

# Hazardous Gas Detection Using Multi Assistance Robot System

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**Abstract:** Safety plays a major role into days world and it is necessary that good safety systems are to be implemented in places of industries, big manufacturing factories, education and work. This work modifies the existing safety model installed in industries and this system also be used in homes and office. The main objective of the work is designing microcontroller based toxic gas detecting and alerting system the hazardous gases like LPG and propane were sensed and displayed each and every second in the LCD display these gases exceed the normal level the nan alarm is generated immediately and also an alerting message (SMS) is send to the authorized person through GSM.

**Keywords:** Remote sensing, Hazardous gas, Robot system.

## 1. Introduction

Robotics has become a staple of advanced producing for over a century. As artificial intelligence and their major tools become additional dependable, sturdy and reducible, such kind of systems area unit developing additional and employed in the war fields, enjoyment and observation functions. These varieties of system area unit in the main management through wireless technology and varied sensor's area unit accustomed observe the harmful to the surroundings. Sensors like mq2, mq3, mq6, temperature, humidity, daylight area unit the parameters accustomed predict the harness of the gas or smoke with the assistance of machine algorithms sort of provision Regression and K- Nearest Neighbour (KNN). These kinds of detection smoke referred to as gas detector, smell detector.

Robots' area unit accustomed replace humans within the war fields. E- Nose technology is employed to observe the harm-full gases within the space} area, alert the admin of the military if any suspicious things are going on within the war field. Also, to capture all the photographs and video through camera.

## 2. Literature Survey

In the year of 2008, Liu Zhen-ya, Zhen-dong and bird genus Rong, "Intelligent Residential Security Alarm and remote System supported Single Chip Computer", the paper focuses on, Intelligent residential thief alarm, emergency alarm, fire alarm, toxicant gas outpouring remote automatic sound alarm and remote system, which is based on 89c51single chip pc. The system will perform associate degree automatic alarm, that calls the police hotline variety mechanically. It may also be a voice

alarm and shows alarm occurred address. This intelligent security system may be used management the power remotely through phone.

In the year of 2008, bird genus Peijiang and Jiang Xuehhu, "Design and implementation of Remote watching System supported GSM", this paper focuses on the wireless watching system, as a result of the wireless remote watching system has additional and additional application, an overseas watching system supported SMS through GSM. Supported the general design of the system, the hardware and code design of the system is meant. During this system, the remote signal is transmitted through GSM network. The system includes 2 components that area unit the watching center and therefore the remote watching station.

The watching centre consists of a pc and a TC35 communication module for GSM. The pc and therefore the TC35 area unit connected by RS232. The remote watching station comprises a TC35 communication module for GSM, a MSP430F149 MCU, a show unit, sensors and DE tethering and process unit. The code for the watching centre and the remote watching station were designed victimization VB.

In the time of 2006, Ioan Lita, particle Bogdan Cioc and Daniel Alexandru Visan, "a replacement Approach of Automatic Localization System victimization GPS and GSM/GPRS Transmission", this paper focuses on, a coffee value automotive localization system victimization GPS and GSM-SMS services, that provides the position of the vehicle on the motorist's or proprietor's mobile as a short communication (SMS) on his request. The system area unit of connected with the motor vehicle alarm that cautions the owner, on his mobile, concerning the events that happens in conjunction with his motor vehicle once it's located. The system consists by a GPS receiver, a microcontroller and a GSM phone. In recent the system area unit oft settled for deed and transmission the information, whenever requested concerning machine standing and cautions the attacker concerning the vehicle started machine. The system area unit oft used as an occasional value result for machine position localizing conjointly as in motor vehicle shadowing system operation.

In the year of 2002, K. Galatsis, W. W. Lodarsla, K. Kalantar- Zadeh and A. Trinchi, "Investigation of gas sensors for vehicle cabin air quality monitoring", this paper focuses on,

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automotive cabin air quality watching may be effectively analyse during metal chemical compound semi conductive (MOS) gas sensors. During this paper, commercially accessible gas sensors area unit compared with made-up Moo3 primarily based sensors possessed comparable gas sensing properties. The sensing element has response seventy-four higher relative to the best business sensing element tested [21]. Within the year 2000, K. Galatsis, W. W oldarsla, Y.X. Li and K. Kalantar-Zadeh, “A Vehicle air quality monitor victimization gas sensors for improved safety”, this paper focuses on A vehicle cabin air quality monitor victimization monoxide (CO) and element (O<sub>2</sub>) gas sensors has been designed, developed and on- road tested. The continual watching of element and monoxide provides else vehicle safety as alarms can be set out once dangerous gas concentrations area unit reached, preventing driver fatigue, drowsiness, and exhaust gas suicides. CO concentrations of 30ppm and element levels not up to nineteen.5% were skilled while driving.

