AUTOMATIC INTRUDER SPOTTER(AIS)

A Course Project report Submitted in partial fulfillment of the Academic requirements for the award of the degree of Bachelor of Technology

Submitted by

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UNDER THE COURSE

SOCIAL INNOVATION IN PRACTICE

CENTRE FOR ENGINEERING EDUCATION RESEARCH
CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)
(NAAC Accredited with 'A+' Grade & NBA Accredited)
(Approved by AICTE, Permanently Affiliated to JNTU Hyderabad)
KANDLAKOYA, MEDCHAL ROAD, HYDERABAD-501401

2021-22

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CERTIFICATE

This is to certify that the report entitled **"AUTOMATIC INTRUDER SPOTTER(AIS)"** is Bonafide work done by P Manvitha (20H51A62A9), S Susrutha (20H51A62B2), S Aneesh (20H51A62B4), V C Sai Abhishek (20H51A62B6), Y Sai Naveen Kumar (20H51A62B8) of II B.Tech, in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology, submitted to Centre for Engineering Education Research, CMR College of Engineering & Technology, Hyderabad during the Academic Year 2021-22.

Names of the Project Coordinators:

1. Kayyam Sathish, Assistant professor
2. K Raju, Assistant professor
3. MD. Asma, Assistant professor

Dr.A.Kotiswar
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DECLARATION

We, the students of II B.Tech IV Semester of Centre for Engineering Education Research, CMR COLLEGE OF ENGINEERING AND TECHNOLOGY, Kandlakoya, Hyderabad, hereby declare, that under the supervision of our course coordinators, we have independently carried out the project titled **"AUTOMATIC INTRUDER SPOTTER(AIS)"** and submitted the report in partial fulfillment of the requirement for the award of Bachelor of Technology in by the Jawaharlal Nehru Technological University, Hyderabad (JNTUH) during the academic year 2021-2022.

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ACKNOWLEDGEMENT

We are obliged and grateful to thank Dr.A.Kotiswar Head (CEER), CMRCET, for his cooperation in all respects during the course.

We would like to thank the Principal of CMRCET, Dr.V.A.Narayana, for his support in the course of this project work.

Finally, we thank all our faculty members and Lab Assistants for their valid support.

We own all our success to our beloved parents, whose vision, love and inspiration has made us reach out for these glories.

ABSTRACT

We are providing a home security for the theft by implementing automatic intruder spotter using ultrasonic sensor and SIM 900a. Now-a-days, the IOT plays a major role in many fields by automating and application. This principle is used to detect the stranger entering into the house. Ultrasonic sensor is used to detect the motion of an intruder or a burglar. If the motion is detected toa owner, then sends an alert call through a SIM900a. The phone call is to alert the owner about the stranger action. The proposed work provides a smart home automation system for theft detection. The house owner can be alert and get the protection to their house.

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1. INTRODUCTION

Innovative technologies are being developed by people to improve the quality of human lives in this age, and all are using technological advances in many ways. One of the ways is security System. In golden days people secure their hoes by using the locks and keys. A due unsecured environment such system can be easily be broken and owners are aware of it. Today in the modern world the security measures are a very important factor regarding its safety. So, the security level has moved on to the next level where all the control regarding the lies is regulated by the Owners hand. Researchers have been conducted regarding the automated and security of the house household items. One of the main developed systems is Home Security System which is a most superior protective device in the recent world. It is a paramount home security which provides affordable, genuine and effective at the same time in this fast-moving competitive world. In this modern developed network society, each and every individual can access their information easily anytime from anywhere. On the other, they can face the risk that others can also hack into their personal and their sensitive information. Due to this risk personal identification technology can differentiate between authorized and imposters which is now generating great interest among users.

Generally, for the sake of purposes, various security measures like PIN verification, identification card techniques are being used but currently, it can be mishandled and hacked. Due to the difficulty faced by the current home-based security and surveillance systems in providing information to the situation while the users being away from home. This paper we have discussed and tried to overcome this project which provides implementation of different features in the home security along with control of home automation using mobile and also provide user to add extra devices that provide them to keep track and record of intruder and direct alert call to corresponding following secure medium to ensure the very first safety towards environment.

