International Journal of Trend in Scientific Research and Development (IJTSRD)
International Open Access Journal
ISSN No: 2456 - 6470 | www.ijtsrd.com | Volume - 2 | Issue – 3

Student Library Attendance using Face Recognition

K. Ravikanth Mishra
Asst. Prof, Dhanekula Institute of Engineering and Technology, Ganguru, Vijayawada, Andhra Pradesh, India

D. Brahmeswara Rao
Dhanekula Institute of Engineering and Technology, Ganguru, Vijayawada, Andhra Pradesh, India

A. Dinesh Chowdary
Dhanekula Institute of Engineering and Technology, Ganguru, Vijayawada, Andhra Pradesh, India

ABSTRACT

In every college there will be a huge number of students who uses the facility of library to access or to refer different varieties of books to gain knowledge about subjects. Every Library maintains a register to maintain the data about members who entered library. Some colleges still use the traditional approaches of maintaining register, which is difficult to maintain, to check and to analyze data. So, we propose a new system in which students are passed through camera at entry point of the library where the students facial patterns are recognized and create the entry record into the database on clicking the button.

Keywords: *Face Recognition; Attendance*

INTRODUCTION

Traditionally, student's attendance is taken manually by using attendance sheet given by the attendant during tutorials and leisure time, which is a time consuming. Moreover, it is very difficult to verify all the students in a large library environment with distributed branches whether the authenticated students are present or not. Using face recognition, it proposes a method to automatically take the attendance of the students in a class. The system stores the details of each student as well as their facial features in the database and it compares the new patterns with the previously stored patterns as per the requirement. Even though other methods such as the Radio Frequency Identification (RFID) tags where embedded in student's card, the use of Near Field Communication (NFC) technology with biometric for identification (fingerprints) can be more accurate, but face recognition always remains a focus of research because of its non-interactive nature and because it is people primary method of person identification.

A time and attendance system provide many benefits to tertiary institutions. Manual systems are also eliminated as well as staff who usually inspect the attendance of students. It is an efficient way to record and manage the attendance in a library. There is also advantage of time saving and speed marking of the attendances. Automated attendance systems can use electronic tags, barcode badges, magnetic stripe cards, biometrics (fingerprint, or facial) in place of paper cards which students usually use. The recorded information is then ideally automatically transferred to a computer database for processing and matching with the existing information to check whether the person is known or unknown. The computer may then be employed to perform all the necessary matching to generate students' attendance sheets which are used mark the register. An automated system reduces the risk of errors that are common in a manual system and allows the workforce to be more productive instead of wasting time on tedious administrative tasks. We have researched and reviewed dozens of attendance systems and came up with the ones we think are best for a variety of tertiary institution.

Choosing an Attendance System for tertiary institution:

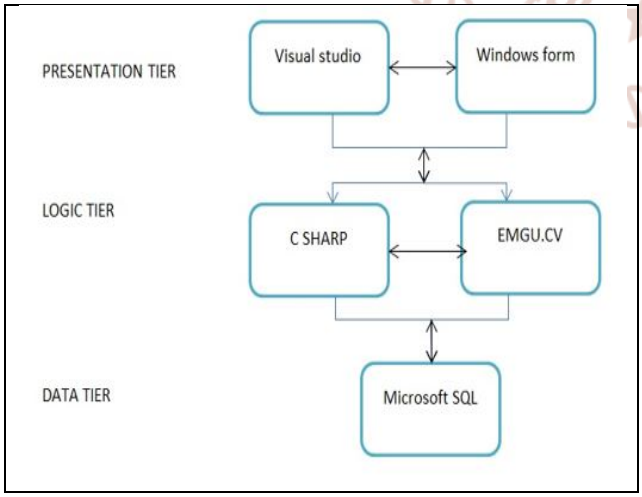
While manual systems were previously used by both small organization and large colleges around the world. The increasing rise in the importance of the education has led to high enrollment of students at the

tertiary level to the extent that there is need for controlling the number of students in a specific area that is a library. The existing systems such as RFID and biometric tend to be expensive given the current economic crises hence the facial recognition system being more viable. Since the proposed facial attendance system will use the existing tools such as computers. Having the facial system, the security will be improved when writing exams and the time will be saved.

System Architecture:

System Architecture is a conceptual model that define the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behavior of system. System Architecture describes the various tiers of a system (Data, Logic and Presentation). The data tier describes the raw unmodified data contained within the system which in our system was developed with Microsoft SQL Server.

The Logic tier represents the use of the data to make the system work and feed the system with the necessary data needed to work. These include the face detection, attendance marking, and enrolling new students. This was achieved using C# and an open source library Emgu.cv using Haar Cascades. The presentation tier refers to the specific view a user wants to see. These include querying the database for reports and showing relationships between entities. Visual studio Windows Form Applications helps us to design these presentations.



