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Attendance Monitoring System Using NFC

K.Muthuselvi¹, E.Maheswari², N.Selvarani³

AP, Department of EEE, Kalasalingam Institute of Technology, Krishnankoil, Tamilnadu, India¹

Department of EEE (UG), Kalasalingam Institute of Technology, Krishnankoil, Tamilnadu, India^{2,3}

ABSTRACT: Attendance system is a system that is used to track the attendance of a particular person and is applied in industries, universities, schools or work place. The attendance process normally involves circulating a paper for the students to register their names or the lecturer calling the names and registering the students either in a paper or from PDA/PC. The Near Field Communication (NFC) technology provides a good opportunity to support the automated execution of several education related process. NFC is an emerging short-range wireless communication technology. This system uses face recognition for the attendance of student at the college gate. Attendance at gate through face recognition mapped with attendance which is generated through NFC. This mapping is used to avoid fake attendance and increase accuracy. We have used to the NFC technology than we can do it automatically and there is no need to do it by lectures. Here we are planning to use the database storage in a computer or laptop for better performance. Using Wi-Fi module we can access it from anywhere and anytime which will provide us the better proficiency and flexibility.

KEYWORDS: NFC tag, Wi-Fi module, PN532 Read/Write module, Arduino, computer or laptop, Biometric sensor.

I. INTRODUCTION

In the world of the technology there is no one who is not using the technology. But if talk about the Indian Education system still we are far away from technology. Even we have Wi- Fi module and technology but any how we are avoiding this field from using the technology. If someone has used the technology then there are Wi-Fi of work which are done by professors or lecturers. So some time we think if we are using technology and still we have to do work manually then what is the use of these technologies. Sometimes people don't want to use technologies because of the high cost of that. After doing a lot of research that how can we use the technology at low cost we found NFC which is chipper in price and can be useful for the attendance. NFC stands for the Near Field communication. Another important quality is battery less tags system of NFC. NFC is mainly combination of tags, an antenna and IC chip which is having the Unique Identification number. To detect that we have the NFC Reader, Which will read the unique ID of the NFC card. Now the next thing is we are embedding the arduino board in this. As our Moto is to use the technology in such a way so that we don't needed to do work manually. After integrating Wi-Fi module we can access the database from anywhere and anytime, anyone and any device. As every university or school has the image of their students in their database. So we will capture the image at real time and then comparing the image with the existing database. So we are retrieving the details of student which have the details like NFC unique no, Name, Branch, and Address. Now we have the result from image comparison and NFC reader. Here our main task starts, compare both the result and put the attendance as present we both the details are present. Here main point is that if someone wants to mark proxies of friend and taking NFC card of friend then only NFC reader will read that value as that student is physically not present so if any one detail is not found it will mark the attendance as absent. One more thing to remember is that if such case is happen then system will automatically send an email to that student as warning that you are trying to break the rule and if next time happens then any action can be taken against you.

PN532 READ/WRITE MODULE

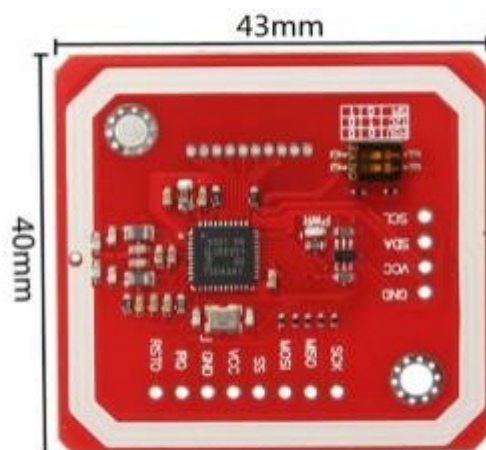
PN532 Read/Write module is a highly integrated transmission module for contactless communication. It included microcontroller functionality on an 80c51 core with 40 Kbytes of ROM and 1Kbytes of RAM.

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In this module build around NXP PN532 In these module used as the frequency of 13.56 MHz. PN532 reader/writer interface in the tags. The PN532 is connected to the arduino using UART serial connection and requires the included PN532 arduino library to successfully communicate. It is used to support host interface. Such as SPI interface, I2C interface, High speed UART (Similar to RS232 with 0 and PVDD voltage levels. It is used to 2.7 to 5.4 V power supply. It integrated RF level detector and data mode detector. It used to hard reset with low power function and flexible interrupt using IRQ pin. In these few application of PN532 module is PC word, Mobile and portable device, Consumer application.

NFC TAGS

NFC tag is a sticker or wristband with small microchip or unpowered chip. Information is stored these microchip. A NFC has ability to send a data. It is also called passive device which means which operate without power supply their own and are reliant of an active device to come into range before they activated.



In order to power these NFC tags, electromagnetic induction is used to create a current in a passive device.

II. ARDUINO BOARD

Arduino is an open source electronics platform based on easy to use hardware and software. It able to read inputs – light on a sensor, a finger print on a button or a twitter message and turn it into an output, activating a motor, turning on a LED, publishing something online. It is a microcontroller (based on the ATmega328). It has a 14 digital input/output pins in which 6 can be used as PWM output. It has a 6 analog input pins, a 16 MHz ceramic resonator, an ICSP header, a USB connection, a power jack, reset button. In the operating voltage of arduino is 5V.