The idea of domestic automation has been around since the past the late 1970s, but with the advancement of technology and services the human beings expectations of what a domestic should to and should be provided have changed lots through the direction of time and automation system. Some of the systems that has been designed and implemented being provided some various benefits and uses of advanced modern technology.

2. LITERATURE REVIEW

2.1 EXISTING SOLUTIONS:

1. Sadeque Reza Khan Et al proposed a home secure system which monitors the obstacle its touch, heat smoke, and sound. It collects information from the sensors and sends SMS to the corresponding number by using GSM module. It uses PIC microcontroller 16F76that control the whole system.

2. Viraj Mali Et al proposed a home automation and security which is of low cost by using motion sensors and GSM where Arduino will trigger an alarm and alert messages and send to the corresponding user through mobile.

3. N. sriskanthan and F. TanKarande developed a home automation system based on Bluetooth wireless technology which allows the user to control different appliances connected over a Bluetooth in a home environment. It is complicated for vast usage and has some limitations which do not provide full home security system.

4. Bhavani Annapurna et.al developed a system which is password based digital lock where an access control system allows authorized persons to access restricted area and RF wireless communication that transmits theft indication signals to the neighboring houses.

5. Huang et al. is a home security alarm system based on Wireless sensor network and GSM technology the working of the system is composed of single center node module and many data collecting node modules operating in a point to the multipoint communication mode. This system overcomes in geographical limitations hence increases operational cost.

3. PROBLEM DEFINATION:

ADVANTAGES:

1. Remote indication: With the use of GSM technology owner of the house or industry get remote indication through call. So even if the user is away from home or industry, he/she will be intimated about the hazardous or undesirable conditions / situations inside the house.

2. This system is fully automated. So once this system is installed inside home or industry, then it does not require any human interaction to operate. With the use of this system, we can save the life of person inside home / industry. Since the accidents caused due to theft can cause life threat.

3. Also, the property inside house and various materials inside the house and industry are saved from to theft.

4. This system is cost effective. Also, it is fast and efficient.

DISADVANTAGES:

The interruption regarding the communication regarding the severe weather issues that may cause loss of range for communicating with users. The most of the system major drawback was the internet monitoring which provides high bandwidth, and high-speed data that required for transmission of information to the following user.

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GAPS IN EXISTING SOLUTIONS:

1. The most of the system major drawback was the internet monitoring which provides high bandwidth, and high-speed data that required for transmission of information to the following user.

2. The limitations of the existing system were the technology which used ZigBee that range is 50 meters only and data transmission rate is also low even less than Bluetooth and Wi-Fi technology.

3. Some of the systems occur due to the limitations of the geographical area and not efficient enough to detect to monitor the object that comes near.

4. The security systems chance of providing false alarms that involve ringing when anyone enters the restricted area.

PROPOSED SOLUTIONS:

The proposed system provides the user with complete control of the interface on which it is based. On mobile application. As home security system which provides 360-degree presence of human sensor which will detect the presence of any intruder in a suitable range detects the motion the GSM module gets invoked. This system provides the extra attachment of other devices sensors in a single shield. Design system reduces the time complexity of connection and transmitting of information to the corresponding user and provide direct message transmission using the GSM module to the user regarding the fraud detection.

3.1 PROBLEM STATEMENT

Nowadays clearly putting our trust in locking of the doors and shutting of the windows is not even tad bit enough to keep our possessions and ourselves guarded from the criminals who will stop at nothing to steal from us. We might not be alert or not even be at that place every time to defend ourselves from such a surprise attack.

Safety and security are of utmost importance in our day-to-day life. The approach to home security system design is almost standardized nowadays. In this paper, it is intended to improvise these standards by employing new design techniques and developing a low-cost home security and safety systems. The design of simple hardware circuit enables every user to use this wireless home security system with ultrasonic sensor. Gas sensor, Smoke sensor and Motor driven door locking system at Home. The system is fully controlled by the Atmel Atmega8 microcontroller The microcontroller will constantly monitor all the sensors and if it senses any security issue then the microcontroller will send the CALL to the user mobile through GSM modem.

NEED STATEMENT:

Home security is the most vital aspect for every homeowner either in an individual house or an apartment. To get the absolute peace of mind whether you are at home or out of home you must ensure that your home is installed with the perfect home security monitoring system. This wireless home security system can be used to provide security system for residential, industrial, and for all domestic and commercial purposes using GSM technique The basic components of a home automation security system are motion detectors. In this paper, we emphasis to add more functionality to existing security design standards. The device has subsystems. Like, intrusion detection and door locking subsystem.

