

Integrated Security System With Remot Controlling Of Appliances

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Abstract - The need for smart home surveillance systems nowadays could be a serious demand. because the number of crimes is increasing on a daily basis, there has got to be something that may keep us safe. We are all attentive to the high end security systems present within the market but they're not easily available to everyone. We therefore will provide a solution by constructing a price efficient electronic system that has the aptitude of sensing the motion of the Person. Temperature sensor and LPG leakage detection sensor is integrated which checks temperature of person which helps to cut back spread of COVID- 19 and detects the leakage of gas and sends the information to the owner through SMS respectively.

Key Words: Security, Arduino, GSM, LPG, Temperature, Bluetooth, Door Lock, Fingerprint sensor, PIR Sensor.

1.INTRODUCTION

Starting from the small houses to huge industries, security is very essential to fulfill our safety aspects as Burglary and theft have always been a problem [1]. The Internet of Things (IoT) is communications network which built on an “always-on” the Internet. IoT can be well thought out as a grid of corporeal things which can be log on thru the Internet. Arduino UNO, a credit card size low-price reasonably priced computer. Arduino UNO platform is being used widely from the past few years. IoT is linking routine entities cleverly to the Internet to permit communication between things as well as people, also amongst stuffs themselves. The Issue of Owners cant able to know what is going on in their house when they are not at house, besides that, problems such as theft and fires in the house while the user is at house can be overcome by this system. The system can allow user to control electrical appliances at house from a remote location, the user may be able to control the light and fan as well as air conditions for the house in case they are not at house, any disturbances will also be notified to the user The system also can deter theft and burglary in the house by certain measures such as vibration detector and alarm system, owner will be notified. The system also can deter fire by the use of smoke detectors and heat detectors, the public authorities and owner will then be notified. The security system using conventional pin number for security can be replaced with the more modern and secure biometrics system.

2. OBJECTIVE

The main aim of this project is to:

1. Authenticate the person using Biometric fingerprint sensor.
2. Control house appliances from remote place.
3. Detect LPG gas leakage and send the data to owner through GSM.
4. Check the Temperature of a person at Door.

3. METHODOLOGY

As soon as motion of a person is detected of that person is captured using the temperature sensor module, system will send a notification to the owner’s mobile phone. If the person is already registered through fingerprint module, he/she can enter the house through authentication. If the LPG gas is detected, the details will be sent to owner’s mobile phone through GSM module. The electric appliances like TV, AC, Fan, etc will be controlled from mobile phone using Blynk app.

4. BLOCK DIAGRAM AND FLOWCHART

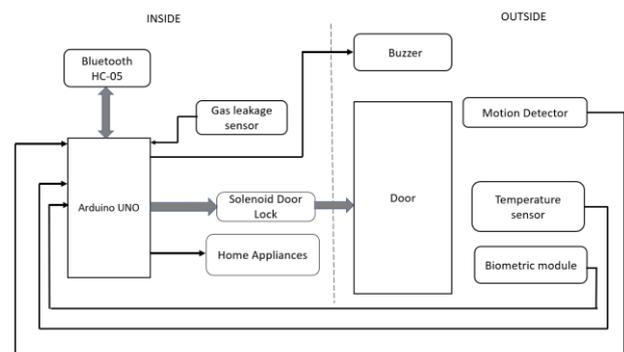


Fig.1 Block Diagram

In the Proposed project, the Fig.1 shows the block diagram which contains PIR motion detector which is used to detect the motion, LPG gas leakage detector is integrated with this project to detect the gas leakage, MLX90614 temperature sensor which is used to detect the temperature of visitor, biometric module is added to give access using biometric verification all these sensors and modules are

connected to the Arduino UNO. Solenoid door lock is present to control opening and closing the door, buzzer is added so that it makes noise when gas is leaked.

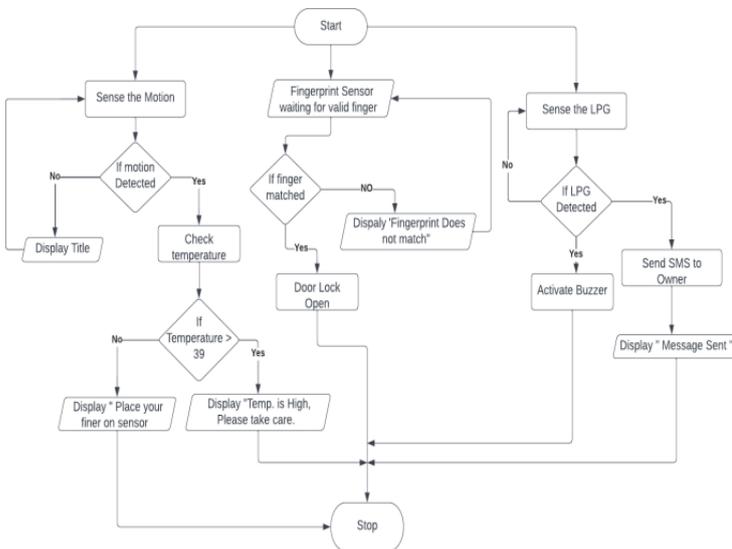


Fig.2 Flowchart

Fig 2 shows Activity diagram, the process begins with the start, which is the standard way of beginning the process. All the sensors that are connected to the Arduino are initiated. This means that they will be put in their start conditions for the system to begin.

