**Gas Leakage Monitoring and Alerting System**

**Gas Leakage Detection And Smart Alerting System Using IOT(2018)**

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, the elementary concern of any project, has not been left untouched by IoT. Gas Leakages in open or closed areas can prove to be dangerous and lethal. The traditional Gas Leakage Detector Systems though have great precision, fail to acknowledge a few factors in the field of alerting the people about the leakage. Therefore we have used the 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 readings. Our main aim is to proposing the gas leakage system for society where each flat have gas leakage detector hardware. This will detect the harmful gases in environment and alerting to the society member through alarm and sending notification.

**-ShitalImade,PriyankaRajmanes, Aishwarya Gavali**

**IOT Based Industrial Plant Safety Gas Leakage Detection System(2018)**

Most of the fire-breakouts in industries are due to gas leaks. These cause dreadful damage to the equipment, human life leading to injuries, deaths, and environment. Currently available leakage detectors warn the people around using on-site alarms. So, this project proposes a leakage detector which sends the warning to the concerned people through SMS. This detector senses the presence of harmful gases particularly, LPG, Methane and Benzene. LPG and Methane gases catch fire easily resulting in blasts. Benzene is carcinogen effecting the health of workers, if inhaled in higher concentrations. Hence, detection of these gases is essential. This low cost project includes MQ6, MQ4 and MQ135 gas sensors which detect LPG, Methane and Benzene gas leaks respectively and uses ESP-32 as a Wi-Fi module. The concentration levels of the above mentioned gases are uploaded in the UBIDOTS cloud and the login details are included in the alert message so that the user can check, if needed. The prototype of the proposed system generates a sound alert using buzzer on detection of a dangerous leakage and sends an SMS to the concerned person using IFTTT web service. Different color LEDS are used to specify the gas leaked for example, RED LED indicates the presence of LPG.

**-Ravi Kishore Kodali**

**-R.N.V. Greeshma**

**-Kusuma Priya Nimmanapalli**

**-Yatish Krishna Yogi Borra**

**IoT Based Smart Gas Management System(2019)**

The problem of gas leakage and fire is often encountered in our day-to-day life. LPG, Liquified Petroleum Gas, is highly flammable gas used as fuel in heating appliances. Leakage of this gas raises the risk of building fire, suffocation or an explosion. The mentioned problem can be solved with the development of reliable techniques to detect gas leakage. As soon as gas leakage will be detected, user will be notified via SMS and call so that he/she can turn off gas valve from anywhere in his work place. The issue of flame and fire at kitchen can be monitored with the help of fire sensor. The buzzer starts beeping whenever fire is detected. In addition to these, it is often found that a person forgets to book gas cylinder due to his/her busy schedule. The main aim of this paper is to design an IOT based Smart Gas Management System that will be able to detect gas leakage and fire. With the help of load sensor, automatic booking of a gas cylinder is also facilitated. Notification is sent to the booking agency to book a gas cylinder whenever load cell detects that the weight of gas cylinder has reached below a threshold value. At the same time, user will be notified about gas cylinder going empty.

**-Sony Shrestha, V. P. Krishna Anne,R. Chaitanya**

**IOT Based Smart Gas Leakage Detection & Alerting System(2021)**

Gas leakages are causing massive explosions in places throughout the world.The conventionally available gas leakage detectors only have the provision to alarm the user who is physically present at the spot . Hence, to overcome this limitation, this project implements a model which sends an email to the user in case there is a leakage. This model detects the leakage of Liquid Petroleum Gas & Benzene. LPG is highly inflammable and results in blasts. Benzene when inhaled in higher concentrations affects the health of workers in industries since it is carcinogenic. Hence, this cost-effective project uses MQ 6 and MQ 135 sensors for detecting the aforementioned gases using Arduino -UNO ,Wifi ModuleESP8266andThingspeakcloud.The real-time information of the above-mentioned gases are uploaded in the cloud and displayed in the form of a graph to the user. The prototype of this model generates an email to the concerned person using IFTTT web service. An LED is also used as a visual alarm at the site of leakage.

