Face and Bio-Metric Based Attendance and Security System using RFID and Arduino

Abstract: We are proposing a system of employee attendance & security system using face and Biometric integrated with Smart RFID cards using Arduino. With this proposed system the drawback of existing RFID attendance system such as dual or multi entry with single card or miss-use of the cards can be prevented. The existing RFID based attendance system has been enhanced with the integration of face recognition of the particular employee with his unique employee number. With integration of finger print authentication (Bio-metric) into the system, security has been enhanced. Audio welcome message on the valid Employee attendance registration has been introduced & for unauthorized entry Audio alert has been introduced along with Sound Alarm (buzzer).Keywords: Arduino, Face Recognition, Finger Print Recognition, Smart Cards, RFID,Audio,Security.

I.INTRODUCTION

Face based recognition of the people is very helpful to ascertain their identity. Many papers have been proposed related to RFID and finger print based attendance system. We are integrating the face recognition techniques and hence proposing a prototype which will not only be helpful for attendance recording and tracking but also it will enhance security. We are proposing a system in which the employee data is created in the company or any other institutional database. The photo will be uploaded into the database as well. First we need to detect the faces from the live video streaming from the camera. Using suitable face recognition algorithms, the face matching is done with the employee when he enters into the campus from the live video captured by the cameras. This step acts as first layer of security for the sensitive places. If match of the face does not happen then alarm gets triggered & security guards will take action. If the face of the person entering campus matches with the available database, his Bio-metric finger print authentications is taken. If the finger prints match then an automatic attendance update is done with respect to his employee ID card number found in the database with the entry time & date details. Every time he needs to swipe his ID card both for gaining access into the campus as well as while exit. With this kind of system we can restrict the unauthorized use of ID cards as we are using face recognition technology too in the proposed system. Dual or multi people entry with single access card too can be prevented. With the help of

the Finger print based bio metric authentication, we can add multi-layer security system to the concerned sensitives secure research establishments. Finger print based attendance is common now a days in all institutional and research establishments. In this paper we will focus on face-based authentication with bio metric system.

A. Technical Background

We can refer figure-1for the block diagram. We use Arduino UNO microcontroller here. With the help of Max 232converters the serial communication between PC or Laptop and Arduino UNO takes place. Finger print sensor and RFID reader has been interfaced with the Arduino. RFID tags with unique tag number have been used as Smart ID cards for the employees. In this prototype the inbuilt webcam has been used. In depth details about the components used have been omitted as it is considered to have readers the technical knowledge about the same.

B. Proposed Solution

When an Employee tries to gain entry into the campus, he is asked to swipe his ID card. Web camera captures the live video & the frames from the live video are processed for the face detection first. As face detection is the first step towards the specific employee face recognition. Once face is detected, then the face of the employee captured is matched with the face of the concerned employees face photo already present in the database which has been tagged for the particular employee ID number. Once all the parameters match then the left-hand thumb finger print is taken and it is also checked for authentication. If found matched then the Attendance is marked in the file with the log in details.

II.PROPOSED SYSTEM

Now a days we come across finger print based attendance system. In the proposed system we have integrated the advantages of RFID and Bio-metric with the face recognition techniques, thus providing a three layer full proof security system for any sensitive establishments. Fig1: Block Diagram of Proposed Face & Bio Metric Based Attendance & Security System The block diagram has been given in figure-1. Inbuilt webcam along with speakers of the PC or laptop has been used along with other hardware components. We have tried to minimize the hardware components by directly interfacing the Arduino with PC. For Sound we have used the inbuilt speakers

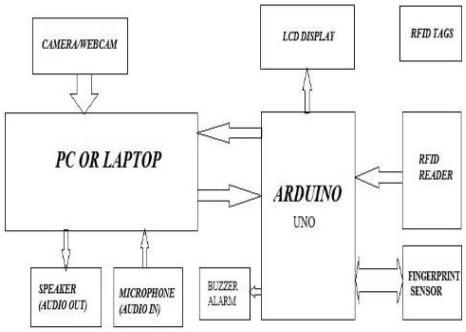


Fig1: Block Diagram of Proposed Face & Bio Metric Based Attendance & Security System

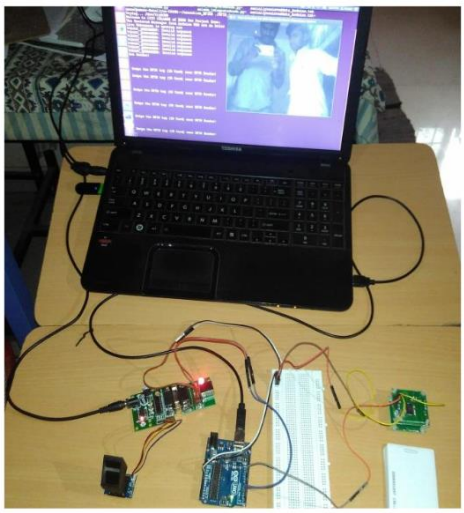
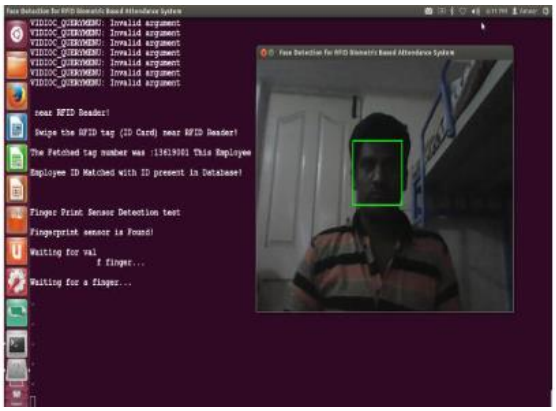


Fig 2: Hardware Implementation of Proposed System



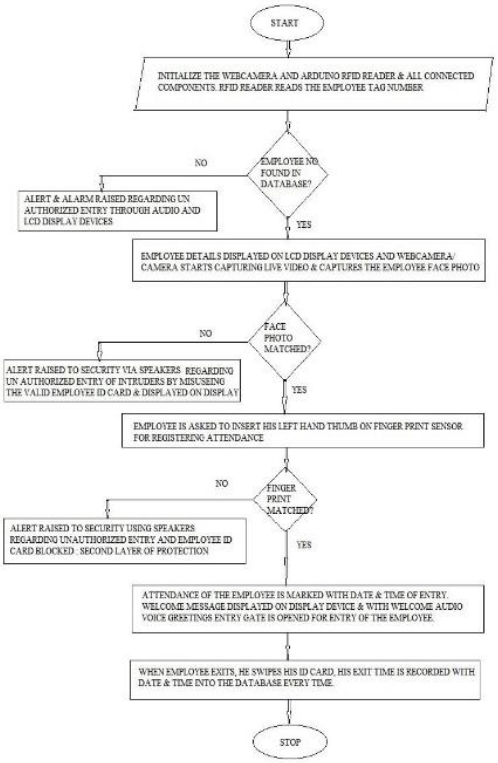


Fig3: Flow Chart of The Proposed System Working

S.N	Employee ID no	Employee Name	Found in Database	Matched with Face & Fingerprint Tagged to ID No. in Database	Attendance Registered
1	03104909	Shariff	No	Not Required	Not Required
2	11056815	Affan	Yes	No	Not Required
3	13619925	Saleem U S	Yes	Yes	Yes
4	13618813	Surendra S	Yes	No	No
5	13619001	Venu D Gowda	Yes	Yes	Yes
6	13619187	Sandeep Badnikai	Yes	No	No
7	13619372	----	No	Not Required	Not required