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Acquiring Class Attendance using Face Recognizing Technique in Cloud

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Abstract: Student Attendance recording and maintaining is important task in every college to measure the student participation for every particular class. Maintaining attendance in registers for every class is a time-consuming process. To overcome this problem many automated attendances regarding systems were introduced. In this paper we are using face recognizing technique to register student attendance and the data is stored in cloud using datasets. Data sets contain already student registered information basing on the information attendance is marked by using face reorganization techniques. This paper explains how we are capturing images and storing the attendance implementation process.
Keywords: Face recognition, Cloud computing, datasets, types of cloud, system architecture.

I. INTRODUCTION

Now a day's students' attendance is an important factor and it is taken manually which take a lot of time from the teaching process. To create and maintain the record of attendance is compulsory so many people have come up with various ideas of automated attendance systems which used bio metrics like finger print scanning to identify the individual student regularity to attend the classes. Facing lot of issues in bio-metric attendance method like it is a time-consuming process, network issues and not recognizing the fingerprint while applying mehndi or ink on hands etc. By giving each student a unique barcode value and scanning it every time whenever the attendance was needed to be recorded or by using magnetic tape scratch cards to record their attendance. All these ideas had one big problem i.e. all need some kind of scanners to record the attendance. This makes it very costly to install colleges and also it will take a lot of time to record attendance as students will have to stand in queues and record their attendance after each and every class.

To overcome this problem, introducing a concept of multiple face recognition in a single snapshot. Many studies have been explored Face analysis with various feature representation techniques. Among various feature extraction approaches, model-based techniques, appearance-based, feature-based, are popular. Here enrolling each student complete data in database like Id number, thumb impression, retina and facial characteristics like sad, confused, happy, angry, and surprised by using cloud to maintain light weight process. Integrating cloud computing facilities with a face recognition system will facilitate the identification of most faces from devices, such as webcams, mobile phones, CCTV cameras, and tablet PCs. enrollment and also the matching method to be distantly managed.

II. CLOUD COMPUTING

Cloud computing is one of the emerging techniques to maintain and managing the data through data centers. Cloud can be referred as internet which is virtually present around us. Cloud provides some services in our daily routine like database maintaining, networking, analytics, storage capacity, software and may more. Cloud may help to upload our applications with free of cost.

A. Cloud Computing mainly provides three types of cloud services

1) *Infrastructure as a Service (IaaS):* In IaaS, we can rent IT infrastructures like servers and virtual machines (VMs), networks, storage, operating systems from a cloud service vendor. We can create VM running Windows or Linux and install anything you want on it.
2) *Platform as a Service (PaaS):* This service provides an on-demand environment for developing, testing, delivering, and managing software applications. The developer is responsible for the application, and the PaaS vendor provides the ability to deploy and run it.
3) *Software as a Service (SaaS):* It provides a centrally hosted and managed software services to the end-users. It delivers software over the internet, on-demand, and typically on a subscription basis. E.g., Microsoft One Drive, Dropbox, WordPress, Office 365, and Amazon Kindle.

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B. Types of Cloud Computing

There are three different types of clouds as shown in Fig.1 given below.

1) *Public Cloud:* The cloud resources that are owned and operated by a third-party cloud service provider are termed as public clouds. It delivers computing resources such as servers, software, and storage over the internet
2) *Private Cloud:* The cloud computing resources that are exclusively used inside a single business or organization are termed as a private cloud. A private cloud may physically be located on the company's on-site data center or hosted by a third-party service provider.
3) *Hybrid Cloud:* It is the combination of public and private clouds, which is bounded together by technology that allows data applications to be shared between them. Hybrid cloud provides flexibility and more deployment options to the business.

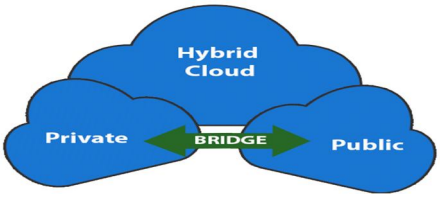


Fig:1 Types of clouds

III. SYSTEM ARCHITECTURE AND IMPLEMENTATION

These are the different steps involved in maintain multiple faces to recognize as shown in Fig.2 given below

1) Gather the information of students remotely like id numbers, thumb impressions etc. Here admin can manage the datasets in database with the help of cloud.
2) Admin have the responsibilities such as create, store, use, share, archive, destroy. These responsibilities are having their own prominent role.
3) Cloud is used to work on multiple platforms.
4) Then the pre-processing technique is applied step-wise like providing input image, pre-processing, feature extraction (like different expressions) and search in database.
5) The face of particular student is matched from the database leads to give the attendance to that particular student.
6) If the student is not appeared means it is referred as absent for that particular class.

