AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH (AIUB)

Microprocessor and Embedded Systems

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Human Detection & Alert Security System.

***Abstract*— -** This report presents a microcontroller security system which can be used in digital door, gate lock or windows. As we can know nowadays several crimes are increasing day by day, some thief stole lots of things by using the window. There are lots of security systems available in the market but those are very expensive and not available to everyone so we decided to make a cost efficient system that has the capability of sensing the motion of the people and it can also alert us by the alarm. We use Grove Ultrasonic sensor for measuring the distance of a human and display the distance into the LCD for visual display of information. There is another sensor Grove Luminance sensor module which will help us to detect night light and daylight. The basic idea of this project is if it is day then we can easily see the thief by sunlight so we need only alarm here we don't need any light in the day as it is only waste of electricity. But on the other hand, if it is night then our system will alert us by alarm and also light will glow up so that we can see the thief. And the whole process of this security system is controlled via an Arduino Uno.

Index Terms—Security, Sensor, Ultrasonic, Luminance, Microcontroller, LCD ,Arduino UNO.

INTRODUCTION

Nowadays security is one of the most important issues for any country. This is very essential to protect our home and our property. If we consider our country we can see that this kind of stolen incident happening every day. Because of that reason, lots of damage and loss occurring. The main reason for that kind of incident is a lack of security. Installing a home security system means to protect your home and valuables, and to keep your family safe from potential break-ins by burglars. Nowadays lots of security systems available in the market. But those are very expensive and some door locks being opened by the invalid user to invade homes and offices. Because of that reason we decided to make a security system which is more efficient and budget-friendly and also can be used on the side of the window.

In this paper we discussed the earlier researches that have been done on security, the Basic working process of our system, objective followed to complete the designed model. We showed the simulation of this system and also we describe the implementation of software in this paper. Social impact and future works are also described in this paper.

LITERATURE REVIEW

In this paper we design and implement a security system with an ultrasonic sensor module to enhance the system's reliability. Automated Security systems are commonly employed in smart homes, Offices to ensure owner safety and to avoid or reduce property loss. In the case of Security threat, these systems automatically notify owners about this emergency situation and may perform some proper actions to reduce the impact[2]. The smart home safety and security systems in the considered papers of this study are based on Arduino boards. These boards are open-source microcontroller- based boards developed by ‘‘Arduino.cc’’[3]. The microcontroller unit (MCU) will constantly check for the receiver output of the ultrasonic transmitter. If the receiver output is high, the MCU will perform distance analysis of the object from the sensor using the fact that ultrasonic waves travel in air at 340m/s[4].

BASIC IDEA OF PROJECT

Here in figure 1, we represent the basic idea of our system. Here we can see that the ultrasonic sensor will take the input. Then if it detects any human in the range what we set in the condition it will show a message on the led screen and also generate an alarm.

Here ultra-sonic module is the main module of this security system. It will detect a human in front of it. If any human comes in a range of 100 cm then it will show a message and also create a warning by ring the alarm. A light will also glow up to see the thief.

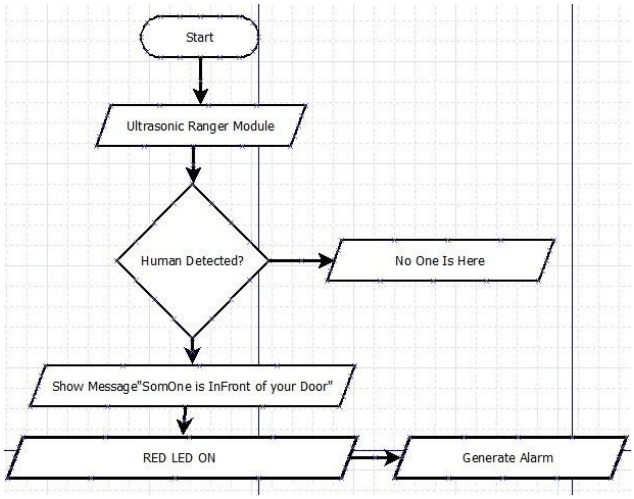

Figure 1: Block diagram of Security process

SOFTWARE IMPLEMENTATION

We implement this full project by using simulation in Proteus 8.9 professional. Here we draw a flowchart basis project. There are One is Schematic Diagram and another one is visual Designer.

