IMPLEMENTATION OF VIDEO TAGGING: IDENTIFYING CHARACTERS IN VIDEO

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Abstract

Automatic face detection in movies has been an interesting area of research. Due to the various appearances of the characters in the moving film it is not easy to identify the true faces. There has been a significant growth in the field of image processing to detect still human faces with high accuracy and results. This idea can be further used to implement video tagging. We see biometric security check points that compare still images to verify a person in the database and the same can be done if a person is in the motion. This paper proposes a method to identify characters appearing in the moving film.

Keywords—*Video Tagging, Image processing, Eigen objects, Security, Template matching*

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1. INTRODUCTION

The growing video and TV content on the internet comes with huge amount of digital video data just like still images. This resulted in studying and developing efficient techniques for understanding the video content. The concept of automatic video analysis is one of the technologies which is studied and implemented here.

Video tagging is a concept similar to image tagging with a difference being that the faces are in the motion in the former. The key concept is to store the image from a running video and storing it after training under constraint like size of image, gray scale and bytes. Photo tagging has been implemented in various social media such as Facebook and Instagram where you can tag a person once and the next time you upload a photo of the same character his name will appear automatically.

The objective is to identify the human faces present in the running film and label them with their corresponding identity for example *the name of character*. Figure1 explains the underlying idea by pointing the name of faces detected.

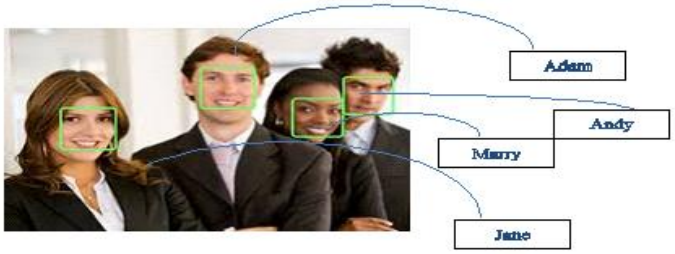
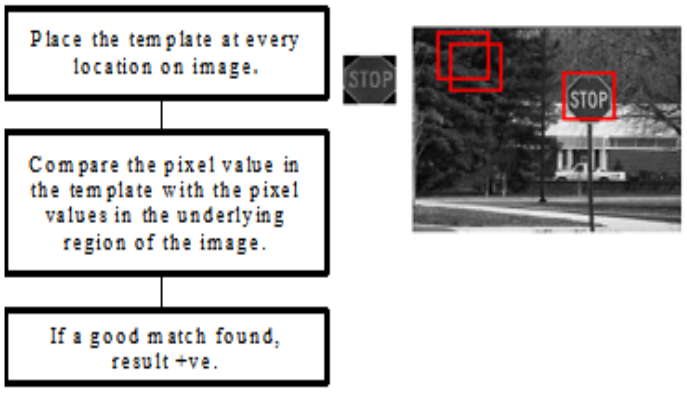


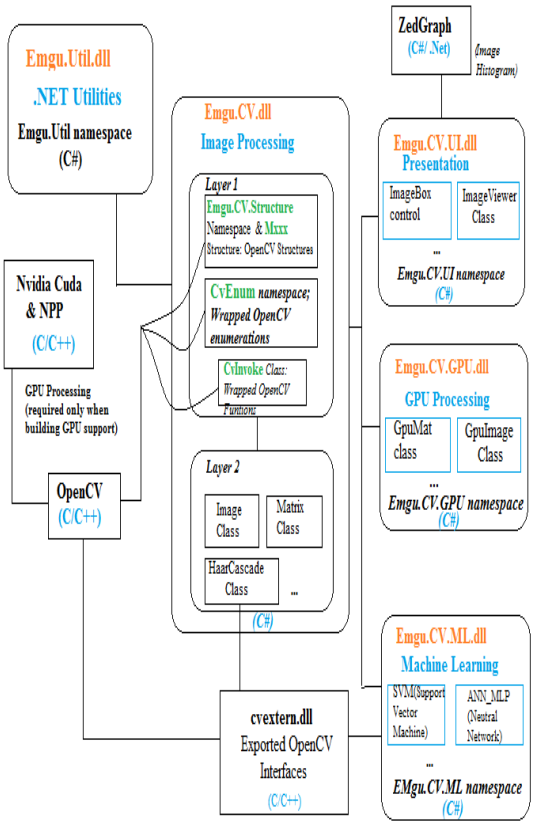
Fig.1

2. RELATED WORK

Template matching is a common technique where an object is captured as an image called *template*.