**-Rohan K H**

**IoT-based Gas Leakage Detection and Prevention System(2021)**

Gas is a form of natural gas which has been liquefied under extreme pressure and then contained in a metal cylinder. It is very sensitive to fire and can cause a great disaster if it's exposed to any fire source without precaution. Gas is more available than any other natural gas so most people choose Gas for their needs like cooking and other needs. So the event of gas leakage or blast occurring by leaked gas is frequently seen and heard. In this paper, a device has been introduced to prevent any possible accident from happening. It is called Smart Gas and Fire detector. The device can detect any spillage of gas and fire very quickly and send a response via gsm tool directly to the user very fast and a buzzer is set up to alert. The device also has another feature with an exhaust fan which will be activated in case of gas leakage and fire detected, to reduce the density of gas by pushing the air outside. The device is designed to detect gas and fire as quickly as possible. Its performance is the same in case of closed and open both types of room.

**- Pushpendra Kumar Pateriya**

**Analysis of IoT Based Smart Gas Leakage Detector and Notification System(2021)**

This study proposes a low-cost device that enables users to communicate with home liquefied petroleum gas (LPG) through the Arduino Blynk program. As a result, we've integrated the Wi-Fi module with smartphones and created a simple user interface rather than an involved number of switches like we've seen in many parts of our homes. The Blynk App is a well-designed GUI creator that can operate on Android that has been presented in this paper.

**- Shanmukapriya Amuthan**

**- Mohd Shahril Izuan Mohd Zin**

**Design Of An Alert System For Gas Leakage(2021)**

Liquefied Petroleum Gas (LPG) is a main source of fuel, especially in urban areas because it is clean compared to firewood and charcoal. Gas leakage is a major problem in the industrial sector, residential premises, etc. Nowadays, home security has become a major issue because of increasing gas leakage. Gas leakage is a source of great anxiety with ateliers, residential areas and vehicles like Compressed Natural Gas (CNG), buses, and cars which are run on gaspower. One of the preventive methods to stop accidentsgassociated with the gas leakage is to install a gas leakage detection kit at vulnerable places. The aim of this paper is to propose and discuss a design of a gas leakage detection system that can automatically detect, alert and control gas leakage. This proposed system also includes an alerting system for the users. The system is based on a sensor that easily detects a gas leakage.

**-ILONWAFORCHUKWUKA LEVI**

**Gas Leakage Detection System using IoT with integrated notifications(2020**)

In the past few years there is a rise in home automation systems which benefits the need for people using methods of Internet of Things (IoT). The main idea of this paper is to carry out the literature review on IoT based gas detection techniques and to ensure the safety of people and surroundings. By presenting a simple yet reliable system, gas leakage detection system using MQ5 gas sensor and arduino uno controller is incorporated with a cloud storage for data collection and also used for storing and analyzing data. Gas leaked is converted from Parts Per Million (PPM) to volts through the arduino IDE and results in notifying the user when the threshold limit is crossed. The user is alerted via an application for quick notification through the internet and also through a buzzer /LED for physical notification.

**-M Athish Subramanian**

**IoT Based Intelligent Industry Monitoring System(2019**)

The Internet of Things (IoT) is a newly emerging field with a vision of connecting `things', human and machines together making them an integral part of internet. The entire world is moving towards modernization and automation which may result in excessive pollution of environment. Determining the air quality is a prime need of the hour. This paper deals with the development of pollution monitoring system with deployment of intelligent sensors. Monitoring the gas leakage level from any part of the globe can be achieved by integration of big data to the Google Cloud via web servers. Analysis of the data is simplified thereby enabling ease of monitoring. Alerts can be triggered in case of drastic deterioration of air quality. The proposed method finds application in industry and also in monitoring of pollution caused by vehicles.

