T181066.pdf

by Iiuc Library

Submission date: 21-Dec-2022 01:53PM (UTC+0530)
Submission ID: 1985414194
File name: T181066.pdf (2.64M)
Word count: 8026
Character count: 51348

BACHELOR OF SCIENCE IN ELECTRONIC AND TELECOMMUNICATION ENGINEERING

COMPRESSIVE SMART HOME SECURITY SYSTEM

Submitted by:

Shak Nayem Uddin

T-181055

Supervised by:

Mohammad Mostofa Amir Faisal

Assistant professor

Department of ETE

International Islamic University Chittagong

Department of Electronic and Telecommunication Engineering International Islamic University Chittagong

Kumira, Sitakunda, Chattagram

September 2022

DEDICATION

This project and book are dedicated to all our deserving professors and our cherished parents for their prayers and encouragement in helping us reach our objective.

CERTIFICATE OF APPROVAL

The project entitled as "Comprehensive Smart Home Security System" submitted by Shak Nayem Uddin to the Department of Electronic and Telecommunications Engineering (ETE) of International Islamic University Chittagong (IIUC) has been accepted as satisfactory to partially fulfill the bachelor's degree criteria in Electronic and Telecommunications Engineering and approved as to its style and contents for the examination held on 10th September 2019.

Approved by:

Mohammad Mostafa Amir Faisal

Supervisor & Assistant Professor

Department of Electronic and Telecommunication

Engineering Faculty of Science and Engineering International

Islamic University Chittagong Kumira,

Sitakunda, Chittagong.

CANDIDATES DECLARATION

It is hereby declared that the project and book do not include any illegal declarations and have not been submitted anywhere else for the purpose of receiving a degree or certificate.

_____

Shak Nayem Uddin

(T-181055)

Acknowledgements

All praise and glory are due to Allah (SWT), the Merciful One, in order that He may grant us a wealth of opportunities and show us His kindness and wisdom throughout our lives. And may Allah's peace and blessings be upon His Prophet Muhammad (PBUH), who has been a source of wisdom and inspiration for us. We sincerely thank our thesis advisor Mohammad Mostafa Amir Faisal for his expertise in this field of research, as well as for his invaluable advice and support during the study time. We thank Sayed Zahidur Rashid, Chairman of the Electronics and Telecommunications Engineering Department of IIUC, for his timely recommendations and provision of the best departmental equipment. We also appreciate the devotion and sacrifice of Engr. Abdul Gafur, our thesis' convener. We are also very appreciative of Abu Zafar Imaran along with all of our teachers for their dedication to us during all four years of school. We also think back on how much our parents have helped us throughout our lives. Additionally, we thank our friends and well-wishers for helping us finish our thesis work, whether directly or indirectly.

Abstract

Security or home security is essential for our daily life. In our project, we propose an intelligent door-locking system in a cost-effective way. An intelligent door lock system proposed here consists of Arduino Uno as a microcontroller, a Numerical keypad for authentication, a Motor module for opening and closing the door, an LCD display for understanding a particular state of the door, a GSM module for communication with a certain distance, lager light technology for advanced Security.

Contents

Chapter 1

1.1 Introduction

The Internet of Things (IoT) conceptualizes the idea of remotely connecting and monitoring real-world objects (things) through the Internet. When it comes to our house, this concept can be aptly incorporated to make it smarter, safer, and more automated.

Security is of most concern for anyone nowadays, whether it's data security or the Security of their own home. With the advancement of technology and the increasing use of IoT, digital door locks have become very common these days.

Over the past ten years, the academic community has become more interested in smart home automation. Home security system research is an area that is continually expanding. Because it is simple to manage from a tiny device like a smartphone, tablet, or laptop, its popularity is growing every day. The automated and computerized control of household activities, features, and appliances is referred to as "home automation." Our home's electrical switchboards are scattered around several rooms, making it challenging for everyone—especially the elderly and physically challenged—to use them. With speech-based home automation, we may manage the appliances in our house by speaking orders into a voice control kit. We discovered certain flaws when examining some earlier research papers that are the primary barriers to the control of our home's electrical appliances. We attempted to solve these issues in our project and make it ideal for the control of our household appliances. Some electrical appliances have automated controls. We assure flexibility and ease of use for those with physical disabilities in our project. Intelligent individuals can operate with Android applications, and automatic controlling is dependent upon some sensors. Wireless technology uses a variety of techniques, including Bluetooth, WI-FI, and GSM. New designs and various home appliances are discussed in this study. A microcontroller-based Bluetooth-based home automation system has been developed. Traditionally electrical appliances in a home are controlled via switches that regulate the electricity to the devices. As the world gets more and more technologically advanced, we find new technology coming deeper and deeper into our personal lives, even at home.

1.2 Project Objectives

- Review the existing literature regarding the smart home security system
- Comparing the performance of available smart home security systems
- Proposing a comprehensive and cost-effective smart home security system
- Implementation of the proposed model

1.3 Application

There are a lot of applications for this project. Some of the applications of this project are given below.

1. We can use this project in our home.
2. We can use this project in our office.
3. We also use this device for our farms.
4. This project also uses for people who are old.
5. This project helps to use smart security systems that have little knowledge of how to use electronic devices and smart suppliance.
6. By using this project, any wild animal, like a cat or something like this, cannot enter one's house by the door or open windows.

1.4 Advantage and Benefits

The advantage and benefits of this project have many, some of them given below.

1. Password or pin code base app security system.
2. Multiple users use this device for different purposes.
3. Our project is cost-effective and easy to set up, that's why all categories can use it.
4. We will know when anyone wants to enter our home or office without permission.

5. Because of using GSM (Global System for Mobile Communication), we will be notified when someone or something tries to access our home or spaces present in-home or a particular place.
6. Leaser security systems give us more Security when we are present or absent in our home or office.

1.5 Project Outline

In this thesis book, we discussed and described our project in between 5 chapters. The outline of the thesis book is as follows:

Chapter 1: In this chapter contains the part of Introduction. In this chapter introduction of this project has been described and discussed.

Chapter 2: In this chapter contains a review of the literature. This chapter provides a discussion of all earlier work connected to this system.

Chapter 3: comprises an approach where the essential circuit diagrams, block diagrams, and flow charts, as well as the technique of developing the entire system, have been addressed.

Chapter 4: In this chapter includes a discussion and results on how our method performed in certain areas.

Chapter 5: In this chapter provides a conclusion that discusses the conclusion and future work.

1.6 Summary

It is necessary to select a technique by which we may get to our objective since we have to take obstacles and boundaries into view. After considering all the problems, limitations, implementation, performance analysis, and market analysis of smart home security systems have been designed with Microchip ATmega328P for the betterment of coding and responsiveness at a limited cost. Here we use SIM900 GSM (Global System for Mobile Communication) module for communication and alert systems with long distances. Leaser base security systems are certainly very available at low cost in

our country's market. Most of the elements we use in this project are available and very easy to set up. This project equipment is not so many. That's why we can use this project or system small size box like 8 to 10 inches so that we can use it for commercial purposes. The door lock system of our project is open in a very simple way, and it is a pin code method. We use this method or technique because old people, children, the people who know about technology very little and who do not want to involve with a complex system. It is very to set up and use.

Chapter 2

Literature Review

2.1 Introduction

We shall refute earlier research that is relevant to the topic in this chapter. For a better understanding of the project, a broad discussion on the idea of independent devices will also be covered. This talk will provide clear examples of independent devices and their operating principles. This section provides a summary of some earlier work that is relevant to the project. The television remote, a basic home automation device, was actually invented in 1893. Therefore, smart home devices have been available since the start of World War 1 (1914).

Its development has come about as a result of several unofficial studies and ideas by technology enthusiasts who desire a better method to complete tasks at home quickly and easily. But nowadays, home security systems like projects and devices are not so very unavailable, but our project is comprehensive and cost-effective to others.

2.1.1 Paper- 1:

Design and implementation of a home security system and monitoring by using ireless sensor networks WSN/Internet of Things.

This paper is based on identifying unnatural activities of the home appliances and aware user by SMS using sensors such as temperature, humidity, gas sensor (MQ-135), Flam sensor, two Arduino Uno, and two Nrf24l01 transceivers that is transmitter and receiver and using raspberry pi to display the data on the serial monitor through the program of Arduino.

2.1.2 Paper- 2:

IOT-based home security and automation using google assistant.

This project provides the structure and mode of an automated earth system and wireless home protection system that uses the ESP32 camera Node MCU module to send alerts to owners if anyone takes a picture of the door and sends it to the owner. This system

includes an automated home system and voice control in the raspberry pi and the IFTTT web page, an Adult app account, and Google support API. Used Components are cost-effective and available.

2.1.3 Paper- 3:

Iot-based Integrated Home Security and Monitoring System.