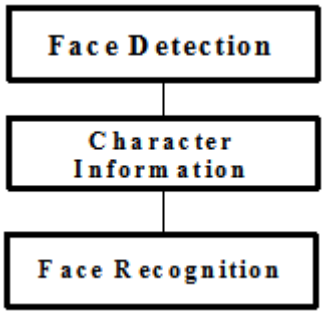


The match will fail if the object appears scaled, rotated, or skewed on the image. Instead, this can be done using Emgu CV image processing library.It is written entirely in C#. The benefit is that it can be compiled in mono and therefore is able to run on any platform Mono supports, including Linux, Mac OS X, win. It comprises of 2 layers, Layer 1 contains *functions, enumeration, structures* and Layer 2 has classes. The figure below is the architecture overview of the Emgu CV library.



3. WORK DONE

The idea in this paper uses the above mentioned Emgu, an image processing library to achieve the video tagging concept. The process consists of mainly three following steps:



When the video is played or streamed the faces appearing on the screen will be detected. Faces will have different orientation, size and color. Only after the face of a person is detected, the information of its identity will be entered that can be Name, ID, Gender etc. of the person. This information will be stored in the database as a tag which will be called in the future reference. So when a video is played and the same person whose information is already stored appears in that video, the system will recognize him [8] and displays his related information.

4. IMPLEMENTATION OF VIDEO TAGGING

4.1 Detecting the Face

It uses simple rectangular features also called *Haarfeature*[2], where each feature is a single valueobtained bysubtracting sum of pixels under white rectangle from sumof pixels under black rectangle. If the difference is above threshold, corresponding feature like eyes, nose etc. are present. Then a special representation of the sample called the integral image is used which makes feature extraction faster. A series of *AdaBoost[2]* classifiers works as a filter chain. Image sub regions that make it through the entire cascade are classified as face. All others are classified as non-face. The classifiers are used efficiently by assigning heavily weighted filters first on the window, if a window fails the first stage, discard it and we don't consider remaining features on it. If it passes we apply the remaining featuresand continue the process. Finally once the face is detected using above filters, we draw a focus around the region to highlight the face.

4.2 Recognizing the face:

Once the faces are detected they are saved into database as image templates. All the trained faces are histogram normalized to convert them into 0-255 gray scale [3] and correspondingly object recognizer is created for the given faces. Calculation of Eigen image and correspondingly Eigen values are done after that.And when the new face is detected, calculation of Eigen distance value [4] of the projected face with the trained faces isperformed.If the value of Eigen distance is greater than threshold for a particular image, and we display the label of the correspondingtrained face to the projected face.

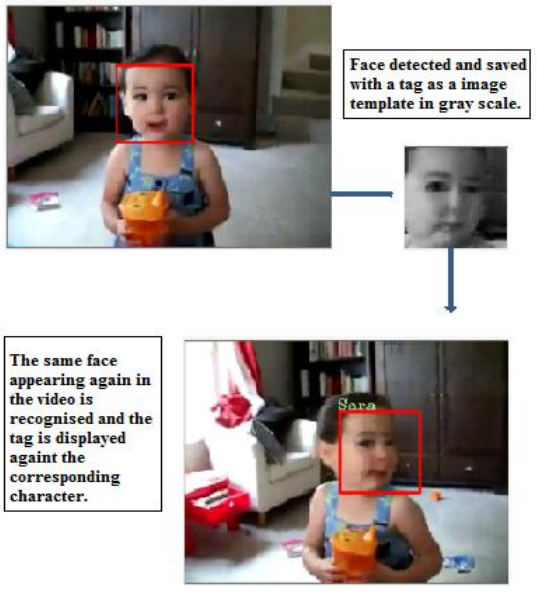


Fig 2 Video tagging illustrations

5. CONCLUSIONS

Video tagging is done on a video with the concept explained in the paper. Figure 2 shows the process steps taking place, a face is recognized successfully after matching with the image template of the person stored for the first time. Now if the same person appears in that video or any other video, the face will be automatically recognized by the system with a tag to tell who the person is. Implemented concept of video tagging in this paper can have various utilities.

FUTURE WORK

The basic concept will remain the same which is to identify a character present in the video [5] or live streaming. The following work can be done in future based on the work done-

Tagging a Video on the Facebook

Photo tagging is a major reason that makes photos special on Facebook. So video tagging can be introduced too. You can tag a video to show who's in the video or tell who you are with. The tag will be the user name of the person. When a friend is tagged in the video, he will be notified through an alert. The user needs to be tagged just once in a video and every time that person appears in any video uploaded later; he will be recognized automatically like auto photo tagging.

Biometric Security Checks for Secure Areas

In normal face recognition biometric test a person stands in front of the detector and matches the traits with the once stored in the system. In that a person should be still to match the features. So using this idea there is no need to stop and unlock. The person can be recognized while in motion and the camera will detect and recognize if the person appearing on stream is valid in database or not and permission will be granted if match is found.

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