

Customized NFC enabled ID card for Attendance and Transaction using Face Recognition

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Abstract - In recent times, the important aspect that concerns the administration of an Educational Institution is the student's attendance. Overall poor attendance affects academic which results for students to fall under the detention list. Currently a student marks his attendance manually by the lecturer or an attendance sheet is circulated, this consumes a lot of time & proxies may take place. This attendance system integrates NFC reader along with Face recognition system. NFC readers would be installed at various locations in campus and face is recognized by using camera in college premise. When student comes in the vicinity of readers at main gate and at other locations within the campus then his/her identity is detected and location can be found and the reader will send the location to the server. Then server checks the timetable of that student if he/she is not attending the lecture then according to timetable notification will be send to the Admin. This system ensures that attendance records of the students would be tracked properly and efficiently. The system may also generate detention list of the student. By using Customized cards students are enable to do transactions at canteen & stationary shop. The respective amount will deduct automatically from student's accounts. Parents are aware of student's activities, expenditure in college from parent's app. Teachers can also give reviews to each student via teacher's web portal. Presently this system is proposed over small scale, but in future we can increase scalability, easy to control and reliable.

Key Words:- Arduino UNO, NFC, Face Detection Module, Attendance Module, Transaction Module, MySQL Database.

1. INTRODUCTION

Attendance of every student is maintained by every school, college and university. The staff or respective teachers has to maintain proper record for the attendance. Attendance system is used to track the attendance of any person and is implemented in the schools, universities, industries, working places and many other places. The manual attendance record system is less efficient and is time consuming. Also to calculate the average attendance of each student is tedious task. The traditional way for taking attendance has too many drawback. Old conventional methods for student attendance

are still in practice. This leads to students signing proxy of their friends who are absent in the institute.

Hence we need transformation in a system that will solve the problem of student record management and their average attendance calculation. The technology-based attendance system such as smart cards and biometrics based attendance system reduced human involvement and errors. The proposed system should store the absent and present student's attendance details in digital format so that management of attendance becomes easy. Also system provides access of NFC cards at Canteen to purchase any food items and at college stationary. Amount will be deducted from student account.

2. LITERATURE SURVEY

This paper discusses the implementation design of college student management information system to promote the systematization, standardization & scientific process that a college student management will involve this is done in order to improve its management and service level of college student management that it can offer. The modular & structural design concept, improves the security system & maintainability [1].

The maintenance of an attendance is a very hectic procedure if it's done manually. One of the newest & fastest way for managing the attendance can be done with the help of biometrics or fingerprints. One of them includes Face Recognition. With the help of such a system we can avoid the important issue of fake attendance & proxies. In the previous there were some problems & disadvantages such as light & darkness problem, especially the head pose problem. The important aspect here is detecting the face & specially recognizing them. Then all the comparisons are verified with the database of the faces that are stored. This can be really helpful & an efficient way to maintain the record & attendance of a student [2].

Here in this paper it describes the mobile payment system for merchant payments, it can be made using existing NFC & GSM architectural components. There are various mobile payment methods have been proposed, but such methods are introduced for peer to peer connections & transactions

rather than a conventional payment environment. Here we make use of NFC so that we can establish a short range communications which is allowed for possible integration with the existing Point of Sale equipment and especially for the payment process from its customer and the seller's perspective remains unchanged or disturbed. This model offers an acceptable security for low value payments, customer anonymity and ubiquitous implementation using available technical components [3].

3. System Overview

A. HARDWARE

Arduino :

Arduino is an open source platform. Arduino boards can read input from sensors and give output on respective device. The board is controlled by giving set of instructions through the microcontroller. For development on arduino we require Arduino Programming Language, Arduino IDE.