This Design and development integrated home security and monitoring system using IOT by combining the Arduino-nano and NodeMCU ESP8266 as a controller. The home security system involved an RFID reader, a numerical code to open the door, and e-mail notifications to users. The system can monitor the condition of the house and control the output of lights and solenoid valves remotely by using an application on the smartphone through an internet connection. In the home security part, the system can detect RFID cards that are integrated with the notification system by sending an e-mail to family members and using a password to open the door and Monitoring part controls the AC bulbs and solenoid valve as actuators.

2.1.4 Paper- 4:

IoT-based security system and intelligent home automation multi-monitoring and control systems

This paper presents the execution of savvy Smart Homes with frameworks and propelled advances. The framework configuration does not expel the current electrical switches, yet it gives a more secure control over it with the low voltage utilization method. Establish the water level checking and monitoring by utilizing the application on Android Smart telephone; work the lighting framework is more intelligent by utilizing the PIR sensor**.**

2.1.5 Paper- 5:

IOT-based Home Security and Automation using Random Number (Password) Generators and Face Detection.

Safety and Security will be achieved by a three-layer security system, including an RFID-based detection system and Face Detection. The use of very cheap components such as the GSM module, a camera, and keypad protect just work to be effective enough

for a low-range security system for Houses. The system is designed to be implemented in the houses of the common man where the threat of theft from daily commotions such as visitors (maids, repairmen, etc.) is a matter of concern.

2.1.6 Paper- 6:

IoT-based home automation and security systems: A literature survey.

The main reasons why automation is a widely known concept that is still not in much use are:

(a) Consumers find home automation systems very expensive

(b) They have no idea of what a home automation system is, i.e., they are completely unaware of its existence

(c) Even if they knew what a home automation system was, they didn't know its uses or how such systems could benefit them.

The main aim of any technology is to ease a task with maximum possible efficiency, and the home automation industry is just the best example of this. These smart homes are capable of notifying you in real time so that you can take immediate action.

2.1.7 Paper- 7:

Home Security Alarm Using Wemos D1 and HC-SR501 Sensor-Based Telegram Notification

To help the community in dealing with the theft that enters the house, a Home Security Alarm was made using WEMOS D1 and HC-SR501 Sensor with Telegram Notification. The whole tool is divided into several parts, which consist of HC- SR501 Sensor, WEMOS D1 and Buzzer. Home Security Alarm uses a PIR Sensor a detection the presence of humans entering the house, a Buzzer that provides notification sounds inside the house, and a telegram which is software to receive and activate notifications if someone is detected entering the house. Home Security Wemos d1 alarm and PIR sensor can more effectively assist people in overcoming theft that occurs at home.

2.1.8 Paper- 8:

An Intelligent, Secure, and Smart Home Automation System Security system:

In this paper, Blockchain Technology plays a vital role by providing a reliable, secure, and decentralized mechanism for the identification and authentication of IoT Devices.

2.1.9 Paper- 9:

IoT-based cost-effective home automation and security system:

In this paper, Security is provided to the home using an automatic door lock system.

2.1.10 Paper- 10:

Design and Implementation of an IoT-Based Smart Home Security System Security:

Here they are using web cameras for security surveillance and also using smart door sensors that will inform the user through an android application of door open events in a house or office environment.

2.1.11 Paper- 11:

IOT-Based Smart Security and Smart Home Automation Security System:

In this paper, they are providing Smart Security by sending a captured image through an E-mail to the owner using the Internet when an object is detected.

2.1.12 Paper- 12:

Internet of Things and Smart Home Security
(i) "Iot-based integrated home security and monitoring system."
Security:

In this paper, They Planned and built up incorporated home security and the Internet of Things (IoT); at that point, the Node MCU ESP8266 and Arduino-nano joined as a controller. The home framework security included digital code, RFID to disclose the entryway, and e-mail notices to clients.

(ii) "Smart home automation and security system using Arduino and IOT, Security:

Presented a dynamic, secure system for home using Arduino and IOT in addition to sensors that will be interfaced with Arduino. The situation of our home apparatuses will get transferred through a wireless module to a cloud system

iii) An advanced internet of thing based security alert system for a smart home. Security:

An advanced Internet of Things-based Security caution for Smart Homes, when nobody is available there so as to identify an intruder or some strange event at home, The PIR module and raspberry pi are used with a cheap home security system for limiting the postponement during the procedure of e-mail alert.

iv) Automatic service request system for Security in a smart home using IoT Security:

The usage of automatic system-based Raspberry Pi helps the framework to be examined intelligence home security related to the cloud or web server by means of utilizing the system remotely.

2.1.13 Paper- 13:

IoT-based security system and intelligent home automation multi-monitoring and control systems

In this paper, they are using RFID based security system.

2.1.14 Paper- 14:

IoT Based Security and controlled smart home automation system using GSM Security:

They maintain security systems by using electronic door lock arrangements. In addition, it allows the person who has only RFID authentication to enter the home. SMS is used to alert users via mobile phone when the system detects a possible intrusion occurs.

2.1.15 Paper- 15:

IoT-Based Smart Security and Home Automation System

This IoT project focuses on building a smart wireless home security system that sends alerts to the owner by using the Internet in case of any trespass and raises the alarm optionally.

2.1.16 Paper- 16:

A face recognition method in the Internet of Things for security applications in smart homes and cities.
Security:

The Embedded system is designed for human Detection using a smart security system. Images are captured by the camera and sent on a smartphone.

2.1.17 Paper- 17:

Integrating face recognition security system with the Internet of things.

They proposed a system for security purposes that is based on facial recognition security. The system is implemented using python, open CV, Simple Mail Transfer Protocol (SMTP), an e-mail server, and a raspberry pi processor.

2.1.18 Paper- 18:

Smart Home Security Using IoT and Face Recognition.

In this paper, they are using facial recognition. In this system, smartphones and web applications are used to monitor the persons who enter in home and also decide who will enter the home. The web camera is connected to the Raspberry Pi, which contains PIR (Passive Infrared) sensor and an ultrasonic sensor.

2.1.19 Paper- 19:

IoT-based smart doorbell using Raspberry Pi. in International Conference on Advanced Computing Networking and Informatics.

This system is a combination of a doorbell interface and Raspberry Pi. When someone presses the doorbell, the camera is activated and captures the face. After this, it checks with already registered faces in the database.

2.1.20 Paper-20:

Design and Implementation of A GSM-Based Remote Home Security and Appliance Control System.

The purpose of this study is to develop and put into use a GSM-based home security system that is both affordable and powerful. For the convenience and Security of the resident, a mobile-based home security system is necessary. The system is built to identify burglaries, gas leaks that might be hazardous, fire smoke, and other suspicious behavior before sending an alert message to the owner's phone number. The entire procedure is managed by an android mobile application, and the user may turn on all the alarms before leaving the house using the applications. The alarm system may be turned on and off via the app, which also offers some extra control over switching household appliances. Even in isolated rural areas, and it runs on batteries. Wherever the user is, they may instantly receive the theft and intrusion alarm. To get the alarm message from the security system placed in the user's premises instructing the user that each time they leave the property, they must activate the alarm using the application. The user must sign into the system using a unique password in order to activate and deactivate the alarm system. This stops any system abuse or unintentional alert activation. The program also allows users to turn off any electrical home appliances they may have unintentionally left running. This helps us avoid wasting a lot of energy. The system and application are both very user-friendly. Anyone may use the program on their mobile device without needing to be an expert. The planned system allows for the addition of additional sensors. If the user wants to manage more appliances, he or she may also add extra relays. Therefore, taken as a whole, the technology is a cutting-edge, smart household security system that can provide us with comfort anytime we wish to leave home.

2.1.21 Paper-21:

Bluetooth-Based Smart Home Automation System Using Arduino UNO Microcontroller.

Wireless technology uses a variety of techniques, including Bluetooth, WI-FL, and GSM. New designs and various home appliances are discussed in this study. Design and implementation of a Bluetooth-based home automation system utilizing an Arduino UNO Microcontroller 15. The Arduino PWM approach is used to regulate the DC motor speed according to the pulse width, and the H-Bridge driver circuit is utilized to control the motor's direction. The home automation applications discussed in this article include the ability to use a smartphone app using Bluetooth wireless technology to manage a DC motor's speed and direction as well as its light, fan, and heater settings. Relays are used to link these devices to the input and output ports of the circuit board. This Design is affordable, adaptable, and makes use of cutting-edge equipment. An easier method of system installation is made possible by the control board's use of wireless Bluetooth connectivity. The method was successfully constructed and run.