User design phase:

System users normally judge a system by its interface than its functionality. A poorly designed interface can cause a user to make catastrophic errors. During this phase, users interact with systems analysts and develop models and prototypes that represent all system processes, inputs, and outputs. The RAD groups or subgroups typically use a combination of Joint Application Development (JAD) techniques and CASE tools to translate user needs into working models. User Design is a continuous interactive process that allows users to understand, modify, and eventually approve a working model of the system that meets their needs. The objectives of the UD stage are to analyze in detail the business data associated with the proposed system area, to develop the system structure in terms of the automated and manual functions that will comprise the system, to develop proposed screen layouts for the most important automated functions, to select the appropriate construction approach for the system and, to prepare a work plan defining the steps necessary for transition of the system, the effort required to perform these steps, and a schedule by which these steps can be completed. The UD stage produces a detailed system area model, an outline system design, and an implementation plan. End users participating in Joint Application Design (JAD) workshops perform the analysis and design activities associated with this stage.

Conclusion:

Attendance is a key factor during exam period. In this project, the potential benefits of implementing e-attendance environment were investigated. This is done in order to eliminate the challenges and limitations of the current manual attendance systems and e-attendance system. This project is centered on how to enhance attendance marking. However, the system also facilitated the surfacing of other components such as venue status at the institution.

In a nutshell, the core motive of e-attendance was studied. Furthermore, the essential benefit of automated student was highlighted. We went further by investigating how face recognition can solve the disturbing challenges manual attendance systems. Based on the knowledge, it was safely concluded that implementing an the proposed system at college library will not only eliminate the challenges that are faced by the college but will also provide a rich,

sound, and more flexible environment that will have a positive effect on attendance during tutorial session and exams.

References:

1) H. Cevikalp and B. Triggs, "Face Recognition Based on Image Sets," in Proc. CVPR, Jun. 2010.
2) Y. Chen, et al., "Dictionary-Based Face Recognition from Video," in Proc. ECCV, Oct. 2012.
3) A. Cohen and V. Paclovic, "An Efficient IP Approach to Constrained Multiple Face Tracking and Recognition," in Proc. ICCV, Nov. 2011.
4) A. Raducanu and F. Dornaika, "Pose-Invariant Face Recognition in Videos for Human-Machine Interaction," in Proc. ECCV, Oct. 2012.
5) E. Sariyanidi, et al., "LZM in Action: Realtime Face Recognition System," in Proc. ECCV, Oct. 2012.
6) J. Sivic, et al., "Who are you? - Learning person specific classifiers from video," in Proc. CVPR, Jun. 2009.
7) Z. Song, et al., "Learning universal multi-view age estimator by video contexts," in Proc. ICCV, NOV. 2011.
8) M. A. Turk and A. P. Pentland, "Face Recognition Using Eigenfaces," in Proc. CVPR, Jun. 1991.
9) Q. Yin, et al., "An Associate-Predict Model for Face Recognition," in Proc. CVPR, Jun. 2011.
10) Q. Zhang and B. X. Li, "Discriminative K-SVD for Dictionary Learning in Face Recognition," in Proc. CVPR, Jun. 2010
11) W. Zhao, et al., "Face recognition: A literature survey," in ACM Computing Surveys, 2003.
12) D. Heckerman, D. Geiger, and D. M. Chickering, "Learning Bayesian networks: The combination of knowledge and statistical data," Mach. Learn., vol. 20, no. 3, pp. 197–243, 1995.
13) K. B. Korb and A. E. Nicholson, Bayesian Artificial Intelligence. London, U.K.: Chapman & Hall, 2004.
14) M. Bartlett, G. Littlewort, M. Frank, C. Lainscsek, I. Fasel, and J. Movellan, "Automatic recognition of facial actions in spontaneous expressions," J. Multimedia, vol. 1, no. 6, pp. 22–35, 2006.
15) T. Kanade, J. Cohn, and Y. L. Tian, "Comprehensive database for facial expression analysis," in Proc. 4th IEEE Int. Conf. Autom. Face Gesture Recognit., Mar. 2000, pp. 46–53.
16) S. Koelstra, M. Pantic, and I. Patras, "A dynamic texture-based approach to recognition of facial actions and their temporal models," IEEE Trans. Pattern Anal. Mach. Intell., vol. 32, no. 11, pp. 1940–1954, Nov. 2010.
17) P. Lucey, J. F. Cohn, T. Kanade, J. Saragih, Z. Ambadar, and I. Matthews, "The extended Cohn-Kande dataset (CK+): A complete facial expression dataset for action unit and emotion-specified expression," in Proc. 3rd IEEE Int. Conf. Comput. Vis. Pattern Recognit., Jun. 2010, pp. 94–101.
18) M. Valstar and M. Pantic, "Fully automatic recognition of the temporal phases of facial actions," IEEE Trans. Syst., Man, Cybern. B, Cybern., vol. 42, no. 1, pp. 28–43, Feb. 2012.