International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

DESIGN AND DEVELOPMENT OF AN IOT BASED ROBOT

K. Vinod Kumar[1] M.Tech, T. Sujatha[2], S. UmaDevi[3], G. Sri Teja[4], S. Sujana[5], K. Sucharitha[6]
Assistant Professor[1], B. Tech scholors[2,3,4,5,6]
Department of Electronics and communication Engineering[1,2,3,4,5,6]
Santhiram Engineering College, Nandyal (Dist)[1,2,3,4,5,6]
Andhra Pradesh, India.

10.48047/IJARST/V13/I04/02

Abstract

Several explosions and fires have occurred as a result of leaking LPG gas. If the leak is not discovered quickly, it might have disastrous consequences. There is a project that combines Arduino with the Internet of Things to detect LPG leaks and communicate that information to an IoT module. By the use of embedded electronics, network connection, and software, physical objects may exchange data and have two-way conversations in what is known as the "Internet of Things" (IoT). Neither does an IOT-based gas detection system need any kind of human involvement or supervision to function.

Introduction

Being a developing field, the Internet of Things has important implications for many fields, including technology, society, and the economy. The Internet of Things (IoT) is bringing Internet connectivity and powerful data analytic capabilities to a wide variety of everyday objects, including consumer products, durable goods, cars and trucks, industrial and utility components, sensors, and other everyday objects. This has the potential to revolutionize many aspects of our daily lives. Some estimates put the total number of linked IoT devices at 100 billion by 2025, with an associated worldwide economic effect of more than $11 trillion.

The Internet of Things (IoT) has risen to prominence as a hot issue in the general press as well as the more specialized press and technical communities. As a result of improvements in processing power, electronics downsizing, and network linkages, a broad variety of networked goods, systems, and sensors are now feasible thanks to this technology. There has been a plethora of conferences, publications, and news stories discussing and debating the potential implications of the "IoT revolution," from new market prospects and business models to worries about security, privacy, and technological compatibility. Large-scale adoption of Internet of Things devices has the potential to revolutionize many facets of modern life. New Internet of Things items, such as Internet-enabled appliances, home automation components, and energy management devices, are bringing us closer to a "smart home" future that provides increased safety and savings on utilities. Personal Internet of Things gadgets, such as wearable fitness and health monitoring devices and network-enabled medical equipment, are also changing the face of healthcare delivery. Benefits to independence

and quality of life at a fair cost are anticipated from the use of this technology by the disabled and the elderly.

Literature Review

2008's "Intelligent Residential Security Alarm and Remote Control System Based On Single Chip Computer," written by LIU zhen-ya, WANG Zhen-dong, and CHEN Rong, focuses on an 89c51-based home security alarm system that can detect intrusion, emergency situations, and even toxic gas leaks via remote automatic sound alarms. In the event of an emergency, the system is equipped with an automated alert that immediately contacts the emergency services phone number. Moreover, it displays the location where the alarm went off and can even be set off by voice. Power may be remotely turned on and off through phone using this smart security system. This study focuses on the wireless monitoring system, as opposed to the remote monitoring system based on SMS over GSM, as discussed in Chen Peijiang and Jiang Xuehhua's "Design and implementation of Remote Monitoring System Based on GSM" from 2008. This paper examines the research conducted by K. Galatsis, W. Wlodarsla, K. Kalantar-Zadeh, and A. Trinchi titled "Investigation of gas sensors for vehicle cabin air quality monitoring" in 2002, which found that metal oxide semiconducting (MOS) gas sensors were an efficient tool for analyzing air quality inside a car. In this work, we examine the similarities and differences between commercially available gas sensors and those based on Moo3 that we designed and built. When compared to the best commercial sensor, this one outperforms it by a whopping 74%. The Internet of Things: Problems and Cutting-Edge Solutions for Global-Scale Arkady Zaslavsky and Dimitrios Georgakopoulos's book "Sensor Information Management and Mobile Analytics" covers this topic. Using the information provided in this article, we can better organize the data collected from our many sensors.