At first, we designed our schematic capture by using our required components. As our project is Arduino based we took Arduino Uno first. Then we use two sensor modules in our project one is the Ultrasonic ranger module and the one is the grove luminance sensor module. For output, we use four types of the buzzer, and to generate an alarm we used a buzzer.

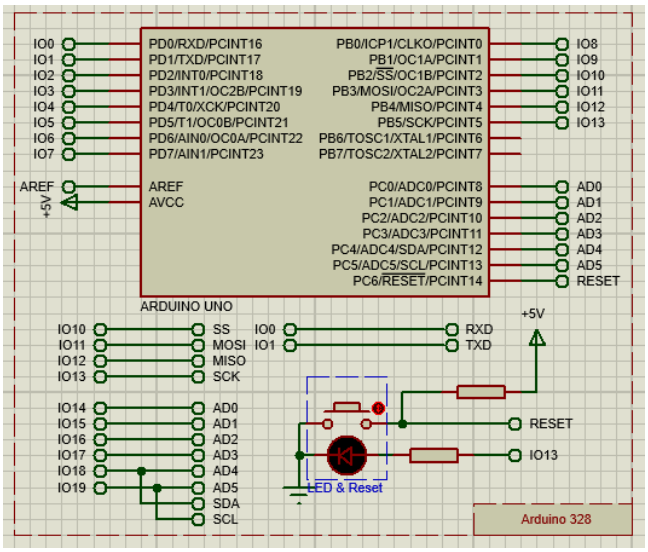

Figure 2: Arduino Uno

Figure 2 is Arduino UNO which will control our system

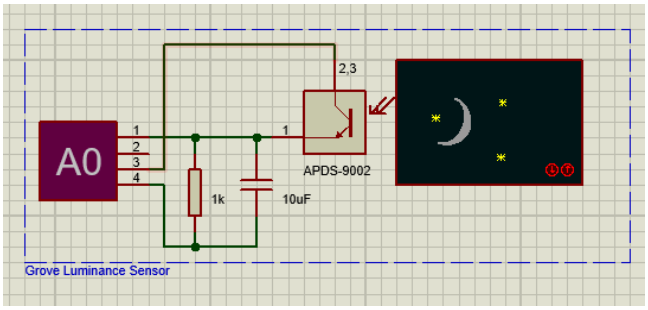

Figure3: Grove Luminance Sensor

In figure 3 this is the grove luminance sensors module. We use it to detect day and night.

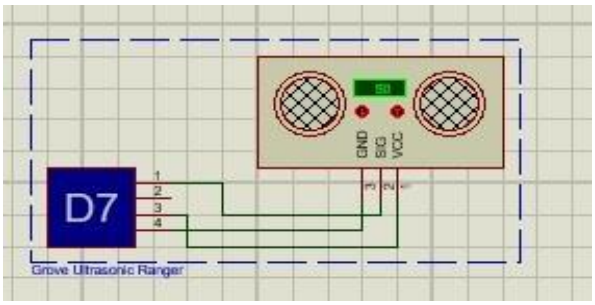

Figure 4: Grove Ultrasonic Ranger

In figure 3, this is the Grove Ultrasonic Ranger module.
We use it to detect one's activity. Like we set here a condition to detect a people ,how much distance he locate from my house
.Based on his or her distance we set some led and a buzzer.

