Feature Extraction and Searching People

PROF.KALAM NARREN

[1]Student, [2]Student,[3]Student,[4]Student,[5]Professor
[1]Computer Department,
[1]Rajarshi Shahu College of Engineering (Pune University), Pune, India
[1]aishwarya29naiknaware@gmail.com,[2]pgpatil7897@gmail.com, [3]patil.vidya559@gmail.com,
[4]salisamruddhi98@gmail.com, [5]vaishalimbarkade9@gmail.com

ABSTRACT

The problem of face detection and face recognition is increasing with the advent of Digitalization. One popular feature of web-based platform is sharing of personal photographs. In 2013, Facebook disclosed that its users have uploaded more than 250 billion photos, and are uploading 350 million new photos each day. In today's digital world, we come across situations where we have an image of any person and want to identify the person in the image and check whether he/she is present on social networking application. For this purpose, we have developed a stand-in application and proposed a system that takes an image as input, processes it to detect human face in given image and draw a bounding box around the detected part in the image using Viola and Jones algorithm. The detected face is compared with images in database of stand-in application and similarity score is provided for each comparison. The similarity scores are ranked and the image in database with highest similarity score is selected. Checks whether it satisfy the minimum threshold of similarity, based on which our system indicates that the person is recognized. The information about the detected person present in the stand-in application database is displayed.

Keywords--- *Feature extraction, Viola and Jones Algorithm, Image processing, Face detection*

I.   INTRODUCTION

In today's digital era, with increasing popularity of the world wide web, people are uploading large number of personal images on various web-based platform. A Software system is designed that can identify face in given image and check whether a particular person is present on a stand-in application. After detection, a bounding box is drawn around the face in image. This is achieved by supervising only set of images that have face (the positive set) and set of images that does not have the face (the negative set). The detected face in image is compared with image uploaded by the account holders on stand-in application. The profile image of the account which gives highest similarity scores and satisfies the minimum similarity threshold is selected as final image. The information of that account is fetched and displayed.

II.   LITERATURE REVIEW

[1] The "Dayong Wang, Charles Otto, Anil K. Jain" have developed a cascaded search system to solve the problem of Large-scale face search and for this purpose they used publicly available CASIA dataset. We are going to refer the deep features used in k-NN search and how these features are used to generate a short list of candidate faces which is re-ranked with the help of similarity scores generated by the face matching algorithm.

[2] The "Mangayarkarasi Nehru, Dr. Padmavathi S" performed experimental work to demonstrate the working of Viola Jones Object Detection Framework for face detection from a given Input image or video. From this paper we learned that the Viola Jones Object detection Framework can detect human faces from a dataset of images consisting of dark and light colored faces, faces with and without glasses, side faces, masked and half covered faces.

[3] For low quality images: "Yuqian Zhou, Ding Liu, Thomas Huang" evaluated the performances of existing face detection algorithms:traditional hand-crafted detectors Viola-Jones model and HoG-SVM model and deep learning based detectors: faster RCNN and S3FD on FDDB. The original images in FDDB were converted into low quality images by applying three types of distortion: blur, noise, Brightness and Contrast. From this paper, we learned that the face detection algorithms are sensitive to low quality images and the robustness of the face detection algorithms in case of low-quality images.

[4] "Kirti Dang, Shanu Sharma" provided a comparative analysis of different face detection algorithms such as Viola-Jones Jones,SMQT features & SNOW Classifier, Support Vector Machine-Based face detection and Neural Network-Based Face Detection bases on the recall and precision value.

Sr. No	Face Detection Algorithms	Precision	Recall
1	Viola-Jones face detector	0.27321	0.27321
2	SMQT Features and SNOW Classifier	0.26792	0.26792
3	Neural Network Based Face Detection	0.339450	0.037582
4	Support Vector Machine Based face detection	0.01392850	0.00835708

Experimental results show that the Viola Jones algorithm has the highest precision and recall, hence we will use Viola Jones algorithm for face detection in our System.

[5] One of the important step in image processing is feature extraction which most frequently extract features such as a colour, texture and shape. "R. Kachouri, K. Djemal, H. Maaref, D. Sellami Masmoudi and N. Derbel" implemented a hierarchical method for extracting features which outperformed the aggregated feature extraction. Hence, we will implement this hierarchical feature extraction method by extracting first the colour, then texture and at last the shape.

[6] For face detection "Ms. M. Mahadevi, Dr. C. P. Sumathi" used skin color based approach followed and face registration using template matching. The proposed method was tested on Indian face database and some real time images and it is successfully detected human facial region for all images with single face.

Algorithm	Images	Precision	Recall rate	Accuracy
Face detection based on skin colour model	150 images	97%	88%	92%
Face detection based on template	150 images	98%	99%	98%

III. PROPOSED SYSTEM

In the proposed system the user will upload the image in either .jpeg or.png image format. Human face will be detected in the input image by processing it using Viola Jones object detection algorithm. The Viola-Jones algorithm detects human face features such as nose bridge, eyes, chin, mouth, or upper body. Human face features are extracted from the input image using haar features, integral image, Ada-boosting and cascading. The extracted features of the image are mapped with the features of the images stored in the database of stand-in application. When the required person is identified on the stand-in application, the mapped image along with information related to that person is extracted from the database and displayed to the user. In case no match for the input image is found, then a message is displayed to the user indicating the absence of the person on the stand-in application.

