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FACE RECOGNITION VIDEO SURVILLENCE USING DEEPLEARNING

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***Abstract*— Face recognition is a biometric technology, which is based on the identification of facial features of a person The main scope of the project is an automated surveillance, and the objective is to recognize and track people who are all in watchlist . The most significant part of the system consists of face detection, face localization and recognition. The face was detected using HOG algorithm. The face is recognized using Local Binary Patterns Histograms. The system obtains underlined facial data through the real-time web-camera. Subsequently, face and background key frames are extracted from the captured video data. The facial image data is compared with the facial images of database. The System displays the recognized person with their details in case of any match. The proposed system is to detect multiple faces at a time which is more accurate, and has better performance, and low cost compared with existing systems.**

***Keywords*—Face recognition Binary Pattern Histogram, camera, HOG algorithm.**

I.INTRODUCTION

The Limitations in the ability of humans to vigilantly monitor video surveillance live and footage led to the demand for artificial intelligence that could better serve the task. The Humans watching are single video monitor for more than twenty minutes lose 95% of their to maintain attention sufficient to discern significant events. When multiple and the cameras are monitored, typically employing a wall monitor or bank of monitors with split the screen views and the rotating every several seconds between one set of cameras the visual tedium is quick overwhelming.

Face recognition system is considered one of the most efficient biometric technique for the detection and recognition of people. The image of the person will be captured by the camera when the person crosses the surveillance area. Then, extraction and pre-processing are done of the face region for further analysis. The main aim of our project is to accomplish a video surveillance system for person identification which will be even useful for police investigations and identifier.

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II. PROPOSED SYSTEM

From the data is recorded from the real time web-camera which will be considered as the input. Identifying moving objects froma video sequence is a fundamental and critical task in many computer vision applications. We proposed a three stage adaptive objectsegmentation algorithm for colour surveillance videos. The detected face is recognized and pre-processed for representation and quality purposes. The image stored in the database will be matched with the recognized face and decision .

METHODOLOGY

The above flow chart shows that the model uses video data captured through a web camera which will be taken as the input. Segmentation is used to identify the moving objects in the video frame. We proposed a three stage adaptive object segmentation algorithm for colour surveillance videos. HOG (Histogram of Oriented Gradients) algorithm is used for Detection of human faces. The Face representation is the core of the recognition algorithm used in this system. In order to get the best quality of image in the real time video sequence, we need to assign weights to each of the normalized parameters (NHP, NS, NR, NB). To obtain the low dimensional feature from the face images we used Convolution Neural Network (CNN), popularly known as deep learning. A deep network is a feedforward network comprising of many function composite layers Feature extraction and the dimension reduction are required to achieve better performance for the classification of images. The Extracted image of the person will be tracked if notified. The input data's will be Extracted and classified to find the most compacted and informative set of features. Decision will be based on the image source from the database
and the detected face.

A. Segmentation

During image preprocessing from a video sequence is a fundamental and critical task in many computer vision applications. We proposed a three stage adaptive object segmentation algorithm for colour surveillance videos. In the first stage, background is modelled using Multiple Correlation Coefficient (R abc) using pixel-level based approach for motion segmentation. Segmented foreground objects generally include their self-shadows as foreground objects since the shadow intensity differs and gradually changesfrom the background in a video sequence

HISTOGRAM OF ORIENTANT GRADIENT (HOG)

Histogram of Oriented Gradients, also known as HOG is the feature of the Canny Edge Detector. SIFT (Scale Invariant and Feature Transform). It is used in computer vision and the image processing for the purpose of object detection. The technique countsoccurrences. the gradient orientation in the localized portion of an image and HOG descriptor focuses the structure or the shape of anobject. better than any edge descriptor as it uses magnitude as well as angle of the gradient to compute the features. the image it generates histograms using the magnitude and orientations of the gradient

B. Local Binary Pattern Histogram (LBPH)

LBPH (Local Binary Pattern Histogram) is a Face-Recognition algorithm it used to recognize the face of a person. It is known for its performance and how it is able to recognize the face of a person from both front face and side face

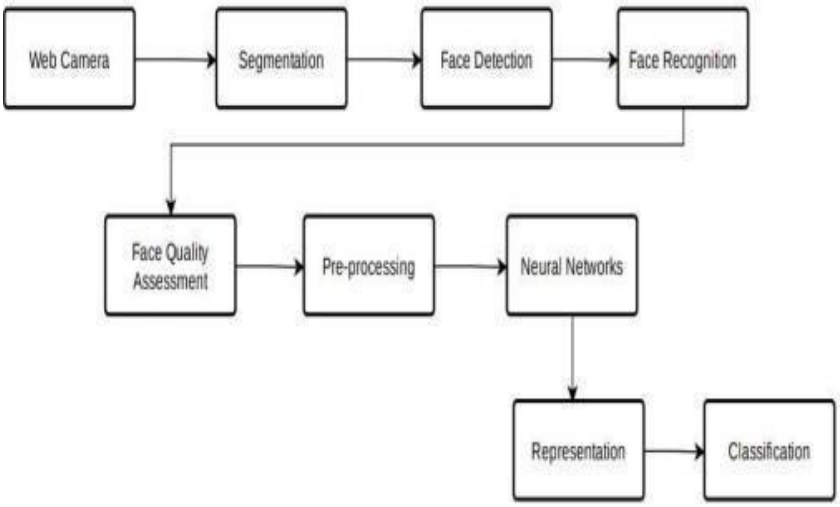
C .Working principle of local Binary Histogram