A. Roles Involved

1) *Admin:* Admin can manage the whole data set to create or destroy. Each and every time it is needed to update the database to manage and avoid the fault errors.
2) *Cloud:* With the help of cloud can maintain many applications like server, database etc., in free off cost. Because cloud is an open source as well it provides different types of services and methods also. Hence it helps us to maintain the application in low cost.
3) *Technique:* Throughout this approach applying a technique called pre-processing which are as discussed in the above workflow.
4) *Register:* Each student attendance is updated for every class. It may help to concentrate on the teaching only.

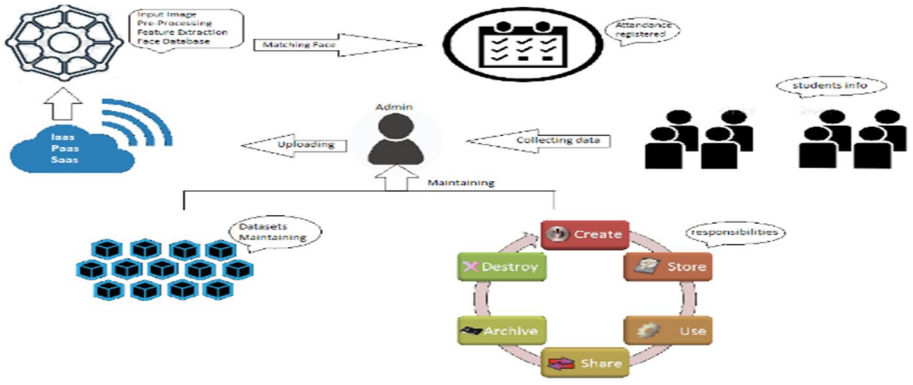


Fig 2: Architecture for implementation process

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IV. FACE RECOGNITION

Face recognition system is a technique for identifying or verifying a person for computer vision problem that has gained the attention of researchers, whereas to analyze the face and reduce dimensionality appearance-based techniques are employed. There are multiple methods in which the system works but it uses comparing facial feature from images with faces in database. Projecting a face onto a sufficiently low-dimensional feature area whereas holding the distinctive facial characteristics in a very feature vector serves a vital role in recognizing typical faces.

I. In this approach have a tendency to use an algorithm to detect face so we use haar algorithm. It is an object detection cascade function that is trained from a lot of negative and positive images. It extracts features such as edge, line, four-rectangle features from images. All the possible sizes and locations of each image features is calculated. Group the features in to different stages and apply one by one. If it passes the first stage, apply the second stage of features and continue the process or if it fails in first stage discard the process. This algorithm gives the 95% correct result for detection of a human face.

II. The face recognition is most important process in which it is based on the geometric features of face. It recognizes by marking points for position of eyes, nose, ears and other are used to create a feature vector. This has been done by the calculating the Euclidean distance between the reference image and vector. There are two forms of algorithm one is Eigenface and Fisherfaces. The Eigenface algorithm works on concept that all parts of face are not equally important to recognize that person. It takes most important part and discard rest. The fisherfaces algorithm extracts the principle components which separates one individual from another so that one feature can't dominate features of another.

In the next step the set of all faces are combined together and placed into a database set. Then from the database set is calculated and subtracted from the database set of each image, for this the convirance matrix is used to calculate the each eigenfaces and eigenvectors. In the final step it selects the best eigenfaces which has the highest eigenvalues. The eigenvalues each is compared with one other so that to identify which face have been matched with which face. Then lastly if the eigenvalues of two faces are similar, then they have the same faces.

V. DATABASES

There are many database sets in that we can use any one of the datasets to store the data in cloud. Each dataset has its own specification like size, no. of images, type etc., to store the data.

A. Google facial expression comparison dataset:

This dataset could be a large-scale facial features dataset consisting of face image triplets along with human annotations that specify that two faces in each triplet form the most similar pair in terms of facial features. Every triplet during this dataset was annotated by six or lot of human raters. This dataset is a kind of completely different from existing expression datasets that focus mainly on separate emotion classification or action unit detection. It can store 156k face images. This dataset is meant to assist researchers engaged on topics associated with facial expression analysis like expression-based image retrieval, emotion classification, expression synthesis, expression-based photo album summarization, etc.

B. Facescrub

Large face datasets are vital for advancing face recognition analysis, however they are tedious to make, as a result a lot of work has to go into cleaning the huge amount of raw data. To facilitate this task, have a tendency to developed an approach to assembling face datasets that detects faces in images returned from searches for public figures on the Internet, followed by automatically discarding those not belonging to each queried person.

