

HOME INNOVATION

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OBJECTIVE

- This project deals with the design & development of a home security system with theft informing, fire informing and gas leakage informing features. A hardware prototype is implemented with the help of Arduino controller, gas sensor, fire sensor, motion sensor and GSM module. In case of any event occurred, GSM module will send a message alert to owner mobile number and activate related actuator to mitigate the problem.

INTRODUCTION

- There is an increasing demand for smart homes, where appliances react automatically to changing environmental conditions and can be easily controlled through any common device.
- This project presents a possible solution whereby the user controls devices by using their existing cell phone, where control is communicated to the Microcontroller from a cell phone

WHAT IS HOME INNOVATION?

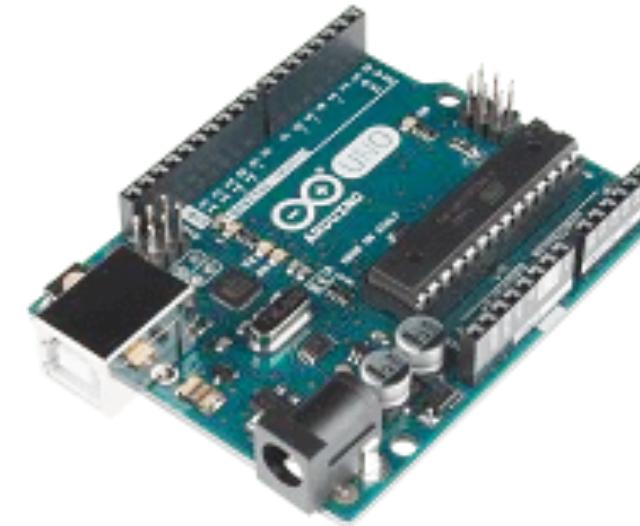
- Home innovation involves introducing a degree of computerized or automatic control to certain electrical systems in a building.
- These light, temperature control, etc. demonstrates a simple home innovation system which includes a remote mobile host controller and several client module (home appliances).
- The client modules communicate with host controllers through a wireless device such as Bluetooth enabled device like cell phone.

COMPONENTS REQUIRED

- Arduino UNO
- GSM Module
- LED
- Resistor
- Smoke sensor
- Motion sensor
- Gas sensor
- Power supply
- Zero circuit board
- Jumper wire
- Buzzer

ARDUINO UNO

- **Arduino Uno** is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSP header and a reset button.



GSM MODULE

- The **Arduino GSM Shield 2** allows an Arduino board to connect to the internet, make/receive voice calls and send/receive SMS messages. The shield uses a radio modem [M10 by Quectel](#). It is possible to communicate with the board using [AT commands](#). The [GSM library](#) has a large number of methods for communication with the shield.



RESISTOR

- A **Resistor** is a passive two-terminal electrical component that implements electrical resistance as a circuit element.
- In electronic circuits, resistors are used to **reduce current flow**, adjust signal levels, **to divide voltages**, bias active elements, and terminate transmission lines, among other uses.



SMOKE SENSOR

- A **photodiode (smoke sensor)** is a semiconductor device that converts light into an electrical current. The current is generated when photons are absorbed in the **photodiode**. Photodiodes may contain optical filters, built-in lenses, and may have large or small surface areas.



GAS SENSOR

- The Grove - Gas Sensor(MQ2) module is useful for gas leakage detection (home and industry). It is suitable for detecting H₂, LPG, CH₄, CO, Alcohol, Smoke or Propane. Due to its high sensitivity and fast response time, measurement can be taken as soon as possible. The sensitivity of the sensor can be adjusted by potentiometer.



