

Attendance Monitoring System

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Abstract: In the perception of attendance monitoring system, It takes the attendance automatically using Facial Recognition. The construction is depends of the face recognition of students and applies the system to any classroom or laboratory while teaching. This concept mainly based on the algorithm called Speed Up Robust. The method consists of capturing the individual students or group of students Image in the class and compares with the pre stored individual identified images of the students with the individual or group image, if the student face is found in the group then the attendance will updated. The entire code is written in software called Python. Attendance database will Stored in MS-Excel file. Python is very high configuration software for simulation.

KEYWORDS: Smart Attendance System, Numpy, NFC(Near-field communication), RFID(Radio Frequency Identification)



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INTRODUCTION

Due to students interest in classroom, and whose is the largest union in study environments of university or institutions, so recording absence of department having a large number of students in a classroom is a difficult task and also time-consuming. Moreover, the process will takes much time of teachers, and many efforts are spent by the staff of the department to complete the attendance rates for each student. So in many institutions and also academic organizations, attendance is noted as important criterion which is used for various purposes. These purposes includes recording and keeping assessment of students, and promotions of optimal and consistent attendance in class. As long as in many developed countries, a minimum percentage of class attendance is required in most of the institutions and this policy has not been adhered because of the various challenges of the present method of taking attendance. The process of recording for attendances to students in the form of hardcopy papers and the system was manually done. Besides wasting time and keeping effort for preparing sheets and also documents, other disadvantages may be visible to traditional one due to the damage of the sheets could be stolen. The developed system considers as one of the alternative to the traditional one, it is easy, fast , simple and reliable than that of traditional one, especially after the development of information technology and its usage by educational institutions. Therefore, the design of student attendance system has a significant reality meaning.

The system mainly Web-based application developed for daily usage of attendance in the departments within the university. It facilitates access to the attendances of a particular students in a particular classes. This system will also helps by generating report and also evaluating the attendance eligibility of a students. The system is not only improvement of the work efficiencies, students study and development, but also can save human and material resources.

LITERATURE SURVEY

2.1 Attendance Systems Using NFC Technologies with Embedded Cameras on Mobile Devices

According to research journal "Attendance System Using NFC (Near Field Communication) Technologies

with Embedded Cameras on Mobile Devices. The attendance system is improved by using NFC technology and mobile application. According to the research papers, each students is given a NFC tag that has a unique ID's during their enrolment into the colleges. Attendance of each classes will be taken by touching or moving these tag on the lecturer mobile phones. The embedded camera on the phone will then capture the student's face to send all the data to the college server to do validation and verification. The advantages of this method is where the NFC is simple to use, and the speed of connection establishment is very high. It indeed speed up the attendances taking process a lot. However, this systems couldn't automatically spots the violations when the NFC tags is not personally tagged by the original owners. Apart from that, the convenience of the systems which uses the mobile phones as the NFC readers was actually an inconveniences to the lecturers. Imagine if the lecturers had forgotten to bring their mobile phone to work, what would be the backup procedures for the attendances to be recorded? Moreover, most of the lecturer will not likely to prefers their personal smart phones to be used in this ways due to privacy matters. Hence, unique information about the student like biometrics or face recognitions, which is guanine for a student should be used in replacements of the NFC tag. This will ensures attendances to be taken originally by the actual students.

2.2 Face Recognition Based Attendance Marking System

The second research journals "Face Recognition Based Attendance Marking System" is based on the identifications of face recognitions to solve the previous attendances system's issues. This systems uses cameras to captures the images of the employees to do face detections and recognitions. The captured image is compared one by one with the faces databases to search for the workers faces where attendances will be marked when a results is found in the face databases. The main advantage of this system is where attendance is marked on the server which is highly secure where no one can mark the attendance of other. Moreover, in this proposed systems, the face detections algorithms is improved by using the skin classifications techniques to increase the accuracy of the detections methods. Although more efforts are invested in the accuracy of

the faces detections algorithms, the systems is yet not portable. This system requires a standalones computers which will needs a constant power supply that makes it not portables. This type of systems is only suitable for marking staffs attendances as they only needs to report their presences once a day, unlike students which requires to reports their attendances at every class on a particular days, it will be inconvenient if the attendance marking system is not portable. Thus, to solve this issue, the whole attendance management system can be developed on an portable module so that it can be work just by executing the python program.

2.3 Fingerprint Based Attendance System Using Microcontroller and LabView

This system is using 2 microcontrollers to deal with the fingerprint recognition process. Firstly, the fingerprint pattern will be obtained through a fingerprint sensor, then the information will be stransmitted to microcontroller 1. Next microcontroller 1 will pass the information to microcontroller 2 to do the checking with the database that resides in it. After finding a student’s match, the details are sent to the PC through serial communication to be displayed. This design is good as it accelerates development while maintaining design flexibility and simplifies testing. But again, this system is attached to a PC which make it not portable. Other than that, the database information cannot be accessible easily. Meaning that, for the parents whom are interested in knowing their child’s attendance cannot easily or conveniently access the information. Therefore, to provide accessibility of the student’s information to the legitimate concerned party, the information can be uploaded to a web server for easy access. While the authentication for the appropriate access can be enforced through a login screen.