2.2 Problem Statement

It's an era of automation. When we talk about automation, one and most important topic that comes up is about Security of the system. We see that Security is inextricably linked with our smart homes and regular life. People already write the paper and do a lot of work to implement the security system and also work for enhanced the security system. We find that lot of technology and techniques uses for establishing a security system and enhancing security systems. Here our work is about combining the best and most effective technologies and techniques and avoiding redundant things in a world of comprehensive security systems. We are going to propose that kind of system which will ensure all the security features with an affordable price point. In a technical word we are solving

- Making the system comprehensive
- Improving performance
- Reducing the cost

2.3 Summary

After reviewing the aforementioned earlier work and thinking about all of these factors, the comprehensive smart home security system developed by us is the use of a simple, easy-to-use, cost-effective, and easy-to-maintain system that we solve the problem of ensuring the Security of our necessary places.

Chapter 3

System Description

3.1 Introduction

Security system or protection of our places is not a new team. From the very primitive age people protect themselves with various way. Now this era is an era of electronics that's why security system also change into digital and smarter day by day. Our work and project are also introduced same as our era is going through. In our project we use some electronics devices and elements which is supper available in country. In our project someone how is know the used pin code for enter a house he or she can easily enter house and door will be automatically closed after sometimes later when someone enter our house or places. In his project leaser system also help to improve security system and given extra protection for any person or any kind of animal from entering our place by windows. Our used microcontroller is available in market, and it is also low price from other microcontroller and easy to use for upload code. But when this project is constructing all the electronics product are in little bit high price because of pandemic situation of CORONA virus and War between some of countries.

3.2 Functional Block Diagram:

The overall operation of the project is divided into two section and block diagram cross ponding to these two sections are combined with given below-

3.3 The Function Block Diagram for GSM System:

functional Block Diagram is use for commination with microcontroller, keypad, Leaser, GSM (Global System for Mobile Communication) module are shown below

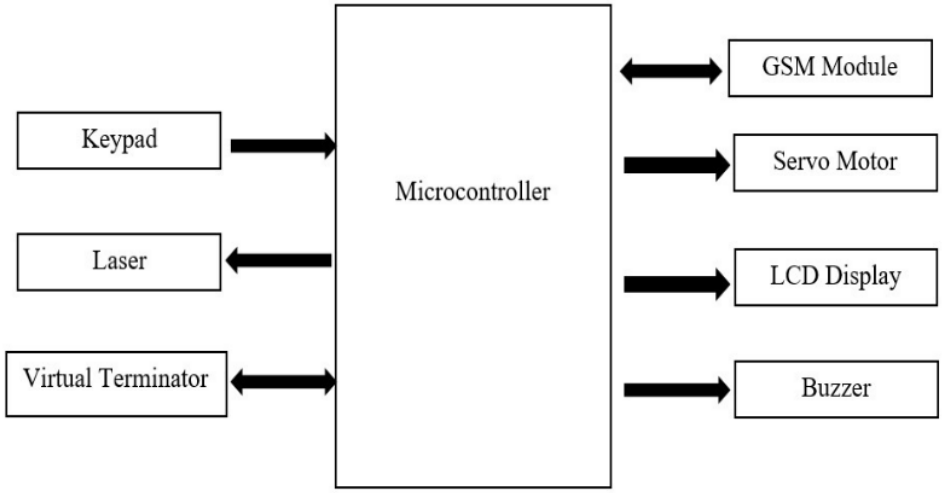

Figure 3.1: Block Diagram

3.4 Flow chat

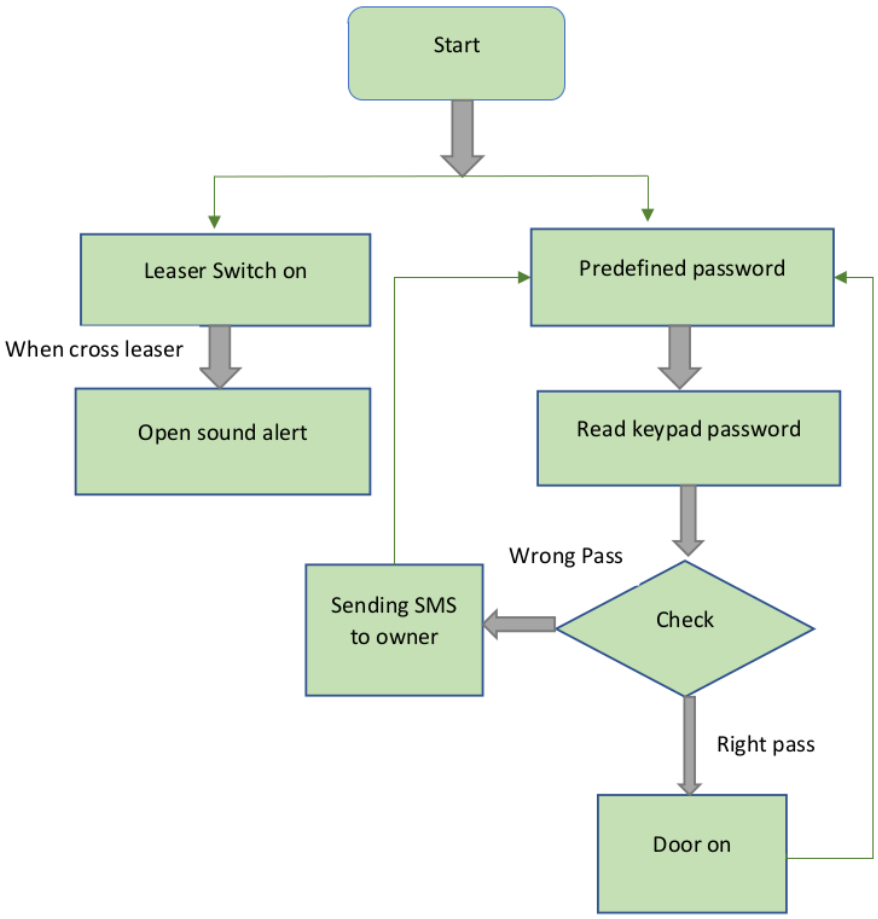

Figure 3.2: Flow chat of the system

3.5 Circuit Diagram

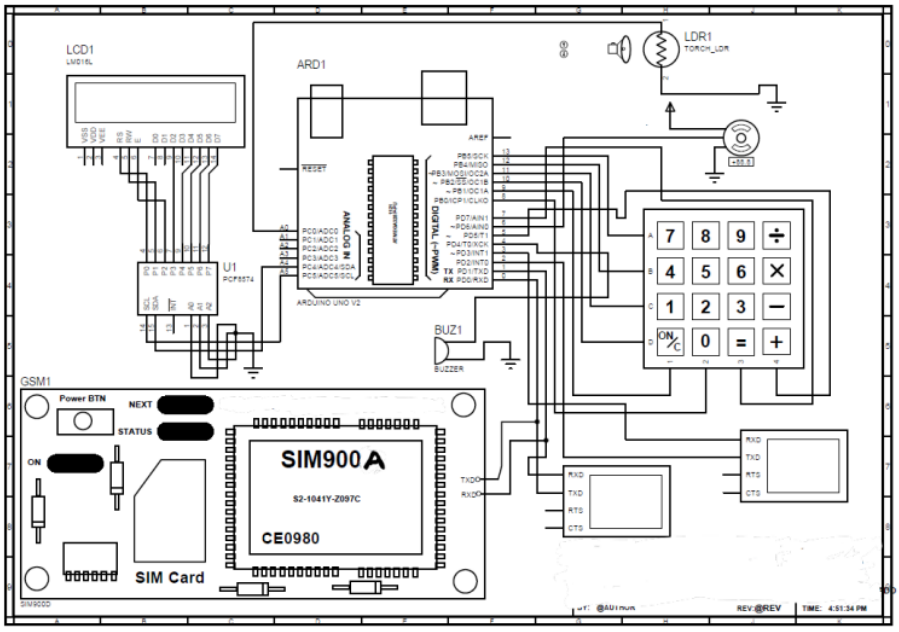

Figure 3.3 Circuit Diagram

Hardware Description

3.6 Microcontroller

A microcontroller board called Arduino Uno is based on the ATmega328P. (datasheet). It contains a 16 MHz ceramic resonator (CSTCE16M0V53-R0), 6 analog inputs, 14 digital input/output pins (of which 6 may be used as PWM outputs), a USB port, a power connector, an ICSP header, and a reset button. It comes with everything needed to run the microcontroller; to get started, just use a USB cable to connect it to a computer, or an AC-to-DC converter or battery to power it. You can experiment with your Uno without being very concerned that you'll make a mistake; in the worst case, you can change the chip with a few dollars and try over.

