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Uniform and Attendance Detection Using Deep Learning

Dheeraj Yadav[1], Priyanshu Rai[2], Riya Keshwani[3], Vandana Singh[4], Vijendra Pratap Singh[5]
[1,2,3,4]*Computer Science And Engineering ,Institute of Technology And Management ,Gorakhpur ,India.*
[5]*Assistant Professor Department of Computer Science and Engineering, Institute of Technology and Management, Gorakhpur, India.*

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Abstract: *This project is useful for the travel program team and for students. Refers to integrated hardware, software and processes that enable automated data processing functions and communication functions in an organization. It involves using computers and software to digitize, store, process and communicate on normal tasks and processes in a standard way. In addition, attendance is considered a major problem for teachers in the classroom. It takes time, effort and is difficult to manage. Ten years ago, downsizing the student visit process was done and changed. The energy generated in this development is the desire for automation, simplification, speeding and saving time and effort.*
Key Word: *Recognition, Detection.*

I.INTRODUCTION

This project is a prototype for the attendance system using face recognition and uniform detection and it is restricted with in the college premises. This has been implemented under the guidance of college professors. This project is useful for the attendance system team and as well as to the students. It refers to the collective hardware, software and processes that en able automation of the information processing and communication tasks in an organization. It involves using computers and software to digitize, store, process and communicate most routine tasks and processes in a standard way.

Face recognition is one of the most intensively studied technologies in computer vision, with new approaches and encouraging results reported every year. Face recognition approaches are generally classified as feature-based and holistic approaches. In holistic based approaches, recognition is done based on global features from faces, whereas in feature-based approaches, faces are recognized using local features from faces [1].

In other words, the purpose of this project is to create a system that help steachers take student visits more effectively. Although those presence programs are all around us, Tibah University lecturers still use the traditional method of recording student movements either by shouting the names of students or by a handout among students to sign next to their names. Both methods are time consuming and compliant with high error scales.

1.1 Objectives

- Our primary goal is to help the lecturers, improve and organize the process of track and manage student attendance and provides a valuable attendance service for both teachers and students.
- Minimize manual process errors by providing automatic and reliable travel system using face recognition technology.
- Increase the privacy and security that no student can disclose to himself or her friend while they are away Produce monthly reports for educators.
- Adaptability, the power of discourse to set records was available.
- Calculate the percentage of absenteeism and send reminder messages to students..

1.2 Benefits

- Students will catch up on time when they go toclasses. This is because the visit of a particular student can only be taken fromhim or her where there are no people who will be recognized by the program.This can not only train students to be punctual and avoid any misconduct such as signing up to visit their friends.
- The center can save a lot of resources enforcement is now more technologicallyadvanced than human control which will wastethe resources of many people in a non-essential process.
- It saves a lot of costs in the sense that paperwork was completed completely.

1.3BasicFunctionality

- Face Recognition

- Uniform Detection
- Attendance Detection

II. LITERATURE SURVEY.

A thorough overview of prior research on a subject is a literature survey. The literature review examines scholarly books, journals, and other sources that are pertinent to a particular field of study. It need to provide a theoretical framework for the study and assist you (the author) in defining its scope. AzizaAhmedi et. al.[2] "Face recognition based attendance marking system". In this projected work, sort to find the attendance, positions and face descriptions in classroom lecture, we projected the presence administration system based on face detection in the classroom lecture. The system estimates the presence and the location of each student by continuous inspection and footage. The result of our beginning experiment shows continuous inspection improved the performance for estimation of the attendance.

Mr.C.S.Patil et.al. [3] "Student Attendance Recording System Using Face Recognition with GSM Based". Student footage system using face validation was considered and implemented. It was tested with dissimilar face images. This idea is working properly with different panel. All windows are running separately and equivalent. If appreciation is to participate as a viable biometric for validation, then a further order for improvement in detection score is necessary. Under controlled condition, when lighting and pose can be controlled, this may be possible. It is more likely, that future improvement will rely on making better use of video knowledge and employing fully 3D face models.

"Face Detection System for Attendance of Class Students"[4]. An regular attendance supervision system is a essential tool for any LMS. Most of the existing system are time consuming and necessitate for a semi instruction manual work from the instructor or students. This approach aim to explain the issues by integrates face detection on the procedure. Even though this method still lacks the capability to identify each student on class, there is a still much more room for enhancement. Since we implement a modular approach we can get better different module until we reach an acceptable detection an identification rate. Another issues that has to be taken in consideration in the opportunity is a process to ensure users privacy. Whenever you like a representation is stored on servers, it must be impossible for a person to use that image.

"Implementation of Automated Attendance System using Face Recognition"[5]. Automated presence system has been envision for the purpose of falling the errors that occur in conventional (manual) attendance taking system. The aim is to computerize and make a system that is useful to the institute such as an organization. The efficient and exact method of attendance in office atmosphere that can reinstate the old manual methods. This technique is secure enough, reliable and available for use. No need for dedicated hardware for installing the system in office. It can be constructed using a camera and computer.