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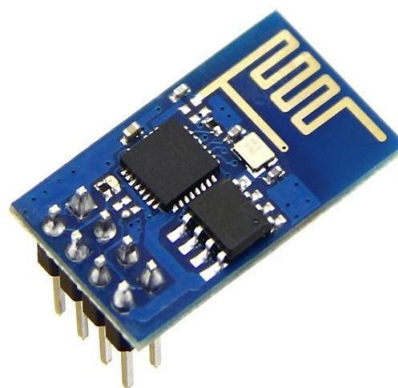
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ESP8266 WIFI MODULE ESP8266 module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network.



Its high degree of on chip integration allows for minimal external circuitry, including the front end module, is designed to occupy minimal PCB area. One useful feature of Uno Wi-Fi is support for OTA(over the air) programming, either for transfer of arduinosketches or Wi-Fi firmware. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

II. FACE DETECT BIOMETRIC SENSOR

It is a security identification and authentication device or one type of biometric computer application which can identify or verify a person from a digital image by comparing and analysing patterns. These biometric systems are used in security systems. A facial recognition system uses biometrics to map facial features from a photograph, video or in real time. It compares the information with a database of known faces to find a match. Facial recognition is mostly used for security purposes, though there is increasing interest in other areas of use. Mashable ran its tests with two sets of identical twins who experienced false matches in both cases. With both sets of twins, the other twin unlocked the iphone X, even though neither one had registered his face with face id on the iphone.

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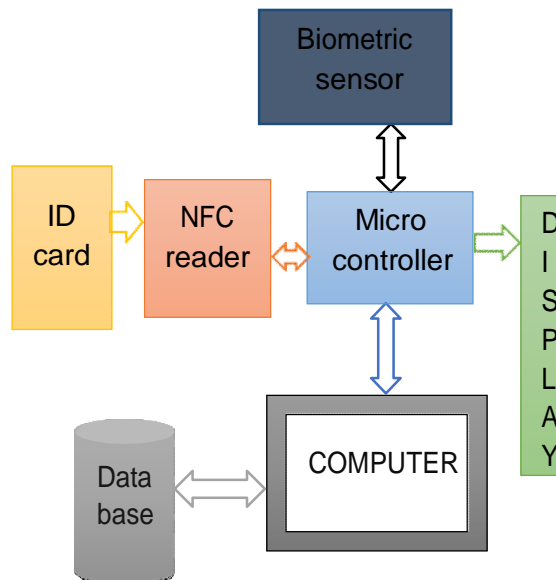
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III. BLOCK DIAGRAM



Attendance system is a system that is used to track the attendance of a particular person and is applied in the industries, schools, universities or working place. In NFC (Near Field Communication) is a two way communication. It has a 106,212,424 kbps data rate. When the NFC reader attached to the entrance of the class room or department. The students are show an ID card for NFC reader with the distance of 10cm. At the same time face detection biometric sensor is detect to student face. Then the data read to NFC reader and send the arduino board (microcontroller).



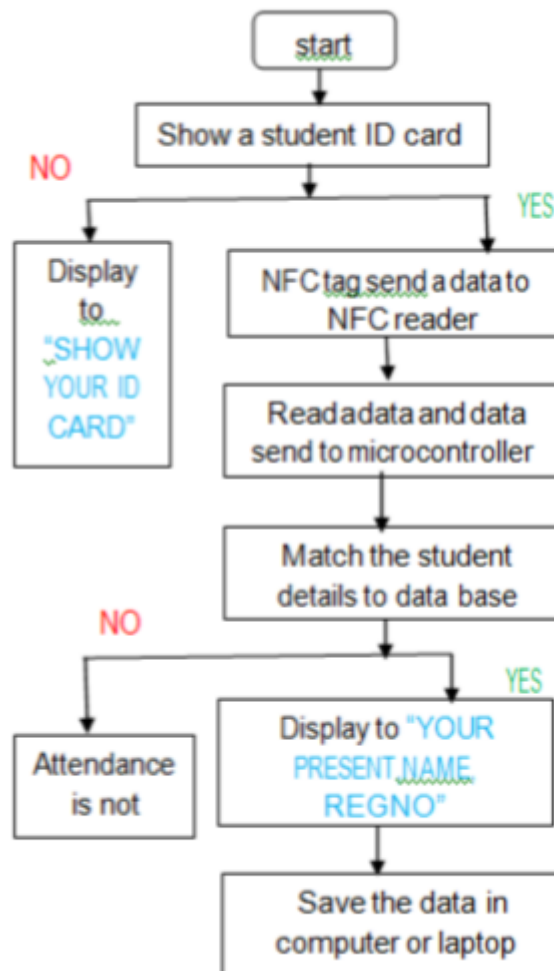
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At the same time biometrics to map the facial features from a real time. Already student data base stored the computer or laptop. In arduino compare the ID card data and student face into database. No paring required for data transfer for NFC. It has ability to tap screen to transfer data. In same data means to display “your present”. Otherwise “you are absent”.



ADVANTAGES

- Decrease human effort and paper work.
- Easy attendance recording.
- Portable device and low cost.
- Easy to use and user friendly.
- Time saving compared to manual attendance.
- Accuracy high.



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IV. CONCLUSION

Here main thing is how you are going to use and utilize the technology in day to day life. In the above discussion we have used the NFC in the attendance monitoring system. By using above we are doing lots of work automatically instead of doing manually, which is the best part of that. We are making it flexible so that can be accessed from anywhere.

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