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| **TITLE** | **AUTHOR** | **YEAR** | **METHODOLOGY** | **FINDINGS** | **PROS/CONS** |
| Electronic design of liquefied petroleum gas leakage monitoring, alarm, and protection system based on discrete components | Attia, Hussain A., and Halah Y. Ali. | 2016 | Liquefied Petroleum Gas, gas leakage, LPG detector, Operational amplifier, drive circuit, Buzzer, Valve. | Various parameters are measured and monitored in the system of through a LCD display which appears readings of temperature, smoke and alcohol levels. | The proposed system senses accurately the leakage state of LPG gas in home or industrial locations through continuous sensing to gas leakage level.  **CONS:**  When heavy dust,steam or fog blocks system will not able to take measurements. |
| Wireless Gas Monitoring and Alerting System (WGMAS) for Warehouse using Arduino and Raspberry Pi | , D. R., C. Balasubramaniyan, and D. Manivannan. | 2016 | Gas warehouse monitoring, IoT, WGMAS, WSN. | The developed WGMAS provides an efficient, periodical monitoring and alerting framework for the plants to prevent the explosion due to the leakage. | The proposed method also has a strategy to inform the admin regarding the fault of the node and to activate the MRN.  **CONS:** |
| "Fire detection, monitoring and alerting system based on IoT." | Gosrani, Shreya, Abhishek Jadhav, Krutika Lekhak, and Devesh Chheda | 2016 | Ardino board, Fire detection, IoT based monitor, Wi-Fi module. | The sensors detects and alerts the local emergency with the data collected by the system, and alerts organizations like fire departments, police stations and hospitals by sending the exact location to both user and operator through module which all are well connected with. | This system has tried to solve almost every problem related to the safety of homes and its assets.  **CONS:**  The framework which we have assembled is only one single unit for testing reason. |
| Internet of things (IOT) based gas leakage monitoring and alerting system with MQ-2 sensor | Pandey, Rohan Chandra, Manish Verma, Lumesh Kumar Sahu, and Saurabh Deshmukh. | 2017 | Air pollution Monitoring, gas sensors, Raspberry pi or texas module, wireless networks. | If these gases exceed the normal level then an alarm is generated immediately and also an alert message (Email) is sent to the authorized person through the INTERNET and used ARM development board. | . This results in a more efficient in operation because it is connected to a common web page specially built to notify or email the responsible authority automatically so reduces the stress of constant monitoring.  **CONS:**  The choice of using a real time gas leakage monitoring and sensing the output levels of gas has been clearly observed |
| IOT based Hazardous Gas Detection System using AVR Microcontroller | Agrawal, Akship, Lalit Kumar, Pavneet Kumar, and Vikas Kumar Jha. | 2017 | Embedded Systems, IOT, Gas Detection, AVR Microcontroller, GSM Module, Internet Of Things. | In critical situation, that is when the LPG exceeds from normal level above 1000ppm and in the same way when the Propane exceeds the normal level of 10000ppm then an alarm is  generated and a SMS is sent to the authorized user as an alerting system, which helps in faster diffusion of the critical situation. | This project is easy to use and it gives remote indication to user  GSM wireless module is most popular and fastest growing wireless platform in wireless communication.  **CONS:**  Unfortunately outdoor environmental conditions such as changing wind directions and quick dispersion of the gas cloud from a leaking outdoor installation often cause gas detection to fail simply because the gas never reaches the detector |
| Smart Evacuation Alerting System. | Rooban, S., Idupulapati Venkata Sai Eshwar, Ranga PLN Vasista, and P. Venkata Madhava Gupta. | 2017 | Arduino and different types of sensors like Flame, Temperature, and gas sensors | The flame sensor detects the presence of fire or flame based on the Infrared (IR) wavelength emitted by the flame. It gives logic 1 as output if a flame is detected, otherwise, it gives logic 0 as output. Arduino Uno checks the logic level on the output pin of the sensor and performs further tasks such as activating the buzzer and LED, sending an alert message. | Advantages include High-speed response and are immune to the false alarm.  **CONS:**  Disadvantages of UV/IR flame detector include the issue that it cannot be used for non-carbon fires as well as only being able to detect fires that emits both the UV/IR radiation not individually. |
| Gas leakage detection and smart alerting system using IOT. | Imade, Shital, Priyanka Rajmanes, Aishwarya Gavali, and P. V. N. Nayakwadi.. | 2018 | Internet of Things, Gas Leakage Detector, Smart Alerting Techniques, Data Analytics | 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. | This system will be able to detect the gas in environment using the gas sensors. Alerting techniques involving sending text message to the concerned authority and an ability performing data analytics on sensor.  **CONS:** |
| A real-time construction safety monitoring system for hazardous gas integrating wireless sensor network and building | Cheung, Weng-Fong, Tzu-Hsuan Lin, and Yu-Cheng Lin | 2018 | WSN, IoT,BIM,hazardous gas, safety management, job site monitoring | The WSN provides a remote way for monitoring and controlling hazards which eliminates the risk of human exposure to hazardous environments and enhances the human safety in monitoring tasks. | **CONS:**  WSNs not only can be quickly implemented and are free from wire maintenance, |
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