Divide the examined window into cells (e.g. 16x16 pixels for each cell). For each pixel in a cell, compare the pixel to each of its8 neighbour's (on its lefttop, left-middle, left-bottom, right-top, etc.) The center pixel's value is greater than the neighbour's value.
This gives an 8-digit
binary number (which is usually converted to decimal for convenience). Compute the histogram over the cell, of the frequency of each "number" occurring
(i.e., each combination of which pixels are smaller and which are greater than the center). This histogram can be seen as a 256-dimensional feature vector. Optionally normalize the histogram. Concatenate (normalized) histograms of all cells. This gives a feature vector for
the entire window.

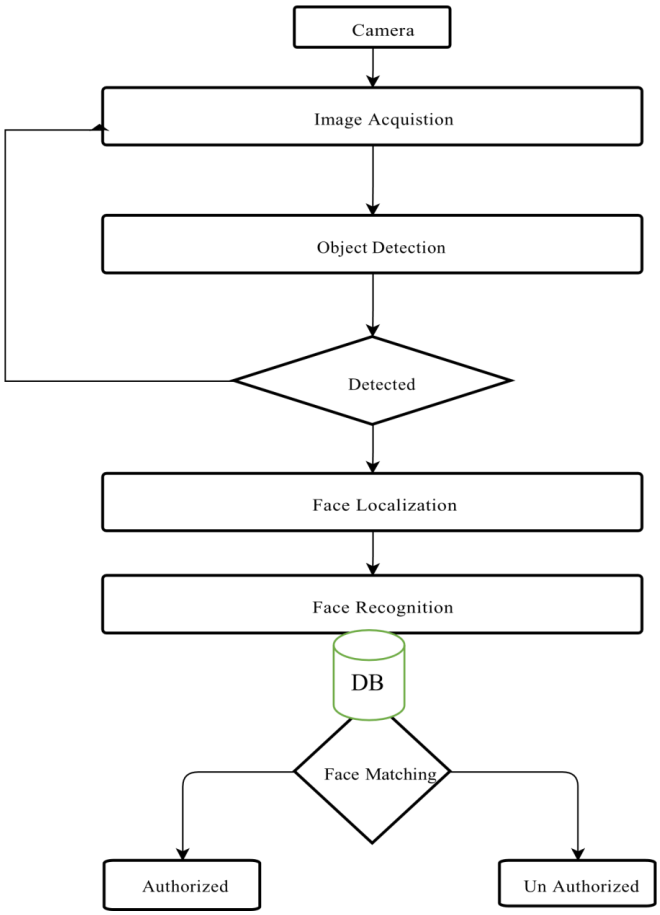
C. Convolutional Neural Networks (CNN)

The Convolutional Neural Networks (CNNs) is the most popular neural network model being used for image classificationproblem. CNN is a powerful algorithm for image processing. The algorithms are currently the best algorithms we have for the automated processing of images. it also used by Many companies use these algorithms to do things like identifying the objectsin an image. types of layers they are three types Convolutional Neural Networks: In a typical neural network each input
Layer.

III Block Diagram



Working ModuleFlow Chart



A. Characterstics

The suggested system uses webcam as image acquisition tools from a real-time environment. The facial recognition process works on real-time video streaming images provided by the web camera. The underlined method extracts a single image frame from the video stream. This acquisition image window size is set to 480 x 640 pixels. Human facial detection is the primary and important step for this facial recognition task. The primary aim of a human facial detection system is to detect any human face inan image

B. Facial Recognition

Facial recognition is the new trend in security authentication systems. For realtime applications, security and surveillance must address the challenges of recognizing faces from live video streaming. In the proposed system (at the entrance of a building), the environment and lighting are constant, but variations in terms of lighting direction and shadow are expected. The system normalizes the image using a particular custom format of 150x150 pixels (Row, Column) for convenience. Facial detection and localization is the primary and important step to find if there is any human face in an image or not. Figure 4 represents the process of detection and localization. The obtained facial image is generated from a 3D RGB color scale to a

