PES University, Bengaluru

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Mini-Project Report
Subject: Designing of IoT Solutions
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On

Biometric Attendance System

Submitted in partial fulfillment of the requirements for the V semester
Bachelor of Engineering

In

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BY

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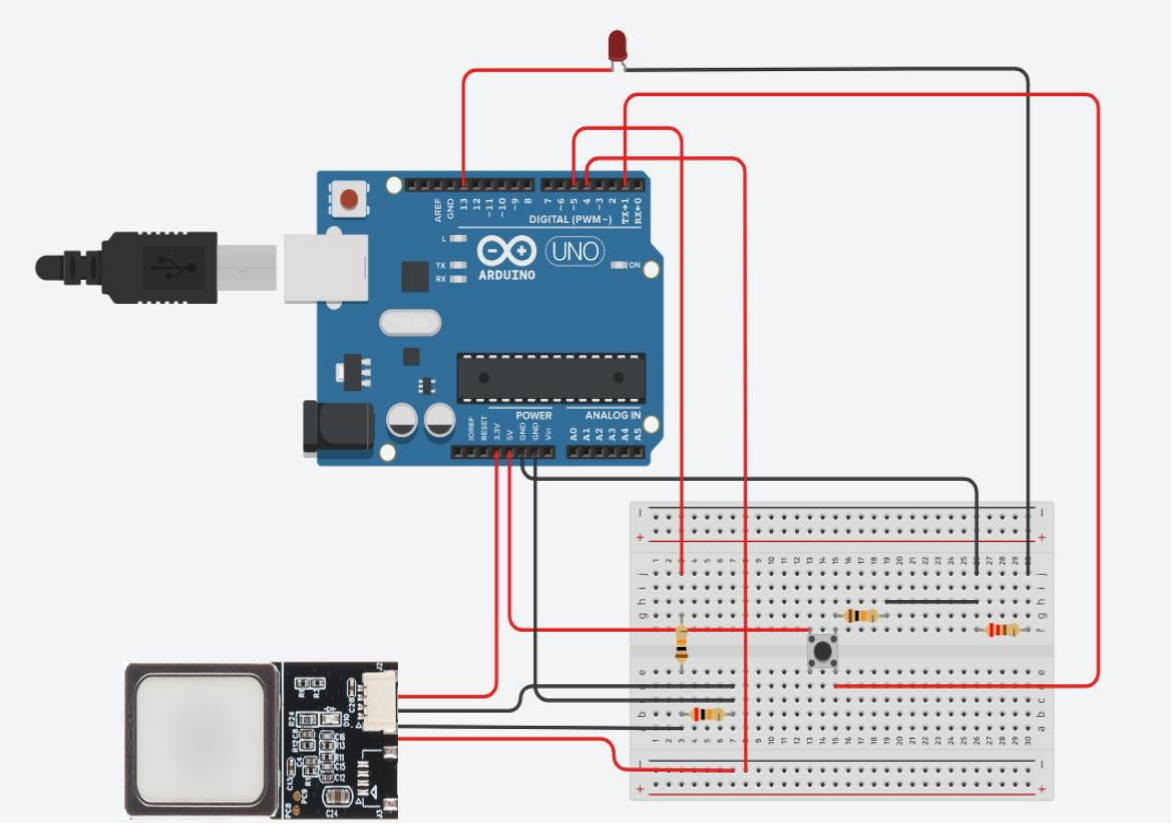
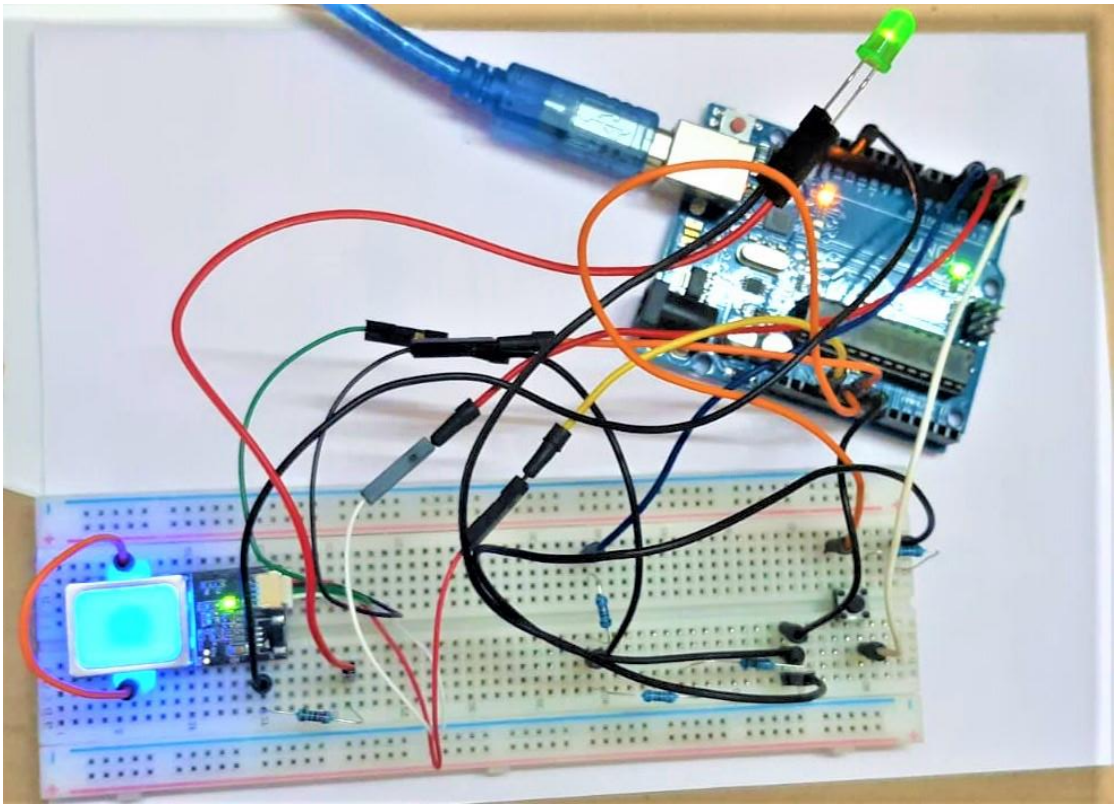
ABSTRACT