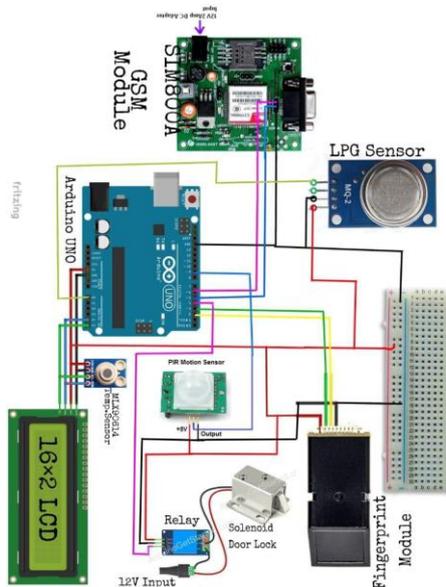


Fig.3 Circuit Diagram

Fig.3 represents circuit diagram where all the sensors, modules and output devices are connected to arduino UNO microcontroller board.

5. HARDWARE AND SOFTWARE SPECIFICATIONS

Arduino UNO : Arduino/Genuino Uno could be a microcontroller board based on the ATmega328P as appeared in fig.4. It has 14 advanced input/output pins (of which 6 can be utilized as PWM yields), 6 analog inputs, a 16 MHz quartz gem, a USB association, a control jack, an ICSP header and a reset button. It contains everything needed to back the microcontroller; basically interface it to a computer with a USB cable or power it with a AC-to-DC connector or battery to get begun.



Fig.4 Arduino UNO

PIR Motion detection sensor: PIR sensor permit you to sense movement, nearly continuously utilized to identify whether a human has moved in or out of the sensors run. They are little, cheap, moo- control, simple to utilize and do not wear out. For that reason, they are commonly found in machines and contraptions utilized in houses or businesses. They are frequently alluded to as PIR, "Detached Infrared", "Pyroelectric", or "IR movement" sensors. Movement finders have found wide utilize in residential and commercial applications. One common application is enacting programmed entryway openers in businesses and open buildings.

Solenoid doorlock: Solenoids are electromagnets. When control is connected, a coil of copper wire interior is energized and gets to be magnetized. The armature of the solenoid that's joined to the locking lock is attractively drawn into the center of the coil of wire, hence opening / opening the hook. When control is evacuated, the attractive field is evacuated and a little spring pushes the hook back out into the bolted position.

Biometric module: A Unique finger impression preparing incorporates two parts: unique finger impression enrollment and unique mark coordinating (the coordinating can be 1:1 or 1: N). When enlisting client ought to enter the finger two times. The framework will prepare the two times finger pictures produce a format of the finger based on preparing comes about and store the layout. When coordinating client enters the finger through optical sensor and framework will create a format of the finger and compare it with formats of the finger library.

Gas Sensor: A gas detector is a device that detects the presence of gases in an area, often as part of a safety system. A gas detector can sound an alarm to operators in the area where the leak is occurring, giving them the opportunity to leave.

GSM module: The GSM (Worldwide Framework for Portable communication) may be a advanced versatile arrange that's widely used by portable phone clients in Europe and other parts of the world. GSM uses a variety of time division multiple get to (TDMA) and is the foremost broadly utilized of the three advanced remote communication advances: TDMA, GSM and code-division numerous get to (CDMA). GSM digitizes and compresses information, at that point sends it down a channel with two other streams of client information, each in its possess time opening. It works at either the 800 megahertz (MHz) or 1,800 MHz recurrence band. It works on frequencies 800MHz. SIM800A can look these two groups consequently. The recurrence groups can too be set by AT Commands. The baud rate is configurable from 1200115200 through AT command. SIM800A is an ultra compact and remote module. The Modem is coming interface, which permits you interface PC as well as microcontroller with RS232 Chip (MAX232). It is appropriate for SMS, Voice as well as Information exchange application in M2M interface. The onboard Directed Control supply permits you to associate wide range unregulated power supply. Utilizing this modem, you'll be able make sound calls, SMS, Read SMS, go to the approaching calls and etc. through basic AT commands. Typically a total GSM module in a SMT sort and made with a really capable single-chip, permitting you to advantage from little measurements. SIM800A GSM Modem with serial and TTL yields.