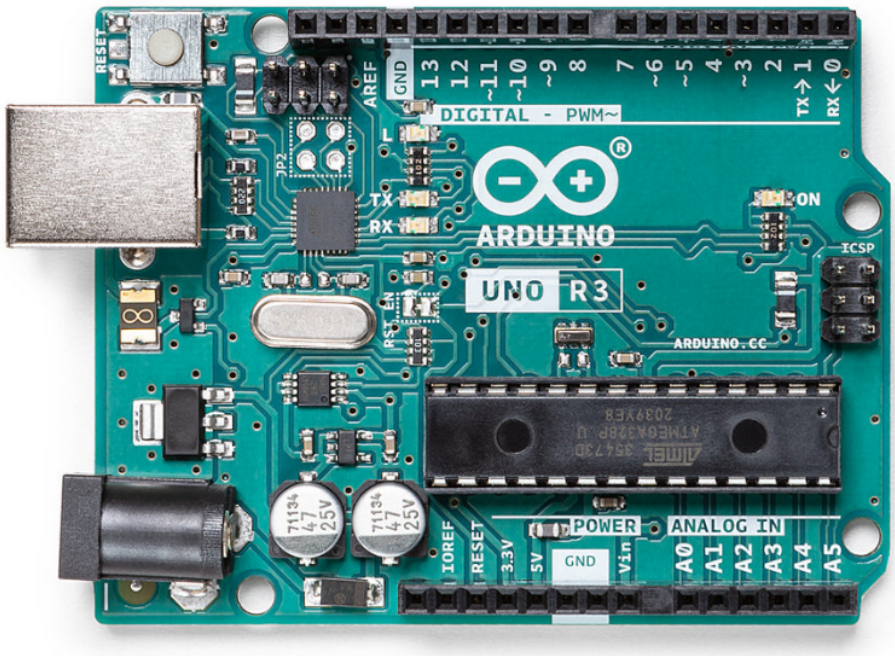

Figure 3.3: Arduino Uno Microcontroller

3.7 Keypad

A 4x4 keypad contains 8 connections in total, 4 of which are linked to the column and the other rows of the switch matrix. One of the columns and the rows are connected to another when a certain button is pushed.

Figure 3.4: Keypad 4*4

3.8 Leaser Transmitter module

The Laser Transmitter module can emit lasers, as its name indicates. A laser is a device that produces light using an optical amplification technique based on the electromagnetic radiation's stimulated emission. Lasers emit coherent light, setting them apart from other light sources.

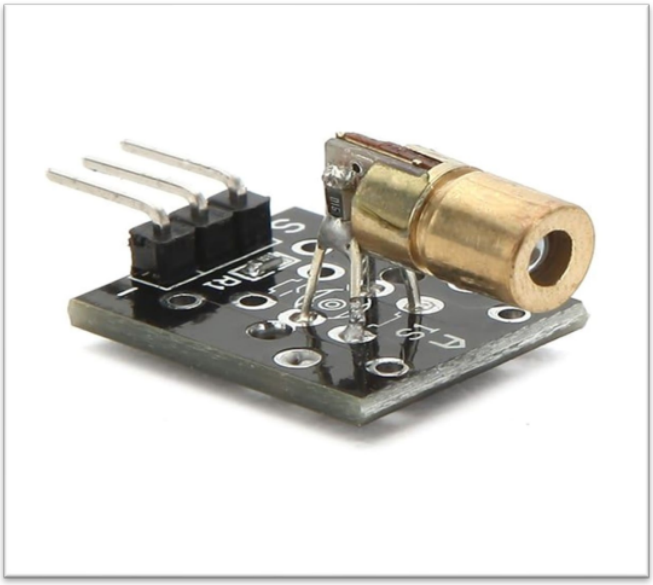

Figure 3.5: Leaser Transmitter Module

3.9 LCD

LCD full form Liquid Crystal Display. With a 16x2 LCD, there are 2 lines that can each display 16 characters. Each character on this LCD is presented using a 5x7 pixel matrix. The 224 distinct letters and symbols that may be shown on the 16 x 2 smart alphanumeric dot matrix display. The Command and Data registers on this LCD are its two registers.

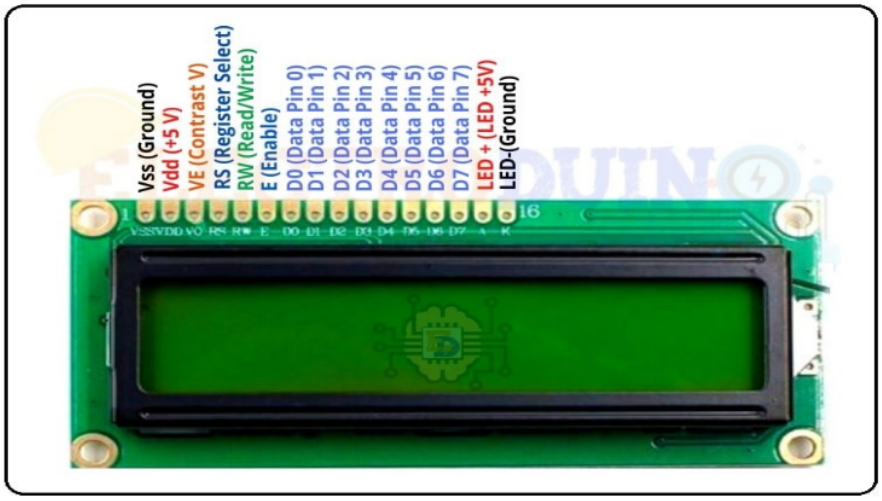

Figure 3.6: LCD 16*2

3.10 Servo Motor

Servo motors, or "servos," are electrical gadgets and rotating or linear actuator that precisely spin and push machine parts. Servos are mostly utilized for linear or angular position, as well as for a set speed and acceleration.

Figure 3.7: Servo Motor

3.11 I2C Module

I2C is a synchronous, multi-slave, multi-master, single-ended serial bus with packet switching. Multiple chips can attach to the same bus, for example. Serial Data Line (SDA) and Serial Clock Line (SCL), both bidirectional open collector and open drain lines that are pushed up with resistors, are the sole lines used by I2C.

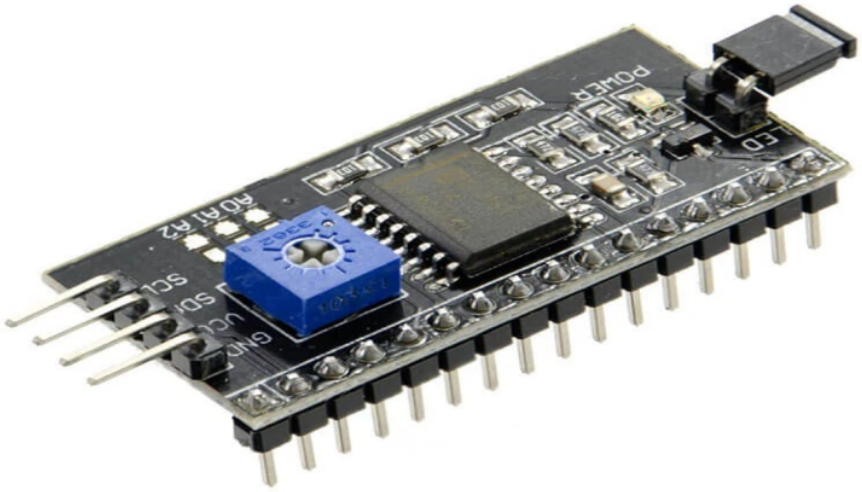

Figure 3.8: I2C Module

3.12 Breadboard power supply module

Breadboard power supply module the 3.3V/5V output MB102 Breadboard power distribution module interface is relatively simple. Connect the regulated or unregulated input across the DC barrel connector by mounting the board in a breadboard similar to the one seen above. By using the ON/OFF switch, turn on the board. In a perfect world, the power LED would be lighted.

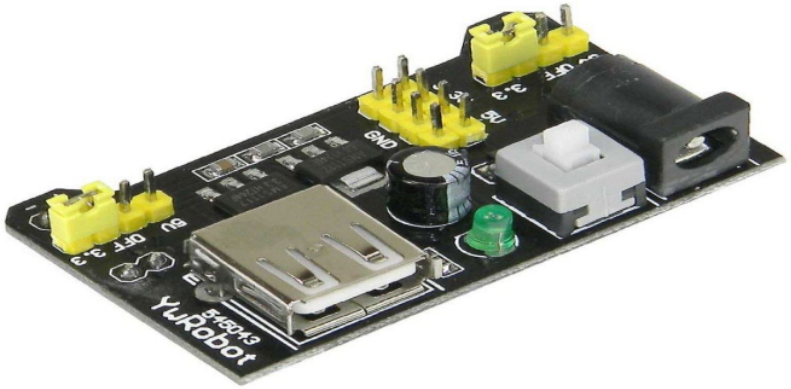

Figure 3.9: Breadboard Power Supply

3.13 GSM SIM900A

The wireless module SIM900A is incredibly small and dependable. This entire GSM/GPRS module is of the SMT variety, has an AMR926EJ-S core integrated single-chip CPU, and benefits pact dimensions and low-cost solutions.