Here, we have built a Biometric attendance system using Arduino that scans for finger print and on successful identification of the person it will log the information of the person to a local file or simply an Excel file. This information can then be accessed easily from opening the file in which the data is stored and making it available for the required authorities to view and analyze information without having any direct physical access to the hardware. Our sensor GT511C3 provides features like enrolling a fingerprint, identifying a fingerprint, capable of 360° recognition, image size, data stored in Excel sheet using a software called PLX-DAQ which helps to put the data obtained from our attendance system directly into an Excel sheet and also can use this software to draw graphs and analyze the data we obtained.

CIRCUIT DESIGN



IMPLEMENTED MODEL



ALGORITHM

The Algorithm of the overall process :

STEP1: Start the process.

STEP2: If not enrolled yet, press the pushbutton to go to the enroll mode.

If already enrolled, go to **STEP4.**

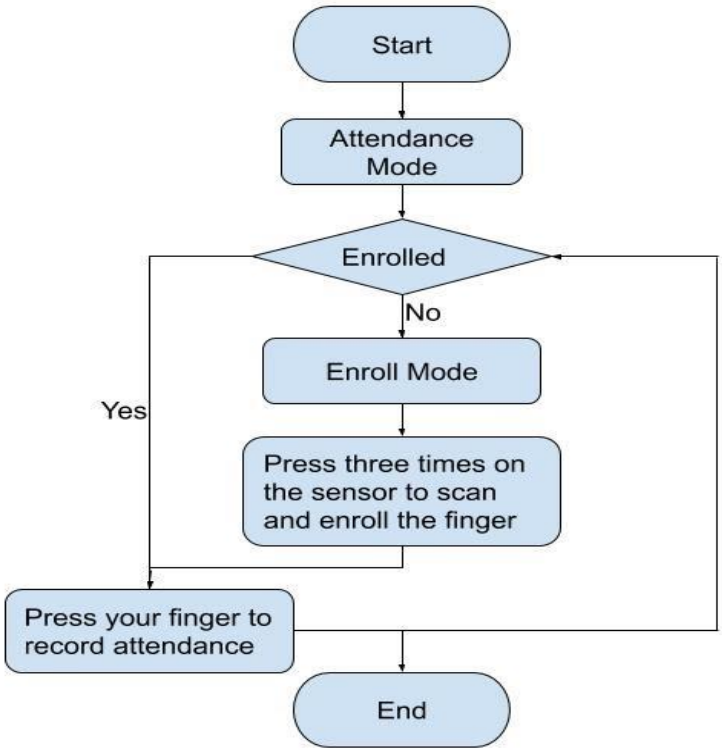
STEP3: Press finger 3 times as mentioned in the LCD display.

STEP4: After successful enrollment, press your finger to record attendance.

STEP5: Repeat this step for further candidates who want to log attendance.

- **STEP6:** End the process.

FLOWCHART



IMPLEMENTATION

Components :

1. Arduino Uno
2. GT511C3 Fingerprint Sensor
3. 10k, 20k, 200 ohms resistors
4. Push button
5. LED
6. Jump wires
7. Breadboard

The two main components for the model are Arduino Uno and Fingerprint sensor, rest are for bringing the components together and user interaction. The implementation of the model is simple and easy as most of the implementation is in software.

Steps for implementation :

- Connect the circuit as shown in the circuit diagram in previous pages.
- Use the resistors as the voltage required by the fingerprint sensor is lesser than what is given out by Arduino.
- After building the circuit, upload the code to the Arduino and run it.
- The system is ready. If the user is new, press the push button to register, else place your finger on sensor to record attendance.

Working :

The system has two modes of working, Attendance mode and Enroll mode. These are indicated by LED light. If the LED light is on, the system is in enroll mode, else it is in attendance mode. By default when the system is started, it will be in attendance mode, if the user wants to go to enroll mode, he/she just has to press the push button provided to do so.

The code first checks the state of the button every time in a loop, if the state of push button is high, it invokes Enroll() method, else will continue in attendance mode.

In attendance mode, the fingerprint sensor will be active all the time and ready to scan the fingerprint at any given time. Once the finger is placed, the sensor scans it and identifies the fingerprint as to whether it is registered or not (whether the fingerprint is stored in the memory or not) using `Identify1_N()` function. If the fingerprint is identified it returns values from 0 to 199 else 200. The log will be stored in the form < Date , User_id > where Date is time and date when the fingerprint was scanned and User_id is a number between (0,199) if the user is registered, else 200. These logs will be stored in local file.

In enroll mode, which is in `Enroll()`, initially we set the led to glow, and using while loop we get the id for the new enrolling fingerprint using the method `CheckEnrolled()`, after we get the new id for our fingerprint, we scan our fingerprint three times using `Enroll1()`, `Enroll2()`, `Enroll3()` using if-else blocks if we encounter any issue while scanning the fingerprint, if we find out we intimate the user with error messages and if we successfully enroll the new user fingerprint we show a successful message and go back to the attendance mode and turn of the LED again.

CONCLUSION

Although the traditional attendance is widely in use, this system can take over within short amount of time due to its ease of use and ease of implementation. This system can also be extended to store the data in a cloud or remote storage by connecting it to a Wi-Fi module. Overall this system provides better functionality, better security and better modification to the logs and also easier to use and implement than current traditional system.