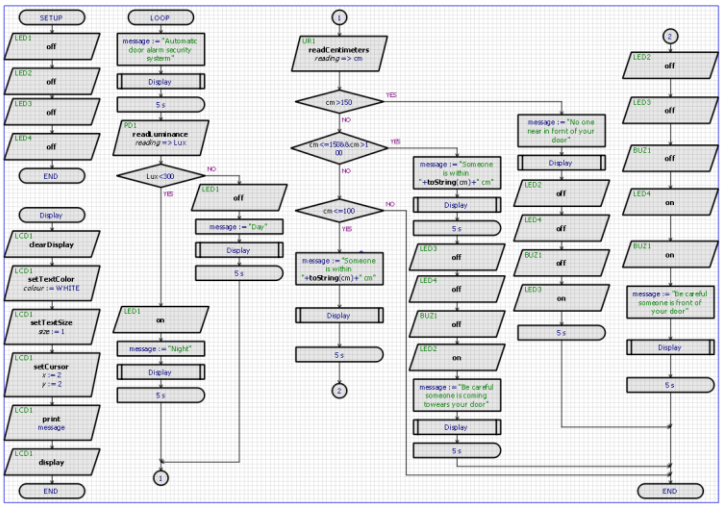

Figure 5: Visual Design

Figure 4, shows the visual design of the whole project. We designed this whole model based on some condition by using those sensor module. Here if it someone is 150 cm then OLED display will show us no one is coming and a green led will glow. Then if someone came less than 150 cm and greater than 100 cm then OLED display will show us " someone is coming" and a blue led will turn on. Then if someone came less than 100 cm then OLED display will show the message "someone is in front of our door" and a red led will turn on and also it will generate a quick alarm.

Result & Discussion

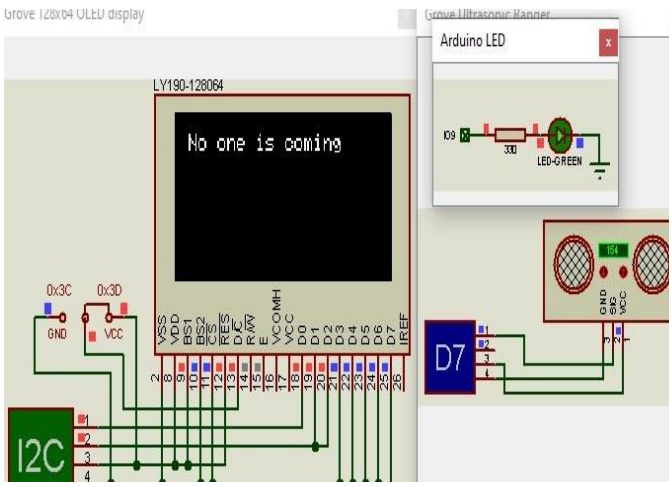

Figure 5: Distance > 150

Here figure 5, shows us that if someone is greater than 150 cm then OLED display shows us that on one is coming and it glows an green led.

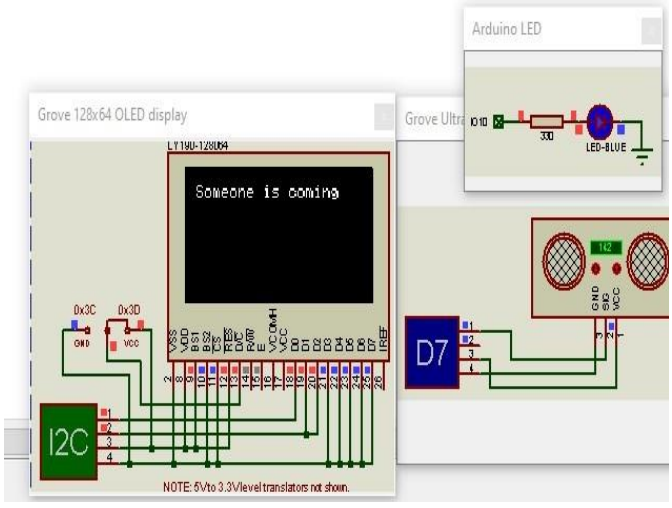

Figure 6: 100 < Distance < 150

Here in figure 6 it shows us that if someone comes less than 150 cm then OLED display will show someone is coming and a blue led will turn on as a warning.

