- **Gas leakage detection and alerting system using Arduino Uno**

  **Syeda Bushra Shahewaz and Ch. Rajendra Prasad**

The usage of the gas brings great problems in the domestic as well as working places. The inflammable gas such as Liquidized petroleum gas (LPG), which is excessively used in the house and at work places. The leakage of the gas causes destructible impact to the lives and as well as to the heritage of the people. So, by keeping it in the concept of the project we have determined to develop an examining system which finds the leak of LPG gas and protects the work places by taken correct precaution at correct time. This system provides the information such as when a gas leakage is noticed, sensors of in the project are used to notice the gas leakage and immediately turns ON the buzzer for the danger indication. Buzzer is a clear indication of gas leakage. By the detection of the hazardous gas the alerting message reached to the person who has control over it from the GSM. Detection of the gas leakage is important and halting leakage is important equally. The main objective of this project is that it is extremely accurate with a least cost, this project system is best to detect gas leakage and also warn people around by buzzer beep sound and an SMS is been send to the responsible person for preparatory safety calculations.

**ADVANTAGES AND APPLICATIONS :**

- Applicable usefully in the industrial and domestic purpose.
- In danger situations we are able to save the life by using this system.
- An alert is indicated by the GSM module.
- A sensor node senses gas like CO2, oxygen, propane.
- The estimated range of transmission and consumption of power is obtained.

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- **Development of a Gas Leakage Detection System**

  **C. C. Nnokwe, B. Ubochi, K. V. Onwuzuruike**

Liquefied Petroleum Gas (LPG) has a very high caloric value and is widely applied for both industrial and domestic use. Due to its non-negative impact on the environment, it is used in homes as a cooking gas and automobile engine fuel (auto gas) and has even been suggested as an alternative to R-12 in domestic refrigerators among others. Due to the flammable nature of the gas, care must be taken in order to guarantee its safe use. In this work, a microcontroller-based gas leakage detection system is developed. Even though significant progress has been made in the development of gas leakage detection systems, key issues still need to be addressed. In this work, a fast gas leakage detector with a buzzer and a text alert system is developed to accurately detect leakage from a single leak source. It uses MQ6 gas sensor placed close to the gas cylinder in order to trigger the alert system when the measured gas concentration goes higher than 100 PPM.

**APPLICATIONS AND ADVANTAGES:**

- Low Weight Alert
- Local Audio Alarm
- Safety has always been an important criterion.

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- **GAS LEAKAGE DETECTION AND SMART ALERTING SYSTEM USING IOT**

- **(Shital Imade, Priyanka Rajmane, Aishwarya Gavali, V. N. Nayakwadi ) Computer Dept.,BSCOER, Savitribai Phule Pune University, India**

Internet of Things aim towards making life simpler by automating every small task around us. As much is IoT helping in automating tasks, the benefits of IoT can also be extended for enhancing the existing safety standards. Safety has always been an important criterion while designing home, buildings, industries as well as cities. The increased concentration of certain gases in the atmosphere can prove to be extremely dangerous. These gases might be flammable at certain temperature and humidity conditions, toxic after exceeding the specified concentrations limits or even a contributing factor in the air pollution of an area leading to problems such as smog and reduced visibility which can in turn cause severe accidents and also have adverse effect on the health of people. System consists of gas detector sensors, Arduino board, ESP8266 and Cloud server. One Society authority person can register the all flat member user to our system. Society admin can add the details of per flat user such as user name, mobile number, per user flat sensor details information. Society admin can configure the threshold value of each sensor. System hardware can be deployed on each flat. Sensors can sense the value per time. System can send the values to cloud server. Server can Check that the sensor values was existed the threshold value. If sensor value can cross the limit the server can send the command to hardware for buzzing the alarm.[3] Server also sends the notification message to user.

## APPLICATIONS AND ADVANTAGES:

- Live-Monitoring and Control
- On-Demand Automatic Reordering Facility
- A UAV System for Autonomous Target Detection and Gas Sensing

- IOT technology to make a Gas Leakage Detector for society which having Smart Alerting techniques involving sending text message to the concerned authority and an ability performing data analytics on sensor.

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- **Gsm Based Gas Leakage Detection System**

- **(H. Huang, H. Bainand S. Zhu, "A Greenhouse Remote Monitoring System Based on GSM," in Proc. of IEEE )**

Gas leakage is a major problem with industrial sector, residential premises and gas powered vehicles like CNG (compressed natural gas) buses, cars. One of the preventive methods to stop accident associated with the gas leakage is to install gas leakage detection kit at vulnerable places. The aim of this paper is to present such a design that can automatically detect and stop gas leakage in vulnerable premises. In particular gas sensor has been used which has high sensitivity for propane (C3H8) and butane (C4H10). Gas leakage system consists of GSM (Global System for mobile communications) module, which warns by sending SMS. However, the former gas leakage system cannot react in time. This project provides the design approach on both software and hardware. Gas leakage detection is not only important but stopping leakage is equally essential.

