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Fingerprint Based Exam Hall Authentication

Dr. P. Chandra Sekhar[1], Bhavani Anagani[2], Reshmi[3], Aruna[4], Sai Priya[5]
[1, 2, 3, 4]*ECE Dept, G Narayanamma Institute of Technology & Science Hyderabad, Ts India*

***Abstract:** This biometric security system is more accurate than the conventional password-based method and is focused on the needs of humans. Despite being one of the earliest biometric procedures, verification is still the most popular because to its ease of use and consistent accuracy. It is necessary to install fingerprint detection equipment in every exam room, office, and classroom. To signify their attendance in class or during the exam, pupils would have to swipe their finger across the sensor. The database contains the student records so they may be verified. When a pupil swipes their finger across the scanner, an assessment is conducted for them; the gadget scans the fingerprint module's finger patterns and compares the information with the data*

I. INTRODUCTION

In schools and colleges, maintaining a structured and well-timed schedule is essential for effective teaching, learning, and overall organization. Traditionally, manual bell systems have been used to signal the beginning and end of classes, breaks, and other important events. However, these systems often suffer from inconsistencies, human errors, and require constant monitoring. To address these challenges and improve efficiency, the implementation of a time-based automatic bell system has gained significant importance.

This introduction explores the concept and benefits of a time-based automatic bell system designed specifically for schools and colleges. By utilizing modern technology, such as microcontrollers and programmable devices like Arduino, educational institutions can streamline their time management processes, ensuring accurate and synchronized signaling of various activities. The automatic bell system operates based on predetermined schedules, eliminating the need for manual intervention.

It provides an audible or visual signal at specific times, ensuring smooth transitions between classes, breaks, and other essential periods throughout the day. With this system in place, educators and students can focus more on their tasks without disruptions caused by human error or delays in manual bell ringing. The core component of this system is the Arduino microcontroller, renowned for its flexibility, accessibility, and ease of programming. Arduino can be used to create a customized solution that aligns with the specific needs of schools and colleges. By integrating Arduino with real-time clock modules and suitable output devices such as speakers or alarms, the automatic bell system can be accurately triggered at designated times.

II. FIGURES

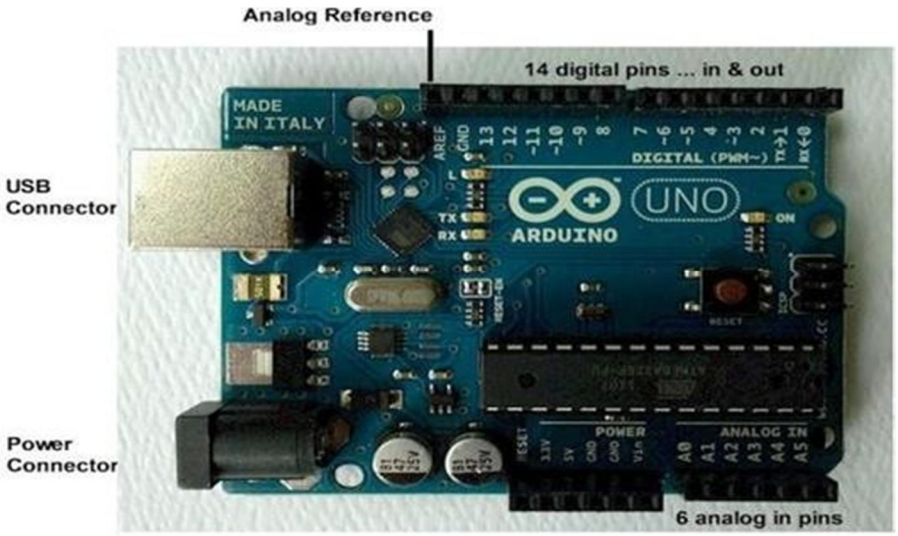

Figure 1. ARDUINO UNO

Figure 2. R305 FINGERPRINT SENSOR

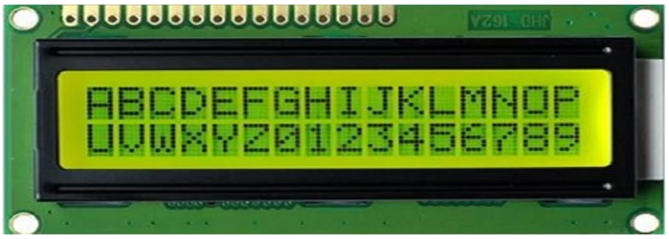

Figure 3. 8-LCD

Figure 4. SG90 SERVO MOTOR

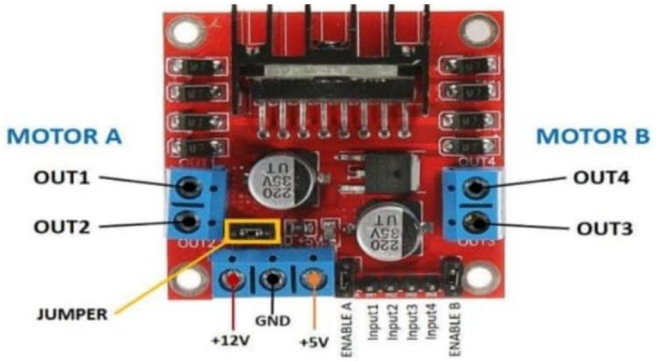

Figure 5. L298 MOTOR DRIVER

III. WORKING AND BLOCK DIAGRAM

A sufficiently appropriate technique would guarantee a highly detailed study project and guarantee a greater level of efficiency and accuracy is used. Using the globally recognized software engineering methodology, the study effort was able to be accepted with relative quiet. During authentication, the user's biometrics are once again taken, and the characteristics that have been extracted are compared (using a matching algorithm) with the features that are already in the database to see if there is a match.