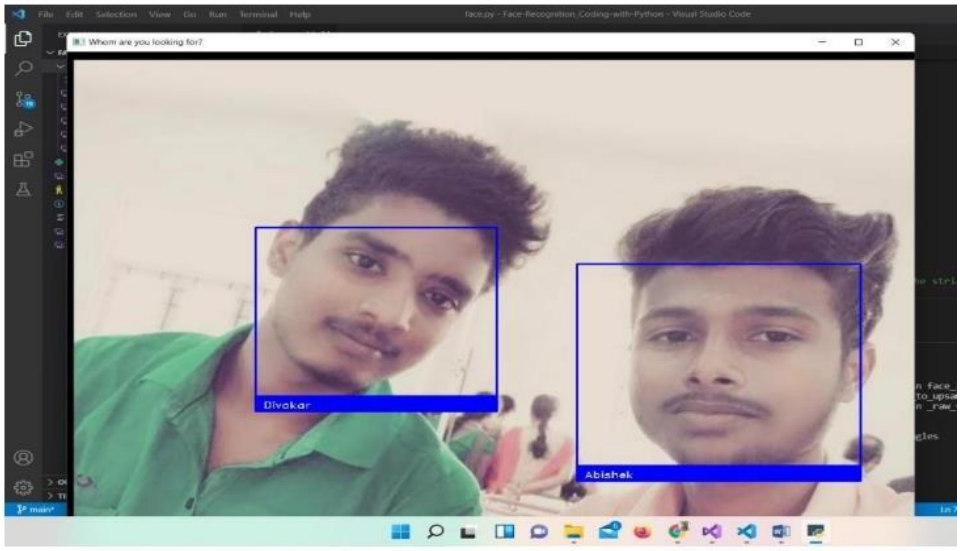
The presented technique utilizes a histogram of oriented gradients (HOG) for fetching of facial features followed by the feedforward backpropagation neural network 20 classifier. A sliding window approach is performed for the detection of an image. The sliding window of detection has a fixed size 150x150. The sliding window detects prominent image pixels from the whole face image. The analysis is divided into two phases. First, the descriptor value is calculated for each sliding window of detection via the HOG feature method. Subsequently, the descriptor values are categorized by applying an FFNN classifier.

- The extracted face image is partitioned into small associated pixels values called cells.
- The HOG edge direction of the pixels in a cell is calculated.
- Each cell is separated in an angular bin in accordance with the edge of the gradient.
- The pixels of every cell contribute to the weighted gradient of the corresponding angular bin
- Neigh bour group cells considers spatial areas known as blocks. Grouping cells in a block is the basis of normalizing histograms.
- The normalized histogram group represents the histogram of the block. The collection of these blocking histograms optimizes the HOG feature of an image.

C. Recommendation of future project

The entire process of emerging a face recognition component via aggregating state of the-art methods with advancement of deep learning is defined. This system could perform for populous facial recognition at a time. We also founded that the problems regarding head pose and light intensity are solved. To construct this module, no such structured body is essential. It determines that with smaller quantity of face images with the proposed system of augmentation, high precision can be attained, 99.3% in overall.

IV OUTPUT



V CONCLUSION

Facial images captured in a video through web-camera in an environment suffer from very poor quality. In addition, due to the characteristics of the cameras, uncontrolled capturing conditions may lead to ambient variations, such as lighting changes, face pose, light shadowing, and body or face motion blur. Keeping in consideration today's security demands, we have proposed a video surveillance system that uses HOG features. However, the feature pattern can have variations due to the change of facial movement ina different video sequence. The proposed model was tested under extremely diverse conditions, and it performed efficiently and accurately. In the future, the system may be extended on some larger datasets using other deep learning methods.

VI REFERENCE

1. [1] Barr, J.R., Bowyer, K.W., Flynn, P.J., Biswas, S.: Face recognition from video: A review. International Journal of Pattern Recognition and Artificial Intelligence 26(05) (2012)
2. [2] Bashbaghi, S., Granger, E., Sabourin, R., Bilodeau, G.A.: Watch-list screening using ensembles based on multiple face representations. In: ICPR, pp. 4489– 4494 (2014)
3. [3] Bashbaghi, S., Granger, E., Sabourin, R., Bilodeau, G.A.: Dynamic ensembles of exemplar-svms for still-to-video face recognition. Pattern Recognition 69, 61–81 (2017)
4. Bashbaghi, S., Granger, E., Sabourin, R., Bilodeau, G.A.: Robust watch-list screening using dynamic ensembles of svms basedon multiple face representations. Machine Vision and Applications 28(1), 219–241 (2017)
5. Canziani, A., Paszke, A., Culurciello, E.: An analysis of neural network models for practical applications. arXiv preprint arXiv:1605.07678 (2016).
6. Chellappa, R., Chen, J., Ranjan, R., Sankaranarayanan, S., Kumar, A., Patel, V.M., Castillo, C.D.: Towards the design of anend-to-end automated system for image and video-based recognition. CoRR abs/1601.07883 (2016)
7. Dewan, M.A.A., Granger, E., Marcialis, G.L., Sabourin, R., Roli, F.: Adaptive appearance model tracking for still-to-video face recognition. Pattern Recognition 49, 129–151 (2016)
8. Ding, C., Tao, D.: Trunk-branch ensemble convolutional neural networks for video-based face recognition. IEEE Trans on PAMI PP(99), 1–14 (2017)
9. Gao, S., Zhang, Y., Jia, K., Lu, J., Zhang, Y.: Single sample face recognition via learning deep supervised autoencoders. IEEE Transactions on Information Forensics and Security 10(10), 2108–2118 (2015
10. Ghodrati, A., Jia, X., Pedersoli, M., Tuytelaars, T.: Towards automatic image editing: Learning to see another you. In: BMVC(2016