3.2 OBJECTIVE

Home Security Systems are an important feature of modern residential and office setups. Home security systems must be affordable, reliable and effective.

Modern complex home security systems include several security features like fire, intruders, electronic door lock, heat, smoke, temperature, etc. Some security systems may be a combination of all the security measures.

Such complex systems may be expensive and may not be affordable by everyone. There are individual security systems based on the requirement.

In this project, we designed a simple but very efficient home security that has a function of calling the homeowner on his/her mobile number in case of an intruder alert.

Home Security Alarm Systems are very important in present day society, where crime is increasing. With the technological advancements we have achieved in the recent years, a homeowner doesn't have to worry about home security while getting off his/her home.

Modern home security systems provide enough security from burglars, fire, smoke, etc. They also provide immediate notification to the homeowner.

The aim of this project is to implement a simple and affordable, but efficient home security alarm system. The project is designed for detecting intruders and informing the owner by making a phone call.

- A GSM based home security alarm system is designed using Arduino, ultra-sonic sensor and a GSM module.
- When the system is activated, it continuously checks for motion and when the motion is detected, it makes a phone call to the owner.

3.3 REQUIREMENT ANALYSIS

Home Security Alarm Systems are very important in present day society, where crime is increasing. With the technological advancements we have achieved in the recent years, a homeowner doesn't have to worry about home security while getting off his/her home.

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Ultrasonic sensor detects motion by sensing the difference in infrared or radiant heat levels emitted by surrounding objects. The output of the ultrasonic sensor goes high when it detects any motion. The range of a typical ultra-sensor is around 6 meters or about 30 feet.

For proper operation of ultrasonic sensor, it requires a warm up time of 20 to 60 seconds. This is required because, the ultrasonic sensor has a settling time during which it calibrates its sensor according to the environment and stabilizes the infrared detector.

During this time, there should be very little to no motion in front of the sensor. If the sensor is not given enough calibrating time, the output of the ultrasonic sensor may not be reliable.

When the ultrasonic sensor detects any motion, the output of the sensor is high. This is detected by the Arduino. Arduino then communicates with the GSM module via serial communication to make a call to the preprogrammed mobile number.

An important point to be noted about ultrasonic sensors is that the output will be high when it detects motion. The output of the sensor goes low from time to time, even when there is motion which may mislead the microcontroller into considering that there is no motion.

Hardware Requirements:

1. ARDUINO:

The Arduino UNO is an open-source microcontroller board based on the Microchip ATmega328P microcontroller. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) via a type B USB cable. It can be powered by a USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. "Uno means one in Italian and was chosen to mark the release of Arduino Software (IDE) 1.0. The Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino, now evolved to newer releases. The Uno also differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it uses the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

Fig 3.3.1: Arduino

2. SIM900A

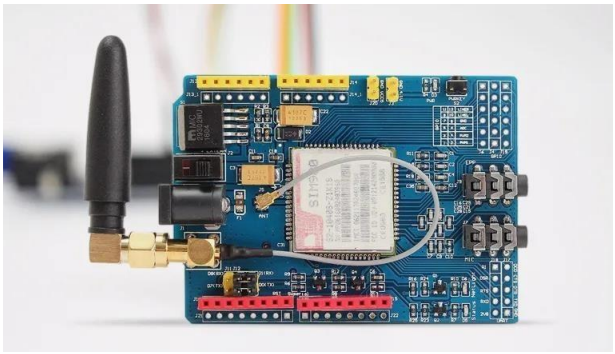

Fig 3.3.2: SIM900A

This is an ultra-compact and reliable wireless module. The SIM900A is a complete Dual-band GSM/GPRS solution in a SMT module which can be embedded in the customer applications allowing you to benefit from small dimensions and cost-effective solutions.

3. Ultrasonic Sensor:

Fig 3.3.3: Ultrasonic Sensor

An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. Ultrasonic waves travel faster than the speed of audible sound (i.e., the sound that humans can hear). Ultrasonic sensors have two main components: the transmitter (which emits the sound using piezoelectric crystals) and the receiver (which encounters the sound after it has travelled to and from the target).