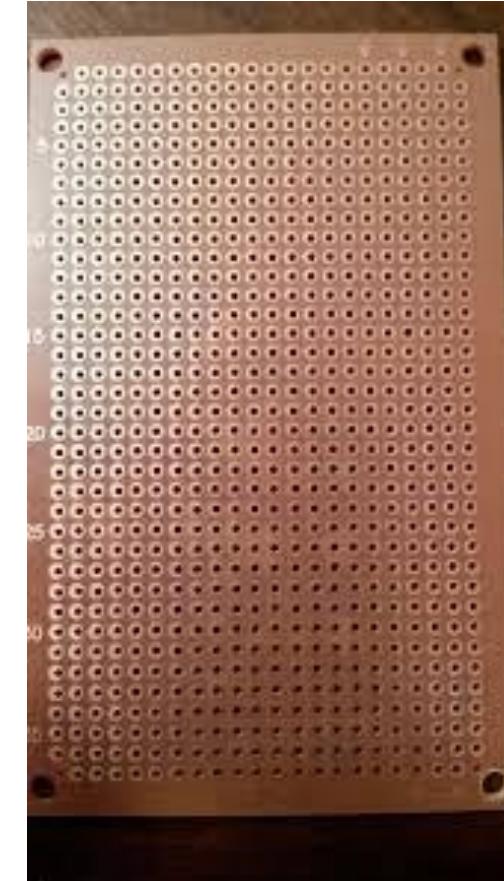
MOTION SENSOR

- **PIR sensors** allow you to sense **motion**, almost always **used** to detect whether a human has moved in or out of the **sensors** range. They are small, inexpensive, low-power, easy to **use** and don't wear out. For that reason, they are commonly found in appliances and gadgets **used** in homes or businesses.



ZERO CIRCUIT BOARD

- Zero Printed **Circuit Board** refers to an all-purpose & conventional **PCB** that embeds the **circuits** arbitrarily to ensure the continuous functioning of the hardware. The layers of general-purpose **circuit board** are coated with copper as to allow appropriate soldering of the components of **PCB**.



JUMPER WIRE

- A **jump wire** (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.