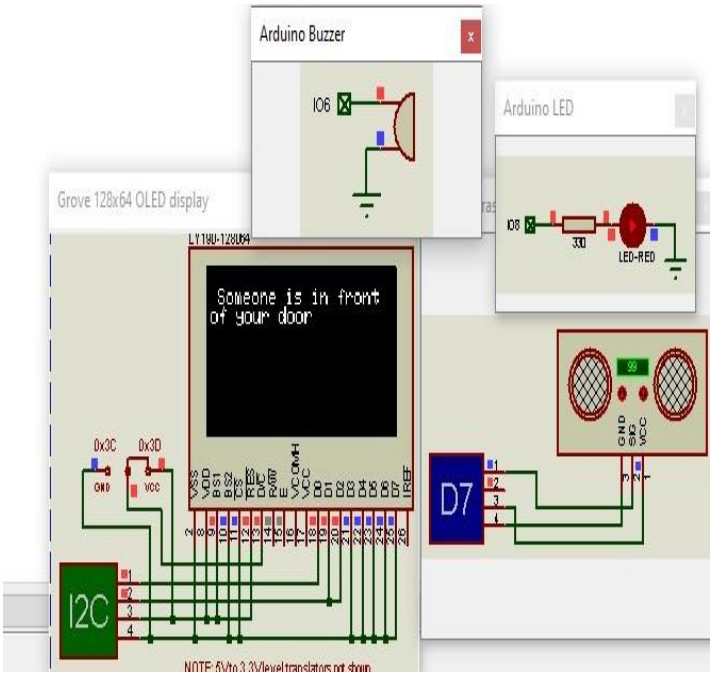

Figure 7: Distance < 100

Here if someone comes less than 100 cm then OLED display will show us that someone is in front of your door and red led will turn on and for warning the alarm will turn on.

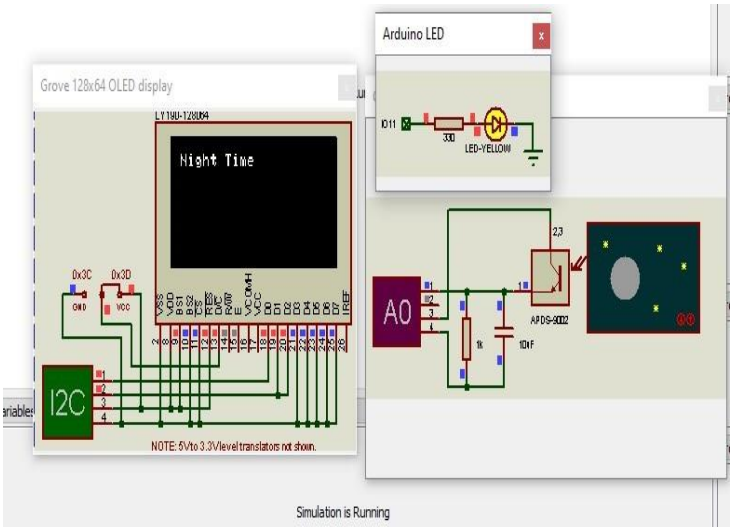

Figure 8: LUX<300(Night Mode)

As in night it is difficult to see who really came in front of door. So at night a yellow led will glow and OLED display will show that this is night time. But in morning this led will turn off so that electricity will not waste.

Future Work / Society Impact

As we know that the rate of crime in the world is increasing day by day due to unemployment, poverty, economic recession, and social line equality. Most of the crimes that are usually done are abduction, robbery, theft, and housebreaks. So to protect our home, family, and property we can easily use this kind of security system. As our system is very cost-efficient so we think anyone can effort this. We can use it in front of our door and also the window so that if any thief comes in the window this system will alert us. It will also save our electricity as it turns off the light automatic in the morning. So I think for security purposes it can make a great impact on our society.

As future work to establish more security pin or password can be added in this project. Face recognition and voice recognition can also be added to this system. For notification upgrade, image or record audio/video can be added in this system

CONCLUSION

Our project aimed to make a cost efficient security system. Then we thought to make a system that can give us an alert when someone comes near the door or window. Then we thought if an OLED display shows us the distance of the object then it will become more efficient so that wee added an OLED display in our system finally we thought generally night guards and also we forget to turn off the security light which is used in front of our house or on the balconies. So that if our system automatically turns off this light then it will save electricity also. This is how we designed our system.

There are some disadvantages like maintenance of this kind of system is very difficult and as we didn't implement it in real life yet so we don't sure about serviceability.

Thus there are some disadvantages but we think our system can make a great impact on security purpose.

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