Bi-Modal Exam Hall Authentication System

Dr. D. Binu[1], D. Bhuvana[2], B. Karthika[3], M. Kayalvizhi[4]

[1]Associate professor, Department of ECE, Sri Ramakrishna Institute of Technology, Tamil Nadu, India.
[234]UG Student, Department of ECE, Sri Ramakrishna Institute of Technology, Tamil Nadu, India.

Abstract- Imperfection in exam halls is increasing day by day. This is due to careless of the invigilator and time-consuming process of candidate checking and authentication in exam halls. The impersonation in exam hall can be reduced by verifying the bi-modal features of the candidate. The proposed system consists of bi-modal scanner connected to Raspberry Pi and data stored in MATLAB database. The system is designed to allow the users by verifying their bi-modal, using face and fingerprint and block unauthorized users. Face detection is used in variety of application that identifies human faces in the form of digital images. The face detection also refers to psychological process by which humans can be checked. The bi-modal system was designed to verify the face and fingerprint features which saved into the database of the system and confirm the eligibility of candidate for examination. If the face details are matched, with database the webcam now sends a signal to fingerprint scanner. If the fingerprint matches with the database, then the door opens automatically.

Index Terms- Authentication, Fingerprint, Face Images, Impersonation.

I. INTRODUCTION

Authentication and identification have always been a major challenge in all types of examination. Verification of the authentic candidate is not easy task, also it consumes lot of time and process. This led to the design of Bi-modal based exam hall authentication system to allow the users after verifying by their bi-modal such as face and fingerprint and stop the non-verified users. Formal examination can be defined as the assessment of a student's performance, when confronted with series of questions and problems, in order to check the amount of knowledge that the student has acquired, the extent to which he/she is able to utilize it, or quality and effectiveness of the skills he/she has developed. During the 19th century, the universities, schools, and other educational institutions became formal written examinations. Examinations were also increasingly employed for the selection of recruits to civil service, and professions, to posts in industry and commence. Over the ages, standardized testing has been the most common methodology, the validity and credibility of expanded range of contemporary assessment techniques have been called into question.

There are two types of the systems that help automatically establish the identity of a person:

1) Authentication (verification) systems
2) Identification.

In a verification system, a person to be identified has to submit an identity claim to the system, usually via a magnetic stripe card, login name, smart card, etc., the system either reject or accept the submitted of identity.

In an identification system, the system establishes a subject identity (or fails the subject is not enrolled in system database) without the subject having to claim an identity. The accurate personal Authentication and identification is become more and more important for the increasing electronically interconnect to information society.

II. EXISTING SYSTEM

In an examination hall an organization that sets the examinations and responsible for marking them and distributing the results. Examination boards have power to award the qualification to the students. Most of the exam halls are running as non-profit organizations. IUM is the first and only private owned University in Namibia, which can be offer qualification in the variety of discipline and well-structured certificates, The high certificates and Diplomas, Honors Degrees, Master's degrees, and Doctorates in different Disciplines such as Telecommunication, Information Technology, Computer Technology Human Resource, Nursing, Education etc. For IUM is be recognized, Respected, and set their standard height, it needs to establish a secure method of registration, authentication, verification, and identification to make sure that who has registered at the first of the year is the one who is going to seat to write the exam. The systems that are used currently are not secure because it requires a student to provide certain physical documents such as student cards, examination admission slip, etc. This type of methods (documents) can be forged by almost anyone in this fast-growing computer technology world. Adoption of Bi-modal Based Exam Hall Authentication system that permit only registered student to enter the exam hall and block anyone who wasn't registered.

The problems in previous identification systems are:

- Student impersonation
- Insecure authentication of students
- Manual verification of student

III. PROPOSED SYSTEM

During authentication and identification, the bimodal of the user is captured again and the extracted features are compared using a matching algorithm with the already existing in the database entries. It has been established the physically reach is not always helpful a much better alternative is to use bi-modals concept that can facilitate stronger security to the problem of exam imperfection.

This implement the creation of database management system (DBMS) which ensure the computer records are kept up to date and made available on demand to those who need them for any purpose associated with the operation of the Service The level of success achieved in caring this research work owed to the methodology adopted. This examination imperfection elimination system uses identification using finger and face.

In identification, the system recognizes an individual by comparing bi-modals of two stages: Enrollment and Authentication. During enrollment, the fingerprint and face are capture optical, solid state or ultrasound sensor or other suitable device and the unique features are extracted and stored in a database entry as a template for the subject along with the student finger and face. The objective of the enrolment module is admitting a student using face and fingerprint into a database after feature extraction. The enrollment process is carried out by administrator in the examination system.