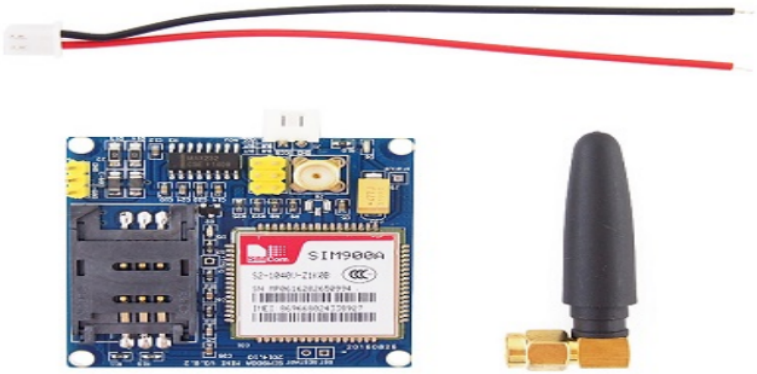

Figure 3.10: GSM SIM900

3.14 Why we use those equipment

In our project we use very common equipment because of availability. In a general sense when any product is available in market that mean we can get it reasonable price point. We use hare Arduino Uno as a microcontroller because it is easy to be coding, available in almost everywhere and easy to communicate with other devices. We use GSM SIM900A module for distance communication. We use it for better signaling in low-cost price. And our project another main equipment is laser. And it also very well-known equipment for advanced and enhanced system. For better security provide at a low price point we are not seeing any other device.

3.15 Description of operation

We connect all the equipment with our microcontroller (Arduino Uno). When someone enter password on the keypad display will show the result as * mark. If he/she enter correct password, then door will be open in few seconds. But if he/she does not use correct than GSM module will be activated, and an alert message or call will be sent to the owner. Owner will be identified when someone try to access in his/her house. Owner use laser system for better security purposes. When owner leave the house, he or she can activate laser. When someone break the system or door or window and enter the house the buzzer will be producing sound at the time of pass-through laser beam.

Chapter 4

Results and Discussion

4.1 Introduction

In this chapter we will discuss about output and final result of this project. Since there is no output curve or value so as a result, we use here several picture by taken from Mobile Phone.

