ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 6, June 2015

Component Based Representation Approach to Recognize Face Photo Using Composite Sketches

Ganesh S. Pakmode

Department of ETC, PCE**,** Rastrasant Tukdoji Maharaj University Nagpur, Nagpur, Maharastra India

ABSTRACT: The problem of automatically matching composite sketches to facial photographs is addressed in this synopsis. Previous research on sketch recognition focused on matching sketches drawn by professional artists who either looked directly at the subjects (viewed sketches) or used a verbal description of the subject's appearance as provided by an eyewitness (forensic sketches). Forensic sketches differ from viewed sketches in that they are drawn by a police sketch artist using the description of the subject provided by an eyewitness. Unlike sketches hand drawn by artists, composite sketches are synthesized using one of the several facial composite software systems available to law enforcement agencies. I propose a component-based representation (CBR) approach to recognize face photo using composite sketch and measure the similarity between a composite sketch and mugshot photograph. Specifically, I will first automatically detect facial landmarks in composite sketches and face photos using an active shape model (ASM). The features are then extracted for each facial component using multiscale local binary patterns (MLBPs) and per component similarity is calculated. Finally, the similarity scores obtained from individual facial components are fused together, yielding a similarity score between a composite sketch and a face photo. By using gender information matching performance is further improved by filtering the large gallery of mugshot images. I believe that the prototype system will be of great value to law enforcement agencies in apprehending suspects in a timely fashion.

KEYWORDS: Component based face representation, composite sketch, face recognition, forensic sketch, heterogeneous face recognition, modality gap

I. INTRODUCTION

Progress in biometric technology has provided law enforcement agencies additional tools to help determine the identity of criminals. Helping to determine the identity of criminals is an important application of face recognition systems. However, many crimes occur where none of this information is present or the facial photograph of a suspect is not available, but instead an eyewitness account of the crime is available. In these circumstances, a forensic artist is often used to work with the eyewitness in order to draw a sketch that depicts the facial appearance of the culprit according to the verbal description .This is commonly used method to assist the police to identify possible suspects. Sketch artist generally needs a large amount of training in both drawing and sculpting, facial composite software kits, which allow even non artists to synthesize a sketch after only several hours of training, have become a popular alternative in criminal justice and law enforcement agencies. Due to budgetary reasons, many law enforcement agencies use facial composite software, which allows the user to create a computer generated facial composite (composite sketch), instead of employing forensic sketch artists. Despite several methods for matching hand drawn sketches to photographs appearing in the literature to our knowledge, there has been only limited research on matching computer generated composites to mugshot photographs. Some of the most widely used facial composite software kits include IdentiKit, Photo-Fit, FACES, Mac-a-Mug, and EvoFIT. IdentiKit and Photo-Fit are examples of early facial composite systems that synthesize a sketch by selecting a collection of facial components, e.g. hair, eyebrow, eyes, nose, mouth, shape, and eyeglasses. FACES and Mac-a-Mug systems are modern component based facial composite systems which include additional facial components

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 6, June 2015

Literature Survey

1.Accordiang to A. K. Jain, B.Klare, and U. Park, ushing this method LBP, CBR, feature Extraction,ASM gives Face matching and retrieval in forensics applications
2.According to X. Wang and X. Tang using method Sketch recognition face normalization face recognition,Sketch synthesis
3.According to P. C. Yuen and C. H. Man using thise method Sketch recognition, Face recognition, gives Human face image searching system using sketches

II. WORKING

1. Preprocessing – involves translation and rotation of face by detecting eye centers using PittPatt Face Recognition SDK software.

2. Feature extraction – Crucial landmarks are first determined and then Multilevel LBP algorithm will be used for extracting window based features for eyes, nose, mouth etc.

3. Dimension Reduction – After the features have been extracted, the dimension of the features can be reduced using feature reduction algorithms such as Principal Component Analysis.

4. Data base maintenance – The features thus reduced are stored in database.

5. Classifier – The test image (sketch) is also followed through the steps from 1-3 and given to the classifier (Neural Network – Supervised) which will be trained by the training set from the database features.

6. Result – The higher matching face is then displayed. Another four such faces will also be displayed which have higher matching percentage below the first face according to the matching percentage.

Fig 1:- Preprocessing involves translation and rotation of face by detecting eye centers

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 6, June 2015

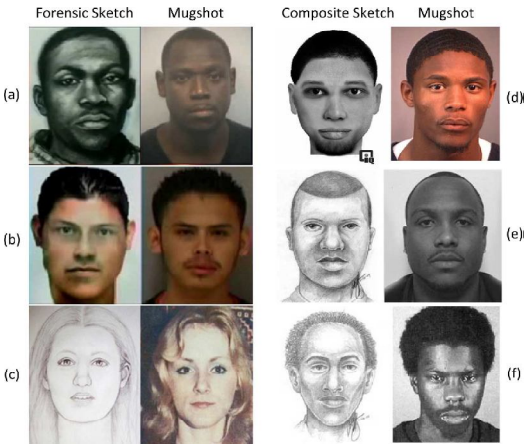

Fig.2 Several cases recently reported in the media where the suspects were identified by using forensic sketches drawn by artists

