IMPLEMENTATION OF FINGERPRINT AUTHENTICATION SYSTEM IN SMART HOME ENVIRONMENT

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1. Introduction

This study aims to explain a prototype for the automation and security with fingerprint or PIN authentication technology. This system helps improve the security and comfort of residents with easy installation and low cost. The system automatically controls (open or close) the door lock/electric latch based on the user's fingerprint that has been registered in the database of the microcontroller.

2. Methodology

2.1. Hardware Design

In this study, the hardware consists of Arduino Mega 2560 as a microcontroller and for input/output supply. Then the other hardware are door lock/electic latch, fingerprint sensor, power supply, LCD and keypad.

2.2. Software Design

The first step in the software design is determining the software requirements of the application to be built, followed by collecting and analyzing user requirements. Then, the next step is coding and implementation.

3. Results & Discussion

In this phase, fingerprint sensors are applied to control the main door of the home. The prototype that has been created is shown in Figure 1.

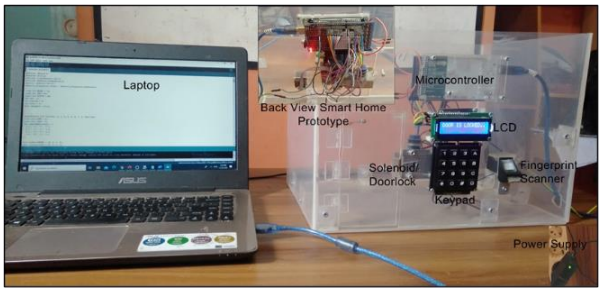

Figure 1. Hardware prototype design

The enrolment and authentication time of fingerprint authentication system as shown in Tabel 1.

Table 1. User enrolment and authentication of fingerprint processing time

User fingerprint	Enrolment Processing time (sec)	Authentication Processing time (sec)
Thumb	3.5	2
Index finger	3.5	2
Middle finger	3.5	2
Ring finger	3.5	2
Pinkie	3.5	2

4. Conclusion

This study provides a basic overview of integrating a door lock, fingerprint sensor, Arduino microcontroller, number keypad and door lock with a simple application.

References

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Applied Science, University of Ontario Institute of Technology 2020.

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