4.2 Project Overview

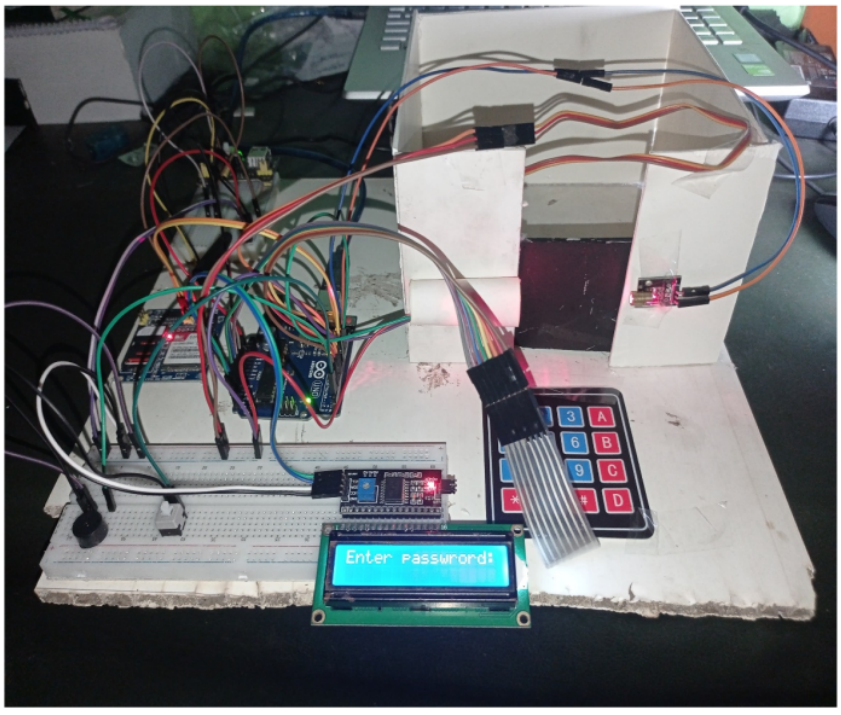

Figure 4.1: Front-side view

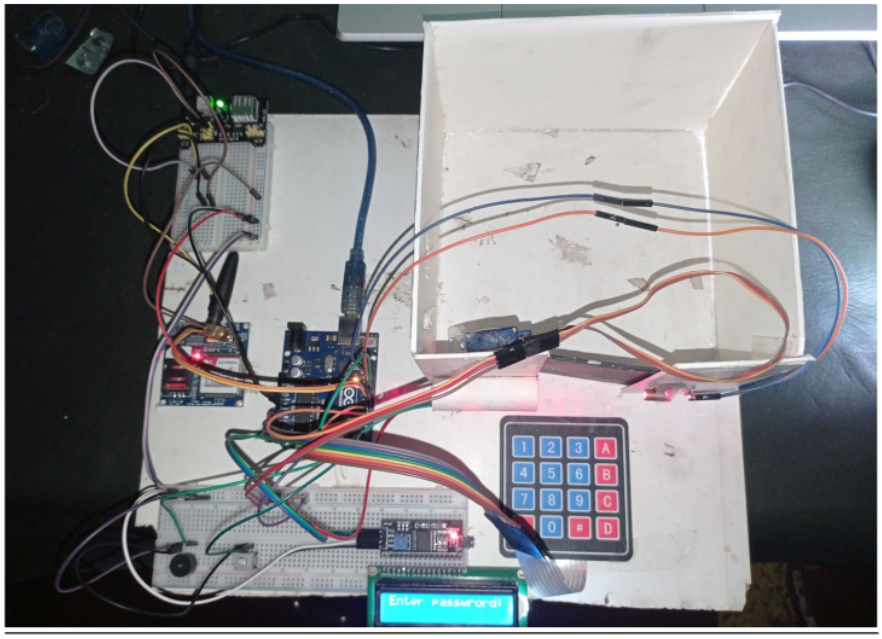

Figure 4.2: Up-side view

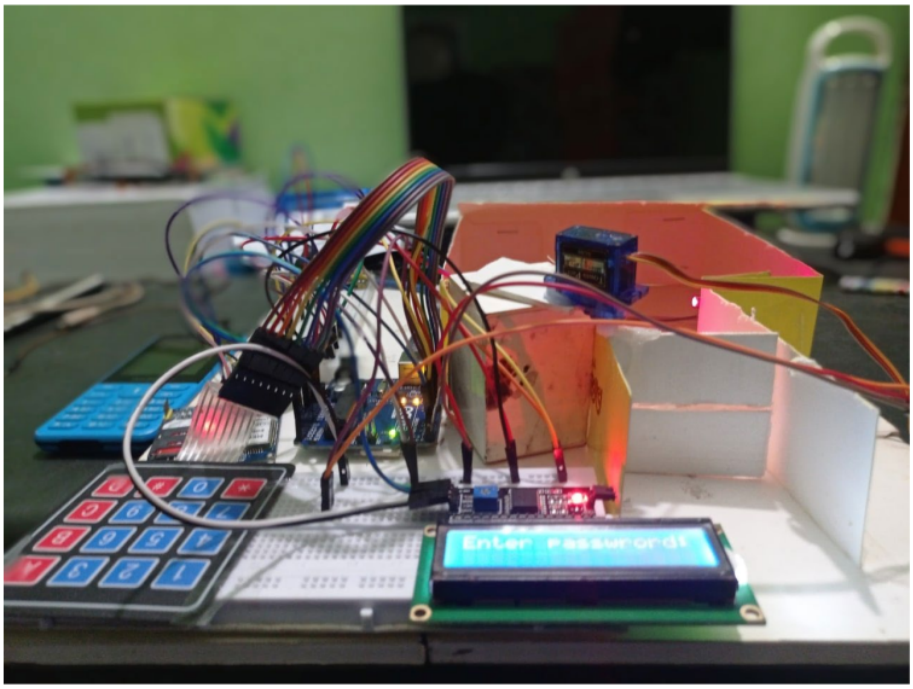

Figure 4.3: Project overview

4.3 Output

4.3.1 Running System

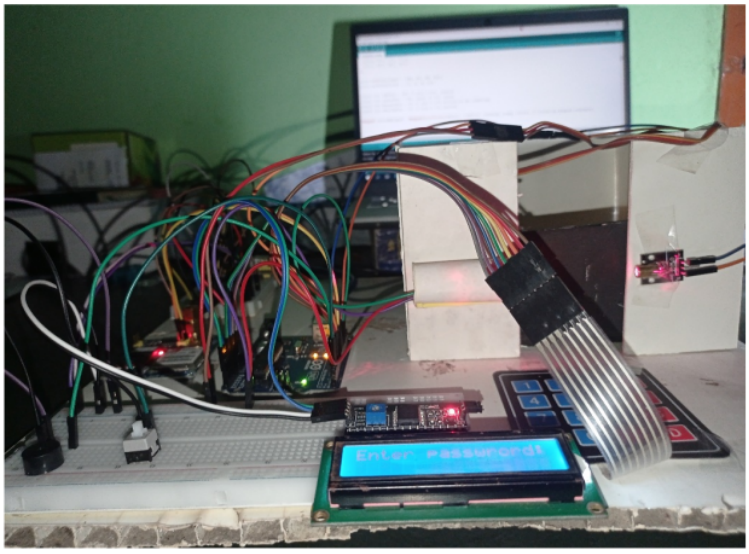

Figure 4.2: Output of running system

Figure 4.3: Input password

Figure 4.4: Automatically locking system

Figure 4.5: Showing wrong password

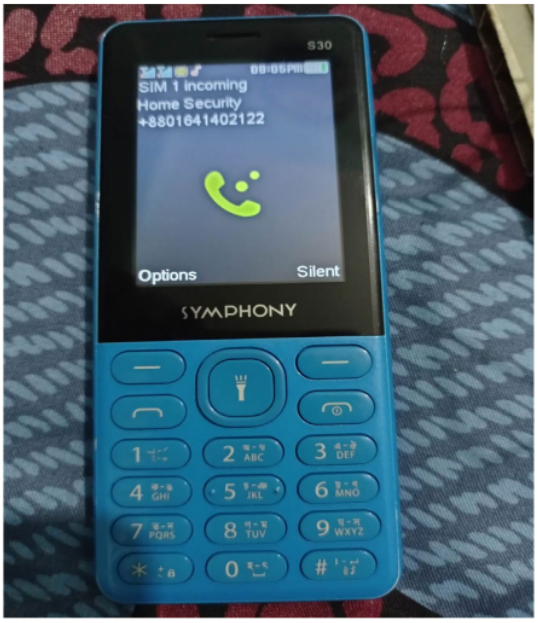

Figure 4.6: Call Alert form GSM

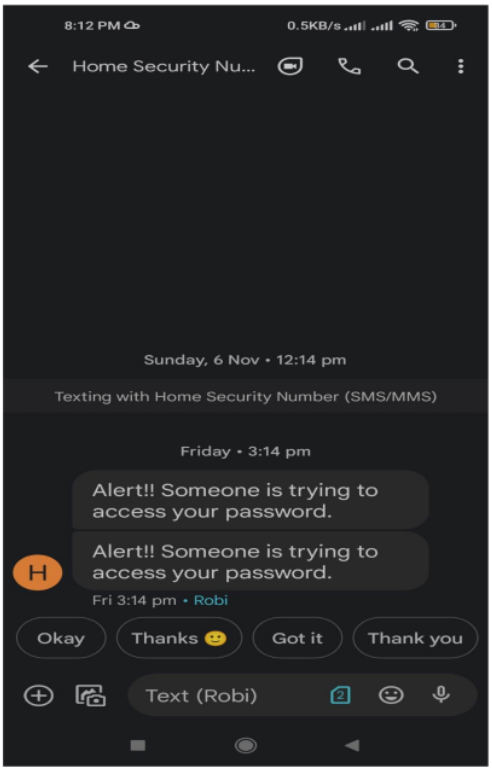

Figure 4.7: Message Alert form GSM

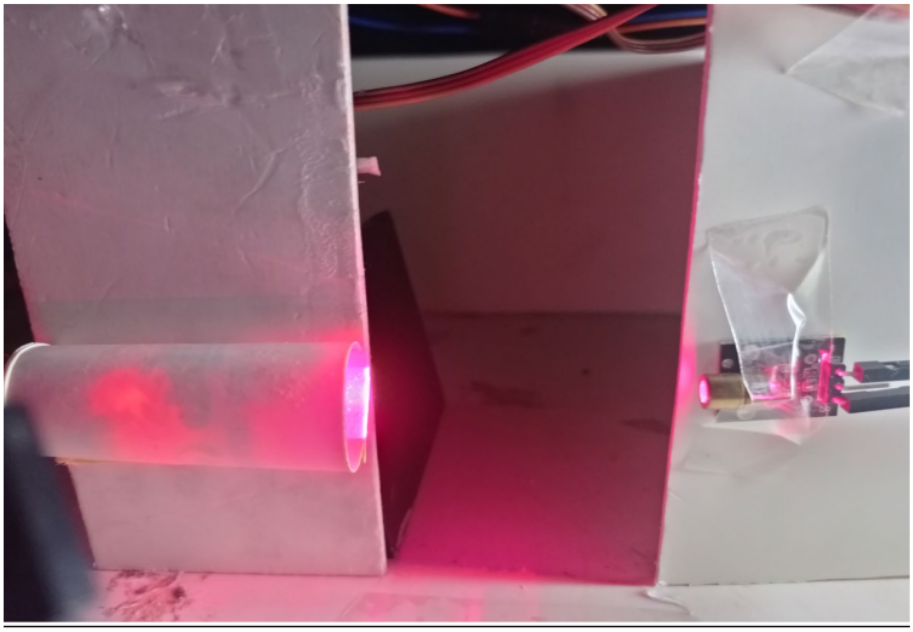

Figure 4.8: Laser System

4.4 Required software

- Proteus
- Arduino

4.4.1 Proteus Software

John Jameson, the company's chairman, created PC-B, the original version of what is now the Proteus Design Suite, for DOS in 1988. Support for Schematic Capture was added in 1990, and a migration to the Windows environment followed soon after. blended mode Microcontroller simulation was added to Proteus in 1998 after SPICE Simulation was initially included into the software in 1996. Shape-based autorouting was included in 2002, and 3D Board Visualisation was a significant product improvement in 2006. More recently, MCAD import/export was enabled in 2015 and a specific IDE for simulation was added in 2011. In 2017, support for high-speed design

was introduced. [1] While maintenance-based service packs are often delivered as needed, feature-led product releases are typically biennial.

4.4.2 Arduino Software

Arduino software may be used to program the Arduino Uno (IDE). The library now includes the keypad.h header file, which is necessary for the keypad to operate. An external hardware programmer is not necessary to upload fresh code to the Arduino Uno's ATMega328 because it may be preprogrammed with a bootloader. Additionally, utilizing Arduino ISP, it is possible to program the microcontroller without using the bootloader by using the ICSP (In Circuit Serial Programming) header. Any of the Uno digital pins can support serial communication thanks to the software serial library. The 12C and SPI protocols are also supported by the ATM328. The Arduino Uno board is made to be reset by software running on a connected computer, rather than needing a physical click of the reset button before an upload.

4.5 Discussion

We face lot of problem, but in the end we able to solve maximum problems. Our integrated job was to build such kind of system which is cost effective but comprehensive. We almost achieved this stage, but for the unitability of world electronics market most of the product price in kind a high. In our project we use very available components in our country market. When we were doing coding for Arduino keypad and GSM Module some of our code and libraries are conflicts with one another. Its takes few more time and research to solve this problem. And GSM Module is very sensitive in power, at first, we use low current power supply that’s why our GSM module are not initiating, and we cannot use it properly. After sometime later Alhamdulillah, we also solve this problem by delivering proper current supply.

4.6 Cost Analysis

We previously mention that in our project we use available and cost-effective product but pandemic situation for corona virus and war between some countries dollar rate is increasing randomly that's why some of the product we have to manage in little bit high price point.