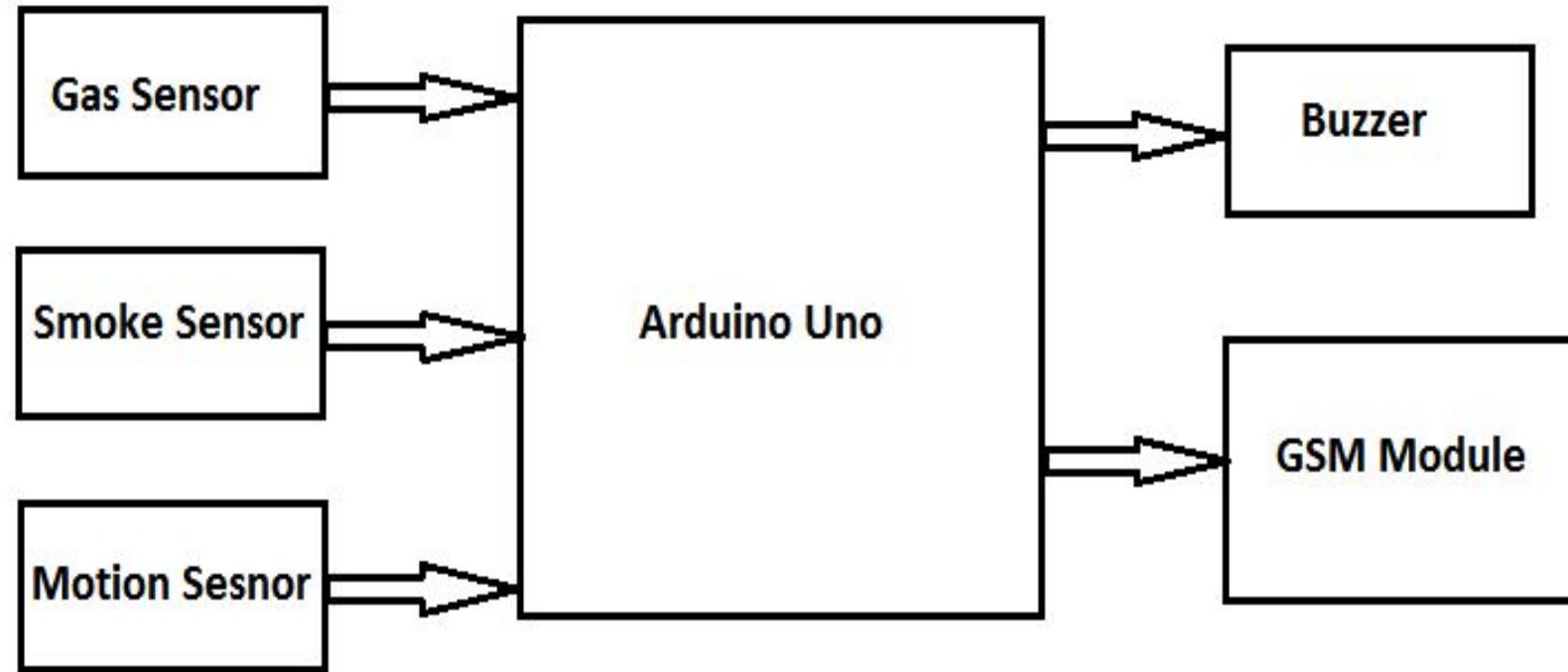


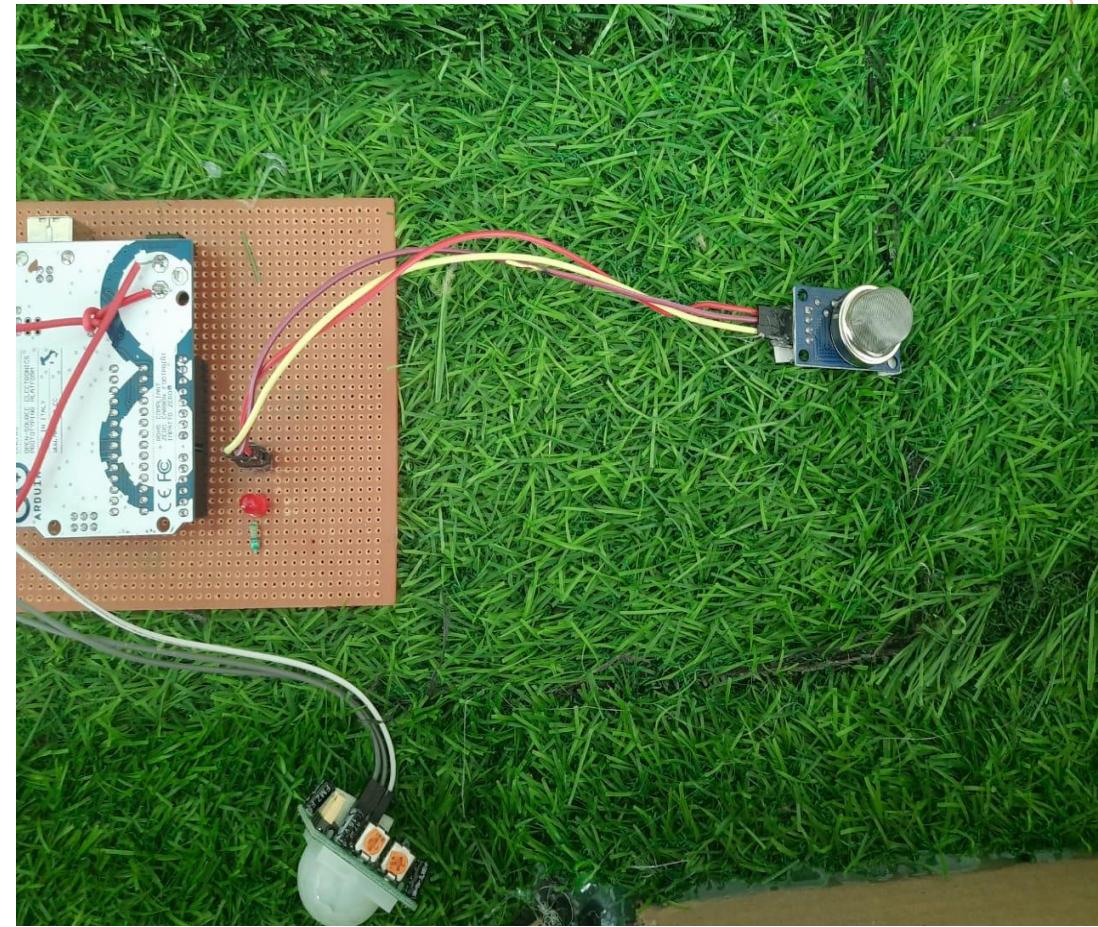
