

# Air Quality Information Based on Iot for Mobile Environment

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## Abstract

This paper describes about our proposed system in which it is able to monitor the quality of the air which is sufficient for the person's survival. In this, the level of carbon-mono-oxide that is the CO level in the environment is also checked. It is useful for monitoring and verifying the leakage of any poisonous air in the environment. The system can be designed to work based on the web application or the android application. The gas detector has been developed using the micro controller in order to measure the values of CO in them. For the purpose of getting information about the temperature that prevails in the environment the temperature sensors are used. In this proposed system the user can get warning about the level of the poisonous gas in the environment by means of an alert message to the person or by get the location of the incident by means of the GPS. The proposed system produces the result by means of creating the graph values for the safe level of CO in the air. The threshold values can also be included in order to plot the graph.

## 1. Introduction:

Nowadays, the pollution that is present in the environment is decreased due to the pollution that arises by means of various factors including the level of oxygen that is present in the environment. The oxygen level is useful for the sole purpose of the surviving in this environment. Due to the various environmental issue the oxygen level is being decreased. In addition to this the level of CO in the environment increases due to the various combustion of the gases in the vehicles and other things. The process of combustion involves in producing the poisonous carbon-mono-oxide gas which is the harmful, odourless gas which cannot be identified easily. This can occur in the machines such as the air conditioning machine which can emit the CFC gas while it is working. This may result in the emission of the CO gas which will be harmful to the people who are present in that particular environment.

The air quality information in the world is developed by the web-based services, which is the one of the methods used to get the alert messages via the email address and other means of communications.

This method is useful for the sole purpose of the identification of the level of the Co gas in the environment. The air quality information is necessary for the purpose of preventing many of the human lives from f=danger due to the various critical situations that occur in the environment. The health monitoring system has to be improved a lot in order to get information using the wireless sensor networks which can be done using the web based services or other web applications.

Recently there has been incidents in the cities like Mumbai, Chennai where the person sleeping inside the car with AC in it, has been suffocated to death due to the low level of air present in it. It occurs due to the cfc gas that gets released due to the combustion process which is in the poor condition. The dirty coils that are present in the vehicles are also involved in this

because it doesn't send the purified air to the vent due to the poor combustion process which has been resulted in the loss of people.

The air quality information system is done solely for the purpose of monitoring the level of poisonous CO gas that is present in the environment.

## 2. Existing Method:

There are several methods that are involved in the process of getting the air quality information in the certain environment. The other methods involved in this is to use the communication using the radio transceiver application. The NFC i.e. Near Field Communication tags are converted into the sensing units which can be useful for the purpose of sensing the harmful gas as the PPM in the environment.

This method does not support the usage of the wifi network or other means to communicate about the incident in the particular place

The various incidents that occur are:

There are many people in different cities who travel to lot of places in every walk of their life. These people have habits of sleeping in the car for several hours during the long journey. This may create or will be the cause for some of the critical incidents that occur in the car due to some leakage of the poisonous gases in them.

There are many incidents that occur in cities such as Mumbai, Delhi etc.

This increasing incident has caused the death toll of people to about 20% a year. On an average 37 children die due to suffocation in a car. Majority of the people who suffer due to this problem are, the children and other aged persons who couldn't identify the quality of the air they breathe immediately in a

particular span of time. They are the victims who get affected generally in these incidents.

The leakage of the poisonous gas inside the cabin of the car can occur due to the emission of the exhaust from the vehicle in any critical situation. This increases the level of poisonous gas inside the car causing the suffocation of the person inside it.

The level of CO that increases in the atmosphere may cause the oxygen level to be lowered in our blood circulation due to the inhale of this poisonous gas present in the any particular environment.

There may be fewer or less amount of CO in our blood. It may be increased when it reaches the threshold level leading to any other problems such as suffocation or heart disease eventually leading to the severe risks or even death.

The amount of air that is present in the closed surrounding or environment may not be suitable for the proper systole and diastole effect of our heart. There should be proper amount of air needed for this effect to breath and pump the heart.