SL No	Component Name	Price in BDT(Taka)
01	Arduino Uno	1000
02	GSM SIM900A	1100
03	I2C	250
04	Breadboard	100x2
05	Breadboard Power Supply	100
06	Laser Transmitter	100
07	LDR	65
08	Buzzer	15
09	LCD	250
10	Connecting Wire	120
11	Power Adapter	340
	Total cost of our project	**3540**

Table 4.1: Product cost

4.6.1 Price Comparison with other system available in market

Available product	Price in Bdt
ZKTeco PL10R Smart Lock with Advanced RFID Technology	7900
ZKTeco HBL100B Hybrid Wireless Biometric Lock	27000
Realtime GL899 Glass Door Smart Lock	7000
ZKTeco TL100 Anti-Theft Fingerprint Lock with Touch Keypad	22500
ZKTeco GL300 Glass Door Lock	16500
SmartX WiFi Smart Door Lock	13150
Electronic Digital Door lock System	6500

Table 4.2: Cost Comparison

4.6.2 Cost Analysis Graph

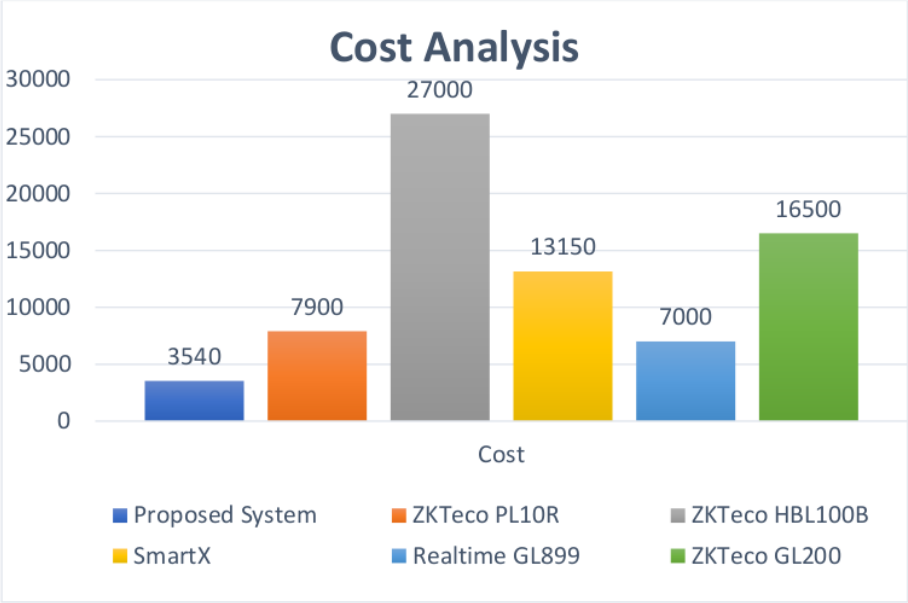

Figure 4.5: Graphical method for cost analysis

4.7 Performance Analysis

Hare, we add Different types of analysis with different perimeter. They are given below

Name of the system	System security	User Friendly	Upgradeability	System failure (50 trials)	Percentage of Error
Our proposed system	High	Yes	Yes	1	2%
Smart Lock with Advanced RFID	Low	Yes	Yes	2	4%
Anti-Theft Fingerprint Lock	Very High	Yes	No	8	16%
Digital Door lock System	Low	No	Yes	1	2%

Table 4.3: Comparative analysis of performance

4.8 Summary

The overall findings of this project are detailed in this chapter. Since there is no output curve or value, this chapter contains numerous images of the project's output. This chapter also discusses comparisons between the proposed system and several prior systems. Our system very cost effective from other available products or system in our country.

Chapter 5

5.1 Conclusion

Comparing to other technologies this is most relevant and useful in the current society. As the rate of increasing social degradation day by day. It's an essential to remedy this kind of situation. For that reason, security is needed for everyone. This project is very efficient and useful to current society. In this we offer a comprehensive security system at affordable price point. Every level and ages people can use this system very easily. So, the outcome of this project is expected to be a sustainable efficient eco-friendly and cost-effective security system.

5.2 Future work

A biometric fingerprint scanner may be added to boost security. In the event of an accident, we may connect sensors like fire, LPG, and PIR motion detectors to the microcontroller so that the door would open automatically. We can connect a camera to the microcontroller so that it can take a photo of the burglar trying to get past the security. To improve safety, this straightforward circuit may be utilized in areas like the house. This project may also be used to control the switching of loads by password with a small adjustment. It may also be applied in businesses to guarantee permitted access to locations with high levels of security. This project also gives us

- Better security of homes
- Cost effective and budget friendly
- Eco friendly
- Easily usable for child and aged people (user friendly)
- Real time security
- Two step security system

5.3 References

[1] Qasim, H. H., Hamza, A. E., Ibrahim, H. H., Saeed, H. A., & Hamzah, M. I. (2020). Design and implementation home security system and monitoring by using wireless sensor networks WSN/internet of things IOT. International Journal of Electrical and Computer Engineering (IJECE), 10(3), 2617. https://doi.org/10.11591/ijece.v10i3.pp2617-2624

[2] Et.al, E. S. (2021). IOT based home security and automation using Google assistant. Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12(6), 117–122. https://doi.org/10.17762/turcomat.v12i6.1275

[3] H. Ali, M. (2019). IoT based security system and intelligent home automation multi monitoring and control systems. International Journal of Robotics and Automation (IJRA). https://doi.org/10.11591/ijra.v8i3.pp205-210

[4] Kaushal , A., E.Sasikala, & Gaur, A. (2020). Iot based Home Security and Automation using Random Number(Password) Generators and Face Detection. International Journal of Recent Technology and Engineering (IJRTE). https://doi.org/10.35940/ijrte.A2020.059120

[5] Wahyuni, R., Rickyta, A., Rahmalisa, U., & Irawan, Y. (2021). Home Security Alarm Using Wemos D1 and HC-SR501 Sensor Based Telegram Notification. Journal of Robotics and Control (JRC). https://doi.org/10.35940/ijrte.A2020.059120

[6] Majeed, R., Abdullah, N. A., Ashraf, I., Zikria, Y. B., Umer, M., & Mushtaq, M. F. (2021). An Intelligent, Secure, and Smart Home Automation System. Hindawi Scientific Programming. https://doi.org/10.1155/2020/4579291

[7] Taryudi, Adriano, D. and Ciptoning Budi, W., 2018. Iot-based Integrated Home Security and Monitoring System. Journal of Physics: Conference Series, 1140, p.012006.

[8] Somraj Chowdhury, Rajkumar Jain, Thimmaiah M. B., Prajwal R., Rakesh K. R.. IoT based home automation and security systems: A literature survey, International Journal of Advance Research, Ideas and Innovations in Technology, www.IJARIIT.com.

[9] A. Ahmed, “Internet of things and smart home security,” Technology Reports of Kansai University, 27-Dec-2020. [Online]. Available: https://www.academia.edu/44783049/Internet_of_Things_and_Smart_Home_Security .

[10] Sinha Chowdhury, S., Sarkar, S., Syamal, S., Sengupta, S., & Nag, P. (2020). IoT Based Smart Security and Home Automation System. IEEE.

[11] Ihsan Abdulla, A., Sinali Abdulraheem, A., Abid Salih, A., A. M. Sadeeq, M., Jamel Ahmed, A., M. Ferzor, Sardar, B., Sardar, M. F., & Ibrahim Mohammed, S. (2020). Internet of Things and Smart Home Security. Technology Reports of Kansai University.

[12] Wadhwani, S., Singh, U., Singh, P., & Dwivedi, S. (2018). Smart Home Automation and Security System using Arduino and IOT. International Research Journal of Engineering and Technology (IRJET).

[13] J. A, R. Nagarajan, K. Satheeshkumar, N. Ajithkumar, P. Gopinath and S.Ranjithkumar, "Intelligent Smart Home Automation and Security System Using Arduino and Wi-fi", International Journal Of Engineering And Computer Science, 2017.

[14] Baig, F., et al. (2012). "Controlling home appliances remotely through voice command." arXiv preprint arXiv: 1212.1790.

[15] Azni, M. N., et al. (2016). Home automation system with android application.

Electronic Design (ICED), 2016 3rd International Conference on, IEEE.

[16] Van Der Werff, M., et al. (2005). "A mobile-based home automation system."

[17] Hasan, N., et al. (2013). Design and implementation of touchscreen and remote control based home automation system. Advances in Electrical Engineering (ICAEE), 2013 International Conference on, IEEE.

[18]. Design and implementation of a G$M based remote home security and appliance control system. Advances in Electrical Engineering (ICAEE), 2013 International Conference on, IEEE.

[19]. Raheem, A. K. K. A. "Bluetooth Based Smart Home Automation System using Arduino UNO Microcontroller."

[20]. Android based smart home system with control via Bluetooth and internet connectivity. Consumer Electronics (ISCE 2014), The 18th IEEE International Symposium on, IEEE.

[21]. Mowad, M. A. E.-L., et al. (2014). "Smart home automated control system using android application and microcontroller." International Journal of Scientific & Engineering Research 5(5): 935-939.

[22]. Piyare, R. and S. R. Lee (2013). "Smart home-control and monitoring system using smart phone." ICCA, ASTL 24: 83-86.

[23]. Piyare, R. and M. Tazil (2011). Bluetooth based home automation system using cell phone. Consumer Electronics (ISCE), 2011 IEEE 15th International Symposium on, IEEE.

[24]. Jadhav, M. K., et al. (2017). "Automatic Street Light Control System." Imperial Journal of Interdisciplinary Research 3.