Physical accomplishments have been shown to be ineffective in many situations; a far better solution is to apply the concept of biometrics, which can provide tighter security to address the issue of exam impersonation. This suggests developing database management systems (DBMS) to guarantee that computer records are maintained current.

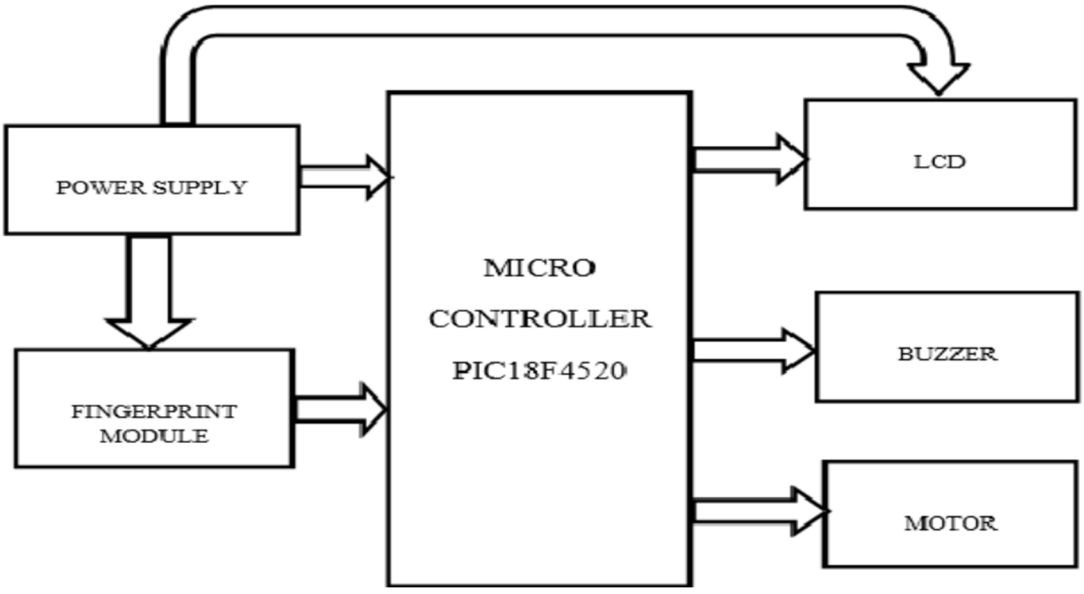

Figure 6. BLOCK DIAGRAM

Manual identification is used in this examination impersonator elimination approach. When identifying a user, the system compares that user's biometrics with each entry in the database. Enrollment and Authentication are the two processes that biometric identification typically involves. When a student enrolls, their biometrics are taken (usually with a fingerprint reader, which is an optical, solid state, ultrasound, or other suitable device). Then, the subject's unique features are extracted and saved in a database together with their student ID as a template for the subject.

The enrollment module's goal is to admit students by using their ID and fingerprints, which are then extracted from a database. To power the components, the system requires controlled DC power supply, and the power must be regulated because these components require consistent power supply within defined limits. When the system is turned on, a lime bright green light appears on the LCD display to indicate that the system is turned on. A few seconds later, the following message appears on the LCD display: ("Fingerprint based exam hall authentication"), the name of the system, and two seconds later, the user is instructed to place their finger on the fingerprint scanner for the fingerprint scan to be captured for authentication.

To summarize the operation, this system is comprised of a fingerprint scanner linked to a microcontroller circuit. The individual must

IV. RESULTS

It requests that the user place their fingers (Put your finger). Then, it displays the authentication results (Enter the passkey or Access denied, student not registered), and, if the user's passkey is correct, the final display says "Access granted." A variable resistor is used to adjust the LCD display's brightness. Crystal. The straightforward job of clocking is to supply the system with a clock in sync with the microcontroller's clock.


