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Sketch Based Image Retrieval System

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Abstract: The systematic approach that bridges the appearance gap for Sketch Based Image Retrieval System. The existence of noisy edge on photo realistic images is factor in enlargement of appearance gap and significantly degrades performance. To bridge this gap the system is proposed that consisting the framework of line segment based descriptor named as Histogram of Line Relationship (HLR) and a noise reduction algorithm as Boundary selection Algorithm. HLR Sketches and extracted edges of photo realistic images as series of Piece wise line segment and capture's the relationship between them. Based on the HLR the object boundary selection algorithm reduces the impact of noisy edges by selecting the shapes edges .A fast method is applied to efficiently and the solution for object boundary selection algorithm. Multiple hypotheses are generated for descriptors by hypothetical edge selection. The selection algorithm is formulated to and the best combination of hypotheses to maximize the retrieval score. To reduce the distraction of false matches in the scoring process, two constraints on spatial and coherent aspects are introduced. By comparing the proposed HLR with state-of-the art descriptor it show that HLR descriptor outperforms them Combined with the object boundary selection algorithm, the framework significantly improves SBIRs performance.

Keywords: Large Scale Sketch Retrieval, Line Segment Based Descriptor, Histogram of Line Relationship (HLR), Object Boundary Selection Algorithm, etc.

1. INTRODUCTION

In this system, the client will give all the information about the suspect person and then in editor using different tools like nose, ears, eyes, hairs etc, sketch will be generated with the help of these tools and this sketch is then sent to the matching algorithm (PCA) that is Principle Component Analyses. In matching algorithm, this sketch is then compared with the digital images sketch, which is obtained by converting the digital image which is present in the database into the sketch. Then both the sketches will get compared, and if match is found, then digital image of that sketch is given as the output from the database, and if the match is not found then it will compare with the sketch of next digital image. Face recognition has attracted great attention in recent years. An important application of face recognition is to assist LOW ENFORCEMENT.

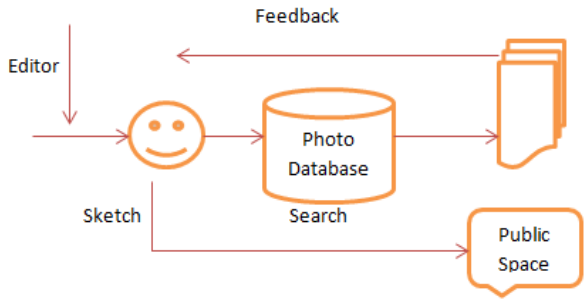

Fig1.face sketch Detection.

Automatic retrieval of photos of suspects from police mug shot database can help the police narrow down potential suspects quickly. However, in most cases, the photo image of a suspect is not available. The best substitute is often a sketch drawing based on their collection of an eyewitness. Due to the great difference between sketches and photos, and the unknown psychological mechanism of sketch generation, face sketch recognition is much more difficult than the normal face recognition based on photo image. During the past three decades, many face recognition techniques have been proposed, however, few face sketch recognition systems can be found effective. Face Photo Sketch Recognition Synthesis was proposed for recognizing face in straight forward way. This technique is used to overcome the difficulty of matching photos sketches in two different modalities. It was developed mainly for security purposes thus used in LAW ENFORCEMENT. Automatic retrieval of photos of suspects from police mug-shot database can help the police narrow down potential suspects quickly. However, in most cases, the photo image of a suspect is not available. The best substitute is often a sketch drawing based on the recollection of an eyewitness. Therefore, automatically searching through a photo database using a sketch drawing is very useful. It will not only help the police to locate a group of potential suspects, but may also help the witness and the artist to modify the sketch drawing of the suspect interactively based on the similar photos retrieved. The key objective for sketch-based face photo recognition is to reduce the difference between the two modalities i.e. to bring photo sketch into same mode so that recognition processes become easier. It can also be used in many other fields where photo is not available but it describes the details of the photo. This method significantly reduces the difference between photo and sketch .This show that the synthesized sketch by any of this method transformation is a good approximation to the real one when the transformation procedure can be approximated as linear.

Sketch-Based Image Retrieval through Hypothesis Driven Object Boundary Selection with HLR Descriptor.

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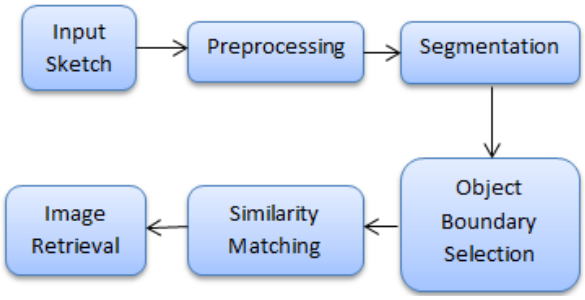

Fig2. Proposed System.

In Face sketch-photo synthesis and retrieval introduces a method for representing face which is based on the features which uses geometric relationship among the facial features like mouth, nose and eyes. Feature based face representation is done by independently matching templates of three facial regions that is eyes, mouth and nose[6].Principal Component Analysis(PCA) method which is also called Eigen faces is appearance based technique used widely for the dimensionality reduction . Face is a very important part of the human body through which and individual can be identified [7].The Face is a primary focus in the society and it plays a major role in conveying identity and emotions of an individual. Other than identical twins every individual has unique facial features. Facial recognition is a form of computer vision which uses human faces to attempt to identify an individual or verify a person's claimed identity.