5.4 Appendix

5.4.1 Source code for this project

```
#include <Keypad.h>
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
#include <Servo.h>
#include <SoftwareSerial.h>


LiquidCrystal_I2C lcd(0x27, 16, 2);


SoftwareSerial mySerial(10, 9); //SIM900A Tx & Rx is connected to Arduino
#10 & #9


Servo myservo;
int pos = 0; // position of servo motor



#define passwordsize 5   // length of password.
char Masterpass[passwordsize] = "5566";   //set password.
char Data[passwordsize];
byte currentposition = 0;
char customKey;



const byte rows = 4; //define the number of rows
const byte cols = 4; //define the number of columns.


char keys[rows][cols] = {
  {'7', '8', '9', 'A'},
```

```
  {'4', '5', '6', 'B'},
  {'1', '2', '3', 'C'},
  {'C', '0', '#', 'D'}
};

byte rowPins[rows] = {A0, A1, A2, A3};
byte colPins[cols] = {7, 5, 4, 3};

const int ldrPin = 12; // pin 12 for  sensor
const int laserPin = 13; //pin 13 for laser
const int buzzerPin = 2; // pin 2 for action to do someting
const int switchPin = 1; // pin 1 for switch

Keypad customkeypad = Keypad(makeKeymap(keys), rowPins, colPins, rows,
cols); // Creating Keypad instance.



void setup() {
  // put your setup code here, to run once:

  //Begin serial communication with Arduino and Arduino IDE (Serial Monitor)
  Serial.begin(9600);
  lcd.begin();
  myservo.attach(6);
  //Begin serial communication with Arduino and SIM800L
  mySerial.begin(9600);

  pinMode(switchPin, INPUT); //Set Switch pinmode
  pinMode(ldrPin, INPUT);//define detect input pin
  pinMode(buzzerPin, OUTPUT);//define ACTION output pin
```

```
 pinMode(laserPin, OUTPUT); //Set laser pinmode as output
}

void loop()
{
 // put your main code here, to run repeatedly:

 lcd.setCursor(0, 0);
 lcd.print("Enter passwrord: ");
 customKey = customkeypad.getKey();

 if (customKey)
 {
  lcd.setCursor(currentposition, 1);
  lcd.print(customKey);
  Data[currentposition] = customKey;
  lcd.setCursor(0, 1);
  for (char Data = 0; Data <= currentposition; ++Data)
  {
   lcd.print("*");
  }
  currentposition++;
 }
 if (currentposition == passwordsize - 1)
 {
  lcd.clear();
  lcd.setCursor(0, 0);
  if (!strcmp(Data, Masterpass))
  {
   lcd.setCursor(0, 0);
```

```
    lcd.print("Password Matched");
    armservo();
   }

   else
   {
    lcd.setCursor(0, 0);
    lcd.print("Wrong Password");
    MakeCall();
    //      SendSMS();
    //      delay(1500);
    //      currentposition = 0;
   }

   delay(1000);
   currentposition = 0;
  }

  //-------For laser on off-----
  laserSecurity();
}

//-----------//
void armservo()
{
  for (pos =75; pos >= 0; pos -= 5) // open the door
  {
   myservo.write(pos);
   delay(5);
  }
```

```
  delay(1000);
  counterbeep();
  delay(1000);

  for (pos = 0; pos <= 75; pos += 5) // close the door
  { // in steps of 1 degree
   myservo.write(pos);
   delay(5);
   //    currentposition = 0;
   //    lcd.clear();
  }
  currentposition = 0;
  lcd.clear();
}
//--------------Function 5 - Count down------------------//
void counterbeep()
{
  delay(200);
  lcd.clear();
  lcd.setCursor(2, 15);
  lcd.println(" ");
  lcd.setCursor(2, 14);
  lcd.println(" ");
  lcd.setCursor(2, 0);
  delay(200);
  lcd.println("GET IN WITHIN:::");
  lcd.setCursor(4, 1);
  lcd.print("5");
  delay(1000);
  lcd.clear();
```

```
lcd.setCursor(2, 0);
lcd.println("GET IN WITHIN:");
delay(1000);
lcd.setCursor(2, 0);
lcd.println("GET IN WITHIN:");
lcd.setCursor(4, 1); //2
lcd.print("4");
delay(1000);
lcd.clear();
lcd.setCursor(2, 0);
lcd.println("GET IN WITHIN:");
delay(1000);
lcd.setCursor(2, 0);
lcd.println("GET IN WITHIN:");
lcd.setCursor(4, 1);
lcd.print("3");
delay(1000);
lcd.clear();
lcd.setCursor(2, 0);
lcd.println("GET IN WITHIN:");
delay(1000);
lcd.setCursor(2, 0);
lcd.println("GET IN WITHIN:");
lcd.setCursor(4, 1);
lcd.print("2");
delay(1000);
lcd.clear();
lcd.setCursor(2, 0);
lcd.println("GET IN WITHIN:");
delay(1000);
```

```
  lcd.setCursor(4, 1);
  lcd.print("1");
  delay(100);
  lcd.clear();
  lcd.setCursor(2, 0);
  lcd.println("GET IN WITHIN::");
  delay(1000);
  lcd.clear();
  lcd.setCursor(2, 0);
  lcd.print("RE-LOCKING");
  delay(100);
  lcd.setCursor(12, 0);
  lcd.print(".");
  delay(100);
  lcd.setCursor(13, 0);
  lcd.print(".");
  delay(100);
  lcd.setCursor(14, 0);
  lcd.print(".");
  delay(400);
  lcd.clear();
  lcd.setCursor(4, 0);
  lcd.print("LOCKED!");
  delay(440);
}

////--------For Calling------------/
void MakeCall()
{
  Serial.println ("Makeing calling");
```

```
  mySerial.println("ATD+8801857282724;");
  delay(1000);
  Serial.write("make call");
}

//--------For Sending Message----------/
//void SendSMS()
//{
//  mySerial.println("AT+CMGF=1"); // Configuring TEXT mode
//  delay(1000);
//  mySerial.println("AT+CMGS=\"+8801857282724\"");//change ZZ with country code and xxxxxxxxxx with phone number to sms
//  delay(1000);
//  mySerial.print("Alert!! Someone is trying to access your password."); //text content
//  delay(1000);
//  mySerial.write(26);
//}

//----------------For laser Security----
void laserSecurity()
{
  int ldrStatus = digitalRead(ldrPin);// read Laser sensor
  int switchPush = digitalRead(switchPin);

  if (switchPush == HIGH)
  {
    digitalWrite(laserPin, HIGH);
    if (ldrStatus == LOW)
    {
      digitalWrite(buzzerPin, LOW); // set the buzzer OFF
```

```
    Serial.println(ldrStatus);
   }
   else {
    digitalWrite(buzzerPin, HIGH);
    Serial.println(ldrStatus); // Set the buzzer ON
   }
  }
  else
  {
   digitalWrite(laserPin, LOW);
  }
}
```

T181066.pdf

ORIGINALITY REPORT

8%	8%	3%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	github.com Internet Source	3%
2	dspace.iiuc.ac.bd:8080 Internet Source	1%
3	Submitted to International Islamic University Chittagong Student Paper	1%
4	forum.arduino.cc Internet Source	<1%
5	journal.umy.ac.id Internet Source	<1%
6	www.researchgate.net Internet Source	<1%
7	www.semanticscholar.org Internet Source	<1%
8	yrpipku.com Internet Source	<1%
9	www.vahealth.org Internet Source	<1%

10	www.ijrte.org Internet Source	<1 %
11	ph01.tci-thaijo.org Internet Source	<1 %
12	www.atlantis-press.com Internet Source	<1 %
13	eprints.utem.edu.my Internet Source	<1 %
14	www.ijariit.com Internet Source	<1 %
15	docs.neu.edu.tr Internet Source	<1 %
16	Submitted to Durban University of Technology Student Paper	<1 %
17	create.arduino.cc Internet Source	<1 %
18	Cristina Stolojescu-Crisan, Calin Crisan, Bogdan-Petru Butunoi. "Access control and surveillance in a smart home", High-Confidence Computing, 2022 Publication	<1 %
19	Yong Tae Park. "Smart digital door lock for the home automation", TENCON 2009 - 2009 IEEE Region 10 Conference, 11/2009 Publication	<1 %

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		

T181066.pdf

GRADEMARK REPORT

FINAL GRADE

/0

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12

PAGE 13

PAGE 14

PAGE 15

PAGE 16

PAGE 17

PAGE 18

PAGE 19

PAGE 20

PAGE 21

PAGE 22

PAGE 23

PAGE 24

PAGE 25

PAGE 26

PAGE 27

PAGE 28

PAGE 29

PAGE 30

PAGE 31

PAGE 32

PAGE 33

PAGE 34

PAGE 35

PAGE 36

PAGE 37

PAGE 38

PAGE 39

PAGE 40

PAGE 41

PAGE 42

PAGE 43

PAGE 44

PAGE 45

PAGE 46

PAGE 47

PAGE 48

PAGE 49

PAGE 50

PAGE 51

PAGE 52

PAGE 53

PAGE 54

PAGE 55

PAGE 56