

The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic look.

Seminar on LPG Gas Leakage Detection And Protection using Arduino

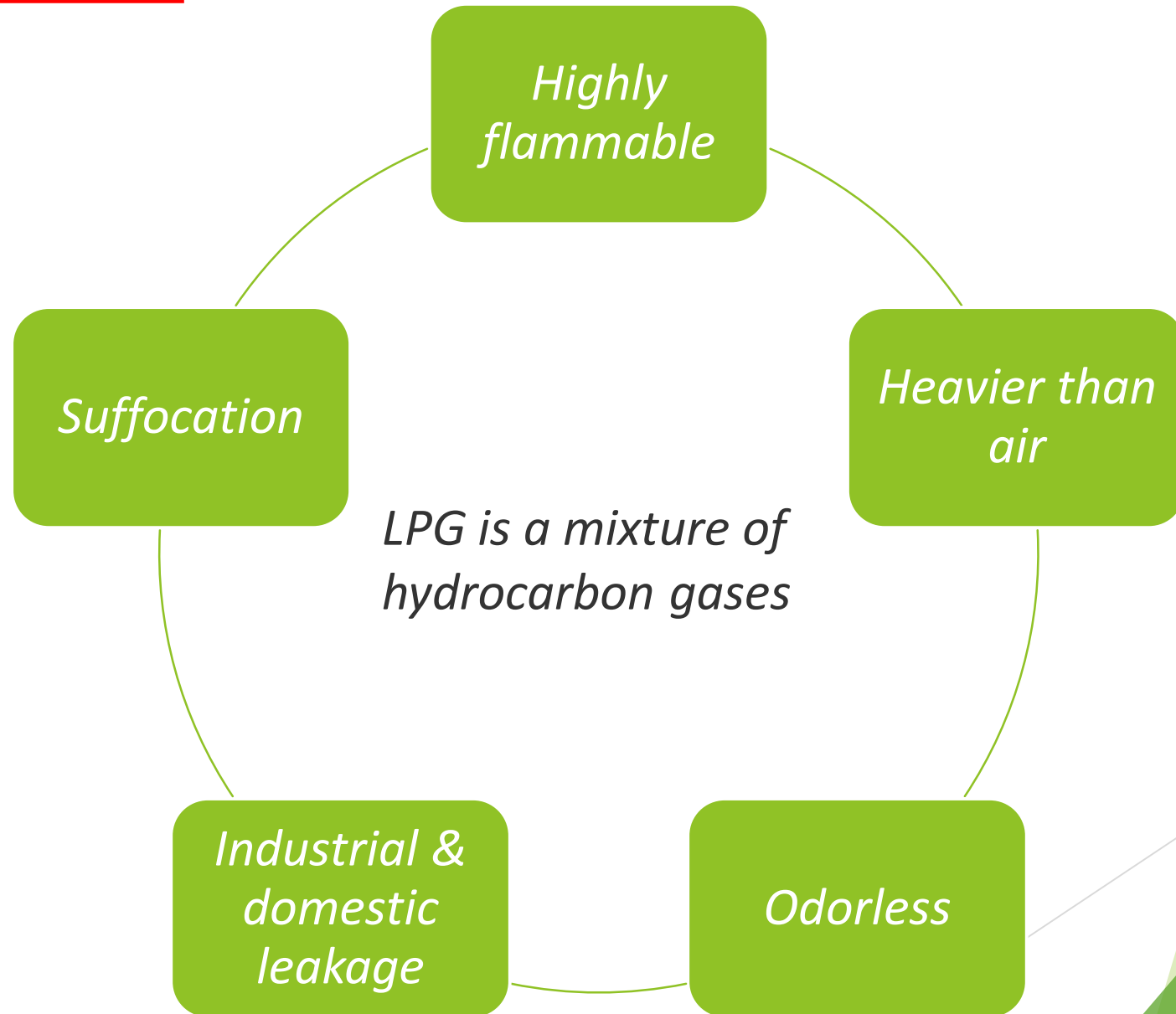
Presented by

Name : Poorvi Gupta

Outline

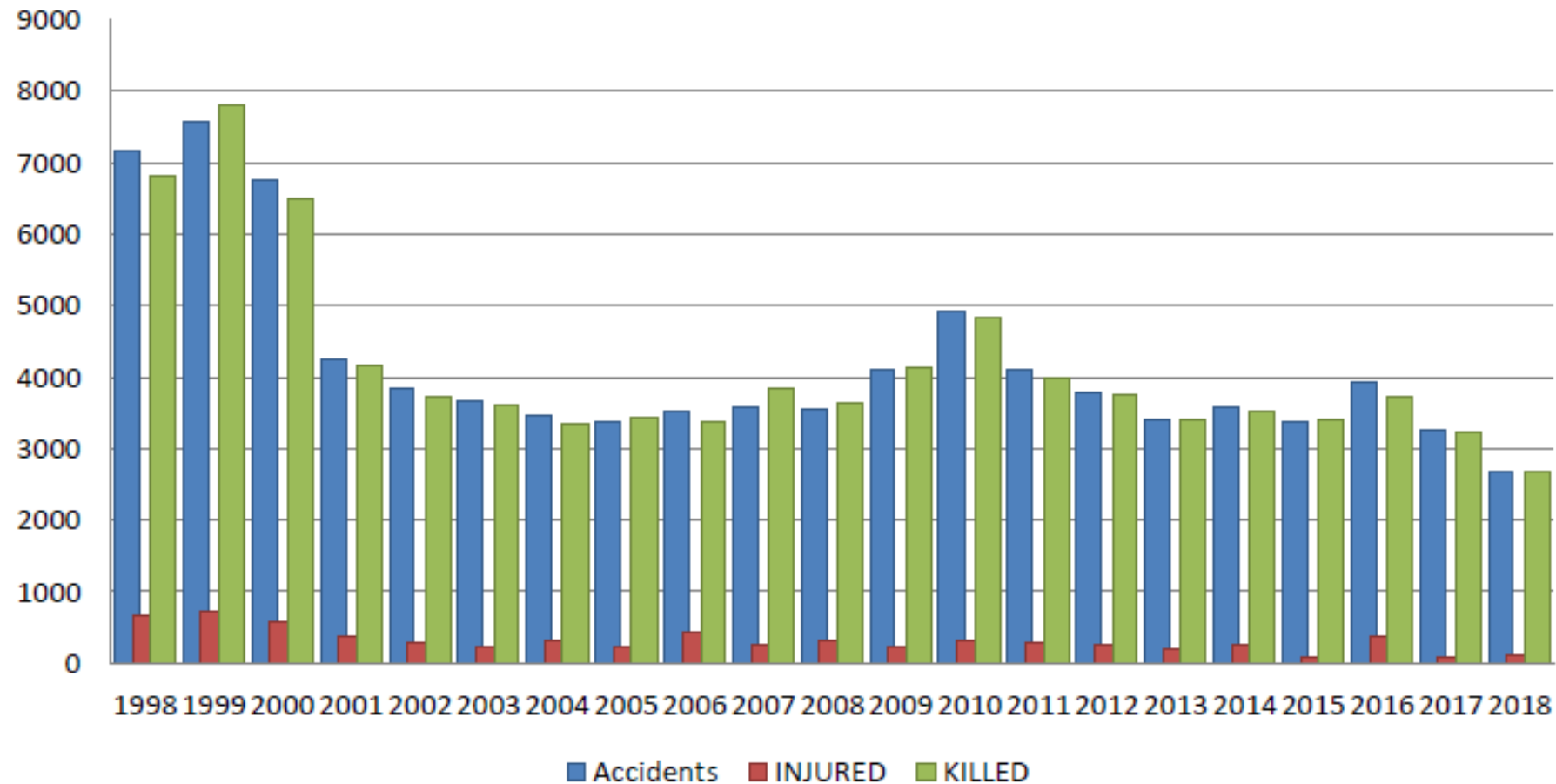
- *Introduction*
- *Previous Work*