Figure 7. figure represents output message on LCD

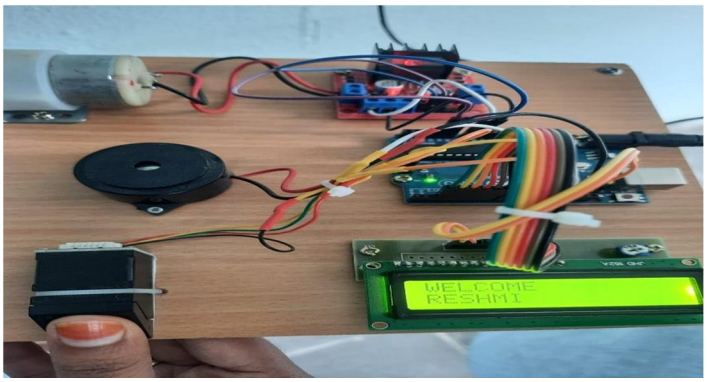

Figure 8. figure represents output when finger is placed

V. CONCLUSION

Exam hall authentication with fingerprints appears to be a reliable and effective way to improve security and expedite the identification procedure in educational settings. Using fingerprints' distinct and unchangeable properties, this technology dramatically lowers the possibility of impersonation and unwanted entry into exam rooms. By putting such a system in place, test integrity is guaranteed, and it also promotes a climate of fairness and trust between instructors and students.

Additionally, fingerprint authentication lessens the administrative load related to manual identity verification, which makes exam day activities run more smoothly and minimizes the possibility of human error. It maintains the legitimacy of academic evaluations and certifications by reducing the possibility of security lapses and unlawful entry.

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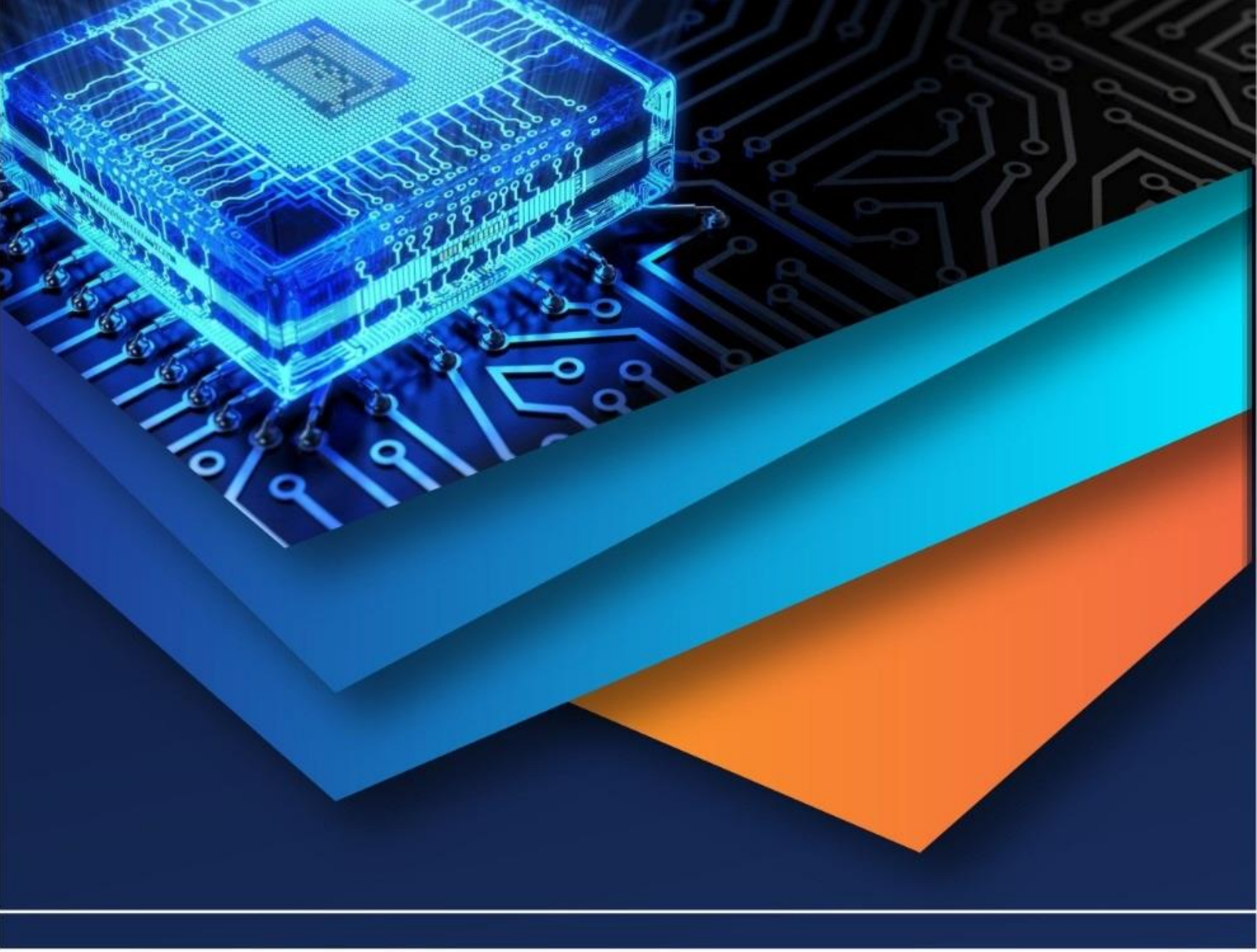

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