2.4 RFID based Student Attendance System

In this system, a tag and a reader is again used as a method of tracking the attendance of the students. The difference between the first journals with this is where attendance’s information can be accessed through a web portal. It provides more convenient for information retrieval. Again, this system is imperfect in the sense that, firstly, it is not portable, as the RFID reader can only work when it is connected to a PC. Secondly, the

RFID tag is not a guanine information that can uniquely identify a student,

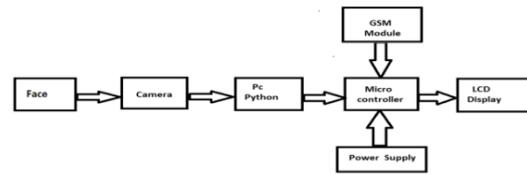


Figure:1 Block diagram of the face recognition method for biometric verification

The face recognition attendance system consists of various phases throughout the completion of the process and is accessed by the administrator. For the students who will be recognized they need not to be registered. For registration, A form must be filled up with the basic details of a student among with their images.

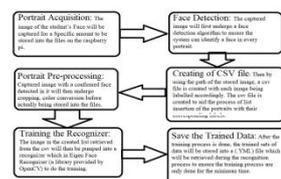
SOFTWARE DEVELOPMENT

There are two major system flows in the software development section as shown below:

- The creation of the face database
- The process of attendance taking

Both processes mentioned above are essential because they made up the backbone of the attendance management system. In this section, the process of both flows will be briefly described. Meanwhile, their full functionality, specific requirements and also the methods/approach to accomplish such objectives will be discussed in the upcoming chapter

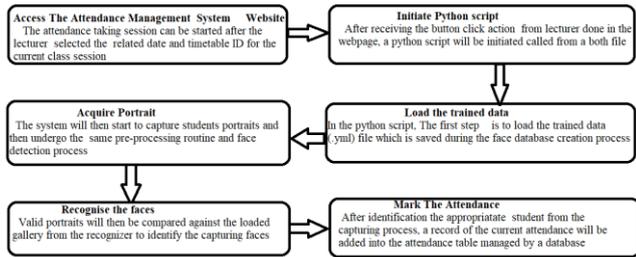
3.1 - The Creation Of The Face Data Base:



The face database is an important step to be done before any further process can be initiated. This is because the face database acts as a comparison factor during the recognition process which will be discussed in later section. In the process above, a csv file is created to aid the process of image labeling because there will be more than one portrait stored for each student, thus, in order

to group their portraits under the name of the same person, labels are used to distinguish them. After that, those images will be inserted into a recognizer to do its training. Since the training process is very time consuming as the face database grew larger, the training is only done right after there is a batch of new addition of student's portraits to ensure the training is done as minimum as possible.

3.2- The Process Of Attendance Taking:



PROPOSED METHODOLOGY:

Once the form is filled up student are captured automatically after face being detected as a part of the registration process and are stored within the particular student folder. Encoding of the register images that are encoded along with their labels. Detecting the facial landmarks is one of the shape predictions problem.

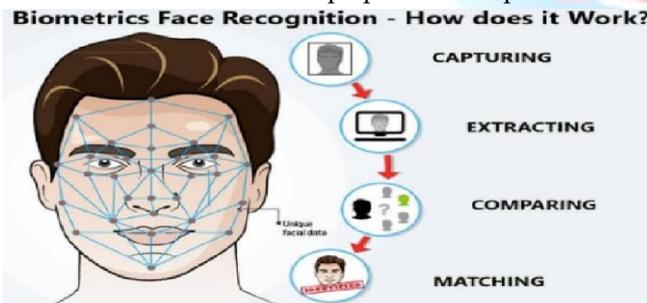


Figure 2 : Biometric face recognition

4.1-Image Acquisition and Pre-processing procedures

After the images are being processed, they are stored into a file in a hierarchy manner. In this project, all the faces will be stored in a hierarchy manner under the „database“ folder. When expanding through the database folder, there will consist of many sub-folders which each of them will represent an individual where a series of face portrait belonging to the same individual will be stored in that particular sub-folder. The subfolders that represent each individual will be named upon the ID no. of that individual which is unique for every single individual in the institution. The whole process of image retrieval, pre-processing, storing

mechanism is done by the script named create_database.py

Once the form is filled up student are captured automatically after face being detected as a part of the registration process and are stored within the particular student folder. Encoding of the register images that are encoded along with their labels. Detecting the facial landmarks is one of the shape predictions problem.