- *Block Diagram*
- *Hardware description*
- *Working Principle*
- *Circuit*
- *Working Methodology*
- *IOT Based Model*
- *Major Challenges*
- *Applications*
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Introduction

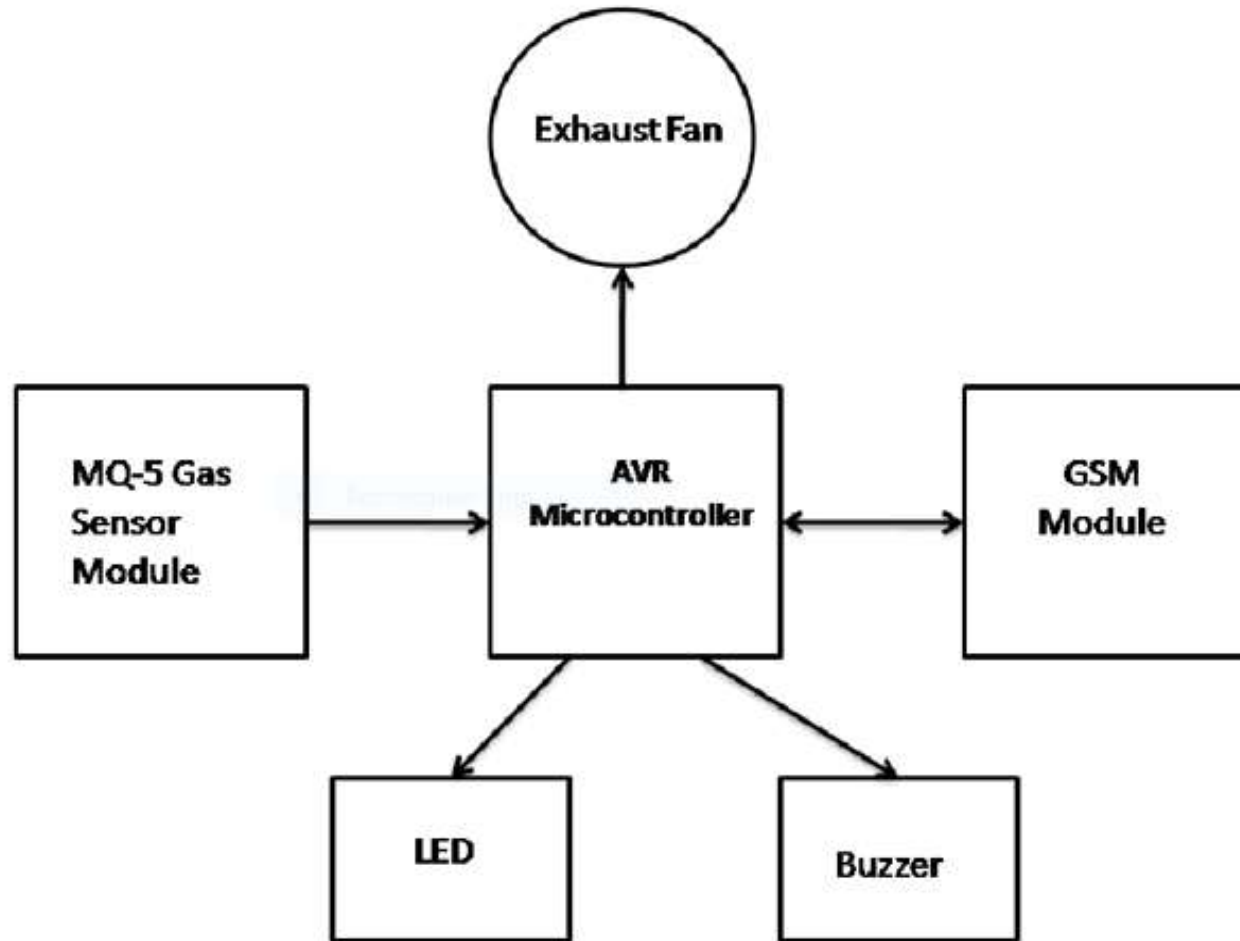


Introduction contd...