Diclehan Karakaya et al., [5] planned the “Electronic Nose” for detection the venturesome gases and predicting the harness of the venturesome gases. The planned system uses the varied chemical sensors for detection the venturesome gases and therefore the machine learning algorithms to predict the harness of the venturesome gases. The author delineated that the planned system may be used for variety of applications: business or business production processes like producing product, medical purpose and in cordial reception, analytical chemistry and medical specialty industries. Electronic Nose application may also be accustomed check the freshness and matureness watching of fruit, for detection of explosives and conjointly in varied transportation for people’s safety purpose and non-public security purpose.

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### 3. Proposed Multi-Function Assistant Robot System

The projected Multi-Function Assistant golem system consists of machine-controlled modules that accomplish the subsequent functions:

- The module is developed for exchange human beings in numerous dangerous areas. Also, these robots can determine the bombs and numerous gases in the war field.

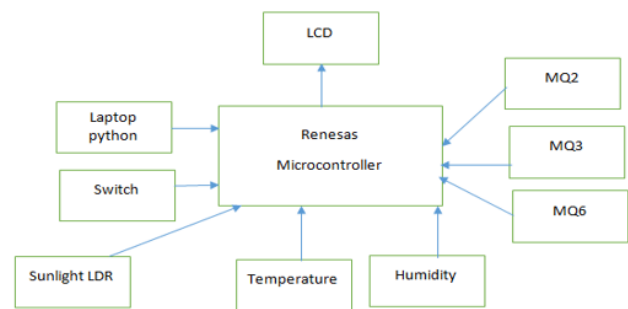


Fig. 1. MFR system architecture

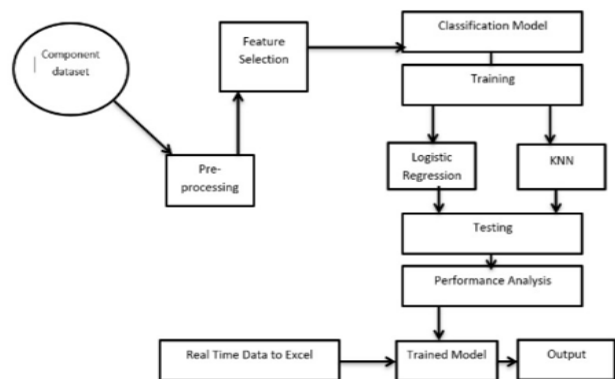


Fig. 2. Modules of MFR system

Logistic regression is one in every of the machine learning formula and supervised learning classification formula accustomed predict the harness of the gas initial it’ll categorize the all the values then it’ll compare with the trained with time period data.

K-Nearest Neighbours (KNN): In statistics, the k- nearest neighbours’ formula could be a non-constant classification model. It is used for classification and regression. In each case, the input consists of the k nearest coaching examples in information set. The KNN additionally known as a lazy learner’s formula.

#### Feature selection:

The options that contribute additional to the prediction of the output are designated from the given set of features computationally victimisation feature extraction algorithms. Numerous feature selection techniques or algorithms are there which are utilized in the past. Feature selection can scale back the quantity of options required for prediction.

### 4. Experimental Setup

This section offers the introduction about the setup that was used for experimentation to run the project. Python language is employed for implementation of algorithm and also the projected system used Logistic Regression and KNN (K-Nearest Neighbour) for prediction. Cube Suit++ is used for development and integration of hardware. The result’s made supported the information from the hardware and predict the harness of the gas victimisation the supplying regression and KNN algorithms.

## 5. Result and Discussion

This section discusses the performance of the developed framework. The potent of developed model is evaluated below supplying regression and KNN algorithms and also the results are compared.

## 6. Conclusion

The gas detector and also the essential level of individual gas ought to be identified and then this method is often enforced by police work numerous gases either in domestic area like places of education establishments, residential and industrial space that avoid damaging of human lives. This method provides fast response rate and also the diffusion are often created quicker than the manual strategies.

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