**-B.C Kavitha**

**-R Vallikannu**

**Development of an automated gas-leakage monitoring system with feedback and feedforward control by utilizing IoT(2019)**

Liquefied Petroleum Gas (LPG) is used in many ranges of applications like home and industrial appliances, in vehicles and as a propellant and refrigerator. However, leakage of LPG produces hazardous and toxic impact on human begins and other living creatures. There by, the authors developed a system to monitor the LPG gas leakage and make alert to users of it. In this research, MQ-6 gas sensor is used for sensing the level of gas concentration of a closed volume; and to monitor the consequences of environmental changes an IoT platform has been introduced. Robust control along with cloud based manual control has been applied so that the gas leakage can be prevented in the response of either feedback or feedforward commands individually. It switches on the specified relays to control the level of gas concentration in the time of leakage the excess gas in times of leakage. It rechecks the value again and again if it crosses 300 ppm it will setup a relay-based switching on control mechanism using Thingspeak cloud. The controller used here is Node-MCU v:1.0. This research provides design approach on both software and hardware. Hence an embedded system comprising of Relay switches, Embedded C++, Gas sensor, Temperature & Humidity sensor along with Internet of Things (IoT) is fabricated to meet the objectives of the current research.

**-Shahadat MhiMd Zaglul**

**A wireless home safety gas leakage detection system(2019)**

A wireless safety device for gas leakage detection is proposed. The device is intended for use in household safety where appliances and heaters that use natural gas and liquid petroleum gas (LPG) may be a source of risk. The system also can be used for other applications in the industry or plants that depend on LPG and natural gas in their operations. The system design consists of two main modules: the detection and transmission module, and the receiving module. The detection and transmitting module detects the change of gas concentration using a special sensing circuit built for this purpose. This module checks if a change in concentration of gas(es) has exceeded a certain pre-determined threshold. If the sensor detects a change in gas concentration, it activates and audiovisual alarm and sends a signal to the receiver module. The receiver module acts as a mobile alarm device to allow the mobility within the house premises. The system was tested using LPG and the alarm was activated as a result of change in concentration.

**-Luay Fraiwan**

**International Journal of Computer and Information System (2022)**

A gas leakage detector is a device for detecting gases in an area that is often used in a security system. This type of equipment is used to detect gas leakage or another emission. A gas warning device can alert operators in the vicinity of a possible gas leak and enable them to escape. The device is important because many gases can be harmful to organic life, such as humans or animals. This can be used to detect flammable, flammable, and toxic gases, as well as a lack of oxygen. Identifying potentially dangerous gas leaks through sensors. These sensors often use an audible alarm to alert people when dangerous gas has been detected. The purpose of this paper is to propose and discuss the design of an IoT-based gas leakage detection system that can automatically detect and warn gas leaks. The proposed system also includes a warning system for users. The system is based on sensors that can easily detect gas leaks.

*-***MethilaFarzana Woishe**

**IoT Based Gas Leakage Detection and Alarming System(2021)**

Gas or liquefied petroleum gas (LPG) is a chemical substance resultant from petroleum and could be dangerous in industrial places or those that deal with this substance. Gas leakage causes many health issues. So, to prevent such catastrophes and in order to maintain a clean air environment, the workspace atmosphere should be frequently monitored and controlled. The proposed monitoring gas leakage detector system is based on Internet of Things (IoT) technology. NodeMCU ESP8266 Wi-Fi is used to be the microcontroller for the whole system. The combustible gas sensor (MQ2) is used in order to detect the presence of methane (CH4) and carbon monoxide gas (CO). MQ2 sensor will detect the concentration of the gas according to the voltage output of the sensor and the ESP8266 will send the data reading from the gas sensor to Blynk IoT platform over an IOS phone; data visualization is done using Thingspeak IoT Platform. Besides, a fan will immediately work upon the leakage occurs along with an alarming buzzer.