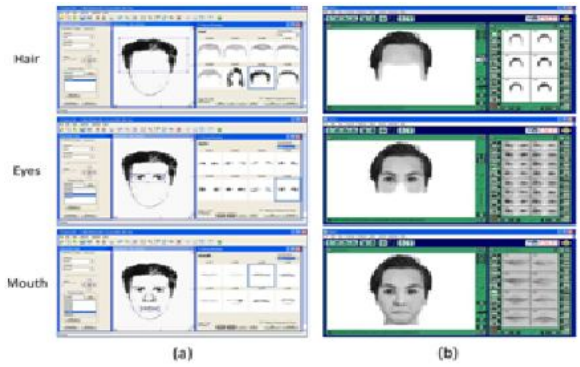

Fig 3 Procedure for creating a composite sketch using (a) IdentiKit and (b) FACES . The three rows, respectively, show how the hair, eyes, and mouth components

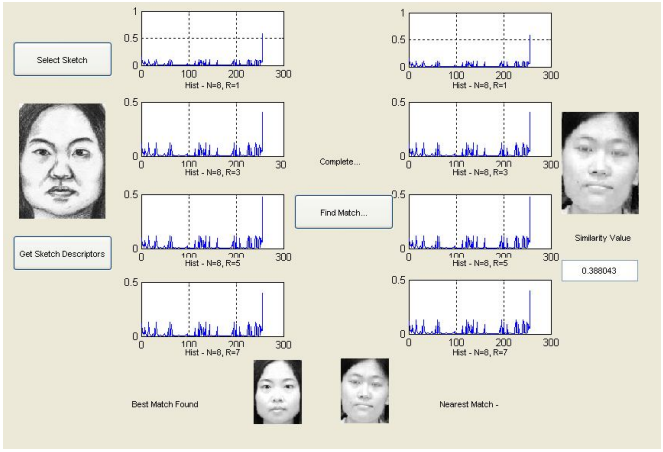

Fig.4 Maching component based representation

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 6, June 2015

III. SIMULATION RESULTS

The synopsis proposes a novel scheme to embed secret data directly in compressed and then encrypted H.264/AVC bit stream. Firstly, by analyzing the property of H.264/AVC codec, the code words of IPMs, the code words of MVDs, and the code words of residual coefficients are encrypted with a stream cipher. The encryption algorithm is combined with the Exp-Golomb entropy coding and Context-adaptive variable-length coding (*CAVLC*), which keeps the code word length unchanged. Then, data hiding in the encrypted domain is performed based on a novel code word substituting scheme. In contrast to the existing technologies discussed above, the proposed scheme can achieve excellent performance in the following three different prospects.

IV. REFERENCES

1 A.K. Jain, B. Klare and U. Park, "Face matching and retrieval in forensics applications," *IEEE Trans*, vol. 19, no. 1, p. 20, Jan. 2012.
2 Brendan F. Klare , Zhifeng Li ,Anil k Jain "Matching Forensic Sketches to mug shot photos." IEEE Trans, Vol.33, NO.3 march 2011.
3 P. C. Yuen and C. H. Man, "Human face image searching system using sketches," *IEEE Trans. Syst., Man, Cybern. A, Syst. Humans*, vol. 37,no. 4, pp. 493–504, Jul. 2009.
4 X. Wang and X. Tang, "Face photo-sketch synthesis and recognition," *IEEE Trans. Pattern Anal. Mach. Intell.*, vol. 31, no. 11, pp.1955–1967, Nov. 2007.
5 X. Tang and X.Wang, "Face sketch recognition," *IEEE. Circuits Syst. Video Technol.*, vol. 14, no. 1, pp. 50–57, Jan. 2004.
6 X. Gao, J. Zhong, J. Li, and C. Tian, "Face sketch synthesis algorithm based on E-HMM and selective ensemble," *IEEE Circuits Syst.Video Technol.*, vol. 18, no. 4, pp. 487–496, Apr. 2008.
7 A. K. Jain, B.Klare and U. Park, "Face matching and retrieval in forensics applications," *IEEE Multimedia*, vol. 19, no. 1, p. 20, Jan. 2012.
8 W. Zhang, X. Wang, and X. Tang, "Coupled information-theoretic encoding for face photo-sketch recognition," in *Proc. Conf. Computer Vision and Pattern Recognition*, 2011, pp. 513–520..
9 Z. Lei and S. Li, "Coupled spectral regression for matching heterogeneous faces," in *Proc. IEEE Conf. Computer Vision and Pattern Recognition*, 2009, pp. 1123–112.
10 J. Huang, V. Blanz, and B. Heisele, "Face recognition using component- based SVM classification and morphable models," in *Proc. First Int. Workshop on Pattern Recognition with Support Vector Machines*, 2002, pp. 334–341.
11 T. Cootes, C. Taylor, D. Cooper, and J. Graham, "Active shape models their training and application," *Compute. Vis. Image Understand.*, vol.61, no. 1, pp. 38–59, Jan. 1995.
12 PittPatt Face Recognition SDK, Pittsburgh Pattern Recognition [Online]. Available: http://www.pittpatt.com.
13 FaceVACS Software Developer Kit, Cognitec Systems GmbH, http://www.cognitec-systems.de, 2010.

BIOGRAPHY

Ganesh S. Pakmode is a student of M tech communication engineeringin PCE nagpur. My intrest is in image processing . I am doing my project work in image processing field.