Objectives of the proposed system are as follows:
To develop the software system 'Feature Extraction and Searching People', which will take image in .jpeg or.png as input, process it using Viola-Jones algorithm to detect face in that image. It will compare the detected face with the profile image of account holders on social networking platform and recognize the person in the given image. The public information of the recognized person on the stand-in application will be displayed.
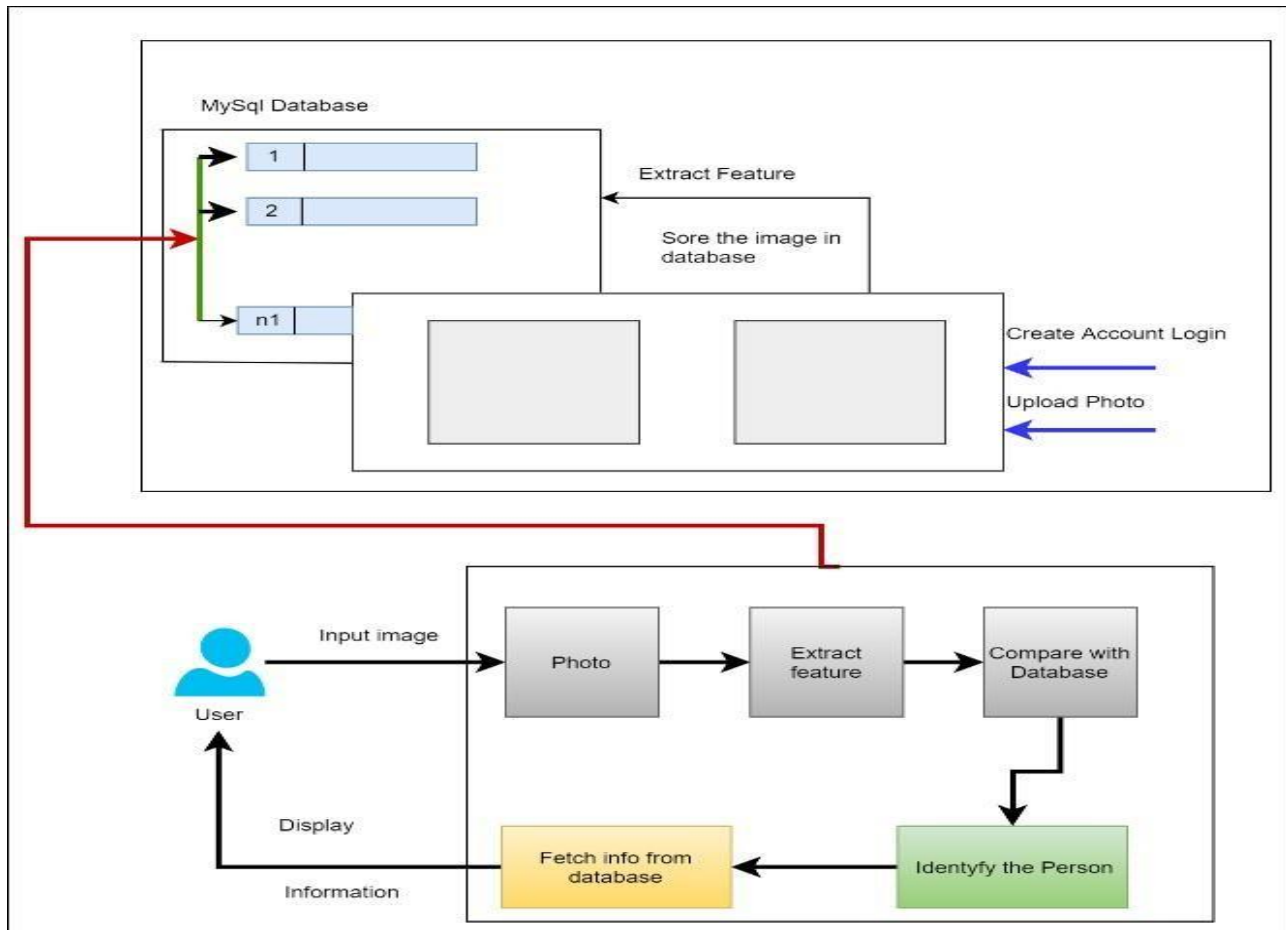
Fig.: Working of the proposed system

IV. CONCLUSION AND FUTURE SCOPE

In our proposed system we have addressed the problem of person identification from a limited set of images, in the case of stand-in application. We make use of Viola Jones algorithm consisting of steps such as Haar Feature, Integral Image, Ada-Boosting, and cascading for person identification. Person in the input image will be recognized and his/her information will be fetched from database and displayed to the user.

REFERENCES

[1] Dayong Wang, Charles Otto, Anil K. Jain, "Face Search at Scale", IEEE Transactions on Pattern Analysis and Machine Intelligence, Volume: 39 , Issue: 6, June 1 2017.

[2] Mangayarkarasi Nehru, Dr. Padmavathi S, "Illumination Invariant Face Detection Using Viola Jones Algorithm", 4th International Conference on Advanced Computing and Communication Systems (ICACCS), 2017

[3] Yuqian Zhou, Ding Liu, Thomas Huang, "Survey of Face Detection on Low-quality Images", 13th IEEE International Conference on Automatic Face & Gesture Recognition 2018

[4] Kirti Dang, Shanu Sharma, "Review and Comparison of Face Detection Algorithms", 7th International Conference on Cloud Computing, Data Science & Engineering - Confluence, 2017

[5] R. Kachouri, K. Djemal, H. Maaref, D. Sellami Masmoudi and N. Derbel, "Feature extraction and relevance evaluation for heterogeneous image database recognition", First Workshops on Image Processing Theory, Tools and Applications, 2008

[6] Ms. M. Mahadevi, Dr. C. P. Sumathi, " Face Detection based on Skin colour model and connected component with template matching", International Conference on Information Communication and Embedded Systems, 2014