**-Noor Kareem Jumaa**

**Gas Leakage Detection and Level Monitoring System Based on IoT(2022)**

Liquefied Petroleum Gas (LPG) is widely used for heating, cooking, automotive fuel, and a variety of other applications around the world. Liquefied Petroleum Gas is highly flammable. There had been many serious accidents, such as explosions and fires involving leakage of liquefied gas. If a leak is not noticed early enough, such accidents can have dangerous consequences. The problems of gas leakage and cylinder availability are faced daily. LPG is a flammable gas that is used to power heating appliances. The risk of structural fire, asphyxiation, or explosion is increased if this gas escapes. This problem can be solved by developing an effective means of detecting gas leaks. The user will be alerted via ThingSpeak as soon as a gas leak is detected. This project also deals with the percentage of gas remaining in the cylinder, which is determined by a sensor known as a load cell, and the percentage of gas remaining in the cylinder is constantly updated in ThingSpeak. When a gas leak is detected, the buzzer makes sound. In addition to this, gas levels are often detected and the user is alerted via ThingSpeak. The main goal of this project is to create a gas leak detection and monitoring system based on the Internet of Things (IoT). With the use of a gas sensor and a load sensor, this system will be able to monitor gas leakage and gas level. This data is transmitted to the user via the Internet of Things and displayed using ThingSpeak.

**-B. MUKESH KUMAR**

**IoT-Enabled Hazardous Gas Leakage Detection System for Citizen's Safety(2022)**

This chapter attempts to develop a hardware system prototype to detect hazardous and lethal gas leakage in the model environment using a microcontroller in conjunction with some sensor technology and alarming actuators to acquaint the concerned authorities and personnel. The chapter's proposed architecture strives to ensure the security standards of a dedicated place in hazardous and lethal gas detection by the intimation of any negative outliers. We have deployed scripts written in C++ on the microcontroller via Arduino integrated development environment (IDE) serial debugging and easy deployment tools. Metal oxide-based (MOS) type sensor, MQ2, is employed to continuously sample the subject and sense the existence of the target compound(s) in its vicinity. Sensors from the MQ sensor series are widely used in low power-consuming components to detect combustible gases and flammable steams. These modules seem to emerge as an effective and inexpensive solution to target compound detection according to both households and industry standards. This attribute of the MQ sensor series could be substantially applied to detect gas leakage. A discussion on actuation, alarm, and implementation of integrating a simple buzzer, however following the same channel, required and desired mechanism and apparatus can be combined. The proposed system first provides the ability to detect gas leakage and lethal compounds in its vicinity. Second, it produces low output to Arduino, which alarms the concerned authorities. Furthermore, it provides the low-powered, inexpensive, highly customizable, and widely available constituent hardware. Moreover, we will discuss some more alternatives and complications of the MQ2 sensor unit and proposed solutions.

**-PrernaSharma, Latika Kharb**

**Sensor based Smart Automated Gas Leakage Detection and Prevention System(2022)**

Liquefied petroleum gas (LPG) is commonly used for heating, cooking, automotive power, and various other uses worldwide. LPG is a particularly flammable gas, and LPG leaks cause significant incidents. The cause may arise from improper installation to the use of faulty gas cylinders. Since LPG is an extremely volatile and flammable gas, a reliable safety system has been designed and developed using IoT (Internet of Things) capable of detecting gas leakage, turning on the emergency alarm, tracking the location, and sending alerts messages to users and nearest helpline number. The proposed model sort out into four modules, such as Gas Detection Module (GDM) always detect the gas leakage to avoid unexpected incidents; Location Detection Module (LDM) track the gas leakage location and pass the value to NM; Notification Module (NM) is responsible for generating the message service to notify the nearest help center and user; In the case of a gas leak, the Alarm Module (AM) is responsible for activating an emergency alarm. The result shows the system successfully performed. It can be noted that the proposed can be embedded with any environment, including home, office, ship, industry, etc