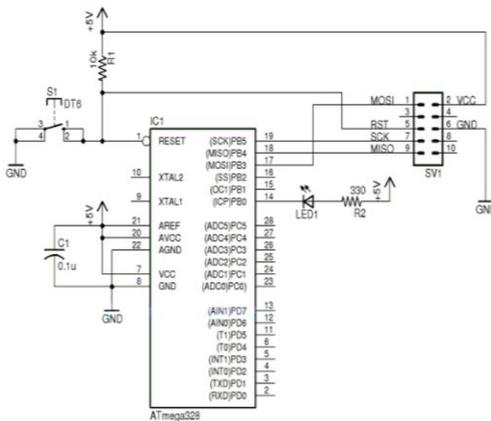
There are many other reasons for the suffocation of people and some says that the closed car alone brings in this effect, but opening of windshield also causes the level of oxygen to reduce in lower limits which leads to the decrease in the fluid level in our body causing many effects and leading to severe discomfort.

Thus in order to monitor the level of poisonous gas in the environment and to make the data available at any time the proposed method will be useful.

### 3. Proposed Work:

In this proposed work the level of CO in the environment can be monitored by means of various techniques. The values of human lives are more important. so in order to maintain it, air quality information is to be monitored. The proposed system consists of monitoring the air quality information using the portable gas instrument in which the level of the poisonous gas i.e. CO is monitored and the graph can be used to check periodically the level of it.

The idea of monitoring the Co level and the other toxic gases are done by the use of air sensors which are connected together with the other sensors and the devices using the arduino board and are controlled by means of the AT mega 328p microcontroller.



Pin configuration

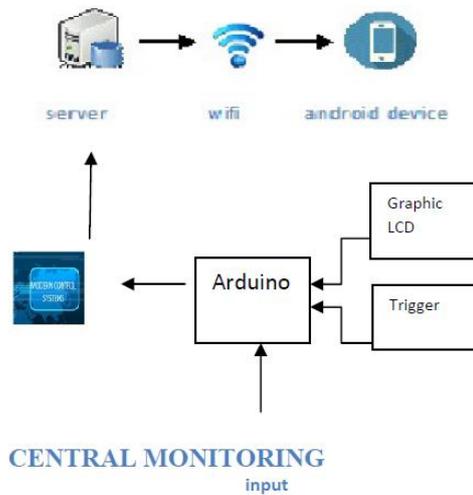


AT mega 328p microcontroller

### Block Diagram

The block diagram of our proposed system consists of microcontroller, air sensor for detecting the quality of air, the alarm for indicating that the level has reached the threshold value in the device. Then the server is connected to that of the controller by means of the wifi module in order to transmit the data sets frequently to the server.

The web server can be used to connect to that of the mobile device by means of android and the result of it will be viewed in the device.



### 4. Monitoring the Co Level

The basic idea of monitoring the level of CO in the air is done using the air sensors that are connected in the arduino board. In this method, the level of it is compared with the threshold value that is stored in the controller. If the level of it differs from that of threshold value, then it will give an alarm sound indicating that it has changer from the purity level to poisonous one.

They are monitored and the graph is plotted for the purpose of easy identification of the areas where the air is polluted. In various places the quality of the air is monitored and the graph is taken for the purpose of verification.

Table showing status of air quality

Co level (ppm)	Date	Threshold value	status
50	12.1.18	70	Safe
85	25.1.18	70	Warning
96	2.2.18	70	Warning
38	6.2.18	70	Safe
71	16.2.18	70	Warning

## 5. Server for Storing Data

The level of CO in air will be different in different situations and the data of it will be useful in identifying the locations where it is very prevalent. In order to store the data, we need the Db server for storing the data of the level of CO in various areas which will be done using the data that are transmitted from the microcontroller to the web based server. This helps us to find the amount of level in the air in any particular environment. The data are fed into server at every instant of time to check for the safety level of the toxic gases in the air.

The data in server can be viewed using the android application using the interface between them

## 6. Future Work:

The future enhancements of our paper is to implement the air quality monitoring in order to find the poisonous gas in environment in any surroundings. It also helps in identifying the gas leakages in the underground areas such as sewage and other links to avoid the unnecessary sufferings by the people.

## 7. Conclusion:

This paper concludes that the level of CO present in the environment can be identified by means of the sensor. It also shows that the poisonous gas present in the closed environment such as the car can also be monitored and controlled by means of sensor. Thus it will be useful for various environments at any time and anywhere.

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