For the purposes of [1], two primary components are employed: the transmitter and receiver modules. The former module is used to detect a shift in gas concentration through the implementation of a dedicated sensing circuit. This module determines whether the concentration of the gas has reached an unsafe level. Alarms sound and a signal is sent to the receiver module when a change in gas concentration is detected. The receiver module also doubles as a portable alarm, allowing you to move freely about the home. For validation, we employed LPG and found that the system would sound an alert if the gas concentration changed. PIC-16F877 microcontroller and radio frequency transceiver are used in this system. This system was designed to detect gas leaks and block them before they may cause damage, as detailed in reference [2]. There are three distinct parts, or modules, to the system. The

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
IJARST
ISSN: 2457-0362

MQ6 gas senor first detects any gas leaks. Second, the gas detector notifies the ARM microcontroller of an issue. The microcontroller then sends a signal to any external devices that are connected to it, triggering them to begin functioning. At last, the GSM module is enabled, sending SMS to the previously set mobile numbers, and the devices such as the buzzer, exhaust fan, and sprinkler carry out their respective tasks. There is a GSM module and an ARM-based microprocessor, the LPC2148, at work here. See [3] for citation. This solution proposes an inexpensive microcontroller called Arduino with an Android smartphone for use in home automation. Arduino can be programmed to accept keyboard input or sensor data, allowing it to manage a wide variety of connected electrical appliances through a variety of output peripherals. Since that mobile phones function as wireless communication devices, Bluetooth, a short-range wireless technology suitable for an interior setting, is used to link the Arduino and the smart phone. Since that the Arduino micro-controller lacks a built-in Bluetooth radio, wireless communication is enabled by use of an external HC-05 Bluetooth module. In a smart house, all of the appliances may be controlled with the touch of a button on any Bluetooth-enabled smartphone, thanks to the Arduino board.

Existing System

A gas detection system must not only keep a constant eye on things, but also stop gas from escaping into the atmosphere in the first place, so that fires may be contained. Any gas leak, whether in a home, business, restaurant kitchen, canteen, etc., has become an issue in modern society. Gas sensors are the workhorses of a gas leakage detecting system (depending on the requirement of the place). For LPG leakage monitoring, the suggested system employs a MQ6 sensor. The major goal of this project is to develop an innovative method for reliably detecting any fault of a pressurized gas system, with the end goal of preventing the buildup of flammable gases and the resulting damage or explosion that may result from their accumulation.

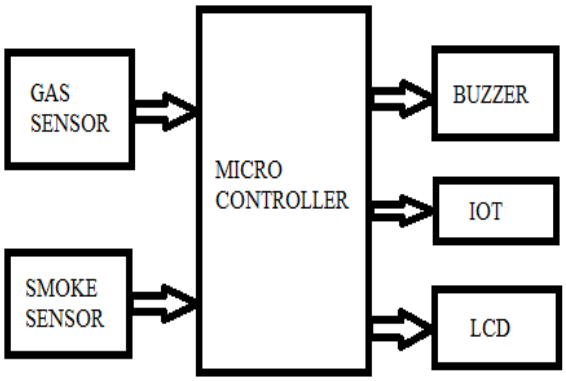
Proposed System

Using an ATmega 328 microcontroller, the suggested system is shown in fig. 1. The foundation of this system is an Arduino UNO board. A thermostat and a MQ-6 gas sensor are included in the system. These two components work together to monitor the gas concentration and ambient temperature of the space where the system is located, and display the results on an LCD screen. In order to notify the user, the Arduino UNO board with the appropriate code put onto it is equipped with an Ethernet shield. If the concentration of a gas rises over a user-specified threshold, in this case 250 parts per million, an alarm will sound. The user may

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
IJARST
ISSN: 2457-0362

activate features including an exhaust fan, a light, a buzzer/alarm, and a motor for shutting off the gas supply by using the system's relay. Using an Android app that is compatible with the Arduino setup, the user may turn on and off the devices.

Block Diagram



Applications:

Detecting LPG leaks in homes, hotels, and LPG cylinder storage sites is possible with the use of IoT and Arduino. This project's key benefit is that it can detect leaks and upload that information to a website, where it can be watched and remedial measures made if necessary.

Timely action performed in response to an IOT alert may reduce or prevent damage to people's homes and personal belongings.

Buzzer

An audible signaling device, a buzzer or beeper may be mechanical, electromechanical, or piezoelectric (piezo for short). Common applications for buzzers and beepers include alarms, timers, and the confirmation of user actions like clicking a mouse or typing a string of characters.

