

AN EFFICIENT EXAM HALL AUTHENTICATION SYSTEM IMPLEMENTED USING BIOMETRIC SYSTEM

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Abstract:

Recognition of person on the basis of biometric is an emerging topic. It also involves the validity of identifying. The system is designed to pass users only by verifying their finger print module. It may contain a private ID for validation and yet another ID. The audit form allows you to authenticate spoofing using a biometric device. This is a secure way for an individual to verify their eligibility for the exam corridor, as well as various non-public information stored in the device's database and used to verify the candidate's exam eligibility.

Keywords: biometric, finger print module, Authentication

1. INTRODUCTION

The motivation for this work is to use a fingerprint ID to identify a person. The main aim of this scheme is to allow or disapprove person or persons prior to entering the test corridor. To distinguish the persons this work proposed finger print based exam hall authentication system. The system is meant to permit only users verified by their fingerprint scan and doesn't allow non-verified users. The system mainly consists of fingerprint scanner. In registration mode the system allows to register user's information and save their identity with respective ID numbers within the system memory. After registration the person must scan his/her finger with the help of the scanner. The Arduino UNO checks the person's fingerprint. This ensures only authorized users are allowed to enter the examination hall and unauthorized users aren't allowed to enter the room.

2. MATERIALS AND METHODS

This section presents various hardware and software requirements and the procedure of the proposed algorithm. The block diagram of the proposed concept is presented in Figure 1.

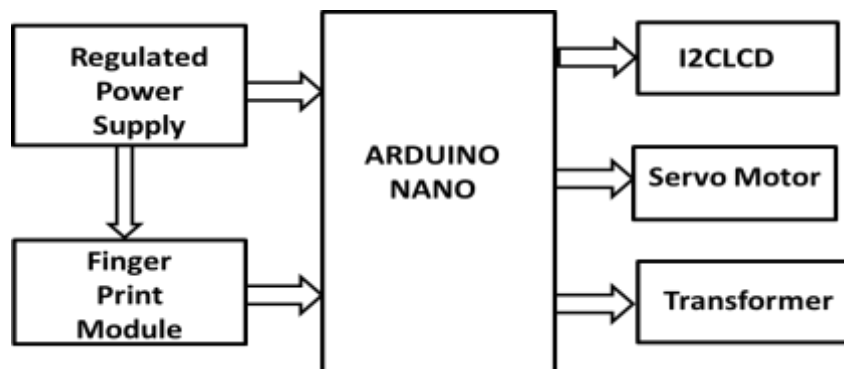


Figure.1 Block Diagram

Hardware Description:

Arduino NANO: The Arduino Nano is a small, fully breadboard-ready board that is entirely based primarily on the ATmega328P introduced in 2008[9]. This is not a rare place to visit all Arduino

forums and take a walk both online and offline. The board can be powered by a mini USB Type B cable or a 9V battery [5]. In 2019, Arduino released Arduino Nano which is an unparalleled evolution of Nano. The Arduino NANO is presented in Figure 2.

Regulated Power Supply (RPS): RPS is an embedded circuit that converts unstabilized AC power to stable DC power [2]. It mainly consists of a rectifier and a filter. It provides a stable voltage to circuits or devices that need to operate within specific power limits. This work uses stream banks as RPS.

I2C_LCD: I2C_LCD is an easy-to-use display module that can simplify the display. It reduces the difficulty of building and allows manufacturers to focus on the core of their work. Arduino library is developed for I2C_LCD [3]. Users only need a few lines of code to achieve complex graphics and text display capabilities [1]. Arduino serial monitor can be replaced at any time and get execution information without a computer. Figure 3 shows I2C_LCD.

Fingerprint Sensor: The operating principle of the fingerprint sensor mainly depends on the processing. Fingerprint processing involves two main components, registration and verification [7]. Fingerprint registration requires each user to place their finger twice. The system uses this to check the processed finger image and generate a saved finger sample [2]. Figure 4 presents the fingerprint module.



Figure. 2 Arduino NANO



Figure. 3 I2C_LCD



Figure. 4 Fingerprint Module

Transformer: A transformer is a passive component that transfers electrical energy from one circuit to another or multiple circuits [4]. When the current changes in the transformer coil, the magnetic flux changes in the transformer core and the electromotive force changes in all the other coils wound around the transformer [6].

Software Description:

Arduino Compiler: The software used here is the Arduino IDE. The Arduino IDE is a cross-platform application written in Java, derived from a processing programming language and an IDE for wiring projects. It was designed to introduce programming to artists and other beginners who are new to software development. Includes a code editor with features such as automatic indentation. Figure 5 present the Arduino IDE. Normally, you don't need to edit the makefile or run the program using commands. Contains the C / C ++ library.



Figure .5 Arduino IDE

MC Programming Language-C: Micro Controller Embedded C is the most popular software programming language for electronic device development. Embedded software is associated with every processor used in electronic systems. The embedded microcontroller C plays an important role in enabling the processor to perform certain functions. In our daily lives, we use many electronic devices such as mobile phones, washing machines and digital cameras. All of these devices work with microcontrollers programmed with Embedded C.

