Total Home Security System using ARM

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ABSTRACT

An intelligent security system that provides a high level of home security using visual surveillance is developed and explored in this paper. This will be very much useful in home and company automation. Security has becoming an important issue everywhere. Home security is becoming necessary nowadays as the possibilities of intrusion are increasing day by day. This paper is about safety from theft, leaking of raw gas and fire are the most important requirements of home security system for people. A traditional communications based security systems provides enhanced security as whenever a signal from sensor occurs, a text message is sent to a desired number to take necessary actions. For extra security we have added finger print sensor and keypad due to this only authorized person can enter home. If someone tries to enter from the window in house then laser security will put on the buzzer and inform to the owner through GSM module. When there is an unauthorized entry on finger print scanner then it will ask for the keypad password and both the entry does not match then it gives security alert in terms of sound and a mail is delivered to the owner.

I. INTRODUCTION

Smart maintenance of security has emerged as a cardinal concern for any personnel systems, especially for an individuals dwelling place. As well, security systems of personal home place are emphasized to be automated and robust for better

convenience and safety issues. The reason is that, over the last decade, the rapid rise of burglary and theft all over the world is threatening due to the vulnerability of traditional home security systems. The reason is that, over the last decade, the rapid rise of burglary and theft all over the world is threatening due to the

vulnerability of traditional home security systems. In addition, the necessity of total home security systems emerges inevitable for people of developing or developed countries.

The current existing home security system for anti-theft and fire system includes infrared rays for input process. Even though these types of security system are comprehensive yet there are still some defects such as the range of infrared based home security system is 4 to 5 meters. The consumers are to keep co-operative relationship with the security service provider and so they have to expense much for to the provider for good service quality. There remain no record how and who has broken the security system and entered the house.

Among some generally used techniques automatic counting approach using light beam suffered some problems like it could not count people accurately when more than one people passes the base line in parallel. The Total Home Security based approach is used in various application to solve the problem

II. WORKING PRINCIPLE

In this module we are working on the Security For Homes. For this purpose we required hardware such as sensors, LPC2148microcontroller, Buzzer, in system programmer and relays to control the appliances. The outputs of all the sensors are connected to ADC. One IR is connected at window and other is at door. The entry from the window is treated as unauthorized entry and entry from door is treated as authorized entry. If there is authorized entry inside the home, latch of the door gets opened at that time and the person who wants the entry will gets

inside the home and for unauthorized entry buzzer will be turned ON. Temperature is continuously monitored, if it is high(greater than 45 degree) in case of fire, a SMS is sent ("Fire at home") to the home owner. If gas sensor is ON indicating the gas leakage then SMS will be send to the owner.
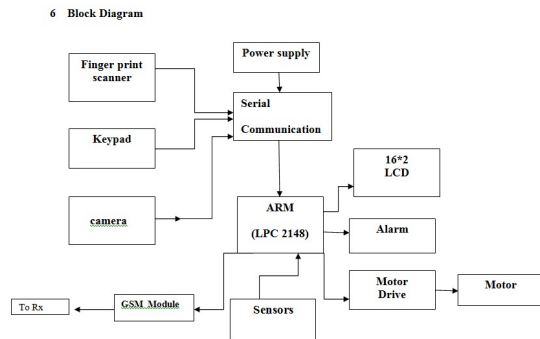

Fig. Block diagram of total home security system

In this paper are going to demonstrate the performance and evaluate, efficiency has been simulated in Proteus simulating software. Proteus software is generally used for microprocessor simulation, schematic capture and printed circuit board (PCB) design. According to the system algorithm, the code is written in JAVA. After writing, the HEX file generated from JAVA is loaded into the microcontroller to generate the appropriate output. If there will unauthorized entry Camera which we have used in the system captures the image of the person who entered the wrong password in the keypad, as a secondary backup image is also saved in the our laptop which is connected to the camera directly.

III. SYSTEM ARCHITECTURE

A. Hardware and software design

It consists of ARM Cortex-A8 processor with 1 GHZ processing speed.ARM7 is a group of older 32-bit RISC ARM processor cores licensed by ARM Holdings for microcontroller use. This generation introduced the Thumb 16-bit instruction set providing improved code density compared to previous designs. The most widely used ARM7 designs implement the ARMv4T architecture, but some implement ARMv3 or ARMv5TEJ. ARM7TDMI has 37 register (31 GPR and 6 SPR). All these designs use a Von Neumann architecture thus the few versions comprising a cache do not separate data and instruction caches.

Camera is placed above the Keypad and LCD. It captures the image after every wrong passkey or finger print entered through the Keypad or LCD respectively. We are using the camera of high resolution such that images stored are much clearer to view to police if there is breakthrough in the home. In this module we are using GSM SIM800 it has some key features such as full modem interface with status and control lines, unbalanced, asynchronous. Serial port have data rate speed of 1200bps to 115200bps, It can be used for AT command or data stream. It support Real Time Clock (RTC).
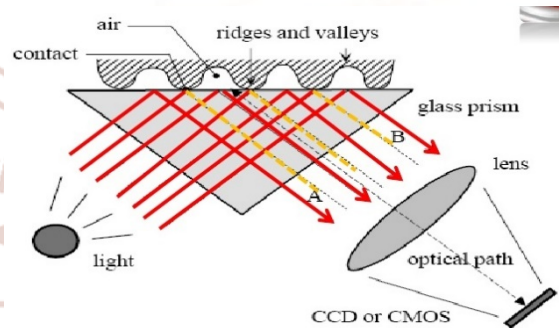

Fig. Acquisition principles of silicon and optical sensors

The acquisition of fingerprint images has been historically carried out by spreadingthe finger with ink and pressing it against a paper card. The paper card is thenscanned, resulting in a digital representation. This process is known as off-line acquisitionand is still used in law enforcement applications. Currently, it is possibleto acquire fingerprint images by pressing the finger against the flat surface of anelectronic fingerprint sensor. This process is known as online acquisition. There arethree families of electronic fingerprint sensors based on the sensing technology.

