used for identifying the face of the criminal. Forensic sketch method is used to draw the criminal face with the verbal description provided by the eyewitness. In this scenario, the face sketch synthesis is a technique used to match the sketch drawn based on eyewitness inputs to that of the set of criminal images in the library by the trained system. The training set are given with the details of the eyes, ears, nose of the criminal. In this system, initially the reverse detecting process is initiated, in which the face of the criminals are loaded and the edges of the part in the face are noted which are then cropped and labeled. The data are stored in bytes and further process is continued by training the data.

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The chapter II explains the literature survey, chapter III describes the methodology and the rest of the paper is summarized by a conclusion.

II. LITERATURE SURVEY

Face sketching has a huge topic of discussion inside the statistic area. Face sketching approaches had represented and different researchers have tested the factors and the characteristics of the face.

Brendan F. K, et al., [1] have proposed the usage of a framework Local Framework Discriminant Analysis (LDFA). In this work, forensic drawings are plotted by comparing the inputs of a witness to a representation of the suspect. Both sketches and photographs are categorized using Scale Invarient Feature Transform and Multi Scale Local Binary Patterns. Photograph descriptor gives the statics.

Hu Han, et al., [2] addressed in his paper about mechanized matching composite sketches to an appearance photo. He has mentioned that the functions are extracted for every facial component using multi-scale local binary pattern(MLBP). Facial composite structures generate frontal sketches that have variations in face scale. To deal with these versions in pose and scale, a geometric transformation is utilized in composite sketches and facial snapshots primarily based on the Pitt Patt Face Recognition.

Ujwala T. Tayade et al., [3] proposed a method for comparing a freehand caricature to an album of photos by using a robust framework called neighborhood characteristic-based pre-processing algorithm. Experiments were completed using forensic sketches for matching. The experimental effects tested by using the matching performance of the proposed set of rules using the pre-processing technique yielded a better identification accuracy in comparison to the alternative strategies.

Scott J. Klum, et al., [4] proposed an exploration of composite popularity by using a Face Sketch ID System which is a scalable and operationally deployable software program that achieves matching accuracy on facial components by using two programs namely holistic and component based.

N K Bansode, et al., [5] used evolutionary genetic algorithm for generating the face sketch from the description given by the eye witnesses. The algorithm uses several iterations to generate the face sketch and operators like selection, crossover and mutation are also used.

Dr. Ashwini Barbadek, et al., [6] have used an Embedded hidden Markov version for face recognition. In his paper, he used a Partial Least Squares technique for characteristic choice in face recognition across one-of-a-kind modalities correctly.

Inside the sorts of sketches, a forensic and composite sketch to regulation implementation is involved. This consists of the lengths, widths, their ratios of various facial parts which include mouth, eyes, nose, lips, etc. The appearence area is first obtained after which those factors are gathered one after the other from the obtained face.

Wang et al.,[7] discussed the failure of conventional methods of face sketch photo synthesis presented a novel dual-transfer face sketch-photo synthesis framework composed of an inter-domain transfer process and an intra-domain transfer process. In the inter domain transfer process, the common facial structures were recovered and in the intra domain process , the loss of identity specific information is reduced.

III. METHODOLOGY

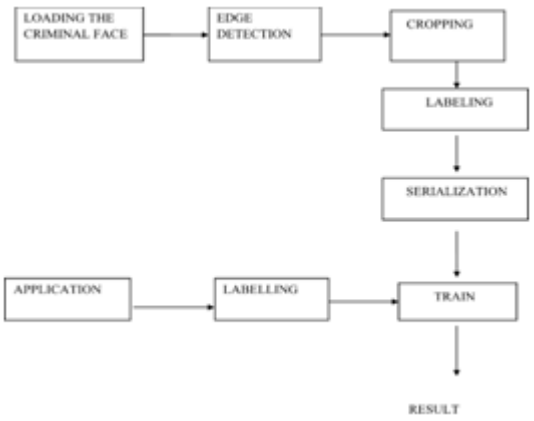

Fig 3.1 Face Sketch Photosynthesis

Fig 3.1 explains the block diagram of the working system which is explained as follows:

STEP 1: Loading the criminal face

The criminal face is loaded with the location. The proper location is applied. It has both the path and format.

STEP 2: Edge detection

The Canny edge detector is used to detect edges in an image. The correct value of the starting point and ending point of the eyes, ears, nose are mentioned.

STEP 3: Cropping

For cropping Numpy Math Algorithm is applied. It is used to collect the data from face such as eyes, nose, and mouth. The data of images are collected from the image data location. The starting and ending point of the parts of the face is given.

STEP 4: Labeling

Labeling is performed by Skicit learn algorithm. The dimension of parts of the face is labeled by grouping the data given by cropping processing.

STEP 5: *Serialization*

The Python pickle module is used in the Serialization, which converts an object into a stream of bytes to store the object which can be understood by the system.

STEP 6 : Train set

The K –nearest neighbor algorithm is used to train the model. It has labeled data to train the system. Criminal name and their information are used as the image data.

STEP 7: Labeling

Labeling is performed by Skicit learn algorithm. The dimension of parts of the face is labeled by grouping the data given by cropping processing. Label encoder is used for labeling the system.

STEP 8*: *Application

The final result is acquired. The criminal facial details are generated. It is automatically viewed and generated.

IV. EXPERIMENTAL RESULTS

The unique image of criminal is sketched by using the size of eyes, ears and nostril. The various patterns and textures are implemented and among the different types of drawings the freehand drawing gives the better results. The absolute drawing of the criminal is obtained this method.

Fig 4.1 Sketch photo of the criminal

V. CONCLUSION

The criminal is identified by using the sketch photo- synthesis method which employs factor definition method for obtaining the different parts of the face. This approach identifies the identical image from the album of images used for training. The criminal face is drawn by step by step procedure. This method produces clear identity such as hairstyles, eyes and ears. The process also helps to identify specific details of the face. The advantage of this process is that it portrays good prediction in all the steps

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