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Secured Remote Control Room using Biometric System

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Abstract: ***The most challenging issue regarding the protection of the main control room entrance of any industrial plant system is the security system design. This is the most emphasized sector through which the modernization of the confidential places can be done. The fingerprint secured entrance to a power controlling room can be the option to save the power usage and protect premises from remote location. After scanning the pre-assigned finger pattern, it can activate the appliances & gadgets of the premises. The designed device should have the quality of low power consumption and higher efficiency. The prohibited room can be locked using the specially programmed device which will be operated by the advanced technology.***
Keywords: Biometric, Security, Finger print, Remote control.

I. INTRODUCTION

The technology of measuring biological data is referred as Biometric. Biometrics are the systems which can provide security to user. Anyone cannot capture the characteristics and misuse the unique features of human beings. But every human being has their own pattern of finger print. So, it cannot be easily copied by others. There are many biometric security systems such as iris of eye, face, signature and voice recognition etc. In biometric security system, passwords are not required to be memorize. So, there is no chance of hacking of password. Therefore, more secured system can be developed than any other security systems. Generally biometric systems follow three steps i.e. data reception, encryption and analysis of the received data. The objective of this work is to provide analysis of the design of biometric security systems and its control system for the known attacks. This helps in identifying the risks that may have outcomes on the security system provided by several unique features of human beings. The concept of internet operated system controlled from remote location also can be incorporated through this type of security systems specially for the saving of power usage in the industrial fields. This type of device is the representative of the Industry 4.0 concept which is very much relevant nowadays. The availability and functionality of the electronic components make it more reliable and fruitful for the implementation of the protected recognition system for the entrance.

II. METHODOLOGY

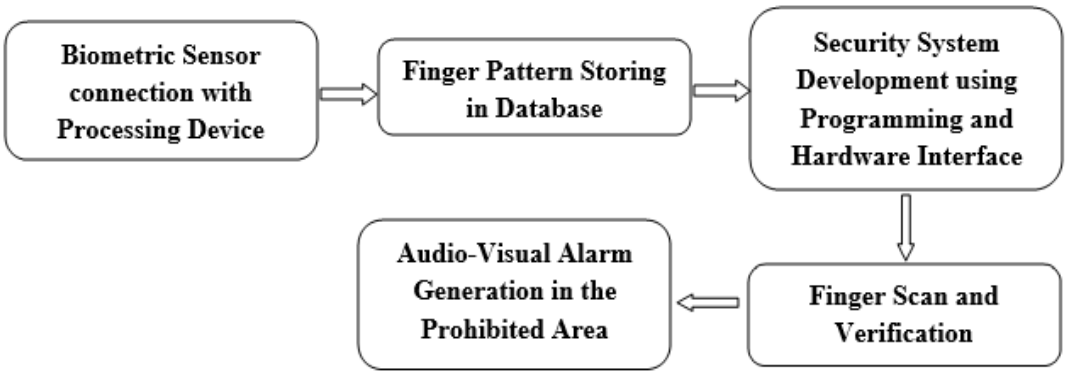

Fig. 1: Block Diagram of the prototype of Secured Biometric System

Here in this project, finger print sensor is used. R307 fingerprint module consists of optical fingerprint sensor, high-speed DSP (Digital Signal Processor), high-performance fingerprint alignment algorithm, high-capacity FLASH chips and other hardware and software composition. The user can store the fingerprint data by 1: 1 & 1: N mode. It is directly interfaced with 3.3 volt & 5 volt supply. The single channel relay module is a convenient board which can be used to control high voltage, high current load such as motors, solenoid valves, lamps and AC load. It is designed to interface with Arduino interfacing board and PIC microcontrollers etc.

This is digital output controllable & compatible with any 5V microcontroller. The Arduino Uno is a microcontroller-based open source electronic prototyping board which can be programmed with an easy to use Arduino IDE (simplified version of C++). Arduino board consists of both a physical programmable circuit board and piece of software. The major components of the Arduino board are USB connector, power port, microcontroller, analog input pins and digital pins etc. After the proper recognition of the finger print, the entrance of the room opens. Otherwise the device will generate the audio-visual alarm for the security guards.

III.RESULTS AND DISCUSSION

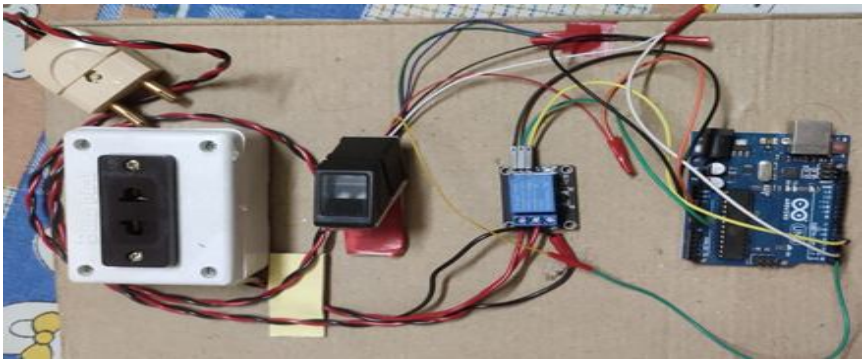

Fig. 2: Pictorial representation of Secured Biometric System

Through the above shown picture the prototype design is demonstrated. The developed prototype is working on the recognition of the stored finger patterns. If any other person who is an outsider of the industry gives the thumb impression the biometrics, it will generate alarm for the security room. Thus, corrective actions can be taken for the trespassers.