## APPLICATIONS AND ADVANTAGES:

- Fire/Safety detection system
- Gas leak alarm
- Gas leak detection system
- Gas detector (LPG, Natural gas)

- **Gas Leakage Monitoring with Mobile Wireless Sensor Networks**

- **(Saeed H, Ali S, Rashid S, et al. Reliable monitoring of oil and gas pipelines using wireless sensor network (WSN)—REMONG[C]//System of Systems Engineering (SOSE), 2014 9th International Conference on. IEEE, 2014: 230-235.)**

In this paper, gas leakage monitoring and early warning system, based on mobile wireless sensor networks

(MWSNs), is developed. The system consists two parts: remote sensors and analysis server. Remote sensors are defined as sensor terminals in this research, and each sensor terminal is composed of gas sensor, microcontroller module, Global Position System (GPS) receiver module, General Packet Radio Service (GPRS) module and power module. They are integrated and mounted on both mobile devices and stationary place to form stationary sensor terminal and mobile sensor terminal. The field data, including gas concentration, speed data, GPS and time information, will be collected by them, and then be transmitted to analysis server by GPRS module via the Asymmetric Digital Subscriber Line (ADSL). S The center server is developed to receive, process and store the data. A real-time monitoring cloud platform is developed to display real-time data. A mobile wireless sensors networks, which consists of mobile sensor terminals and stationary sensor terminals, enable a large-region leakage monitoring. Experiments are carried out to valid the system. The results show that the real-time and early warning gas leakage monitoring system developed in this paper is reliable and practice.

## APPLICATIONS AND ADVANTAGES:

- Harmful Gas Detection
- Fire Hazard Prevention
- Real-time updates about leakages

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- **Smart Gas Level Monitoring, Booking & Gas Leakage Detector over IoT**
- **(Prof. S. K. Nanda B. B. Didpaye. Automated uni_ed system for lpg using microcontroller and gsm module a review)**

This journal explains about the most common problem experienced in our day- to- day lives that is regarding GAS container going empty. We bring this paper to create awareness about the reducing weight of the gas in the container, and to place a gas order using IOT. The gas booking/order is being done with the help IOT and that the continuous weight measurement is done using a load cell which is interfaced with a Microcontroller (to compare with an ideal value). For ease it is even has a been added with an RF TX & Rx modules which will give the same information. When it comes it to security of the kit as well as gas container we have an MQ-2(gas sensor), LM 35(temperature sensor), which will detect the surrounding environment for any chance of error. When ever any change is subjected in any of the sensors (load cell, LM35, Mq-2) a siren (60db) is triggered.

## APPLICATIONS AND ADVANTAGES:

- Oxygen Level Measurement
- Data analytics for improved decisions
- Get real-time alerts about the gaseous presence in the atmosphere
- Get immediate gas leak alerts.

- **IoT Based LPG Gas Level Detection & Gas Leakage Accident Prevention with Alert System**

## (Zaw Lin Oo, Theint Win Lai and Aung Moe)

The main objective of this research is to the continuous measurement of the weight of the cooking gas cylinder but in addition, can store this information over time to the IoT platform and how much amount of gas is spent in a week or a month. When the weight reaches the minimum threshold it will automatically sends an SMS alert to the housewife to chain or refill LPG gas cylinder for regular cooking. This system also designed to detect and sense for liquid petroleum gas (LPG) leakage and the alarm unit will be activated immediately, if the amount of gas concentration exceeds
normal level to prevent accidents in the kitchen environment. There have been reviewed several types of research and projects related to the LPG gas monitoring and gas leakage detection system. SmartGas: A smart platform for cooking gas monitoring [1] used a mobile application to detect the amount of LPG gas remaining in a gas bottle. Arduino UNO R3 microcontroller board with an Ethernet shield is used to obtain the information from the sensors and send data to MySQL local database. The mobile application was developed to access the information from the database server and will provide information of LPG gas consumption.By using IoT, the information of the near to the empty level of LPG gas in the cylinder will send to the user and the gas refill method by using telephonic ordering can be conducted. The purpose of this research is the detection of gas leakage and monitoring the LPG gas cylinder weight regularly to know the remaining value of gas in the cylinder. When the gas leakage is sensed, the warning signal and alarm sound will be active and also switch on the exhaust fan automatically to decrease the gas concentration. The weight of LPG is measured using the load sensor (SEN-10245) and the output of the sensor is connected with Arduino MKR Wifi 1010 microcontroller. The user can know the validity of LPG usage daily because the the amount of LPG gas will be published as events and watch them come through in real-time using the Wia IoT cloud platform. Consequently, the user is alerted by giving SMS notification to their mobile phone when the LPG level is critically low (below 20%) by using the integration function of the Wia IoT platform call Twilio, using its web service APIs. Then by detecting the gas leakage

with MQ6 gas sensor, this research work indicates gas leakage condition and also helps to prevent the LPG gas burst accidents in the home.