No of persons injured and killed by LPG cylinder bursts in India (1998-2018)



PREVIOUS WORKS



Block Diagram for Gas Leakage Detector

Block Diagram

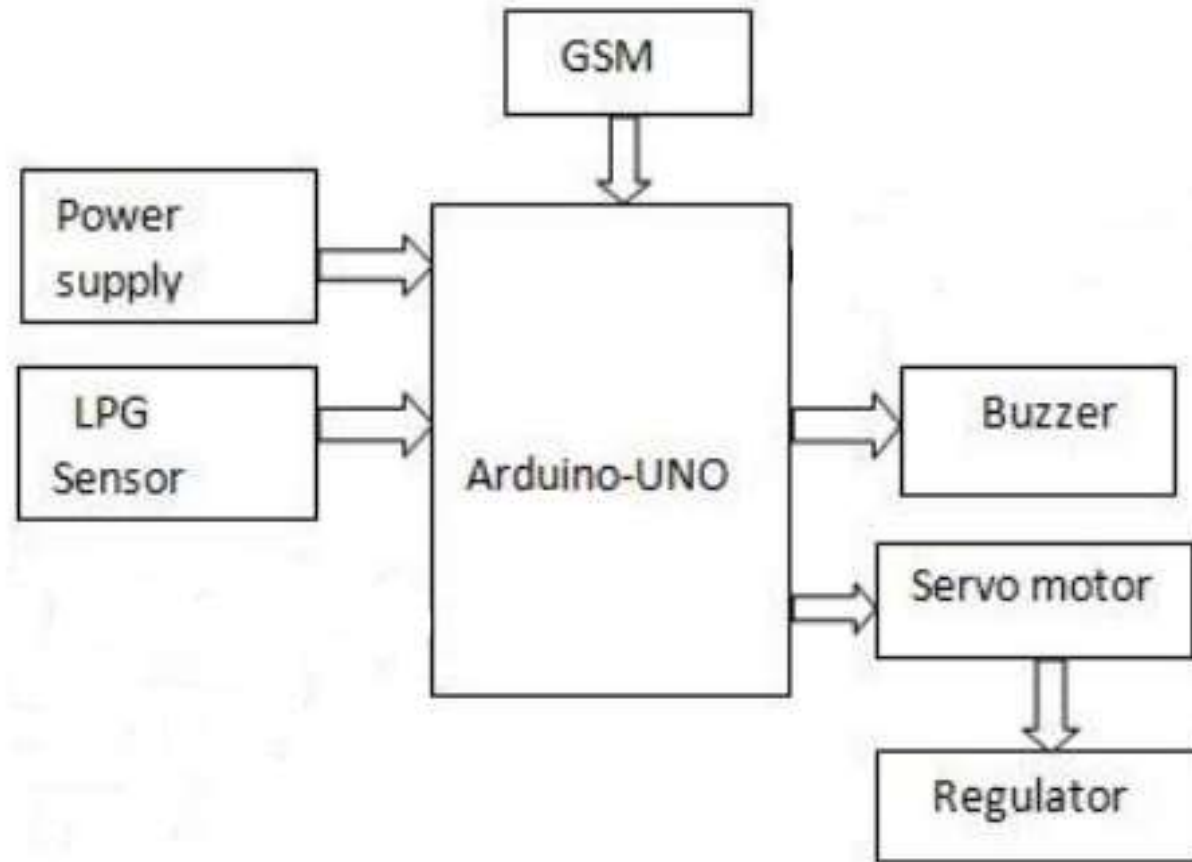
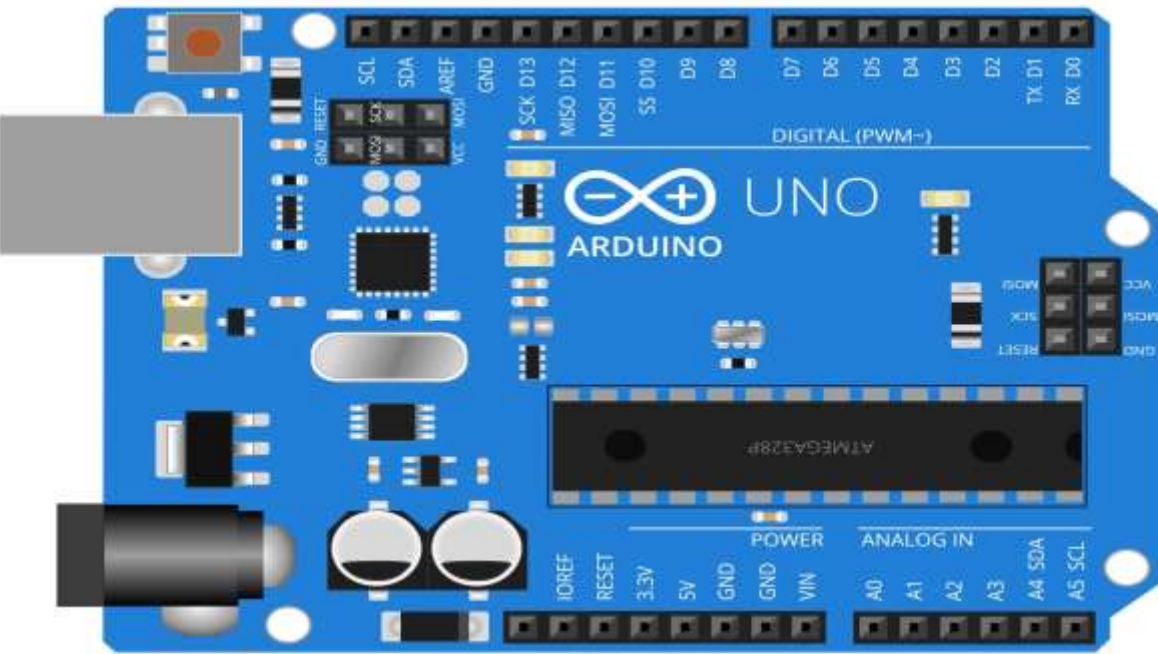