Technical Specifications:

- Microcontroller – Atmega328P
- Operating Voltage – 5V
- Digital I/O Pins – 14
- Analog I/O Pins – 6
- Clock Speed – 16MHz
- Flash Memory – 32KB

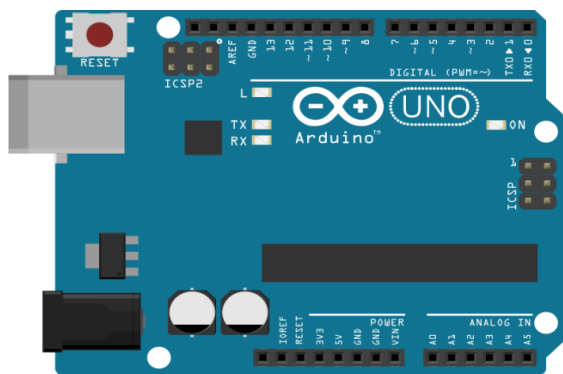


Fig 1:- Arduino Uno

NFC:

IT works on the principles of sending information over radio waves. The technology used in NFC is based on the RFID idea it transfers information through electromagnetic induction. Application needs NFC card reader, to read information inside the NFC card.

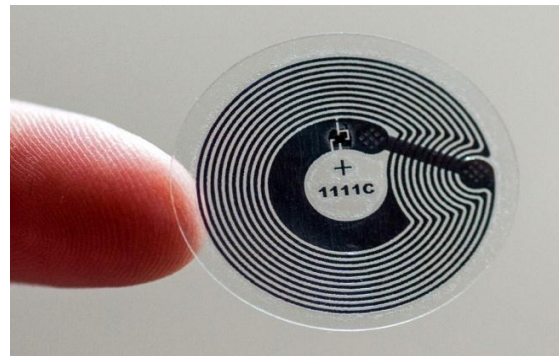


Fig 2:- NFC Tag

B. SOFTWARE

Arduino IDE

IDE makes it easy to write code on Arduino and it is simple to upload the code on board using USB cable. It runs on different platforms like Windows, Mac OS, and Linux. It has a JAVA based environment.

XAMP Server

It installs easily Apache Distribution containing PHP, Perl, and Maria DB/MySQL. XAMP can be used on Windows as well as on Linux.

4. System Architecture

Face Recognition

Attendance Module

Transaction Module

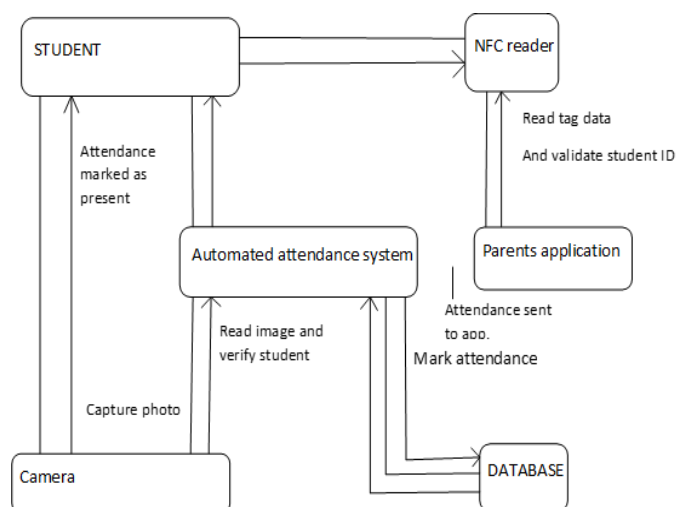


Fig 3:- System Architecture

Face Recognition:

A facial recognition system is a computer application capable of performing identification or verification of a person from a digital image or a video frame which is acquired from a video source. One of the ways to do this is by comparing selected facial features from the image and a facial database.

In this, local features on face like nose, eyes and lip corners are portioned and then given to face detection system to easier the task of face recognition.

Attendance Module:

Registering for attendance in education environments like in colleges is a highly demanding and important activity as a result of increasing number of students. This attendance system will involve a student sign their attendance rather than teacher calling the names and registering the students either in a paper or from PDA/PC.

The issue of cheating in the form of registering for their friends can be solved but imaging the number of students to be from 50 and above, a great portion of the teacher's time will be wasted in performing such tedious process.

Transaction Module:

Mobile payment is an application of mobile commerce which facilitates mobile commerce transactions by providing the mobile customer with a convenient means to pay.

This project comprises of an NFC enabled payment model that is college centric and bank centric. The model developed provides not only the opportunity to create ease and user friendliness for the students.

5. CONCLUSIONS

Typically student's attendance is marked manually which spends a lot of time. Proposed system gives automated attendance of student's via NFC and Face Recognition. In the proposed project we will be able to make transactions virtually instead of carrying hard cash.

6. ACKNOWLEDGEMENT

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