More precisely, Liu et al. [6] introduced a robust clothing recognition and retrieval based on classification and a large-scale dataset. Examined and presented uniform attribute and type classification. However, real-time uniform identification from surveillance videos remains highly challenging because of the difficulties involved in achieving reliable uniform detection and representation.

III.METHODOLOGY

3.1 PCA (Principle Component Analysis)

PCA was invented in 1901 by Karl Pearson. Now it is mostly used as a tool in exploratory data analysis and for making predictive models (E.g face recognition). PCA is the simplest of the true eigenvector based multivariate analyses. Often, its operation can be through of as revealing the internal structure of the data in a way which best explain the variance (major features/ directions) in the data. If a multivariate dataset (e.g set of images) is visualized as a set of coordinates in a high-dimensional data space (1 axis per variable). Then PCA can supply the user with a lower-dimensional picture, a "shadow" of this object when viewed from its(in some sense)most informative viewpoint. Principle Component Analysis (PCA) is a mathematical procedure that uses an orthogonal transformation convert a set of values of possibly correlated face images into a set of value of uncorrelated variable called eigen faces.

3.2 Eigen Faces

It is adequate and efficient method to be used in face recognition due to its simplicity, speed and learning capability. Eigen faces are a set of eigen vectors used in the computer vision problem of human face recognition. The eigen faces are principal of faces or equivalently. The eigen vectors of the covariance matrix of the set of the face images.

3.3 Neural Networks

A neural network, also called as an Artificial Neural Networks (ANN), is an interconnected system of artificial neurons which are similar to the neurons present in the human brain. These artificial neurons use a complex mathematical or computational model to process the information based on a connecting approach to computation. In most cases an Artificial Neural Network is an adaptive system in which the structure of the networks changes accordingly with the flow of external or internal information through the system. These artificial neurons or nodes can be used to find patterns in data or to model complex relationships between inputs and outputs.

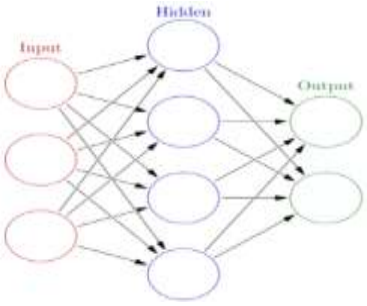

Fig:A simple three-layered neural network

A simple three-layered neural network is shown in Figure. The inputs of the network are given in the form of vectors of multiple dimensions. These vectors are then sent to all the nodes which are present in the hidden layer. These nodes perform different mathematical operations on the incoming data make a decision depending on the data. The final results are then fed into the output layer. This is called a feed forward network. Further there is a concept of back propagation. In back propagation if the output prediction is wrong then the weights learnt at the output layer are corrected and sent back to the previous hidden layers where the weights are corrected and updated. This combination of forward pass and back propagation helps to predict the correct outputs for the inputs. Typically, in a neural network architecture there are a lot of hidden layers stacked upon each other.

3.4 YOLO (You Only Look Once)

Developed by Joseph Redmon in 2016, YOLO is one of the fastest networks for real-time object detection. Before YOLO, for detection purpose the classifier networks were modified to detect the object. But now with YOLO, the object detection is framed as 'a regression problem to spatially separated bounding boxes and associated class probabilities'. YOLO uses a single neural network predicting the bounding boxes and class probabilities from a full image directly in a single evaluation. That is why it gets the name You Only Look Once.

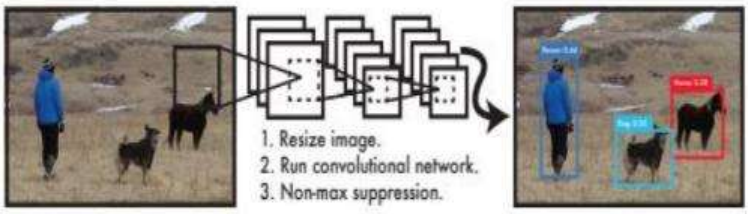

Fig:Detection in YOLO

The basic operation done in YOLO for detection is simple. The input images are resized 448x448 and are given to the neural network. Our system thresholds the resulting detections by certain level of confidence set in the model. This means only the detections with confidence higher than a fixed value are shown as output. Later newer versions of YOLO are developed which are better and faster than the initial versionn.

IV.CONCLUSION

Prior to the development of this project, there were a number of gaps in the participatory processes using the traditional method that created many problems in many institutions. Therefore, the feature of face recognition attached to the attendance monitoring system can not only ensure that attendees will be accurately identified and eliminate errors in the previous system by using technology to overcome errors that not only save the app but also reduce human intervention throughout the process. The only cost of this solution is finding enough space to keep all the faces in the database.

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