Fig. Block diagram

Hardware Description:

Arduino UNO

It has 14 digital input/output pins (of which 6 can be used as PWM outputs); 6-analog inputs ,a USB connection, a power jack and a reset button



Powerful and versatile microcontroller board

*commonly used boards include :
Arduino Uno ,
Arduino Pro Mini*

based on the ATmega328P

easily programmable using the Arduino IDE

MQ-6 Gas Sensor



4 headers so that it can be easily interfaced with the Arduino

High Sensitivity to LPG, iso-butane, propane

detect gas concentrations from 200 to 10,000ppm

MQ-6 GAS SENSOR

sends the signal to the Arduino UNO, which processes it

low-cost device

resistant to vibration, shock and humidity

Servo Motor



Electromechanical device

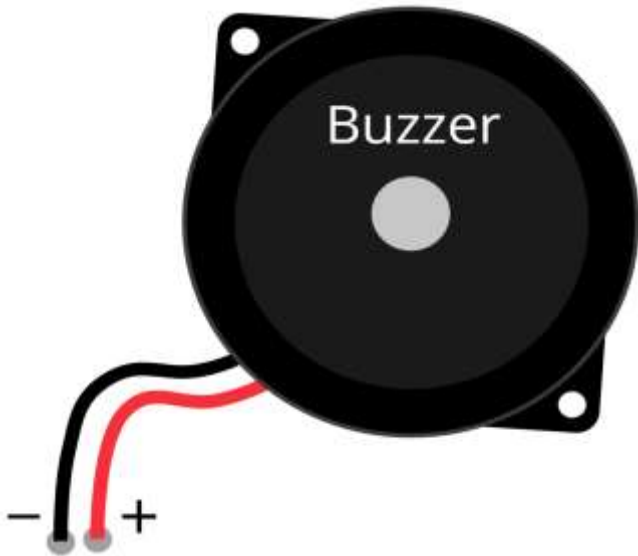
precise control of angular rotation

can be rotated from 0 to 180 degrees

rotation angle is controlled by applying a PWM signal

On leakage, rotation from 90 to 0 degree ,turning regulator OFF

Buzzer

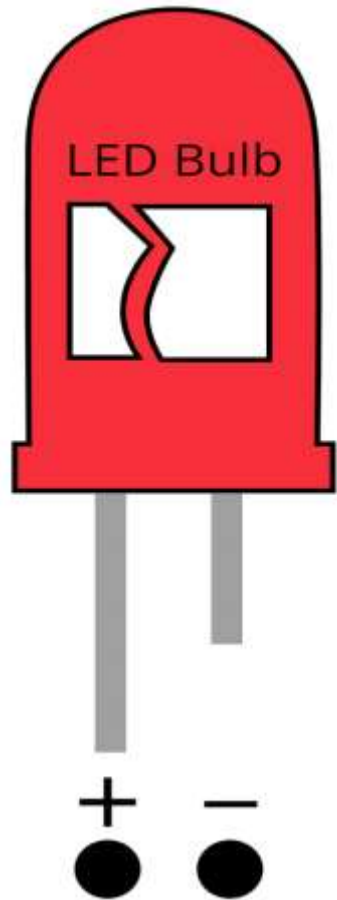


2 pin audio signalling device to alert

resistant to vibration, shock and humidity

receive a signal from the MQ6 gas sensor

LED



visual indication of a gas leak

*low power consumption,
long lifespan*

*to light up as an
indication of a gas leak*

GSM Module (900A)



