

Authentication Based Elective Subject Voting System - A Technical Review

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Abstract— This paper describes a secure elective subject voting system that ensures effective voting procedure. This paper implements the voting system using fingerprint which prevents the unauthorized selection of subjects & provides the student an authentication in very effective manner. The area of bio-metrics was formed and has expanded on to many types of physical identification. The primary idea is to make the selection of subjects very much flexible to students and staff, at the same time reduce the work of the staff committee. This system can be suitable to calculate attendance of workers at the work places in companies. Each individual has a unique pattern of fingerprints motivates the use of them for biometric authentication and are verified for finding the presence of the students during the subject selection process. The same system can be extended for the use of avoiding malpractice in the examinations as a part of examination monitoring system.

Index Terms—Elective, Biometric, Fingerprint, GSM Module, Arduino

I. INTRODUCTION

In final year of engineering there is choice kept for students to choose two subjects per semester as per their own choices. This process is complex & time consuming but a necessary task. And this process should be get done at the starting of the semester. But it not happens that all students come to college since the day the college started, so there are chances that selection of elective subjects of those absent students may be done by present ones. Traditionally, this has been done manually by teachers, where teachers asks the students to write the name of subjects to every student on paper and there are chances that students can change their choices so many times which causes the teachers to change recorded data again & again. The possible solution is to replace the manual selection process in most of the existing systems by biometric based automated voting systems.

Fingerprints play an important role in applications based on biometrics. Every person's fingerprint consists of unique pattern of ridges and valleys on the surface of the finger. The fingerprints are used in many applications, due to its reliability and uniqueness as in. These biometric authentication using fingerprint have many applications in the fields of security, forensics, attendance system and so on as in. This paper presents elective subjects voting system using biometric fingerprint in the field of academia. In every college & in department for students it is compulsory to choose subjects to obtain good knowledge as per there interest. In this paper, a different approach is proposed for biometric attendance system which uses a fingerprint for authentication. This system promotes the development of punctuality and discipline in the student.

II.SYSTEM LITERATURE SURVEY

Koichiro Niinuma, Unsang Park, and Anil K .Jain have published a paper on Soft Biometric Traits for Continuous Authentication. They have proposed a new structure for continuous user authentication that primarily uses soft biometric traits (e.g., color of user's clothing and facial skin). The proposed system automatically registers soft biometric traits each time the user logs in and checks soft biometric matching with the conventional authentication schemes, such as password and face biometric. The proposed scheme has high tolerance to the user's posture in front of the computer system [1].

Narra Dhanlakshmi, Saketi Gautam Kumar,Y.Padma Sai have published a paper Aadhaar Based Biometric Attendance System Using Wireless Fingerprint Terminals in which they have proposed a system in which they have used wireless fingerprint terminal for calculating attendance of students using the biometric fingerprints. They used the Aadhaar data of students for attendance calculation [2].

Ravindra Mishra, Shildarshi Bagde, Tushar Sukhdeve have published a paper Review on Aadhaar Based Voting System using Biometric Scanner in which they have proposed a inbuilt verification system of voter. The process of verification of voter take more time. To overcome these problems this paper proposed inbuilt voter verification system using biometric scanner [3].

Palak Sigal, Rashmi D Patil, Samit Kumar, Saurabh Kumar published a paper on Smart Voting Machine. In which they have implemented the voting system using fingerprint and unique key which prevents the illegal acts against the voting system and provides the voter authentication in an effective way. The proposed system has two methods to double check on security as it uses the unique key and fingerprint as ID instead of voter ID card. The system also ensures that the total count is sent to the mobile via SMS [4].

III. METHODOLOGIES AND ALGORITHMS

The biometric fingerprint is used for authentication of students. This system is very much easy to handle as data of all the students is already stored in the microcontroller. When student will start for selection of elective subjects at that time first system will him/her to authenticate himself/herself. This authentication will get done by biometric fingerprint. If the student is authenticated then the system will ask for the roll no of student. After putting the roll no it will show you the subjects for elective subjects with its options .and you just have to click on the subjects which you want to select for electives. After the proper selection of selection of elective subjects the system will show you a thank you message and exit. And if you want to change your selected elective subjects you can go back to first step where you have selected first subject. There are three chances allowed you to change your choices without exit. The special Authority will be given to staff only. if there is change student want to make after the selection process that time student will require the staff authentication to do changes. Which gives total security and authenticated access to the elective subject selection process. In this way we can store up to 256 student's data as we are using arduino microcontroller.PIC controller doesn't have sufficient space to store data upto 256 students at a time we moved to Arduino controller which offers sufficient memory to stores data [5].