4. Jumper Cables:

A jump wires (also known as jumper, jumper wire, jumper cable, DuPont wire or cable) is an electrical wire or group of them in a cable, with a connector or pin at each end (or sometimes without them – simply "tinned"), which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering. Individual jump wires are fitted by inserting their "end connectors" into the slots provided in a breadboard, the header connector of a circuit board, or a piece of test equipment.

Fig 3.3.4: Jumper Cables

5. Breadboard:

A breadboard is a widely used tool to design and test circuit. You do not need to solder wires and components to make a circuit while using a bread board. It is easier to mount components & reuse them. It consists of an array of conductive metal clips encased in a box made of white ABS plastic, where each clip is insulated with another clips. A typical bread board layout consists of two types of regions also called strips. Bus strips and socket strips. Bus strips are usually used to provide power supply to the circuit. It consists of two columns, one for power voltage and other for ground. Socket strips are used to hold most of the components in a circuit. Every column is electrically connected from inside.

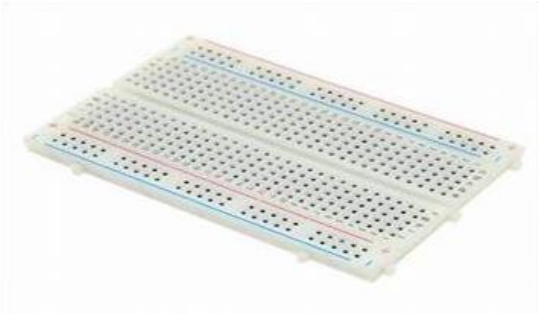

Fig 3.3.5: Breadboard

6. 9V Battery

The nine-volt battery, or 9-volt battery, is an electric battery that supplies a nominal voltage of 9 Volts, actually 7.2 to 9.6 volts, depending on technology.

Fig 3.3.6: 9V Battery

7. 9V BATTERY SNAP TO DC CONNECTOR

9v battery snap clip used to connect with any 9v battery or with any 4 aa battery holders this battery clip can be used to power led or other devices with a 9v battery.

Fig 3.3.7: 9V BATTERY SNAP TO DC CONNECTOR

3.4 METHODOLOGY

This project is based on three main components, basic: The GSM module, ultrasonic sensor and a microcontroller. By using the system, we can secure industry or home very easily. This system consists of a sensor which monitors the area and gives an output whenever a person is moving at the premises. The output of the sensor is given to the control unit, when the control unit gets an input from the sensor then it produces an alarm also send a command to the GSM module so that the module sends an SMS to corresponding number which is preloaded in the circuit unit. This system continuously monitors the status of sensors connected to it. If any of the sensor gives the output indication, then microcontroller-based system automatically sends the alerts to the user. After completion of the command implementation this system sends the confirmation messages back to the calling user.