The Face Scrub dataset was created by using this approach, followed by manually checking and cleanup the results. It includes a complete of 106,863 face images of male and female 530 celebrities, and with about 200 images per person. As such, it is one in all the largest public face databases. The images were taken from the web and are retrieved under real-world situations. Name and gender annotations of the faces are enclosed.

VI. CONCLUSION

This paper proposed cloud-based face recognition technique which is used to mark the student attendance in many colleges to reduce the risk facing by using pen and paper. By using these automated techniques can result in better way to maintain records and reduces the time. Capturing images and storing in datasets and retrieving the store information for matching the images to mark attendance. Cloud is used to store the datasets in which student information is stored and information is retrieved from cloud whenever it is necessary.

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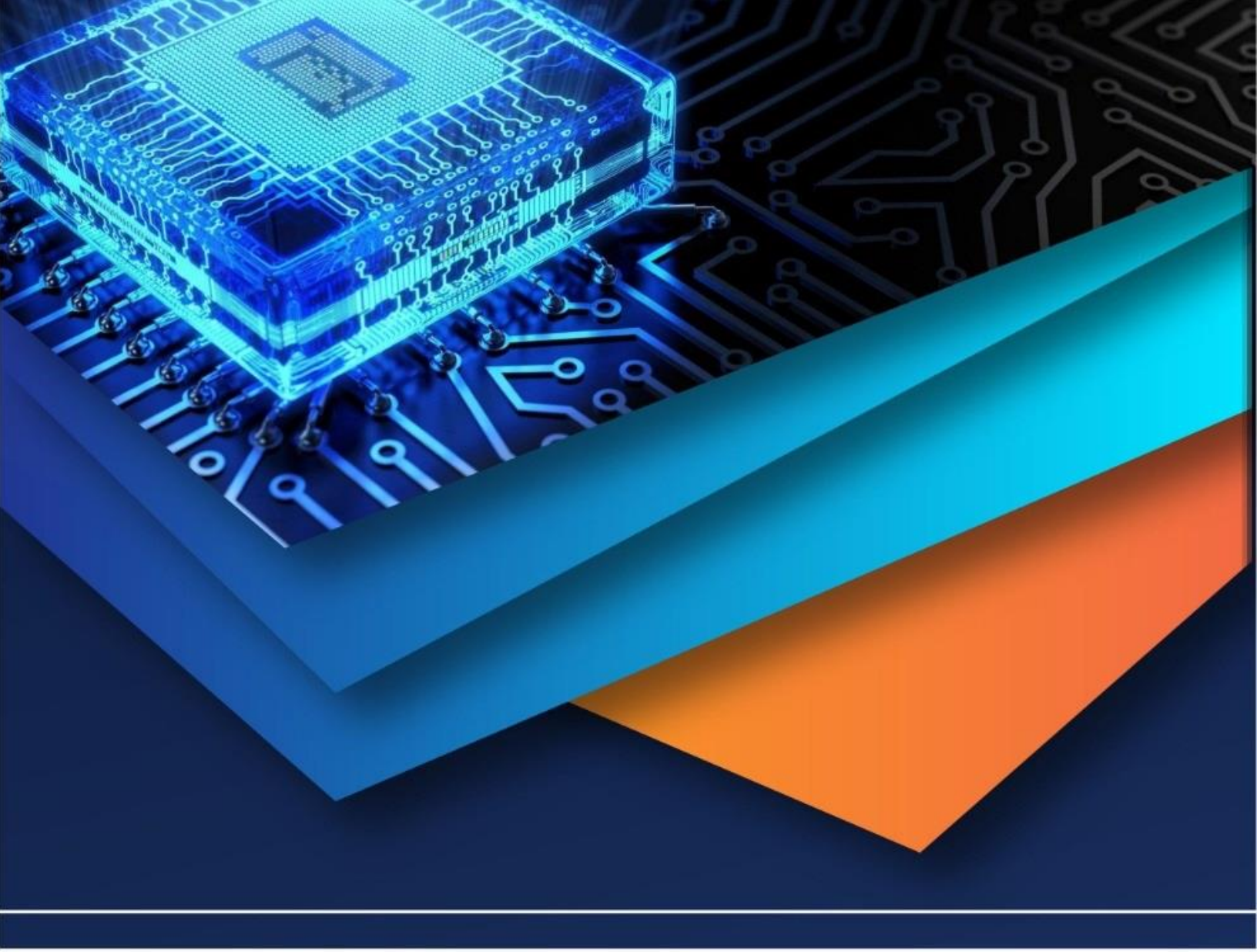
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