DEEP LEARNING BASED ATTENDANCE REGISTER

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ABSTRACT
This project proposes face recognition-based attendance monitoring system for college students. The Gaussian median filter is used reduce the noises from the input image. The DCT-DOST algorithm is used for sampling the image signal. The CNN classifier is used to compare the test data and trained data and gives the result. This project is implemented using Matlab. The paper will show how we can implement algorithms for face detection and recognition in image processing to build a system that will detect and recognize frontal faces of students in a classroom. A face is the front part of a person’s head from the forehead to the chin, or the corresponding part. In human interactions, the proposed solution is to develop a working prototype of a system that will facilitate class control. The second part of the system will also be able to perform a facial recognition against a small database. The face recognition and detection systems have been developed. Some of which are used on social media platforms, banking apps, government offices e.g. the metropolitan police, Facebook etc.

Keywords— CNN classifier, Gaussian median filter, DCT-DOST algorithm, Viola jones algorithm, SVM classifier.

1. INTRODUCTION
Face recognition is the task of identifying an already detected object as a known or unknown face. Often the problem of face recognition is confused with the problem of face detection. Face Recognition on the other hand is to decide if the “face” is someone known, or unknown, using for this purpose a database of faces in order to validate this input face. The digital image processing is an important field in an image processing. An algorithm which is used to perform image processing on the digital images is called as the digital image processing. Comparing to the analog image processing, the digital image processing provides much wider range of algorithms to be applied to the input data and avoid some problems like noise and signal distortion during the processing. The digital image processing is particularly applicable for classification, future extraction, pattern recognition and projection. images are defined over two dimensions (perhaps more) digital image processing may be modeled in the form of multidimensional systems.

Tasks Digital image processing allows the use of much more complex algorithms for image processing, and hence can offer both more sophisticated performance at simple tasks, and the implementation of methods which would be impossible by analog means.

2. OBJECTIVES
Face detection involves separating image windows into two classes; one containing faces (turning the background (clutter). It is difficult because although commonalities exist between faces, they can vary considerably in terms of age, skin color and facial expression. The problem is further complicated by differing lighting conditions, image qualities and geometries, as well as the possibility of partial occlusion and disguise. An ideal face detector would therefore be able to detect the presence of any face under any set of lighting conditions, upon any background. Face detection is a computer technology that determines the location and size of human face in arbitrary (digital) image. The facial features are detected...
and any other objects like trees, buildings and bodies etc. are ignored from the digital image. It can be regarded as a specific ‘case of object-class detection, where the task is finding the location and sizes of all objects in an image that belong to a given class. Face detection, can be regarded as a more general ‘case of face localization. In face localization, the task is to find the locations and sizes of a known number of faces (usually one). Basically, there are two types of approaches to detect facial part in the given image i.e. feature base and image base approach. Feature base approach tries to extract features of the image and match it against the knowledge of the face features. While image base approach tries to get best match between training and testing images.

3. FEATURE BASE APPROACH
Active Shape Model
Active shape models focus on complex non-rigid features like actual physical and higher-level appearance of features Means that Active Shape Models (ASMs) are aimed at automatically locating landmark points that define the shape of any statistically modeled object in an image. When of facial features such as the eyes, lips, nose, mouth and eyebrows. The training stage of an ASM involves the building of a statistical Facial model from a training set containing images with manually annotated landmarks. ASMs is classified into three groups i.e. snakes, PDM, Deformable templates. Based on low level visual features like color, intensity, edges, motion etc. Skin Color Base Color is a vital feature of human faces. Using skin-color as a feature for tracking a face has several advantages. Color processing is much faster than processing other facial features. Under certain lighting conditions, color is orientation invariant.

4. FEATURE ANALYSIS
These algorithms aim to find structural features that exist even when the pose, viewpoint, or lighting conditions vary, and then use these to locate faces. These methods are designed mainly for face localization. Sharif et al proposed an Elastic Bunch Graph Map (EBGM) algorithm that successfully implements face detection using Gabor filters. The proposed system applies 40 different Gabor filters on an image. As a result of which 40 images with different angles and orientation are received. Next, maximum intensity points in each filtered image are calculated and mark them as fiducially points. The system reduces these points in accordance to distance between them. The next step is calculating the distances between the reduced points using distance formula. At last, the distances are compared with database. If match occurs, it means that the faces in the image are detected. Equation of Gabor filter [40] is shown below. The figures shows the complete process of the developed methodology whereas the input image of samples is inspected and pre-processed with filter and pre-processed image is segmented.

Fig. 3.1 Face Detection
This property makes motion estimation much easier because only a translation model is needed for motion estimation. Tracking human faces using color as a feature
Fig 4.2. Input image

Fig 4.3. Input image

Fig 4.4 Detection of Unknown Person

Fig 4.5 Output Image

Fig 4.6 Correlation

Fig 4.7 Command Window
Fig 4.8 Attendance register

5. CONCLUSION AND FUTURE METHODS

All methods discussed so far are able to track faces but still some issue like locating faces of various poses in complex background is truly difficult. To reduce this difficulty investigator, form a group of facial features in face-like constellations using more robust modelling approaches such as statistical analysis. Various types of face constellations have been proposed by Burl et al. They establish use of statistical shape theory on the features detected from a multistate Gaussian derivative filter. Huang et al. also apply a Gaussian filter for preprocessing in a framework based on image feature analysis. Image Base Approach.

REFERENCES