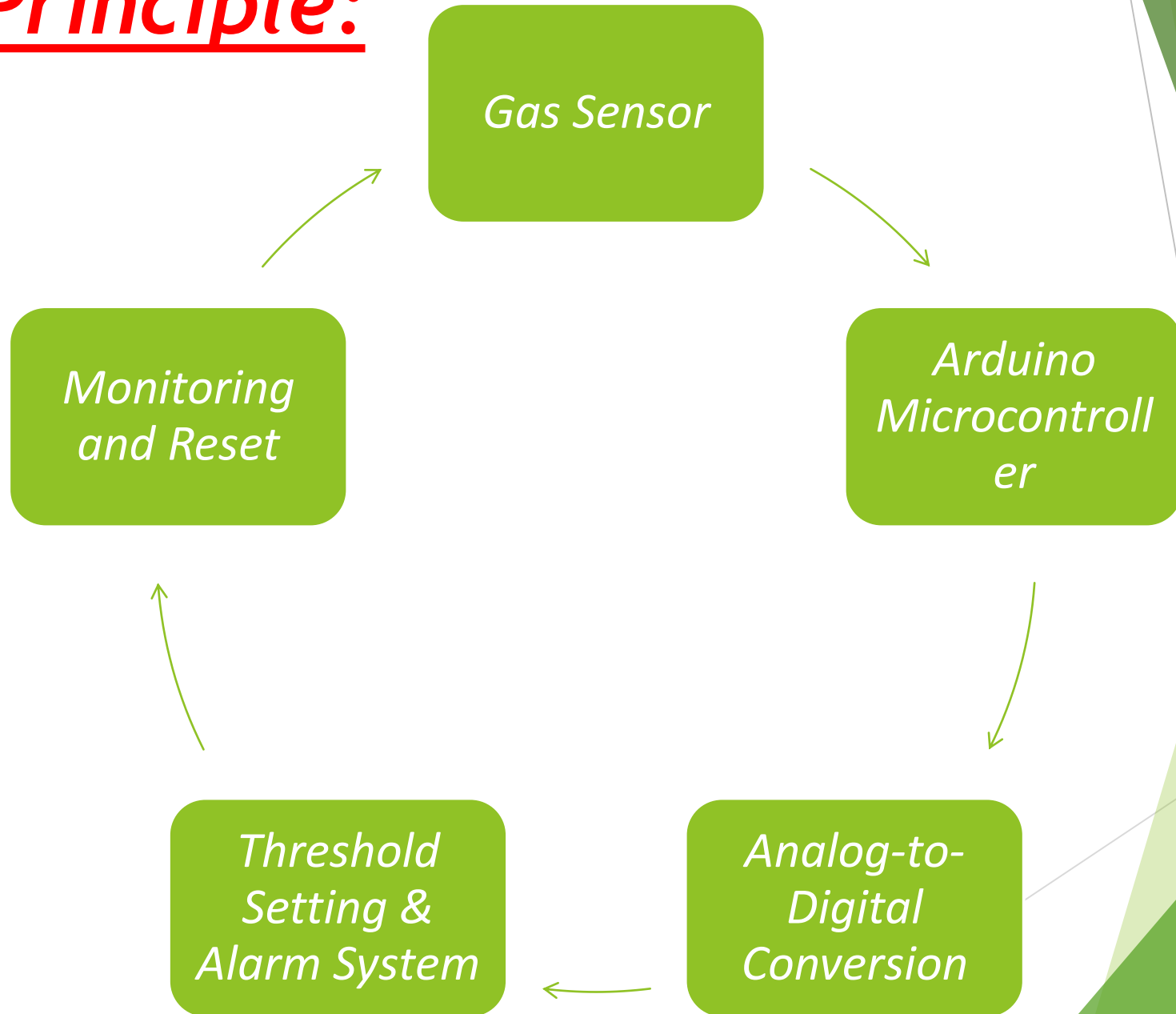
To establish communication

It requires SIM card

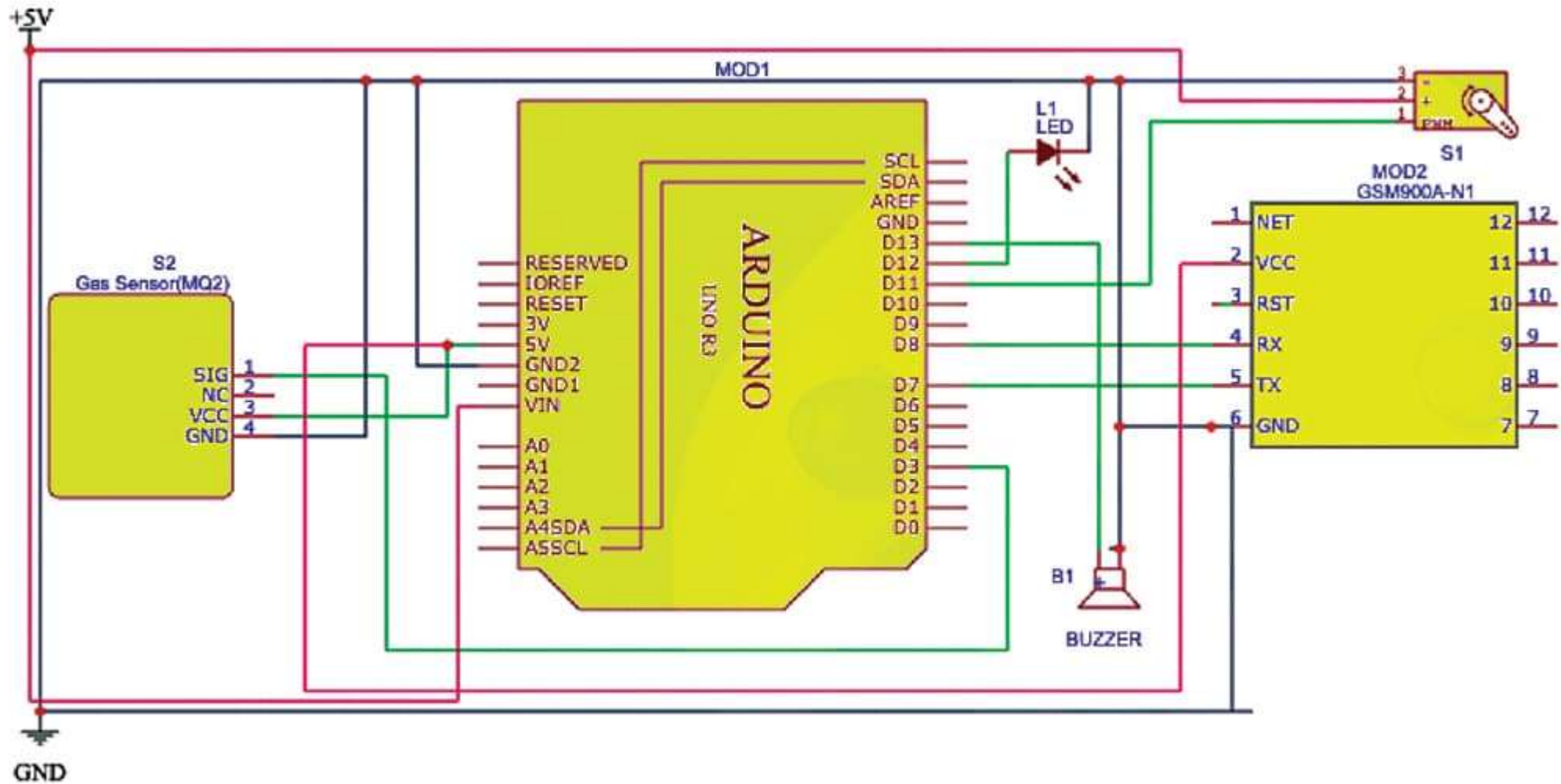
