NALAIYATHIRAN

**GAS LEAKAGE MONITORING AND ALERTING SYSTEM**

ABSTRACT:

Gas leakage source detection and boundary tracking of continuous objects have received significant research attention in the academic as well as the industries due to the loss and damage caused by toxic gas leakage in large-scale petrochemical plants. With the advance and rapid adoption of wireless sensor networks in the last decades, source localization and boundary estimation have become the priority of research works. In addition, an accurate boundary estimation is a critical issue due to the fast movement, changing shape, and invisibility of the gas leakage compared with the other single object detections. We present various gas diffusion models used in the literature that offer effective computational approaches to measure the gas concentrations in the large area. In this paper, we compare the continuous object localization and boundary detection schemes with respect to complexity, energy consumption, and estimation accuracy. Moreover, this paper presents the research directions for existing and future gas leakage source localization and boundary estimation schemes with WSNs.

INTRODUCTION:

Gas leakage is a serious problem and is found in many residential, industries and vehicles such as Compressed Natural Gas(CNG). Gas leaks have been reported to cause accidents in many places. Gas leaks due to increasing demand from LPG users are often improper and untimely action, leading to many dangerous accidents. An effective method by installing a safety system in such a situation as well as monitoring the level of LPG in the cylinder is required so that users are aware of remaining Gas in the cylinder. There have been many accidents due to gas leakage in the last few years. There are some similar examples due to gas leakage. Toxic gasses are one that cause serious health impacts, but also are utilized in industries in large quantities. These gasses need to be monitored; such an increase within the normal level of them might be known and proper precautionary measures are often taken. Arduino is going to be wont to perform the specified task by interfacing gas sensor and LCD to display, Ethernet shield to send alert message to the user via an Android application and servo motor to turn on the window. The system will detect the gas leakage by using a gas sensor and it'll inform the Arduino board which can perform the further actions i.e. opening the window, turning on the fan. The people within the neighborhood also can be included just in case of an emergency. MQ2 LPG gas sensor is employed for input. The gas leakage event may involve danger for all times. There are many deaths around the world due to gas leakage. Thus, it's ensured that one doesn’t need to worry about the gas leakage becoming so intense and out of control that it can cause damage to life or the encompassing environment and also notifying and alerting the workers or residents about the gas leakage. It gives a HIGH output when LPG, i-butane, propane, methane, alcohol, hydrogen and smoke gas is sensed. This module is extremely easy to interface with microcontrollers and Arduino and simply available in the market by name “LPG Gas Sensor Module”. Various kinds of anthropogenic emissions named as primary pollutants are pumped into the atmosphere that undergoes chemical reaction and further leads to the formation of new pollutants normally called secondary pollutants. For instance, according to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), nearly all climate-altering pollutants either directly or indirectly (by contributing to secondary pollutants in the atmosphere) are responsible for health problems. Almost every citizen spends 90% of their time in indoor air. Outdoor air quality of the cities of developed countries improved considerably in recent decades. In contrast to this, indoor air quality degraded during this same period because of many factors like reduced ventilation, energy conservation and the introduction to new sources and new materials that cause indoor pollution. The design of buildings for lower power consumption resulted in decrease of ventilation which further decreases the quality of air inside the building. This increases the need for indoor air quality.

LITERATURE SURVEY:

Gas Leakage Detection Based on Arduino And Alarm Sound, Rhonnel S. Paculanan, Israel Carino, International Journal of Innovative Technology and Exploring Engineering (IJITEE) Vol 8, April 2019. LPG leakages are a mutual hindrance in household and manufacturing nowadays. It is very life threatening if you will not distinguish and modify right away. The idea behind our project is to give a solution by power cut the gas provision as soon as a gas leakage is perceived apart from activating the sounding alarm. In addition to this, the authorized person will receive a message informing him about the leakage. Sanjoy Das, Sahana S, Soujanya K Swathi M C, "Gas leakage detection and prevention using IoT": International Journal of Scientific Research % Engineering Trends. Vol 6, Issue 3, May-June 2020, ISSN (online): 2395-566X. This paper fundamentally manages the advancement of a straightforward gas spill locator at the underlying stage and after that changing this basic gadget into a more progressive gas identifier framework later on. Gas sensors have been specifically utilized which has high affectability for propane (C3H8) and butane (C4H10). Gas leakage system consists of a GSM (Worldwide System for versatile communication) module, which sends SMS as soon as gas leakage is detected. Keywords: Arduino, MQ-6 Gas Sensor, LCD, LPG, Stepper. Dr. Chetana Tukkoji, Mr. Sanjeev Kumar, “Review paper on- LPG Gas leakage detection using IOT”: IJEAST – International Journal of Engineering Applied Science & Technology, Vol 4, Issue 12, April 2020 IJEAST (online): 603-609. 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 prevent any unwanted incident, we need to apply some cautions to discover the discharge. It can be developed with an associate degree Arduino based LPG gas detector alarm, if gas leakage happens. The LPG detector MQ 6 is an 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 beneficial for man as a result of it's a vital caution for our domestic life. Amatul Munnaza, Rupa Tejaswi, Tarun Kumar Reddy, Saranga Moahan “IoT Based Gas Leakage Monitoring System”: Journal of Xi’an University of Architecture & Technology (JXUAT), Vol 12 ISSN No: 1006-7930, Issue 5, 2020. The foremost object of this work is to monitor gas leakage in any industry using a gas sensor and Spartan 6 FPGA process. Structuring a cloud-based monitoring system is very important to reduce the cost of preserving servers, to avoid data misplacements and to make the access easy with multiple internet linked devices (computer, tablet, mobile phone) at the same time anywhere in the world. With the Internet of Things (IOT), we can control any electronic equipment in homes B. F. Alshammari, M. T. Chughtai, “IoT Gas leakage detector and warning generator”. Engineering and Technology and Applied Science Research Volume 10, Issue August 2020, pp no. 6142-6146. This paper presents an industrial monitoring system design using the Internet of Things (IoT). The gas sensor (MQ-5) captured information is posted into a data cloud. The sensor detects the leakage of gas under most atmospheric conditions. All the components are controlled by an Arduino (UNO-1) that acts as a central processor unit in the setup t. As soon as a gas leakage is detected by the sensor, the alarm is raised in the form of a buzzer. This alarm is supported by an LCD to display the location of leakage. Gas Leakage Detection and Prevention System, Shreyas Thorat, Neha Tonape, International Journal of Trendy Research, Vol 4, Issue 7, Dec 2020, ISSN NO: 2582-0958. The objective of this project is to present the design of an automatic alarming system, which can detect and prevent liquefied petroleum gas leakage in various premises. This system alerts the user by sending him a phone call and alerting the neighbors by buzzer alarm after the gas leaks above setpoint 1.The servo motor is used to close the gas pipe valves. This device ensures safety and prevents suffocation and explosion due to gas leakage. This project is implemented using Arduino uno and simulated using Arduino ide and proteus software. Rohan KH1, Navanika Reddy, Pranamya Maddy, Sachit Girish, Dr. Badrinath KI-“IOT based gas leakage detection and Alerting system”: JRP Publications,Vol. 1, pp no. 002-006, February 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. 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.