Figure 3

Facial landmarks such as eyes, eyebrows, nose, mouth, jaw line where used to localize and represent salient regions of the face. Given a input image a shape predictor predicts the localizes key points of interests along the shapes. In the context of facial landmark, our goal is to detect the important facial structure on the face using shape predictions methods.



Figure 4 : Facial Landmarks

During attendance, webcams is connected and as students enters in to the class their faces are detected and recognize after which an entry is marked in Excel sheets as present or not. Report are generated by basis of the attendance sheets. Those reports are stored for further processes



Figure 5: Web cam

RESULTS AND DISCUSSIONS

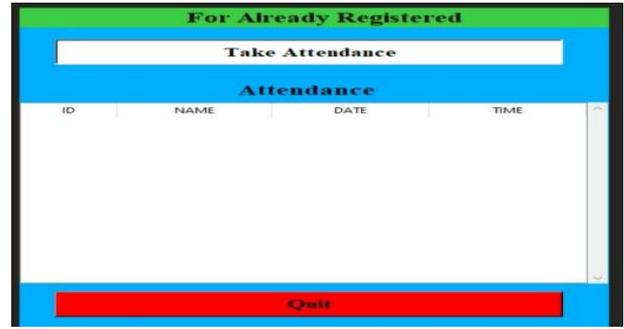


Figure 9: Already registered take attendance image

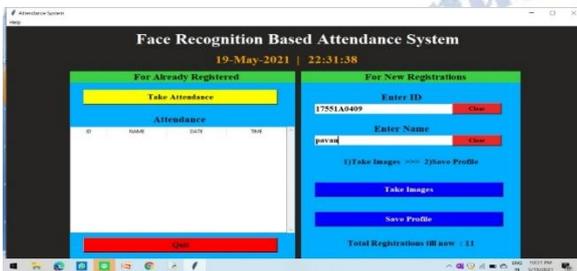


Figure6: Face recognition for new registration image

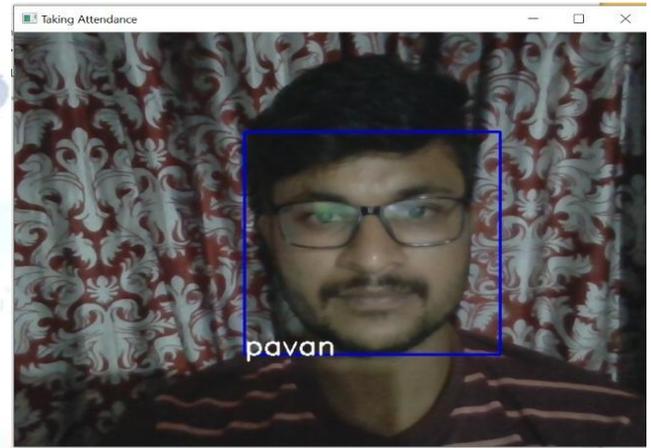


Figure 10: Face comparison known or unknown person image

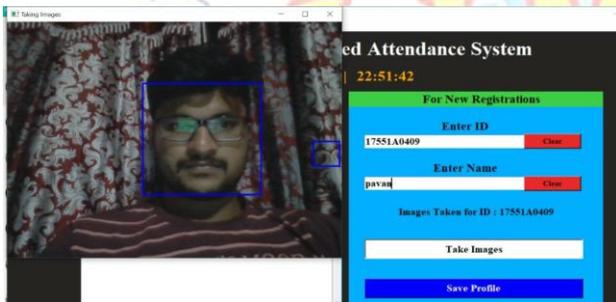


Figure7: Face capturing the image

ID	NAME	date	time
17551A0409	pavan	20-05-2021	10:45
17551A0412	alekhya	20-05-2021	10:48
18555A0406	sujitha	20-05-2021	10:50
17551A0451	sandy	20-05-2021	10:55

Figure 11:MS-Excel sheet

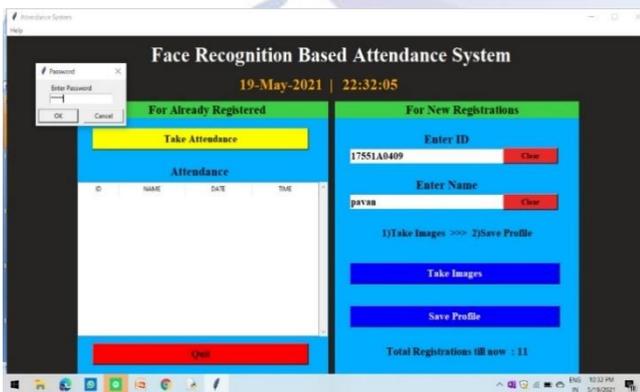


Figure8: For new registration save profile image

CONCLUSION

The system we have developed is successfully able to accomplish the task of marking attendance automatically and output is obtained is updated. Factors such as environmental changes and mild change in appearances impact the technologies to a greater degree than many expect. For implementing where the biometric systems must be verified and identify users reliability over time, facial scan can be a very difficult, but not impossible, technology to implement successfully.

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