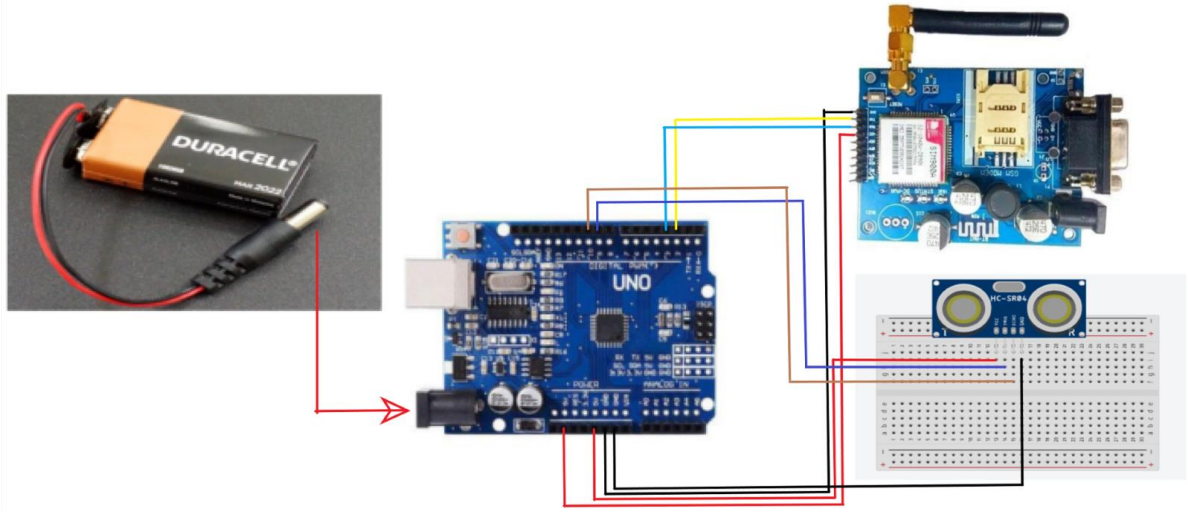

Fig 3.4.1: Circuit Diagram

4.1 CONCEPTUAL DESIGN

- We have proposed a solution-Automatic Intruder Spotter, to protect the valuables from the thefts.
- This device provides security against intruders or burglars.
- It provides the security from intruders with low-cost.
- It provides uninterrupted functionality with high efficiency.
- It protects valuables and personal property like wallets, files, phones, jewelry etc.
- When the owner leaves the home because of any reason (holiday, vacation, etc...), the house will be empty so that the owner will ON the Automatic Intruder Spotter device.
- In night times also the owner needs protection so he will turn ON the device.
- The unauthorized entry into the home is identified by ultrasonic sensor.
- The ultrasonic sensor detects the presence of a human being.
- The ultrasonic sensor will be kept near to the valuable things place (i.e.., cupboards, lockers etc.) or windows or Doors.
- If any human entry is detected by the ultrasonic sensor, immediately alert phone call through SIM 900a will be sent to the owner.