Control via AT commands

Supports UART interface

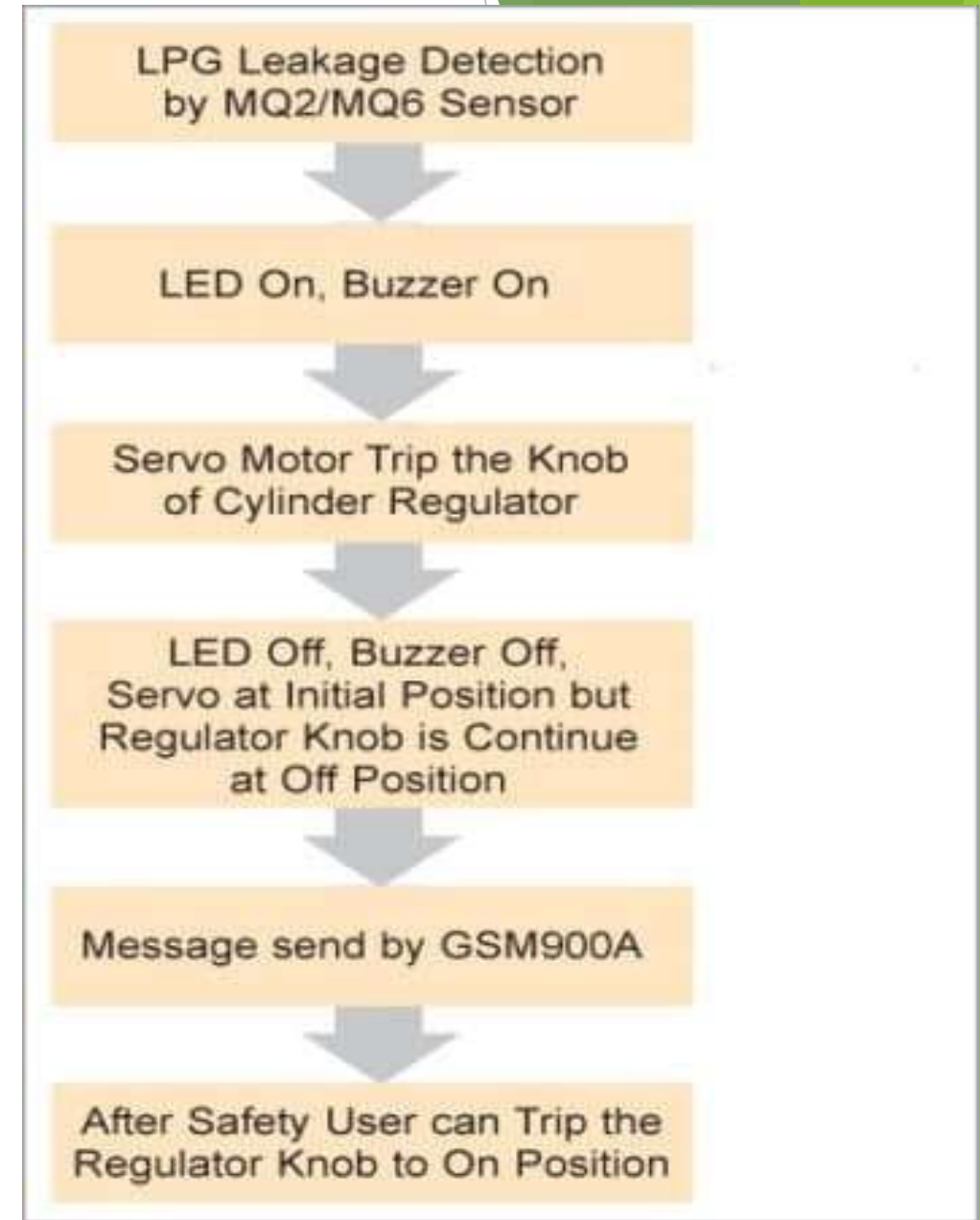
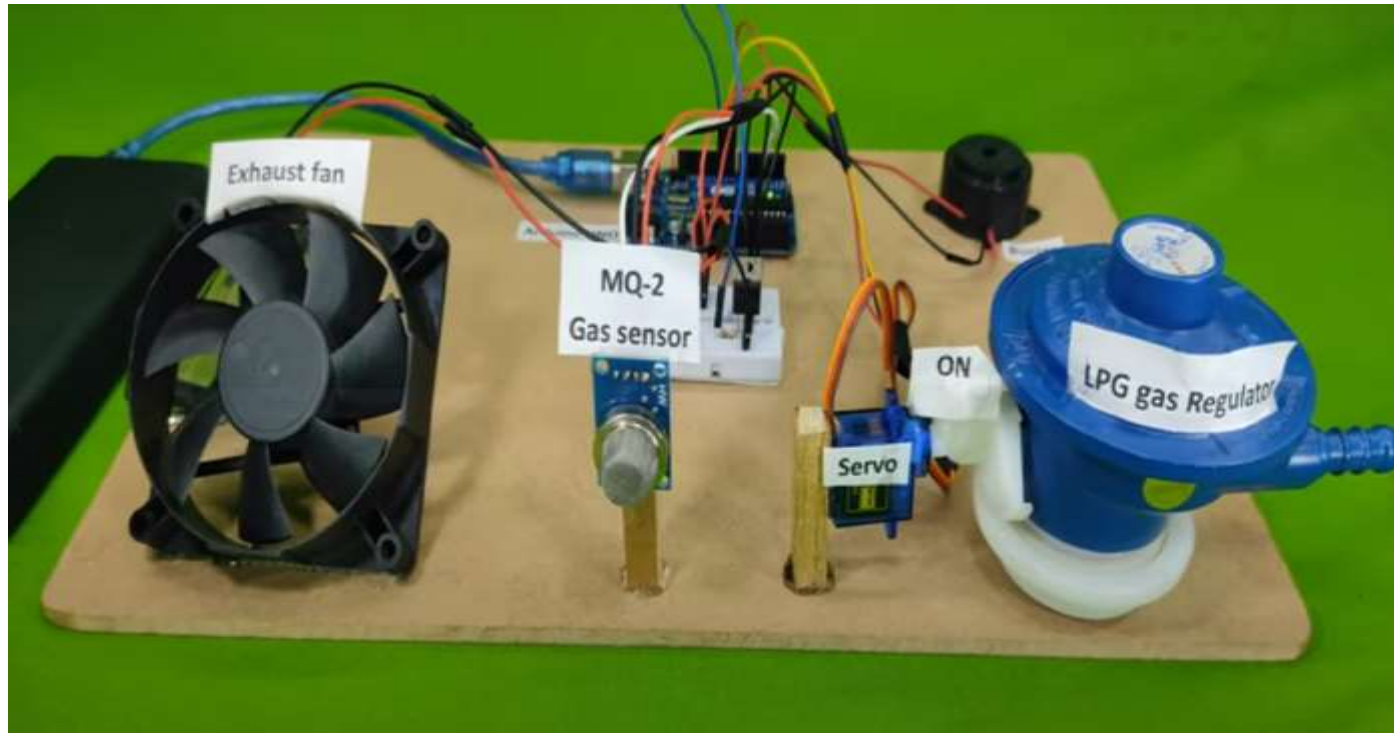
Working Principle:



