Fingerprint and IOT Based Exam Hall Authentication

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Abstract

Security is crucial all around. Access into institutions, examination centers, organizations or even estates ought to be controlled and closely monitored through a verification system. The method of authenticating a student for an examination has an obvious problem such as presentation of fake clearance card, impersonation and so on and the unethical manner associated with the examination is a grim issue that requires the stakeholders in academic area to seek for alternative means of authenticating student for examination, because the manual paper-based clearance process is fundamentally flawed. Sequel to that, a dependable and effective system is designed to tackle the issues of the convectional technique. The system will verify the understudy using fingerprint biometrics technique and generate a report which can serve as an attendance. Multi biometric is an authentication technology using different biometric technology such as fingerprint, facial features and, vein pattern. The process for allowing student to sit for an examination in most universities has been through the presentation of medium of identification such as ID cards,, fees clearance card, photo cards, etc.

Keywords-Fingerprint Sensor, IOT module, authentication, Impersation.

1 INTRODUCTION

All academic institution have certain criteria for admitting students into examination hall. Hence accurate record of attendance and fees payments is necessary. To verify identity of person it is very critical and important task in society. Cash terminals, access control, examination pass identity; internet transactions are the basic examples of security issues where the identities of the users are important and useful.

Most of the universities adopted paper means authentication for eligibility of students for examination. This is issued by the university's examination and record units.

This contains vital information needed in identifying candidates. These may include the student's name, passport photographs and school's authentication stamps. This is known as 'examination pass'. It is the method devised by the institution's authorities in identifying eligible candidates for various examinations.

It is note that with the level of information provided, they still open to student as some of information displayed. By this pass can still be tampered with for the sole purpose of impersonations and other examination fraud as the case may be. Some of students get duplicate pass of examination hall that leads to cheating or fraud.
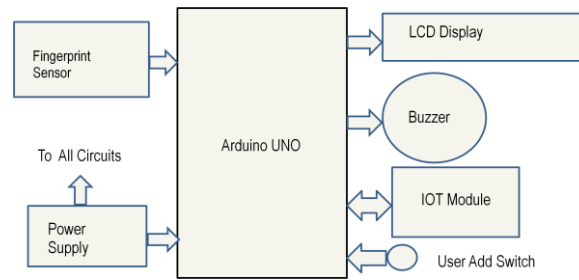
2 PROBLEM DEFINITION-

The problems which are encountered in the previous identification systems are:

- Student impersonation
- Insecure authentication of students
- Manual Verification of students
- Corruption in Examination System

3 METHDOLOGY-

BLOCK DIAGRAM-

4 HARDWARE DESCRIPTION

ARDUINO UNO-

The Arduino Uno is a microcontroller board based on the Arduino328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Arduino8U2 programmed as a USB-to-serial converter. "Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward
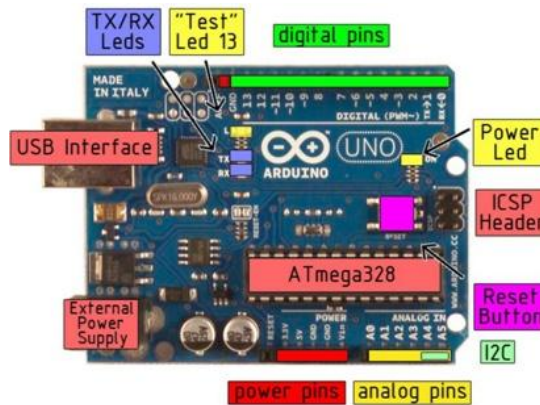
16X2 ALPHANUMERIC DISPLAY-

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs.
A 16x2 LCD means it can display 16 characters per line and there are 2 such lines.
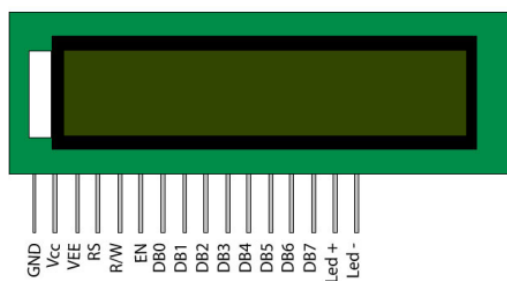
IOT MODULE-

The ESP8266 Wi-Fi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

Fingerprint sensor-

The fingerprint algorithm extracts features from the acquired fingerprint image and represents the fingerprint information. The storage, comparison, and search of fingerprints are all done by operating fingerprint features. Fingerprint processing includes two processes: fingerprint registration process and fingerprint matching process.
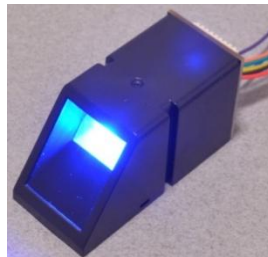
Buzzer-

Piezoelectric Sounders / Buzzers are sound components prepared by incorporating a piezoelectric vibration plate in a plastic case (resonator)..
This characteristic allows them to be used in a wide range of applications. They come as the SMD type, which is optimal for small, high-density mounting and the pin type, which can be used for general purposes.

5 WORKING PRINCIPLE-

It is divided into two stages. They include the:
I. Enrollment
II. Verification

Enrollment:
The device comes on when it is powered. When an individual is to be registered, a number is assigned to him/her using the keypad. This number assigned is automatically stored in the EEPROM of the ARDUINO IC used. When the individual places his/her hand on the finger print module, it captures the print and transfers it into the EEPROM and later stores in the memory card. This process is repeated to be stored in the memory of ARDUINO IC for confirmation. All the activity performed by the microcontroller is being displayed on the liquid crystal display (LCD).
Verification:
The system verifies the student by scanning the fingerprint and compares with the ARDUINO captured image. If the image is registered, it prints out the individual's identification number to confirm his eligibility.
When a wrong finger is placed on the module, it scans the image, sends it to the ARDUINO. This browses through the images in its memory

and if nothing is found, it prints out a message stating that the person in question has no personal details in its memory. A message "NOT REGISTERED" is displayed on the screen. Figure 1 and 2 depict the flowchart of the enrollment and verification stage.

6 RESULT-

Fingerprint matches

Fingerprint not matched

Sr No.	Condition	Result
1.	When fingerprint is matched with already stored data.	It displays the individual's identification number. And door of examination hall will open.
2.	When fingerprint is not matched with already stored data.	A message not matched is displayed on screen. And door of examination hall will not open.

ADVANTAGES-
- This project can be used to easily indetification of authorised person.
- Security
- Complexity of design can be reduced and made compact.
- Unique Identification of Individual Level

DISADVANTAGES-
- The sensors are costly.
- If power supply fails circuits won't work.

7 FUTURE SCOPE-

Further research can be carried out to have more than one biometric technique like a fingerprint and facial recognition and also in very large scale organization, that the memory card cannot contain all the data. A hard-drive can be used.

8 COCLUSION-

The system will successfully identify and verify the registered understudy fingerprint and stored the verified understudy so that the lecturer can retrieve the list of all understudies that was verified to take an examination. The system gives the time when the understudy was verified. In other words, the system generates a report in real time using the understudy fingerprint to avoid or prevent impersonation.

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