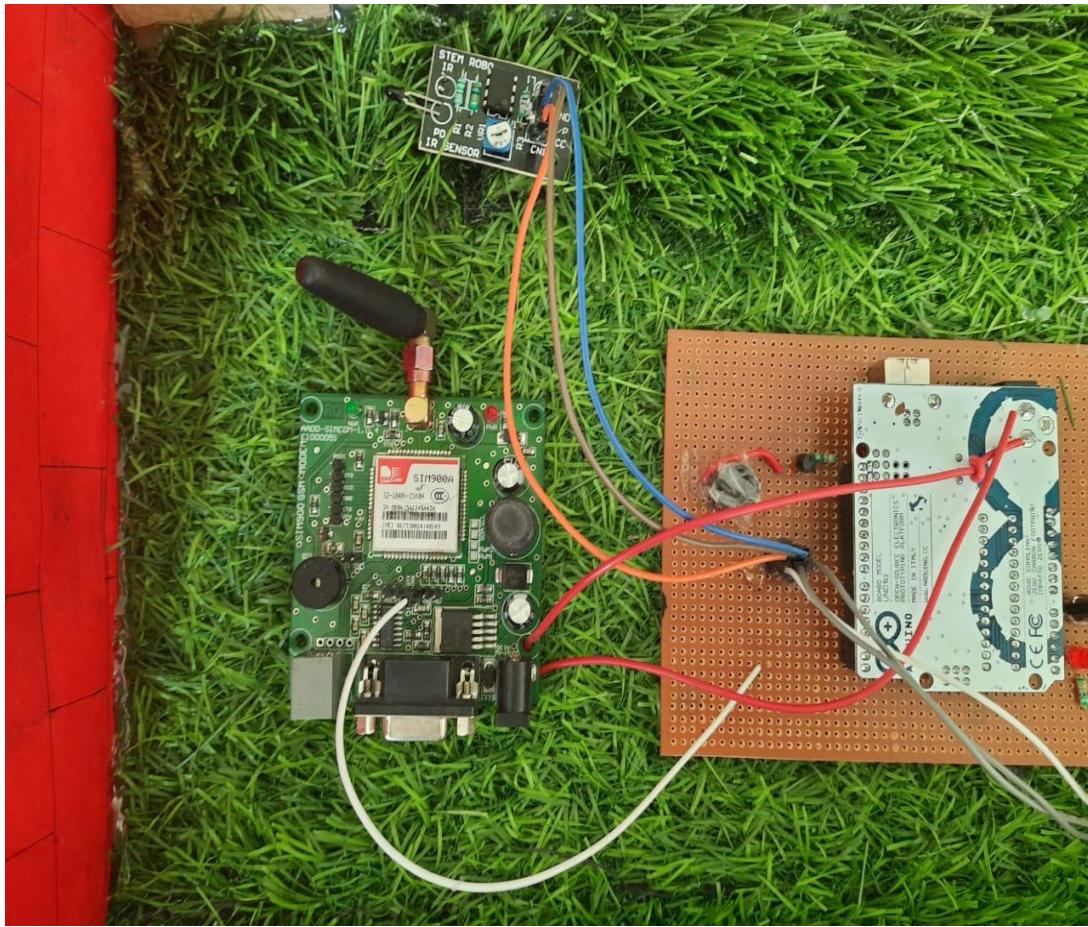
BUZZER