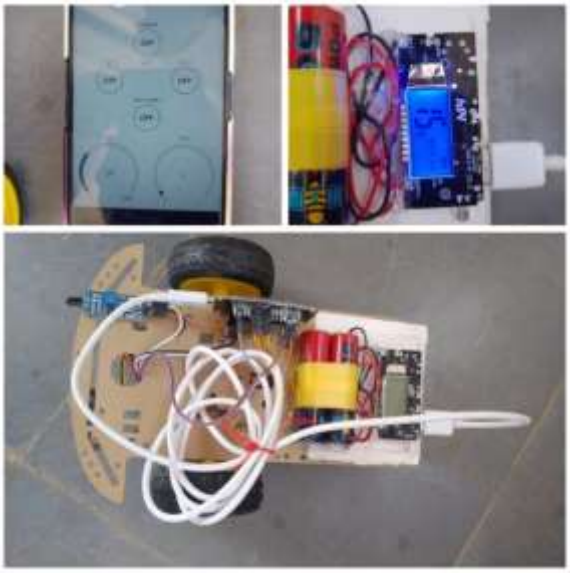
Gas sensors

For the purpose of detecting and classifying various gases, electrical devices called as gas sensors (or gas detectors) are used. In addition to sensing and measuring gas concentration, they are also employed to detect dangerous or explosive gases. Gas sensors are used to detect gas leaks in industrial and commercial settings, as well as to monitor the presence of smoke and carbon monoxide in residential settings. There is a large selection of portable and stationary gas sensors available, each with its own range and detecting capabilities. Embedded systems are often linked to an audible alarm or interface as

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal www.ijarst.in
IJARST
ISSN: 2457-0362

part of a larger system, such as in hazmat and security systems. As gas sensors are continually exposed to air and other gases, they need calibration at more frequent intervals than other kinds of sensors. Physical composition and sensing mechanism may vary greatly amongst sensors because of differences in surroundings and purposes. Metal oxide based gas sensors are widely used in the fields of dangerous gas detection and smoke detection. A chemiresistor is used in this sensor to detect the presence of certain gases by direct contact. Carbon monoxide, hydrogen, methane, and butane all cause an increase in electrical resistance in metal oxide gas sensors. Oxide-based sensors are widely used in residential smoke alarms.

RESULT:



CONCLUSION:

Several explosions and fires have occurred as a result of leaking LPG gas. If the leak is not discovered quickly, it might have disastrous consequences. There is a project that combines Arduino with the Internet of Things to detect LPG leaks and communicate that information to an IoT module.

By the use of embedded electronics, network connection, and software, physical objects may exchange data and have two-way conversations in what is known as the "Internet of Things" (IoT). IoT-based gas detection devices are similar in that they can operate independently of human monitoring.

References

1.Mahalingam, A.; Naayagi, R.T.; Mastorakis, N.E. Design and implementation of an economic

gas leakage detector. In Proceedings of 6th International Conference on Circuits, Systems and Signals, Athens, Greece, 7–9 March 2012; pp. 20–24.

2. Attia, H.A.; Halah, Y.A. Electronic Design of Liquefied Petroleum Gas Leakage Monitoring, Alarm, and Protection System Based on Discrete Components. Int. J. Appl. Eng. Res. 2016, 11, 9721–9726.

3. Apeh, S.T.; Erameh, K.B.; Iruansi, U. Design and Development of Kitchen Gas Leakage Detection and Automatic Gas Shut off System. J. Emerg. Trends Eng. Appl. Sci. 2014, 5, 222–228. Eng. Proc. 2020, 2, 28 6 of 6

4. Soundarya, T.; Anchitaalagammai, J.V.; Priya, G.D.; Karthickkumar, S.S. C-Leakage: Cylinder LPG Gas Leakage Detection for Home Safety. IOSR J. Electron. Commun. Eng. 2014, 9, 53–58.

5. Shrivastava, A.; Prabhaker, R.; Kumar, R.; Verma, R. GSM based gas leakage detection system. Int. J. Emerg. Trends Electr. Electron. 2013, 3, 42–45.

6. Anurupa, A.; Gunasegaram, M.; Amsaveni, M. Efficient Gas Leakage Detection and Control System using GSM Module. Int. J. Eng. Res. Technol.2015,3, 1–4.

7. Meenakshi, A.A.; Meghana, R.B.N.; Krishna, P.R. LPG Gas Leakage Detection and Prevention System. Int. J. Future Revolut. Comput. Sci. Commun. Eng. 2017, 3, 1–4. 8. All Answers Ltd. GSM Based LPG Detection [Internet]. November 2018. Available online: https://ukdiss.com/examples/gsm-based-lpg-detection.php?vref=1 (accessed on 15 October 2020).

8. K.Vinod Kumar, "IOT BASED WIRELESS SENSOR NETWORK FOR PRECISION AGRICULTURE", The International journal of analytical and experimental modal analysis, ISSN NO: 0886-9367

9. Sowmya Gali Packet Loss Aware Trust Management (PLATM) for IOT Network ",International Journal of Advanced Science and Technology,Vol. 29, No. 7s, (2020), pp. 5544-5550

10) Sowmya Gali "Multi-Context Cluster Based Trust Aware Routing For Internet of Things", Journal of Mechanics Of Continua And Mathematical Sciences, Vol.-14, No.-5, Sep - October (2019), pp.396-418.DOI: http://doi.org/10.26782/jmcms.2019.10.00029

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362