**-Zarrin Tasnim**

**IOT Based Gas Leakage System Using Arduino(2022)**

The Internet of Things (IoT) aims to automate the lives of the world by giving the path with or without human interference which will automate the tasks which may be bigger or smaller than we encounter. Because the Internet of Things (IoT) intends to simplify working, It is also practical to use well-being to reinforce present security standards. The essential goal of every project has not gone ignored by IoT. In open or closed situations, gas leakage may be savage. While traditional gas detection systems are noiseless and accurate, they are unaware of a few key aspects in the area of warning people of a leak. As a result, we have built the implementation for both industry and the society which will detect the leakage of gas and also monitor the gas availability. Alerting techniques that include sending messages to the applicable command as well as the ability to analyze sensor reading data. These days, gas leakage and detection are major concerns in our daily lives. LPG gas is very burnable, posing a risk to both people and property. To avoid such accidents, a notable amount of try has gone into developing reliable systems for detecting gas leaks. Our significant objective is to recommend a gas detection that includes gas leakage detecting hardware to households in the area. This can monitor dangerous chemicals in the air at workplaces and it may also be used in households by alerting through an LCD and sending a message to a recorded phone number.

**-A.P. Linge**

**Smart Detection System for LPG Gas Leakage using IoT(2022)**

Now a day’s lot of home fires have been taking place frequently due to the leakage of gases such as LPG, etc. The LPG is highly inflammable and it can easily cause explosion. Liquefied petroleum gas consists of butane and propane. Its versatile nature enables it to get used in various needs like industrial fuel, domestic fuel etc. Most of the fire accidents are caused due to poor quality regulators, human careless and failing to turn off regulators when they are unused. Therefore, the detection of gas detection system is essential. This paper presents the gas detections model using Arduino UNO on the basis of IOT (internet of things). The gas sensor is used to identify the smell of gas leakage. LCD is turned on, when the gas gets leaked. If gas leakage takes place, both the LCD and GSM modem will be turned ON. With the help of GSM modem, messages notifying gas leakage will be send as SMS to user. Then user can take a proper action to avoid any incidents from happening. To avoid fire accidents due to gas leakage, this proposed gas leakage system using IoT has been developed and presented in this paper.

**-Ravisankar B**

**Home and Industrial Safety IoT on LPG Gas Leakage Detection and Alert System(2022)**

Gas leakage is usually the result of poorly fitted, badly maintained or faulty appliances like boilers and cookers. Gas leaks can lead to the presence of dangerous gas in the house. As it is responsible for killing 20 people every year, it is essential to know how to detect a leak. The main focus of this project is to detect and monitor the gas level using gas sensor and send gas level to the Ubidots via Internet of Thing (IoT). This project measures the gas level within the house or Industrial factory and update and keep a safe gas level and stored data into Ubidots’s dashboard. The gas level is analyzed and an alert notification is sent to the owner if there is a gas leakage in the house through social media on the smartphone. The gas level data are analyzed by Ubidots to determine the gas level throughout the day and week. At the end of this project, the user can easily monitor the safety of the house or industrial places in case of gas leak even from afar. The system successfully implemented using the gas sensor connected to Intel Edison that published the gas level data to Ubidots Cloud via IoT and send telegram to owner in case of gas leakage occurs. The owner can login and check the the gas level using Ubidots dashboard.

**-Zainal H. C**

**Gas Leakage Detection and Prevention Kit Provision with IoT(2022)**

For the sake of lives safety and fulfillment of social duties, and keeping in focus the life-threatening instances of blasts and injuries due to leakage of gas in industries, vehicles and houses, a gas leakage system has been designed whereby application of embedded systems and involvement of Internet of things (IoT) in it, a system is obtained that enables us not only to notify the concerned person but also seize any leakage of gas. In the paper, a system has been proposed which lessen the chances of accidents and ensure safety by the virtue of existing electronics and technology.

**-ManaswiSharma1,Diksha Tripathi**