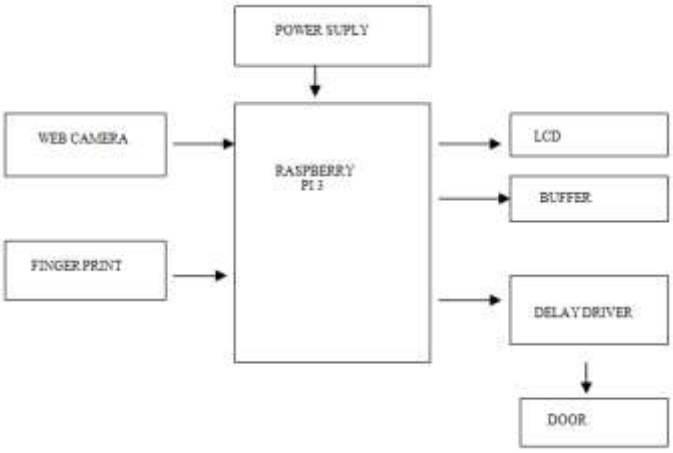

Figure 1: Block diagram

IV. METHODOLOGY

The manual identification examination impersonation eradication system. When it comes to identification, the system compares an individual's biometrics to every entry in the database. Enrollment and authentication are the two phases of biometric identification in general. During enrollment, the biometrics of the user is captured (using a biometric reader, which are likely to be an optical, solid state or an ultrasound sensor or other suitable device) and the unique features are extracted and stored in a database as a template for the subject along with the student face.

The objective of the enrolment module is to admit a student using his/her face and biometrics into a database after feature extraction. These characteristics establish a framework for determining the student's identification and formulating the authentication process.

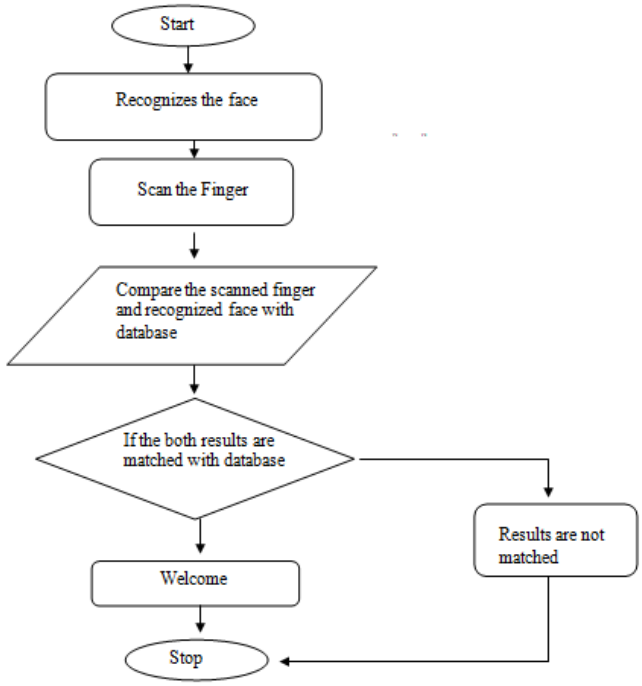

Figure 2: Flow Diagram

V. RESULTS AND DISCUSSION

Due to the human body features with no duplicate characteristics, the student put finger and face turned to bimodal. Computer bi-modals authentication automatic identification technology is the earliest and the most practical and the mature technology among the identification technology. This design such an implementation where first collect or enroll the fingerprint and face of the students who is going to write the examination and store them in raspberry pi When student enters the exam hall the system asks for bi-modal and then controller checks for valid student or not.

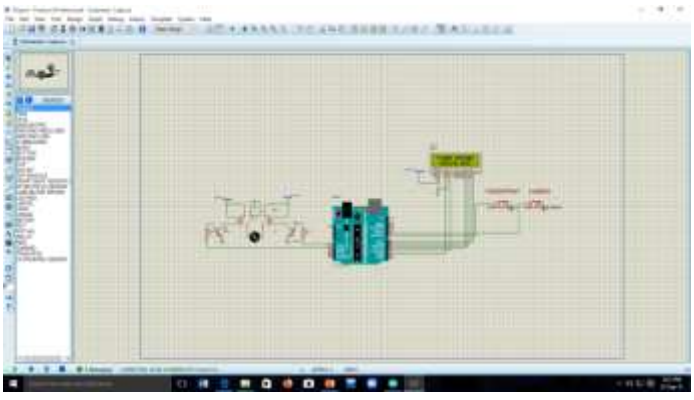

Figure 3: Simulation of Bi-Modal System

Bi-modal authentication and verification software helps improve security for networks, applications, and physical locations by requiring biometric factors as an additional access qualifier. Bi-modal authentication tools utilize physical characteristics such as facial, fingerprint, or voice recognition to verify a user's identity. They are often paired with physical authentication tools or fingerprint and face combinations as a secondary level of authentication. As bi-modal characteristics are much more difficult to mimic, companies leverage these tools to improve the security and effectiveness of authentication processes.

