

Use of Face detection AI for Attendance

Sneha J. Bide

Students, Dept. of Information Technology, Keraleeya Samajam (REGD.) Model College, Maharashtra, India

Abstract - As we all know that taking attendance may be a most vital part in education system. As marking the attendance effectively is extremely important but also it's a time consuming task. Lectures got to spend the time for taking attendance which they will utilize to show as long as there's something which can help them to trace the attendance. AI can help during this using face detection algorithm. The cameras in classroom with the assistance of AI will mark the attendance of the scholars. Also this technique are going to be more accurate and can save tons of your time. Now a days face detection has been commonly in many social media apps and websites than why not in our education system. because it will help the teachers to scale back their work and save time which may be utilize by them to show or think more ways to find out new techniques.

Key Words: Face Detection, Facial structure, Algorithm, Student Faces, Pictures, Camera.

1. INTRODUCTION

The face detection and recognition starts by identifying the frontal faces. Frontal faces is that the front of the top from forehead to chin. this technique will capture the image of the classroom and afterwards it'll compare it with the database which has student data. it'll identify the scholar and mark the attendance. Also it'll send an equivalent to the lecturer taking the category. it'll also help the lecturer to understand which students are present in his/her class. Taking class without interruption is that the most vital thing for a teacher. Knowing who are there and identifying the scholars correctly can help lecturer to form the lecture more interactive. consistent with my personal experience while taking a lecture the interaction between the scholars and teacher is most vital for creating lecture interesting and also helpful for creating the scholars understand the concept more clearly. repeatedly teachers also are unable to spot the scholars or to recollect their names, this technique also will be helpful for teachers to spot the scholars with their names. Face detection is that the technique during which the AI compare to pictures and check out to hitch the coordinates of the 2 to review whether the 2 pictures are same or different. the info of scholars is collected during the admission time like photo, name,

stream, etc. are going to be wont to create the database for our system. Our system will use this photo and names of the scholars to form the attendance.

There are more ways in AI for face detection and recognition. we'll see this methods during this paper. Face detection and recognition isn't new in our society we sleep in. The capacity of the human mind to acknowledge particular individuals is remarkable. it's amazing how the human mind can still continue identification of certain individuals even through the passage of your time, despite slight changes in appearance.

1.1 Background and Literature Review:

Facial detection and recognition has many methods that are used now-a-days. Eigenfaces, neural networks, dynamic link architecture, hidden Markov model, geometrical feature matching, and template matching are the methods considered for developing face detection system. in terms of the facial representations they used these approaches are analysed. This methods are further studied intimately one by one to urge an appropriate technique for our system.

1.2 Objective:

We all know that the technology is evolving rapidly now-a-days. So it's also important to evolve our education system. Using face detection and recognition for marking the attendance of the scholar may be a new evolution in education system. it'll save tons of your time and also help teachers to acknowledge the scholars easily even on the primary day of the category. this system will provide information of all present students within the class to the teacher in seconds. So there'll no need of introduction even on the primary day because the teacher can see all the small print of the scholar in one click. the target of this technique is to bring AI techniques in education system to form it more efficient and easier.

2. Face Detection:

Face recognition are often defined because the method of identifying a private supported biometrics by way of comparing a digital captured image or video with the stored record of the person in question. within the early 90s numerous algorithms were developed for face recognition and increase within the need for face detection. Systems were designed to affect video streaming. The past few years has

proven to possess developed more research and systems to affect such challenges

Face Recognition in two primary tasks: Verification; a one-to-one matching of an unknown face alongside a claim of identity, to determine the face of the individual claiming to be the one on the image. Identification which is additionally a one-to-one matching, given an input image of a face for a private (unknown), to work out their identity by comparing the image against a database of images with known individuals. However, Face Recognition also can be utilized in numerous applications like Security, Surveillance, General biometric identification (electoral registration, national ID cards, passports, driving licenses, student IDs), Criminal Justice systems, Image Database Investigations, open-end credit, Multi-media Environments, Video Indexing and Witness face reconstruction. Face Recognition in commonest form is its frontal view which isn't unique or rigid as numerous factors cause its appearance to vary.