IV.CONCLUSIONS

Specific recognition and presence of human being is utilized here. Power saving method is used. It is secured plant power controlling system. The use of biometric fingerprint for home security system using can be one of alternative of locks and for home security that is reliable and convenient. In addition, the components of the designed system are relatively inexpensive and widely available in the market. It is expected that it will improve the security in not only homes but also at the big factories that uses several machines for work, those machines can be secured as well as can be started by a single touch of thumb.

V. FUTURE SCOPE

The IIOT (Industrial Internet of Things) system can be implemented to this project so that when someone try to open it a notification may be forwarded to the phone number registered to the system. The total database generated throughout the day for various types of finger scanning can be stored online.

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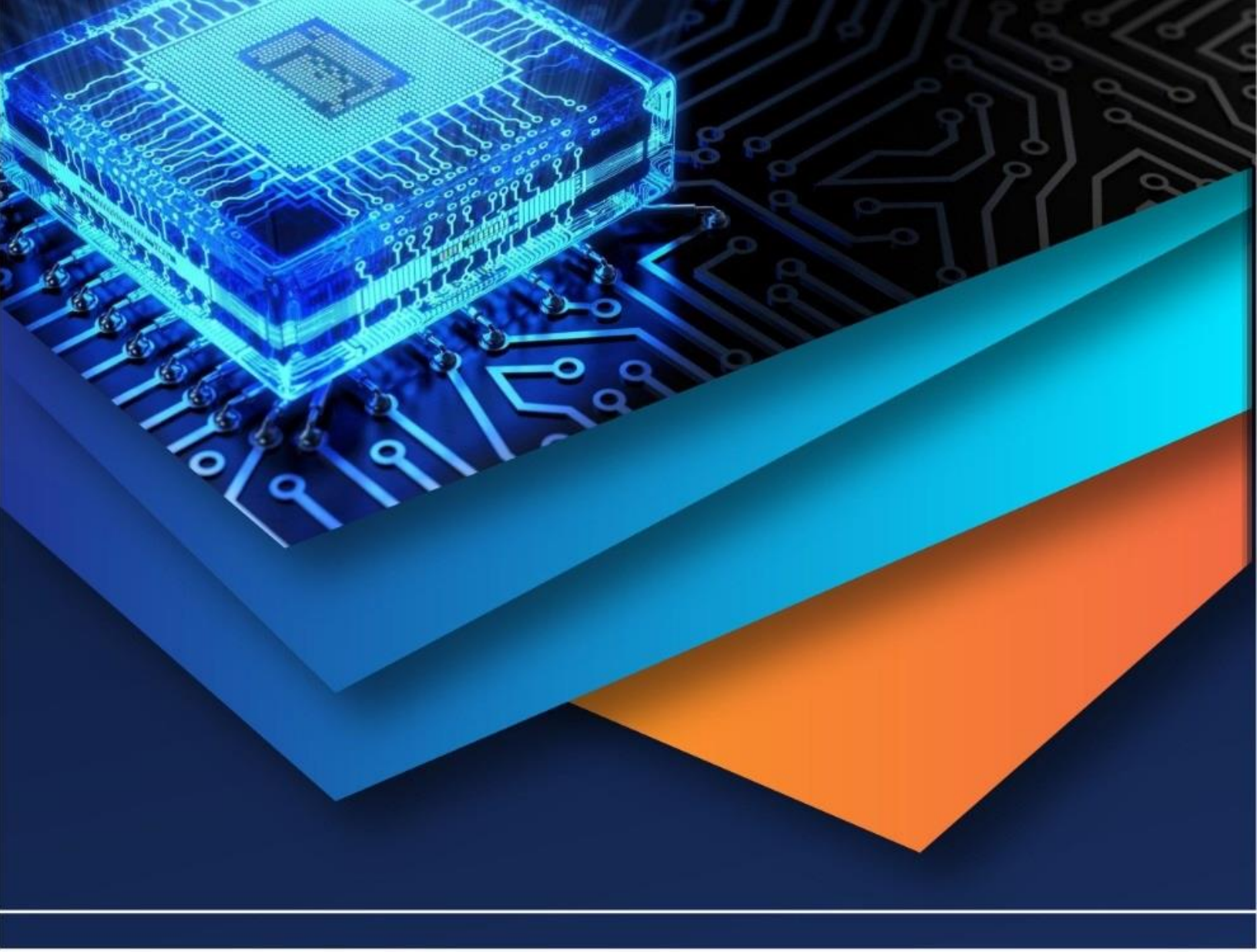

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