The proposed photo synthesis method (SNS-SRE) works at patch-level and is composed of two steps: sparse neighbor selection (SNS) for an initial estimate of the image and sparse-representation-based enhancement (SRE) for further improving the quality of the synthesized image. SNS can find closely related neighbors adaptively and then generate an initial estimate for the image. In SRE, a coupled sparse representation model is first constructed to learn the mapping between sketch patches and photo patches, Finally two retrieval modes, namely sketch-based and photo-based retrieval, are proposed, and a retrieval algorithm is developed by using sparse representation. Experiments will be conducted to measure the effectiveness of the proposed face sketch-photo synthesis and retrieval algorithms [5].

In this system face images include face photos and sketches, so 'pseudo-image 'may means 'pseudo-sketch' or 'pseudo-photo[4]'.For the sake of brevity, here use different notations to represent these two kinds of transformation. ‘Sketch? Photo' denotes the transformation from a sketch to a photo and a pseudo-photo is generated. Correspondingly ‘Photo? Sketch means the transformation from a photo to a sketch, from which a pseudo-sketch results. 'Sketch-photo' presents sketch-photo pairs or the transformation between a sketch and a photo, which can be easily understood in context.

2. EXISTING SYSTEM AND PROPOSED SYSTEM.

2.1 Existing System:

CBIR (Content Based Image Retrieval) as processors become increasingly powerful, and memories become increasingly cheaper, the deployment of large image databases for a variety of applications have now become realizable. Databases of art works, satellite and medical imagery have been attracting more and more users in various professional fields for example, geography, medicine, architecture, advertising, design, fashion, and publishing. Effectively and efficiently accessing desired images from large and varied image databases is now a necessity [1]. CBIR or Content Based Image Retrieval is the retrieval of images based on visual features such as color, texture and shape [2]. Reasons for its development are that in many large image databases, traditional methods of image indexing have proven to be insufficient, laborious, and extremely time consuming. These old methods of image indexing, ranging from storing an image in the database and associating it with a keyword or number, to associating it with a categorized description, have become obsolete. This is not CBIR. InCBIR, each image that is stored in the database has its features extracted and compared to the features of the query image [3].

2.2 Proposed System:

In this system there is minimizing the task of the forensic department and the cops of finding a particular criminal based on the sketch. Previously it was very difficult for the cops and the forensic department to search a particular criminal based on the sketch. By just having the sketch it was complicated to and a criminal. So we have proposed such a project which will be very advantageous in the field of forensic department because it will be very easy to and the criminal based on the photo but from the sketch it is difficult. Here we are going to use three algorithms (SNS-SRE) for converting the database photo to the sketch and PCA algorithm for matching purpose.

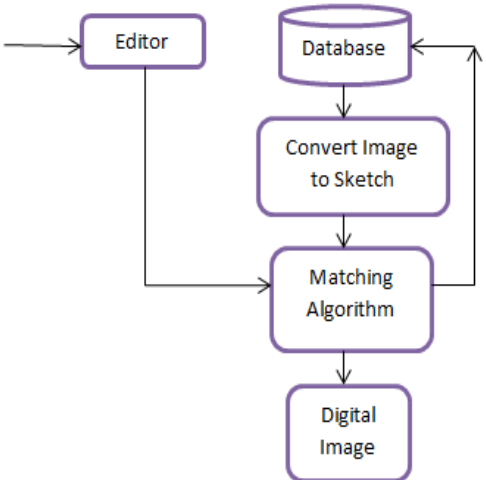

Fig3.System Architecture

1. The witness gives the information about suspect to the administrator.
2. The Editor will draw a sketch by using information from the administrator.
3. Editor -components like eyes, ears, lips, hairs, face, etc.)
4. The digital images of database are converted into a sketch one by one at a time.

5. The sketch is obtained from Editor and the sketch is obtained from Digital Database are compared.
6. If match is found then it will give a result as a digital image and if not then stop the process. The overall architecture (Fig.3) of the system can be subdivided in to three main modules: Editor, Convertor (convert database images into sketches) and Matching Algorithm (PCA, SNS-SRE). Each module is described in detail in the following subsection.

Editor: Editor will develop a sketch - Basically Editor consists of components of eyes, ears, hairs, face, lips etc.... Editor gives the correct and nest resolution of sketch. The intensity of image is considered.
Convertor: Convertor does the function of converting database images into sketches one by one. It has correctness and accurate level of intensity of images.

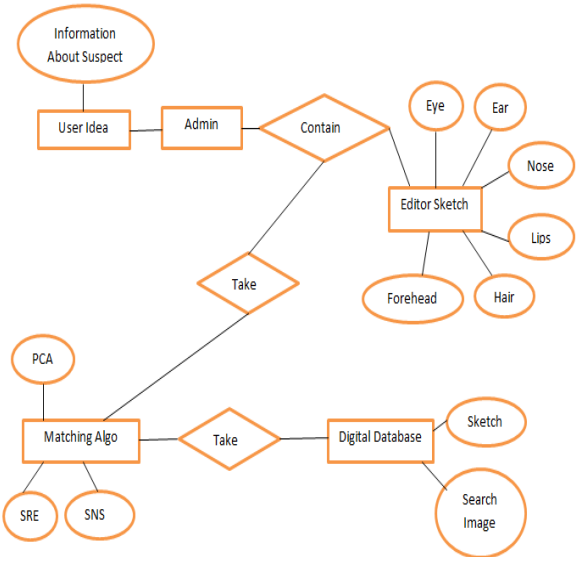

Fig4.Flow and Relationship of proposed system

3. CONCLUSION

The propose work for the object boundary selection algorithm to reduce the impact of noisy edges, which is critical for SBIR. A fast method is applied to efficiently and the solution for the object boundary selection algorithm. To reduce the distraction of false matches in the scoring process, two constraints on spatial and coherent aspects are introduced. The Testing is made with HLR descriptor and the proposed framework on public datasets and a new image dataset of three million images, which we recently collected for SBIR evaluation purposes.

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