➤ BLOCK DIAGRAM:

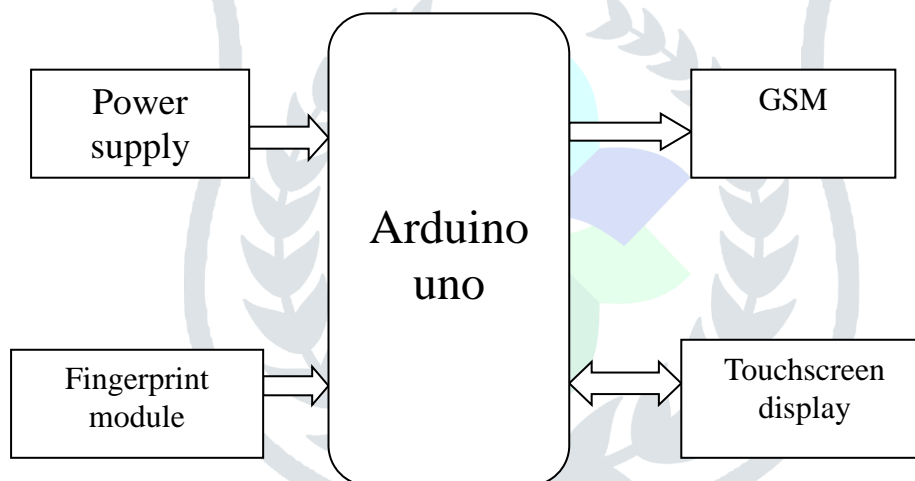


Fig.1: Block diagram of elective subjects voting system

Hardware specification:

➤ GSM Module



Fig.2: GSM Module

SIM800C is a quad-band GSM/GPRS module that works on frequencies GSM850MHz, EGSM900MHz, DCS1800MHz and PCS1900MHz. SIM800C features GPRS multi-slot class10/class12 (optional) and supports the GPRS coding techniques CS-1, CS-2, CS-3 and CS-4. SIM800C can meet almost all the requirements in customer's applications, because of very small

configuration of 17.6*15.7*2.3mm, such as smart phone, PDA and other mobile devices. SIM800C is a SMT package with 42 pads, and it provides all hardware interfaces between the module and customers' boards.

- Touch-screen display:

NX8048T070

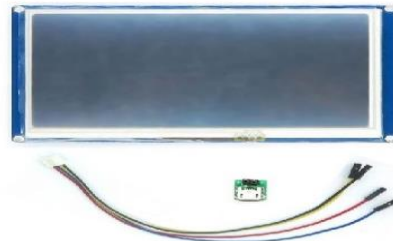


Fig.3:Touch screen display

Nextion is a seamless Human Machine Interface (HMI) solution which offers a control and visualization interface between a human, machine, application and appliance. Nextion is mostly applied to Internet of thing (IoT) or consumer electronics field. This is the best solution to replace the traditional LCD and LED Nixie tube. Features of Nextion include: a 2.4" TFT 320 x 240 resistive touch screen display, 4M Flash memory ,2K Byte RAM, 65K colors.

- Fingerprint module:

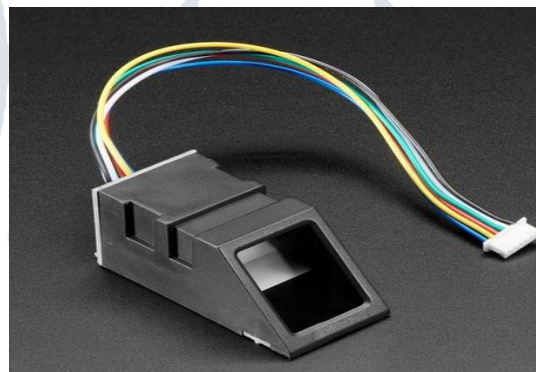


Fig.4: Finger print module

As a standalone biometric solution, Biometric Fingerprints Module gives onboard template storage and one-to-few verification. Incorporating the Biometric Fingerprints Module can suddenly reduce time-to-market, with an easy-to-integrate serial command interface and proves robust fingerprint sensor solution. Biometric Fingerprints Module can easily integrated into virtually any application as an embedded solution. The biometric module can be controlled by a host CPU, which sends basic commands for enrollment and verification through the serial interface. Fingerprint templates are automatically created and stored in the internal memory. Biometric Fingerprints Module comes pre-loaded with software and is ready to use at delivery.

- Arduino IDE:

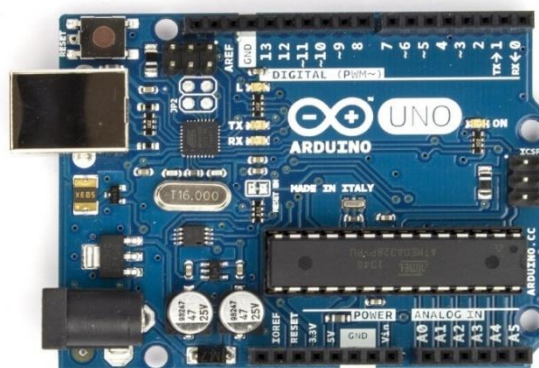


Fig.5:Arduino IDE

The Arduino UNO is a freely available microcontroller board which has microchip mega328p micro controller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins which can be interfaced to various expansion boards (shields) and many other circuits. The Arduino board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) through a type B USB cable. It can be powered by an external 9 volt battery or a USB cable, as it accepts voltages between 7 and 20 volts.

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