Relays: A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts, or combinations thereof.

LCD: LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primary form of operation. LEDs have a large and varying set of use cases for consumers and businesses, as they can be commonly found in smartphones, televisions, computer monitors and instrument panels.

MLX 90614 Sensor:The MLX90614 Sensor is Contactless Infrared (IR) Computerized Temperature Sensor that can be utilized to degree the temperature of a specific protest extending from -70° C to 382.2°C. The sensor employments IR beams to degree the temperature of the protest without any physical contact and communicates to the microcontroller utilizing the I2C convention.

The Arduino IDE: The Arduino Integrated Development Environment may be a cross stage application that's composed within the programming dialect Java. It is used to type in and transfer programs to Arduino consistent sheets, but too, with the assistance of 3rd party centers, other merchant improvement sheets. The Arduino IDE bolsters the dialects C and C++ utilizing extraordinary rules of code organizing. The Arduino IDE supplies a computer program library from the wiring venture, which gives numerous common input and yield methods. The Arduino IDE utilizes the program contended to change over the executable code into a content record in hexadecimal encoding that's stacked into the, Arduino board by a loader program within the board's firmware.

6. APPLICATIONS

- Internet security systems.
- House security system.
- Public places and other large areas.
- Hospitals.
- Schools and retail shops.
- Historic sites.
- High security areas such as Banks, ATMs, Lockers, etc.
- Commercial premisis including shops, restaurants and hotels.
- Storage and warehouse facilities.
- Indudtrial areas such as offices and factories.
- Harmful gas detection.

7. ADVANTAGES

i. Allows remote access to house: This system allows user to control the appliances and system itself from reomte place.

ii. Notifies you of fire or gas problem: This model can notify the user if any fire or leakage of LPG is detected through SMS.

iii. Protects valuables: As the fingerprint door lock system is adapted in this system, no access will be given to the others who does not registered his/her fingerprints with the system.

iv. Real time alerts: The system works in the real time and it can send SMS and other alerts to the user in real time.

v. They can be control from anywhere: All the sensors and other devices which are integrated with this system are can be controlled from anywhere in world through SMS and IoT.

vi. House automation convenience: This system enables the house for automation through IoT for controlling home appliances.

vii. Save money on energy bills: As the user can control the home appliances from the remote place, he/she can turn OFF or turn ON the appliances whenever there is a need/ no need of them, so it can save money on energy bills.

8. RESULTS



Fig.5 Detection motion

Fig 5 shows the detection of motion when someone Enters at the door and LCD will display message ' Motion detected'.

Fig 6 shows the status of temperature sensor, if motion detected the temperature sensor will check the temperature of a person.



Fig.6 Temperature checking



Fig.7 Displaying Temperature

Fig 7 shows the detected temperature displayed on LCD.

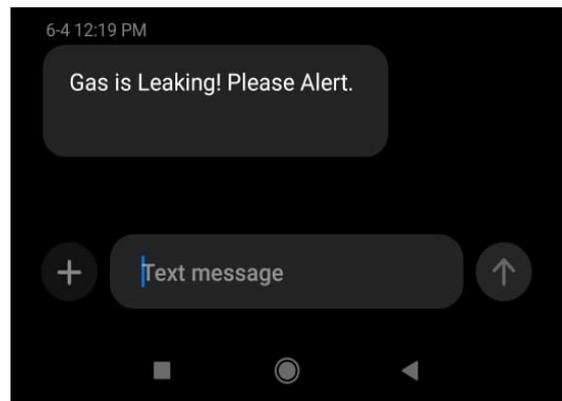


Fig.8 SMS received by owner

Fig 8 shows the status of LPG, when the leakage of ags is detected message will be displayed on LCD and same message will be sent to the owner through GSM module.

9. FUTURE SCOPE

This project is made for demonstration pupose and this can further implemented to enhance the scope of this project. The GSM module used in this project is based on 2G network, for more accuracy and low latency we can latest 4G module. This project is made for demonstration pupose and this can further implemented to enhance the scope of this project. The GSM module used in this project is based on 2G network, for more accuracy and low latency we can latest 4G module. Currently this model can only send message to owner if leakage of LPG detected, by implementing further we can also operate the regulator of cylinder to turn off and turn on if leakage detected. Controlling of an appliances from remote place using IoT is shown using only small LEDs, On further implenting this project we can control all the home appliances which are works AC by placing relays between AC and DC supply. This can reduce the power consumption continuously when we are not using appliances. This can save the money on energy consumption bills.

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BIOGRAPHIES



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