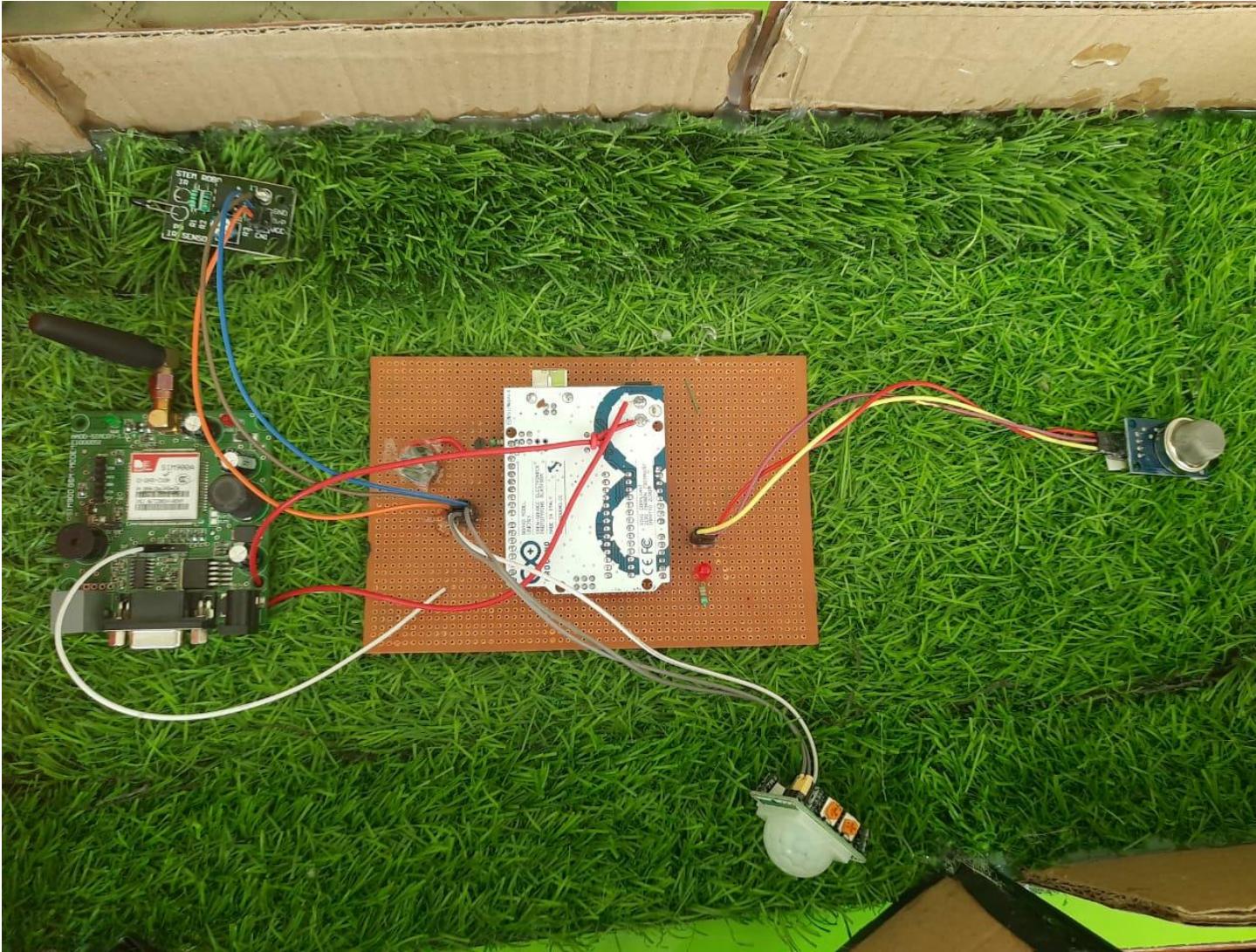
- A **buzzer** or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of **buzzers** and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.