Working Procedure:

The working principle of this project is divided into two phases

1. Registration mode:

The first step in a biometric system is to collect the biometric data used. The device used to collect the first sample depends on the type of physical properties collected[4]. This could be a reader or sensor used to scan fingerprints. Before using the system for authentication for the first time, the user must register a biometric pattern and is assigned a number via the keyboard.

2. Verification mode:

In this verification mode the system verifies the student by scanning the fingerprint and compares with the stored fingerprints [2]. If the image is registered, it prints out the individual identification no to confirm eligibility. When a wrong finger is placed on the module, it scans the image, sends to the fingerprint module [7].This browses through the image in its memory and if noting is found, it prints out A message indicating that the parties have not stored personal data. The message "Not registered" is displayed on the screen.

Flow Chart:

The proposed algorithm is presented like a flow diagram in figure 6.

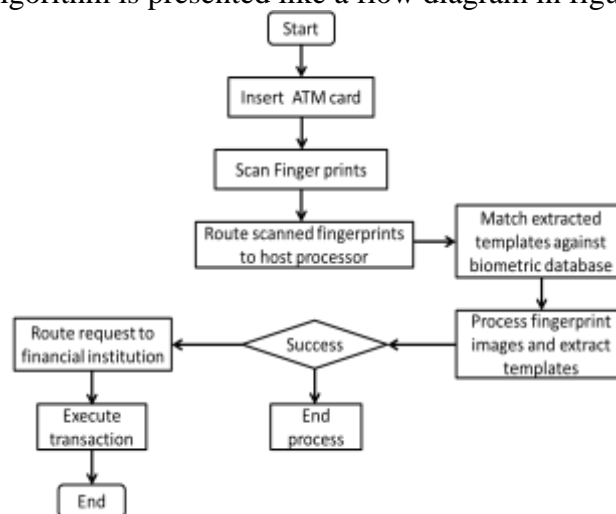


Figure.6 Flow Chart.

Schematic of the Project:

In the schematic shown in figure 7, the Arduino NANO is connected to the LCD's motor. Serial communication port of the fingerprint module interface is connected based on the block diagram. The input is given to the Arduino nano by connecting the transmitter of serial communication to the receiver of the microcontroller. H. Pin number 26, and the receiver for serial communication, is connected to the transmitter on the microcontroller. The LCD is connected to port D and you can use the LCD to display messages [2]. This switch is used to select the Add / Remove option.

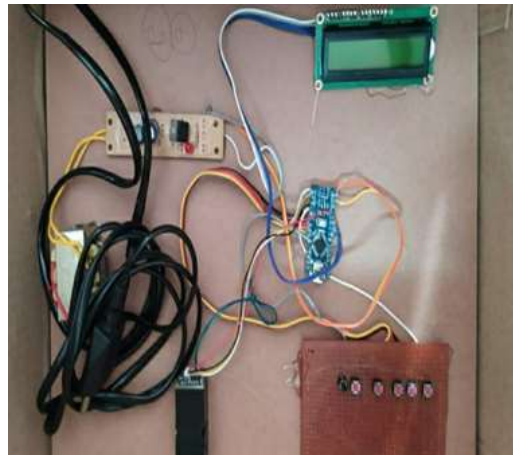


Figure.7 Project Kit

3. Results

The screen shorts of the results obtained are presented in this section



Figure.8 Press Match Key to Start System

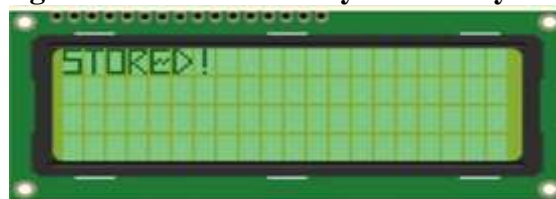


Figure.9 Fingerprint Stored



Figure.10 Finger not found (Not registered should try again!)

4. Advantages and Disadvantages

Merits and demerits of the proposed algorithm are presented in this section.

Merits:

- Fingerprint identification is unique and can never be the same for two persons.
- It offers high accuracy for fingerprint recognition.

- The system uses small storage space.
 - Provides long-term stability high security.
 - Exclusive personal identification.
- De-Merits:
- The system is linked to a forensic application.
 - There are health problems with touching a single scan sensor.
 - The system has inability to enroll some users.

5. Conclusions and Future scope:

The fingerprint system was developed in two convenient modes. Registration mode and verification mode. Registration mode is designed to scan fingerprints and ID numbers that are correctly stored in the system's database [1]. The certification mode is designed to verify the candidate's eligibility for the exam. The developed system basically works according to three criteria. This is the image capture phase where the image (fingerprint) is captured via the R307 fingerprint module [5]. The functional level is the second level, which involves extracting important features for the purpose of the conformance level, which is the certification status in the exam hall authentication.

Biometric get right of entry to the usage of each fingerprints and blood glide detection to keep away from cloning of arms the usage of plastics as defined above [6]. It can be extended with GSM to improve its scope.

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