2.1. Methods of Face Detection:

1. **Correlation Method:** It compares two images by computing the correlation between them, with the pictures handled as one-dimensional vectors of intensity values. The pictures are normalized to possess zero mean and unit variance with the closest neighbour classifier utilized in the image directly. With these considerations stated, the sunshine source intensity and characteristics of the camera are suppressed. The restrictions of this method are; great deal of memory storage needed, the corresponding points within the image space might not be tightly clustered and it's computationally expensive.
2. **Eigenfaces:** This method considers the entire image as a vector. With this method, performance depends on alignment of the photographs with approximately the same pose. The change in lighting conditions, scale, pose and other dissimilarities decreases the popularity rate rapidly.
3. **View-Based Eigenfaces:** Just like the previous method, evaluates images on an outsized database and addresses the matter of viewing orientation.
4. **Independent Component Analysis:** This separates signal into sub-components with the most aim trying to find a linear combination of non-Gaussian data signals that reconstructs the first signal. In this method, images are treated as random variables with pixels as observations and random variables with pixels are treated as images for observations.
5. **Cost-Sensitive Face Recognition:** Most researchers always consider the popularity rate but never take into consideration differing types of misclassifications which can have an impression on the performance of the system. The loss value depends on the classification error.
6. **Elastic Bunch Graph Matching and Related Approaches:** It uses Gabor wavelet features. The

primary phase of the method is to manually label the landmarks presented to the algorithm. The landmarks are then went to compare the landmark position in an imaginary image. The landmark positions are computed by Gabor wavelets convolutions, this are used for face representation. With a "bunch of graph" created to relate this, each node within the graph contains a group of Jets for every landmark on all the pictures. By getting the positions of the landmark and jet values face similarity is obtained.

7. **Kepenekci Method:** During this algorithm, the landmarks are labelled by Gabor filter and obtained dynamically as compared to the previous algorithm which needs manual labelling of the facial landmarks. It also uses the window to scan the pictures and identify the maxima of Gabor filter responses within the window. These points are referred to as fiducial points. The fiducial points aren't constant and went to calculate the feature vectors. The cosine similarity is employed to calculate the similarity of those vectors. The upper the window size the less fiducial points detected. However, an enquiry for larger window results in more computational time. The amount of fiducial points determines the time needed within the comparison stage.
8. **Adaptive Local Hyperplane:** One among the methods suggested by Lenc and Kral (2014) says it's an extension of the K-local Hyperplane Distance Nearest Neighbour (HKNN). This method approximates the likelihood of missing instances within the manifolds of particular classes by an area hyperplane. With this method, classification of an unknown vector starts with identifying the K-nearest neighbor and based this, the local hyperplane is made.
9. **Genetic Algorithms:** In this method, genetic algorithms approach shows how a facial image is processed in lower dimensional PCA sub-space. It's for optimal rotation of a basis vector supported a fitness function, because the rotations are random.
10. **Linear Regression:** It assumes that faces from one class are placed on a linear subspace and multiple training in images for every class (individual).

2.2. Discussion:

Hence, now we all know that there are multiple ways to make a face detection and recognition software. We've settled on an appropriate way which will help in our system to spot students. This face detection algorithm than we'll hook up with our student database and can create an entire software which will use the cameras within the classroom to mark the attendance of the scholars and to spot the scholars.

3. CONCLUSION

In conclusion, the utilization of face detection and recognition AI for attendance marking is extremely effective and time saving. Any which ways teachers use laptops and projectors to form teaching easier and simply understandable, this same laptop, PC, tablet or mobile will help them take the attendance too.

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BIOGRAPHIES



Sneha J. Bide
Student, Dept. of Information
Technology, Keraleeya
Samajam (REGD.) Model
College, Maharashtra, India