The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328 (Arduino Nano 3.0) or ATmega168 (Arduino Nano 2.x). It has more or less the same functionality of the Arduino Duemilanove, but in a different package. It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one. The Arduino Nano can be powered via the Mini-B USB connection, 6-20V unregulated external power supply (pin 30), or 5V regulated external power supply (pin 27). The power source is automatically selected to the highest voltage source.
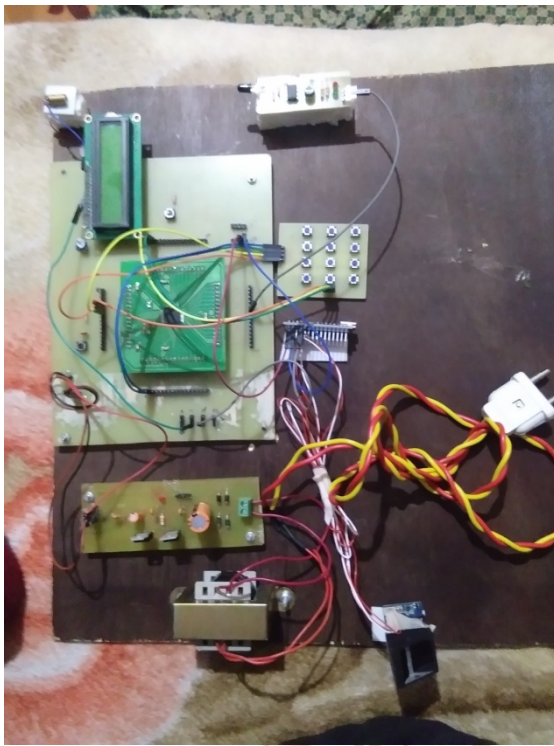
Fig. Hardware required

The Proteus Design Suite is a proprietary software tool suite used primarily for electronic design automation. The software is used mainly by electronic design engineers and technicians to create schematics and electronic prints for manufacturing printed circuit boards. It was developed in Yorkshire, England by Lab center Electronics Ltd and is available in English, French, Spanish and Chinese languages. The Proteus Design Suite is a Windows application for schematic capture, simulation, and PCB layout design. It can be purchased in many configurations, depending on the size of designs being produced and the requirements for microcontroller simulation. All PCB Design products include an auto router and basic mixed mode SPICE simulation capabilities.

NXP Semiconductors produce a range of Microcontrollers that feature both on-chip Flash memory and the ability to be reprogrammed using In-System Programming technology. Flash Magic is Windows software from the Embedded Systems Academy that allows easy access to all the ISP features provided by the devices Flash Magic provides a clear and simple user interface to these features and more as described in the following sections. Under Windows, only one application may have access the COM Port at any one time, preventing other applications from using the COM Port. Flash Magic only obtains access to the selected COM Port

when ISP operations are being performed. This means that other applications that need to use the COM Port, such as debugging tools, may be used while Flash Magic is loaded.
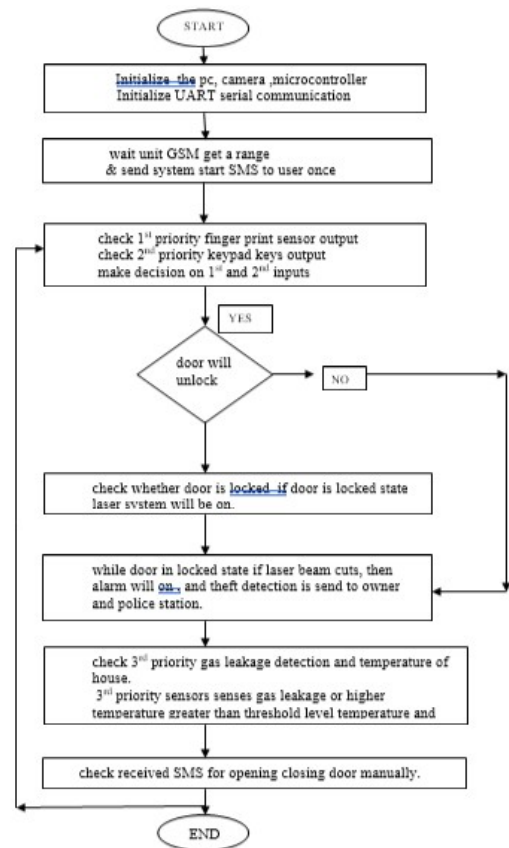
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IV. CONCLUSION

The developed system successfully counted the number of people in a room. The system can also be modified to go to a surveillance mode. It can also be set to surveillance mode automatically after a certain period of the day. Say the user can set the specific time like after the office hours to make it go to surveillance mode. The home automation features adds a new dimension. When the system counts zero people then all loads of the room will be turned off. This feature is helpful in developing countries where load shedding is a major problem. Energy consumption in an efficient manner is also very important to create a balance in nature.

V. REFERENCES

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