**APPLICATIONS AND ADVANTAGES :**

This paper is focused on the gas leakage detection system for home safety and will update regularly about LPG consumed daily. The developed system is affordable cost as components used here are cheap when compared to gas detectors commercially available in the market. LPG leakage is alerted by activating the alarm and using an exhaust fan it removes the leaked gas from the area. LPG consumption is observed and can be booked for a new LPG cylinder by the customer when the gas level is near empty.

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- **LPG Gas Leakage Detection and Alert System**

- **E. Jebamalar Leavline1 , D. Asir Antony Gnana Singh2 , B. Abinaya H. Deepika**

Home fires have been taking place frequently and the threat to human lives and properties is growing in recent years. Liquid petroleum gas (LPG) is highly inflammable and can burn even at some distance from the source of leakage. Most fire accidents are caused because of a poor-quality rubber tube or the regulator is not turned off when not in use. Therefore, developing the gas leakage alert system is very essential. Hence, this paper presents a gas leakage alert system to detect the gas leakage and to alarm the people onboard.
Keywords: Liquid petroleum gas, Gas sensor, Leakage

## ADVANTAGES AND APPLICATIONS

Gas leakage leads to severe accidents resulting in material losses and human injuries. Gas leakage occurs mainly due to poor maintenance of equipments and inadequate awareness of the people. Hence, LPG leakage detection is essential to prevent accidents and to save human lives. This paper presented LPG leakage detection and alert system. This system triggers LED and buzzer to alert people when LPG leakage is detected. This system is very simple yet reliable.

- **LP GAS LEAKAGE ALARM**
- **(M. G.. D. D. Wickramasinghe , N. Abhayasinghe)**

One of the most common types of energy source used domestically is propane in which liquefied gas contains. Though the safety issues are considered by the company, leakage of gas has become a very common accident which can cause damage to human lives and property. This paper presents a low cost, power efficient centralized LP gal leakage alarm system. The system has two main devices: the gas detector and the centralized alarm unit. The gas detector that is located close to the gas usage point (gas cylinder) is a battery operated device that is designed to operate up to 6 months with two AA size alkaline batteries. There can be more than one detector in the systems, which can be separately identified in the system. The centralized alarm unit detects the alerts sent by the detectors and releases the alarm. It has an indication of which detector has released the alert. The alarm unit is ac mains powered and has a battery backup to cater power failures. The components of the device have been chosen considering the power consumption and the time intervals have been calculated concerning the current consumption of each component.

**ADVANTAGES AND APPLCATIONS :**

The paper presented the design, development and implementation of low power, accurate LP gas detector. The 6 month duration of the gas detector is proved theoretically and practically. These product features can be extended with the wider range of requirements. When dealing with more than one unit, handshaking is really important. It assures that two devices are in alert mode. Since these devices are dealing with hazardous gas, safety becomes the major requirement. So handshaking in every 30 minutes assures the two devices are in alert mode.

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- ## LPG GAS LEAKAGE DETECTION USING IOT
- **(Dr. Chetana Tukkoji and Mr. Sanjeev Kumar A. N Assistant Professor, Dept. of CSE Assistant Professor, GITAM School of Technology, Bengaluru)**
  This paper provides a brand new approach to discover LPG discharge supported microcontroller based Arduino. To alert on Liquefied rock oil Gas (LPG) leakage and preventing any unwanted incident, we need to apply some cautions to discover the discharge. It can be developed associate degree Arduino based LPG gas detector alarm, if gas leakage happens. The LPG detector MQ6 is associate degree correct LPG sensing device that acquires the signal intensity. Associate degree economical Arduino based signal process mechanism is followed that effectively quantizes the non-inheritable electrical signal. The intensity of the LPG leakage is classed into 3 categories, such as LOW, MEDIUM and HIGH based on square measure. This paper conjointly shows the ratio and temperature over the alphanumeric display. The importance and connection

of the paper is very beneficiary for man as a result of it's a vital cautions for our domestic life.

- **ADVANTAGES AND APPLICATIONS**

Safety plays a serious role in today's world and it's necessary that smart safety systems are to be enforced in places of education and work. The LPG or gas that is combustible mixture of organic compound gases utilized in use as fuel in abundant application like homes, hostels, industries, automobiles' vehicles attributable to its fascinating properties that embrace high hot price, that manufacture the less smoke, produces less soot and doesn't cause abundant hurt to the setting. Each cases burns to provide clean energy, but there's a significant drawback concerning their outpouring within the air. The gases being heavier than air don't disperse simply could and should and will cause suffocation once indrawn conjointly once gas outpouring into the air may cause explosion' thanks to the explosion of LPG gas the no of deaths has been inflated in recent years. Thus this device is often used to avoid these issues by sleuthing and conjointly preventing outpouring of LPG.