REFERENCE:

[1] Shital Imade, Priyanka Rajmane, Aishwarya Gavali, V. N. Nayakwadi “Review paper on- LPG Gas leakage detection using IOT”: IJIRS –International Journal of Innovative Research & Studies, Volume 8, Issue 2, Feb 2018 IJIRS: ISSN NO: 2319-9725.

[2] Gas Leakage Detection Based on Arduino And Alarm Sound, Rhonnel S. Paculanan, Israel Carino, International Journal of Innovative Technology and Exploring Engineering (IJITEE) Vol 8, April 2019.

[3] Dr. Chetana Tukkoji, Mr. Sanjeev Kumar, “Review paper on- LPG Gas leakage detection using IOT”: IJEAST –International Journal of Engineering Applied Science & Technology, Volume 4, Issue 12, April 2020 IJEAST (online): 603-609.

[4] Sanjoy Das, Sahana S, Soujanya K Swathi M C, "Gas leakage detection and prevention using IoT", International Journal of Scientific Research % Engineering Trends. Vol 6, Issue 3, May-June 2020, ISSN (online): 2395-566X.

[5] Amatul Munnaza, Rupa Tejaswi, Tarun Kumar Reddy, Saranga Moahan “IoT Based Gas Leakage Monitoring Syste”, Journal of Xi’an University of Architecture & Technology,Vol 12, ISSN No: 1006-7930, Issue 5, 2020.

[6] B. F. Alshammari, M. T. Chughtai, “IoT Gas leakage detector and warning generator”. Engineering and Technology and Applied Science Research Volume 10, Issue August 2020 .6142-6146.

[7] Gas Leakage Detection and Prevention System, Shreyas Thorat, Neha Tonape, International Journal of Trendy Research, Vol 4, Issue 7, Dec 2020, ISSN NO: 2582-0958.

[8] Rohan KH1, Navanika Reddy, Pranamya Maddy, Sachit Girish, Dr. Badari Nath K “IOT based gas leakage detection and Alerting system”: JRP Publications,Vol. 1(1), pp. 002-006, February 2021.

[9] D. Surie, O. Laguionie, T. Pederson, “Wireless sensor networking of everyday objects in a smart home environment”, Proceedings of the International Conference on Intelligent Sensors”, Sensor Networks and Information Processing- ISSNIP- 2008, pp. 189 – 194.

[10] J. Tsado, O. Imoru, S.O. Olayemi, “Design and construction of a GSM based gas leak Alert system”‖, IEEE Transaction, IRJEEE Vol. 1(1), pp. 002-006, September, 2014.

[11] M. Eisenhauer, P. Rosengren, P. Antolin, “A Development Platform for Integrating Wireless Devices and Sensors into Ambient Intelligence Systems”, pp.1-3.

[12] Harshada Navale, Prof. B.V.Pawar, “Arm Based Gas Monitoring System”. International Journal of Scientific & Technology Research Volu me 3, Issue 6, June 2014.

[13] Byeongkwan Kang,Sunghoi Park,Tacklim Lee andSehyun Park, "loT- based Monitoring System using Tri-level Context Making Model for Smart Home Services", 2015 IEEE International Conference on Consumer Electronics (ICCE), 2015.

[14] Abhishek, P. Bharath, “Automation of lpg cylinder booking and leakge monitoring system,” International Journal of Combined Researchand Development (IJCRD), pp. 693–695, 2016