4.2 BLOCK DIAGRAM

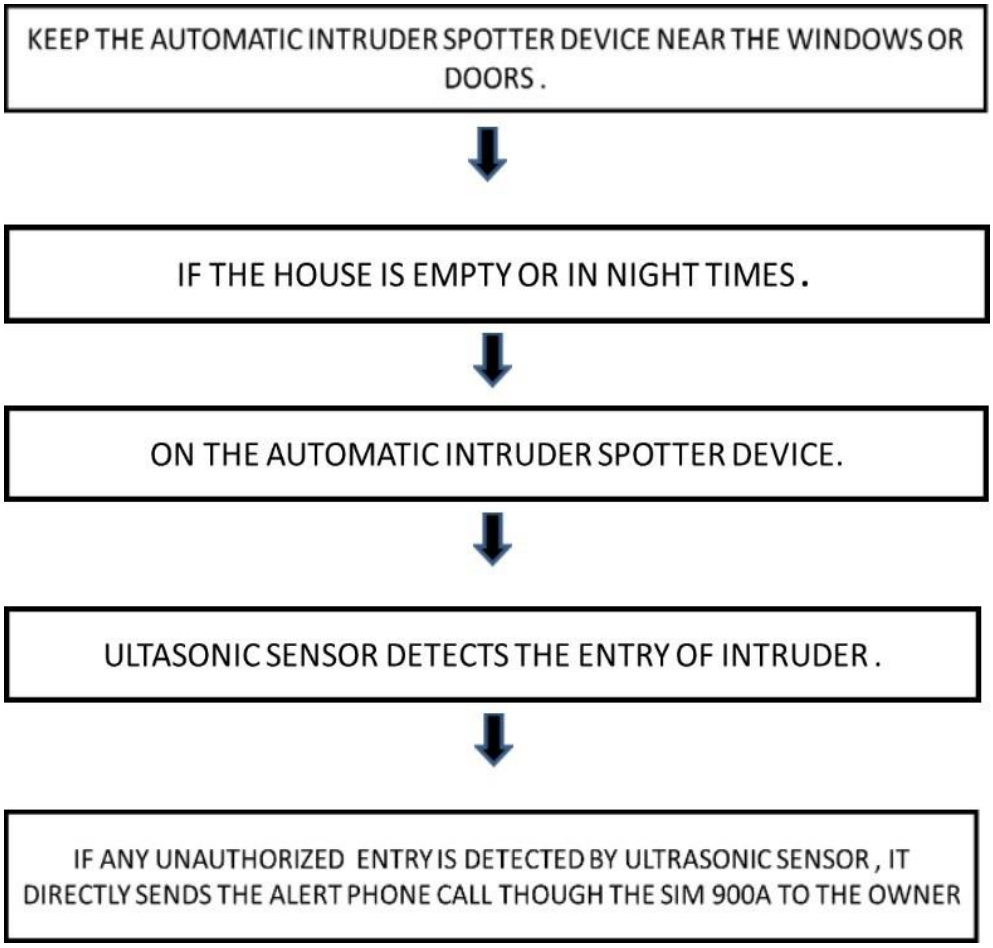

Fig 4.2.1: Block Diagram

4.3 DESIGN DESCRIPTION

Fig 4.3.1: Picture of team members with machine

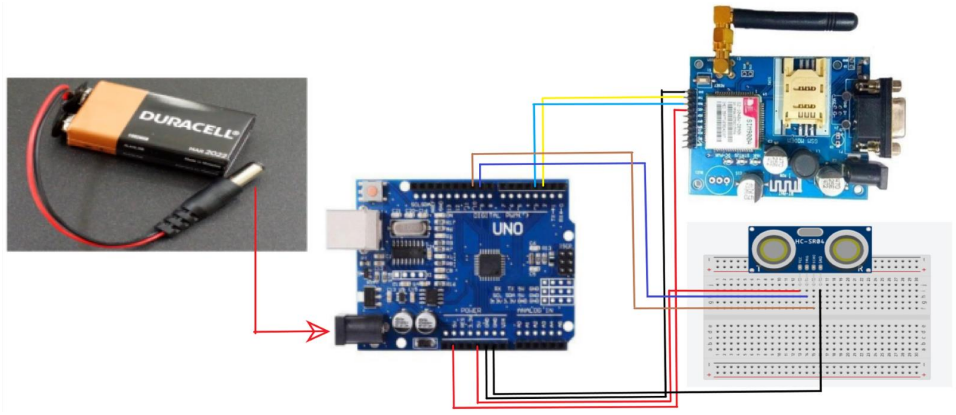

Fig 4.3.2: Circuit diagram description

5. IMPLEMENTATION

5.1 RESULT:

By this we can catch the thief's and unauthorized persons in the prohibited zone. It is very useful and easily detect the thieves and it sends a message and doing a phone call to the owner by alerting there is happening some activity.

Such complex systems may be expensive and may not be affordable by everyone. There are individual security systems based on the requirement. In this project, we designed a simple but very efficient home security that has a function of calling the homeowner on his/her mobile number in case of an intruder alert.

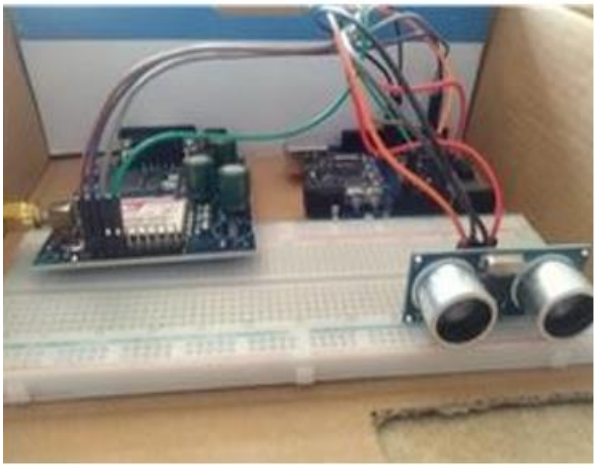

Fig 5.1.1: Inner implementation of our Project

Fig 5.1.2: Team members with stakeholder holding our business model

5.2 CONCLUSION:

At last, we have come up with a solution that of an alerting system which helps to find easily unauthorized people in personal room.

1. Valuable things will be safe.
2. Highly secure.
3. Low cost.
4. High accuracy.
5. Analysis of the project:
6. It alerts the user within a couple of seconds.
7. It will secure the place within a region.

6. APPENDIX

6.1 APPENDIX:

https://images.app.goo.gl/8KLLpGEEHHLxNaRm8

https://images.app.goo.gl/iGhafGjabwjAdX4h9

https://images.app.goo.gl/kVSzQ9NzyxPjwYqd6

6.2 REFERENCES:

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[4] IoT-Based Home Security System with Wireless Communication January 2021

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Fig: Picture with stakeholder