Figure 4: Prototype of the Project

This was proved by implementing the project in simulation but it's working according to the way it is intended to work. By simulating this project, one will see the display on the LCD, the system writing the name of the project "Bi-modal based exam hall Authentication System".

The raspberry will send the signal to the motor driver that drives the door to open automatic. Furthermore, if the student is not authentic, the system will not prompt the student to input the passkey, instead displaying the message "ACCESS DENIED, STUDENT NOT REGISTERED," indicating that the student is not in the system and has not been registered.

VI. CONCLUSION

The Bi-modal for Examination impersonation of face and fingerprint access is a better substitute for the user identity in verifying user's face and fingerprint experience has shown in uniquely identifying individual in the face and fingerprint of sophisticated Forgery technology. The natural use of bi-modal makes it reliable access control technique. The fact that the user no longer needs to carry any identity cards and other documents for identification and verification explain the ease of use. The implemented bimodal extract the features precisely which is much more accurate and faster than previous feature extraction methods. In the proposed system accurately verify the bi-modal of the user who is valid or not. If the user is authenticated Peron, then it allows attending the exam else will not allowed. The proposed method is suitable for all the authentication and verification-based application.

A Bi-modal Model for Examination impersonation and Bi-modal Access is a better substitute for the use of Identity card in verifying users (students) identity. In the face of advanced forgery technologies, experience has demonstrated that identity cards are porous in terms of individually identifying individuals. Bi-modal is a reliable access control approach since it is so intuitive to use. The fact that a user no longer needs to carry identification cards or other documentation to prove their identity explains how simple it is to use. Future development could see the proposed model used in Examination Halls and at every entry point.

REFERENCES

[1] D. Binu and Dr.P. Malathi Published a paper titled "Secured Palmprint Recognition Using Radon Transform for Biometric Authentication" in Journal of Environment Science, Computer Science and Engineering and Technology, Vol.6 (1) February 2017 pages 1-13. (I.F:5.875)

[2] D. Binu and Dr.P. Malathi Published a paper titled "Multi Model based Biometric Image Retrieval for Enhancing Security" in Indian Journal of Science and Technology, Vol.8(35) December 2015 pages 1-10.

[3] D. Binu and Dr.P. Malathi Published a Paper titled "Two-Modal Biometrics based Content-based Image Retrieval Approach (TMB-CBIR) for Biometric Authentication" in Asian Journal of Information Technology, vol.15, issue. 13, pages 2154-2161.

[4] Kavita Gupta, "Review Paper on Biometric Authentication", International Journal of Engineering Research & Technology, Volume 5, Issue 23,2017.

[5] T. Sabhanayagam, Dr. V. Prasanna Venkatesan, Dr. K. Senthamaraikannan, "A Comprehensive Survey on Various Biometric Systems", International Journal of Applied Engineering Research, Volume 13, Issue 5, 2018. [3] V. Kulkarni Vaishnavi, S. Waghmare Mangita, K. Gund Supriya, B. Shivpuje Dananjay, "Fingerprint Based Exam Hall Authentication, International Journal of Research in Engineering Science and Management, Volume 2, Issue 10,2019.

[6] Abdullah Alshbtat, Bistarelli, S., Santini, F., & Vaccarelli, A. (2005, July). An asymmetric fingerprint matching algorithm for java card TM. In International Conference on Audio-and Video-Based Biometric Person Authentication (pp. 279-288). Springer, Berlin, Heidelberg. Mohammad Alfraheed, Nabeel Zanoon "A Novel Secure Fingerprint-based Authentication System for Student's Examination System", International Journal of Advanced Computer Science and Applications (IJACSA), Volume 10, Issue 9, 2019.

[7] San Myint, K., & Nyein, C. M. M. Fingerprint Based Attendance System Using Arduino.

[8] Kanjan, N., Patil, K., Ranaware, S., & Sarokte, P. (2017). A Comparative Study of Fingerprint Matching Algorithms. 33

[9] Bistarelli, S., Santini, F., & Vaccarelli, A. (2005, July). An asymmetric fingerprint matching algorithm for java card TM. In International Conference on Audio-and Video-Based Biometric Person Authentication (pp. 279-288). Springer, Berlin, Heidelberg.

[10] Iancu, I., Constantinescu, N., & Colhon, M. (2010). Fingerprints identification using a fuzzy logic system. International Journal of Computers Communications & Control, 5(4), 525-531.

AUTHORS

First Author – Dr. D. Binu, M.E, Ph.D, Sri Ramakrishna Institute of Technology and binujethro@gmail.com.

Second Author – D. Bhuvana, Bachelor of Engineering, Sri Ramakrishna Institute of Technology and bhuvand2110@gmail.com.

Third Author – B. Karthika, Bachelor of Engineering, Sri Ramakrishna Institute of Technology and karthikamuruga1@gmail.com.

Fourth Author – M. Kayalvizhi, Bachelor of Engineering, Sri Ramakrishna Institute of Technology and kayalkavi28@gmail.com.