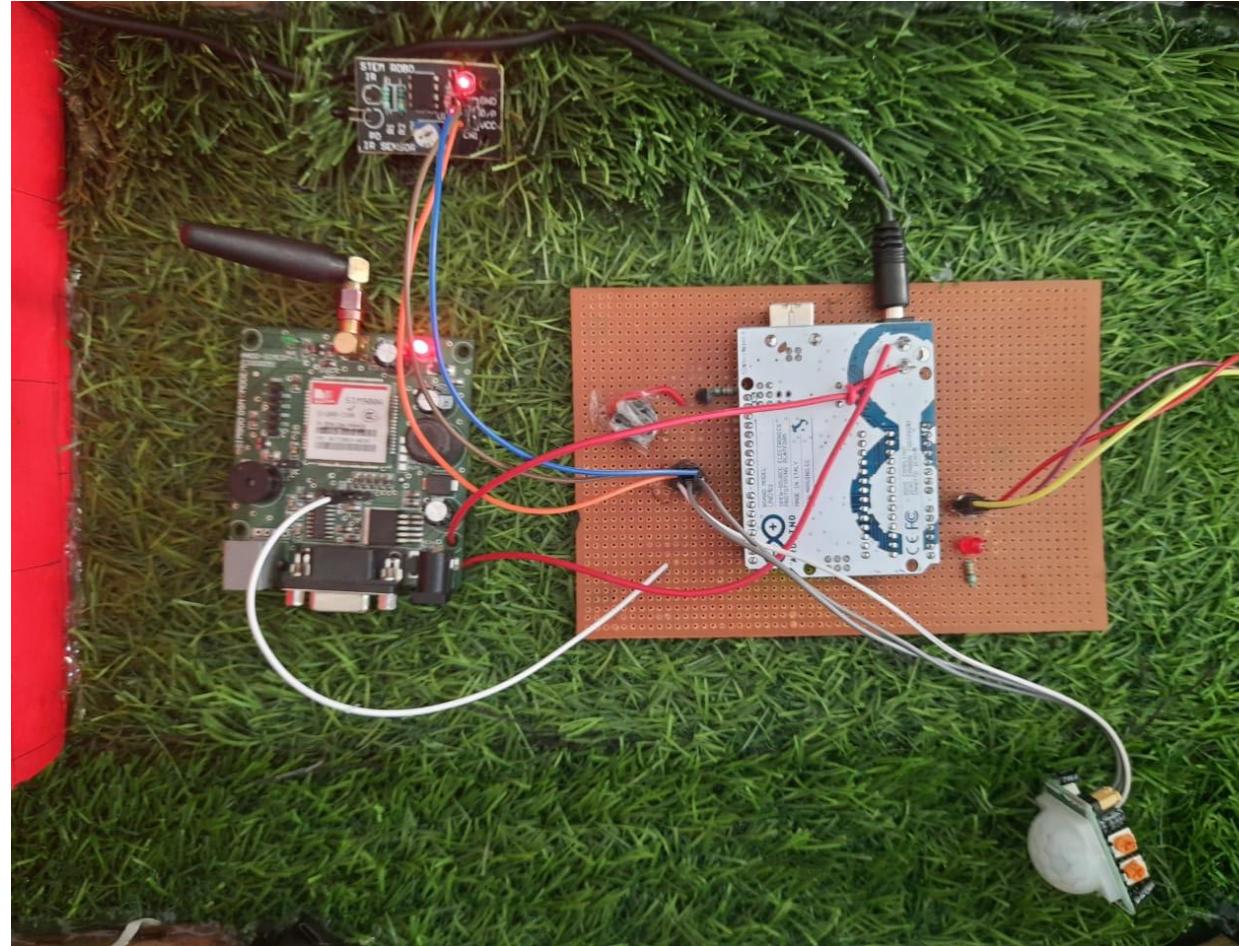
BLOCK DIAGRAM

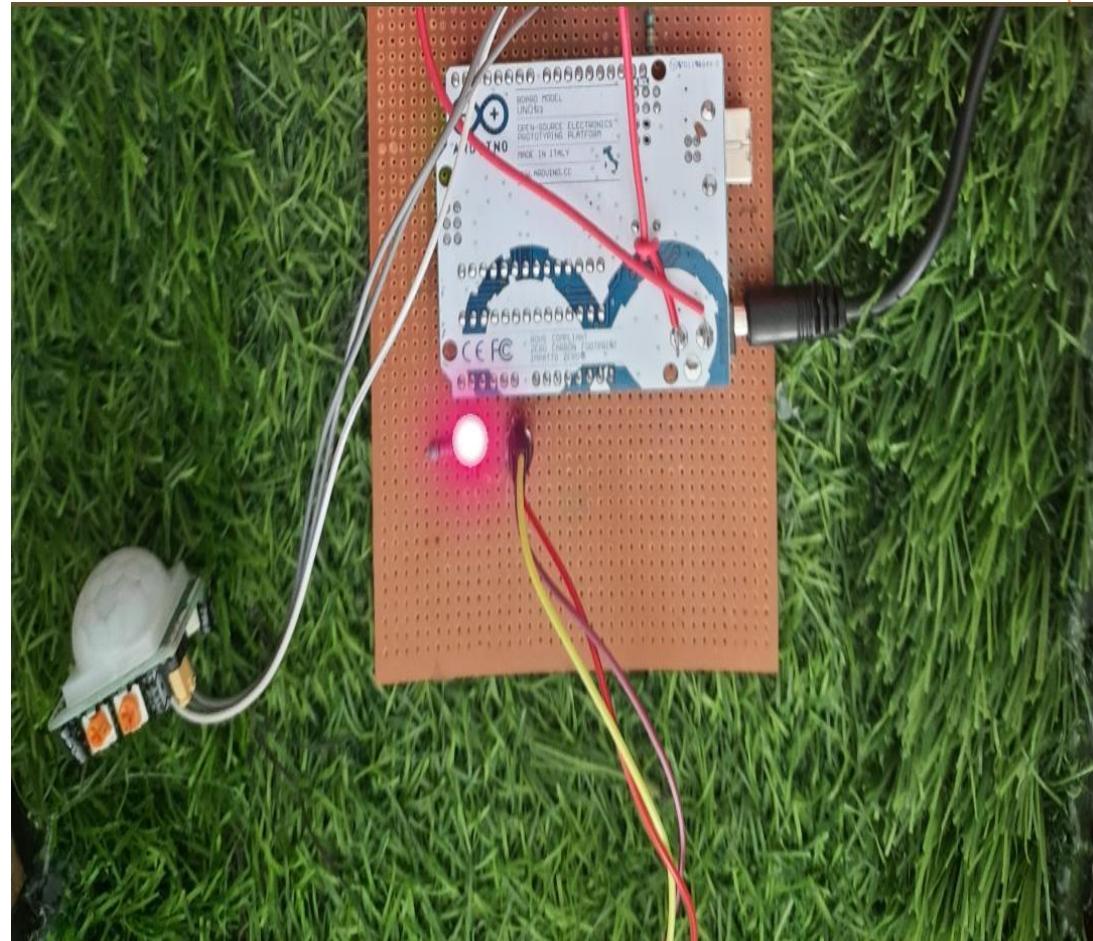
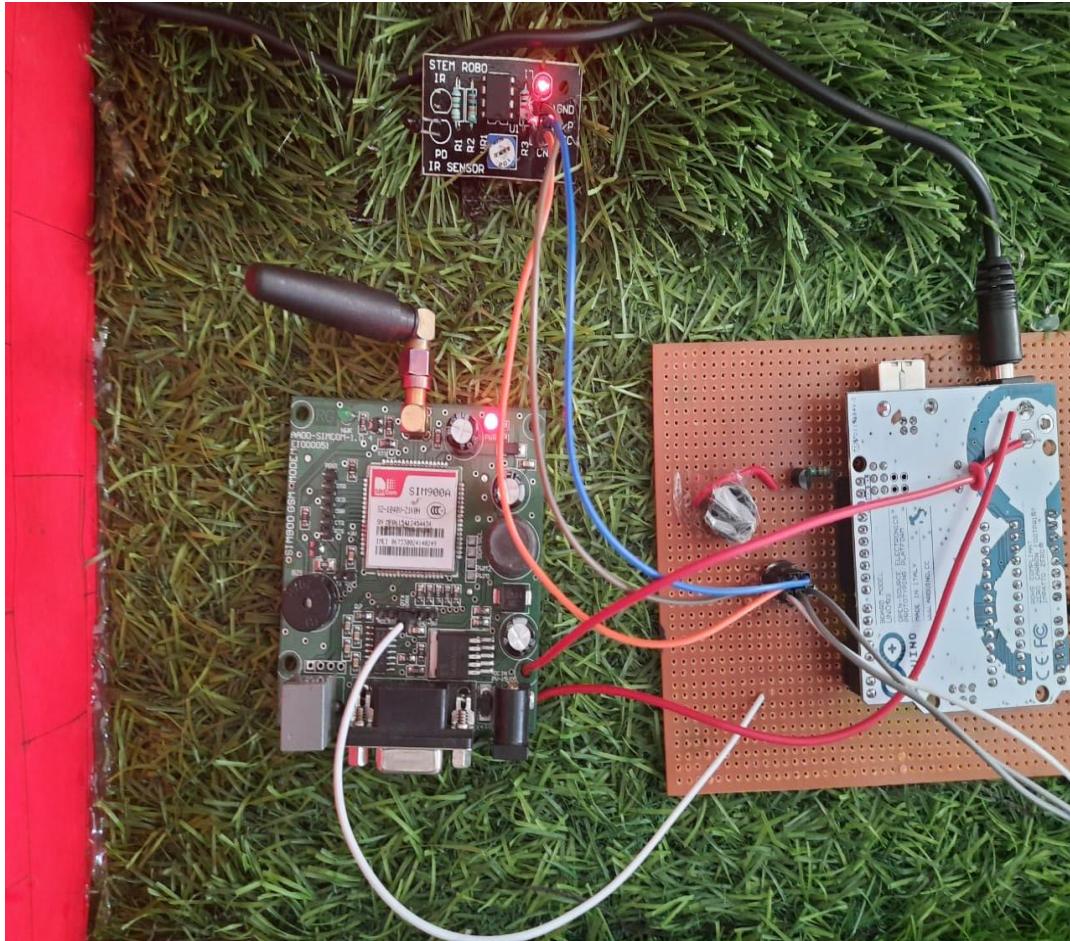






WORKING OF MODEL





Where is Home Automation going?



ADVANTAGES

- Adds safety through appliance and lighting control
- Secures home through automated door locks
- Increases awareness through security cameras
- Increases convenience through temperature adjustment
- Saves time
- Saves money and increases convenience
- Contributes to economy
- Increases peace of mind
- Keep tabs on your children

DISADVANTAGES

- Equipment and installation costs high
- System crashes due to any interconnection
- Human errors
- Reliability

APPLICATIONS

- Lighting control: Leaving the dark ages and stepping into the light
- HVAC Regulation: No longer burned by your heating bill
- Lawn Irrigation System: The grass always remains green
- Smart appliances
- Security systems

FUTURE SCOPE

- New era in energy use
- Home security goes wireless
- Wearable technology is the new black
- Voice commands rule

CONCLUSION

- Home Innovation is undeniably a resource which can make a home environment automated. People can control their electrical devices via these Home Innovation devices and setup control actions through mobile.
- In future this product may have high potential for marketing.



THANK YOU!