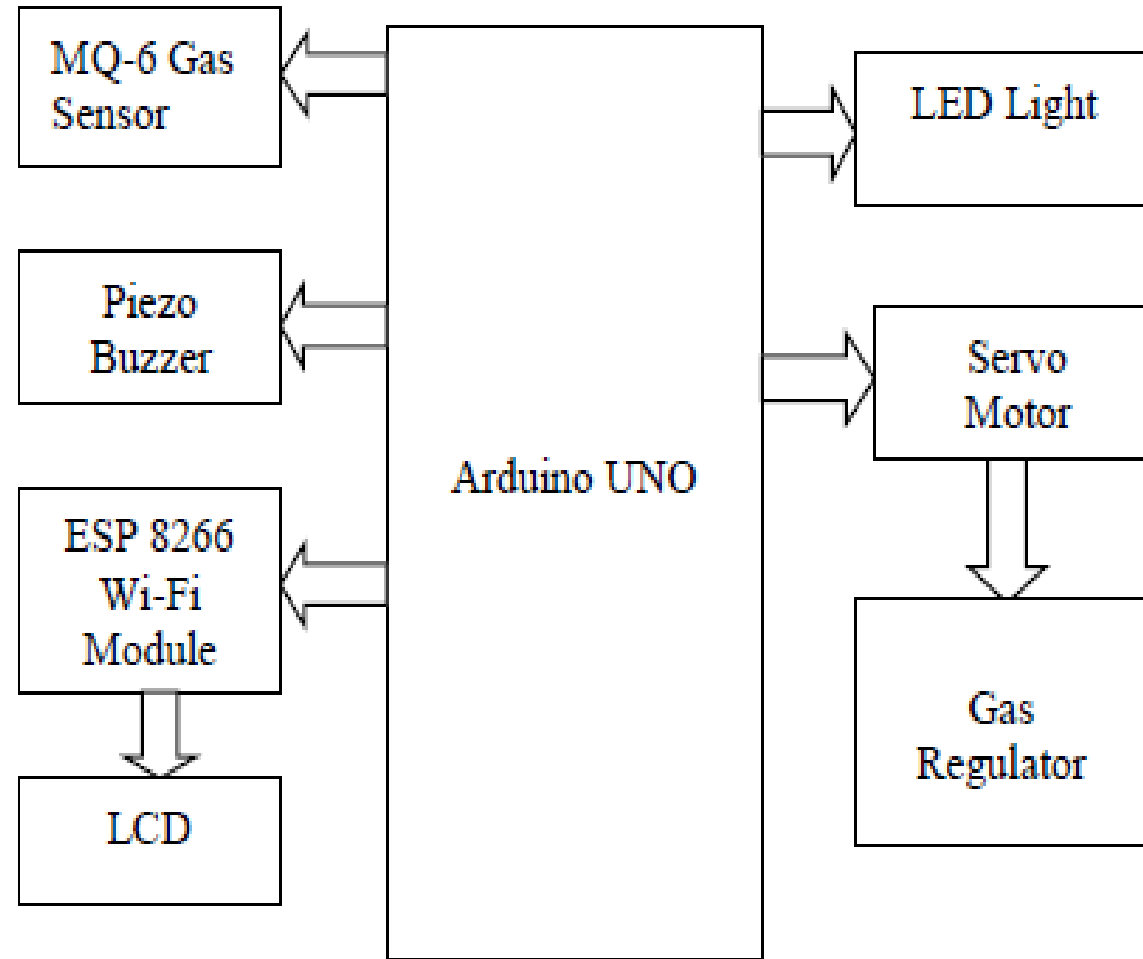
Circuit



Working Methodology



IOT Based Model



Major Challenges

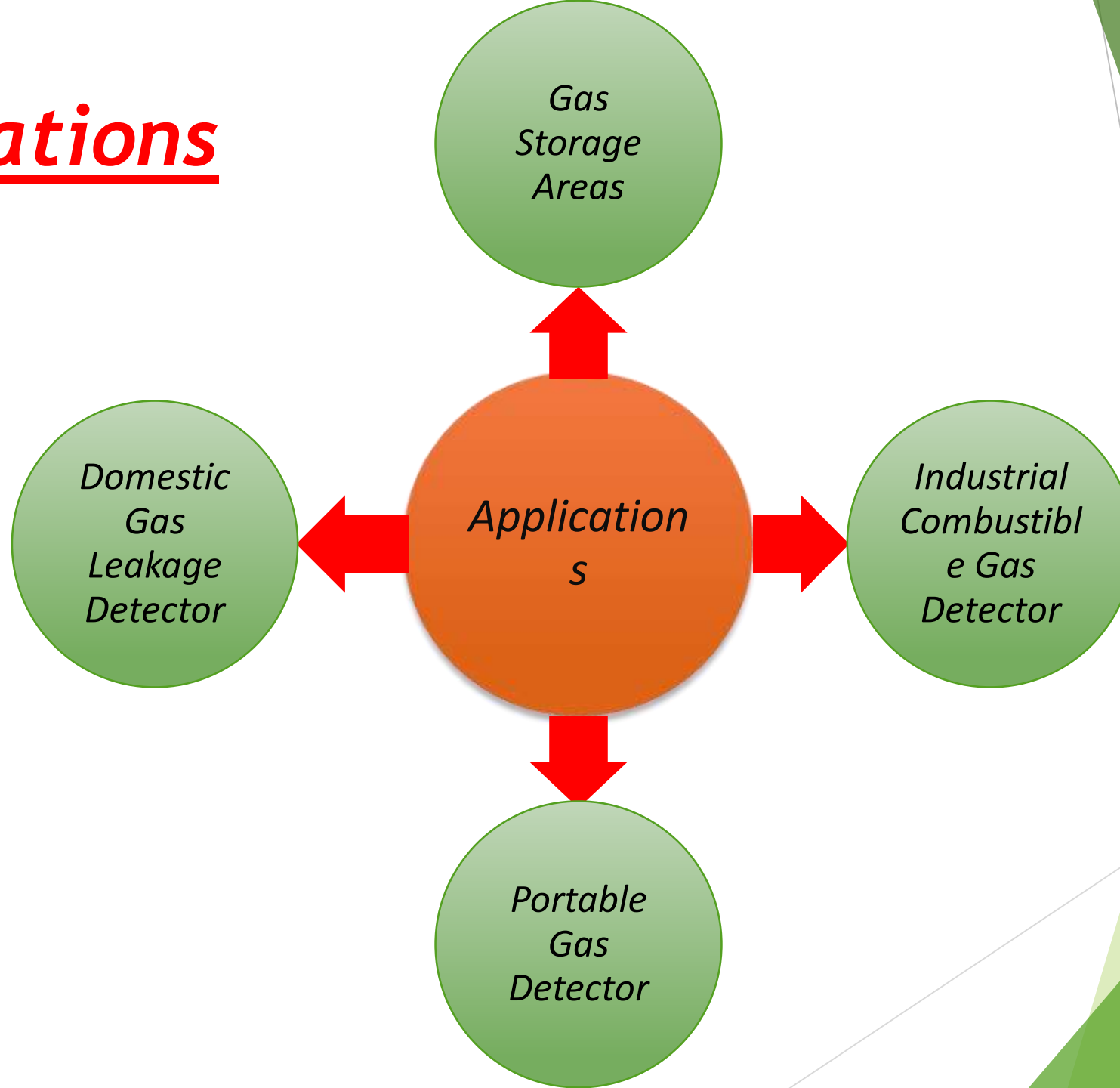
False Alarms

Power consumption

*Regulatory
Compliance*

*Mechanical Wear and
Tear*

Applications



CONCLUSION

- *Buzzer goes off when gas is <25%*
- *No gas detected , servo motor is 90 degree , LED OFF*
- *Gas detected , servo motor is 0 degree , LED ON*
- *Major Challenge Regulatory compliance*

REFERENCES

- ▶ R. VISHNU PRIYA , G. KOWSALYA ,*”Detecting LPG Leakage and Automatic Turn off using Arduino Connected with PIR Sensor” , Journal of Physics: Conference Series ,Vol. 1717, (2021),012043.*
- ▶ Mohammad Abas Malik, Magray Abrar Hassan and Adnan Shaf ,*IOT Based LPG Leakage Detection System With Prevention Compensation, EasyChair Preprint , (July 21, 2020) ,№ 3917.*
- ▶ <https://electronicsprojects.in/lpg-gas-leakage-detector-using-arduino-mq6-gas-sensor-led-and-buzzer/> ,*accessed on 22/01/2024.*
- ▶ Rakesh Jain , *“AUTOMATIC LPG GAS LEAKAGE Detection And Protection”, Electronics For You , August,2023 ,Page No.: 104-106.*

REFERENCES contd...

- ▶ S. Lakshmi Lavanya , M. Devi vara prasad , A. Sravya ,Ch. Durga Prasad ,A. Seshadri ,R. Koti Surya Kumar , “GAS LEAKAGE DETECTOR USINGARDUINO” , *International Research Journal of Engineering and Technology (IRJET)* , Volume: 10 Special Issue: (Apr 2023),Pg No. :350-353.
- ▶ D. Divyasree , G. Abu Bakar , “Gas Monitoring System using Arduino , *International Journal for Research in Applied Science & Engineering Technology*” (IJRASET) , Volume 7 Issue IV ,(Apr 2019),Pg. No. : 1803-1810.
- ▶ <https://www.engineersgarage.com/microcontroller-based-lpg-gas-leakage-detector-using-gsm-module/> , accessed on 31/01/24.