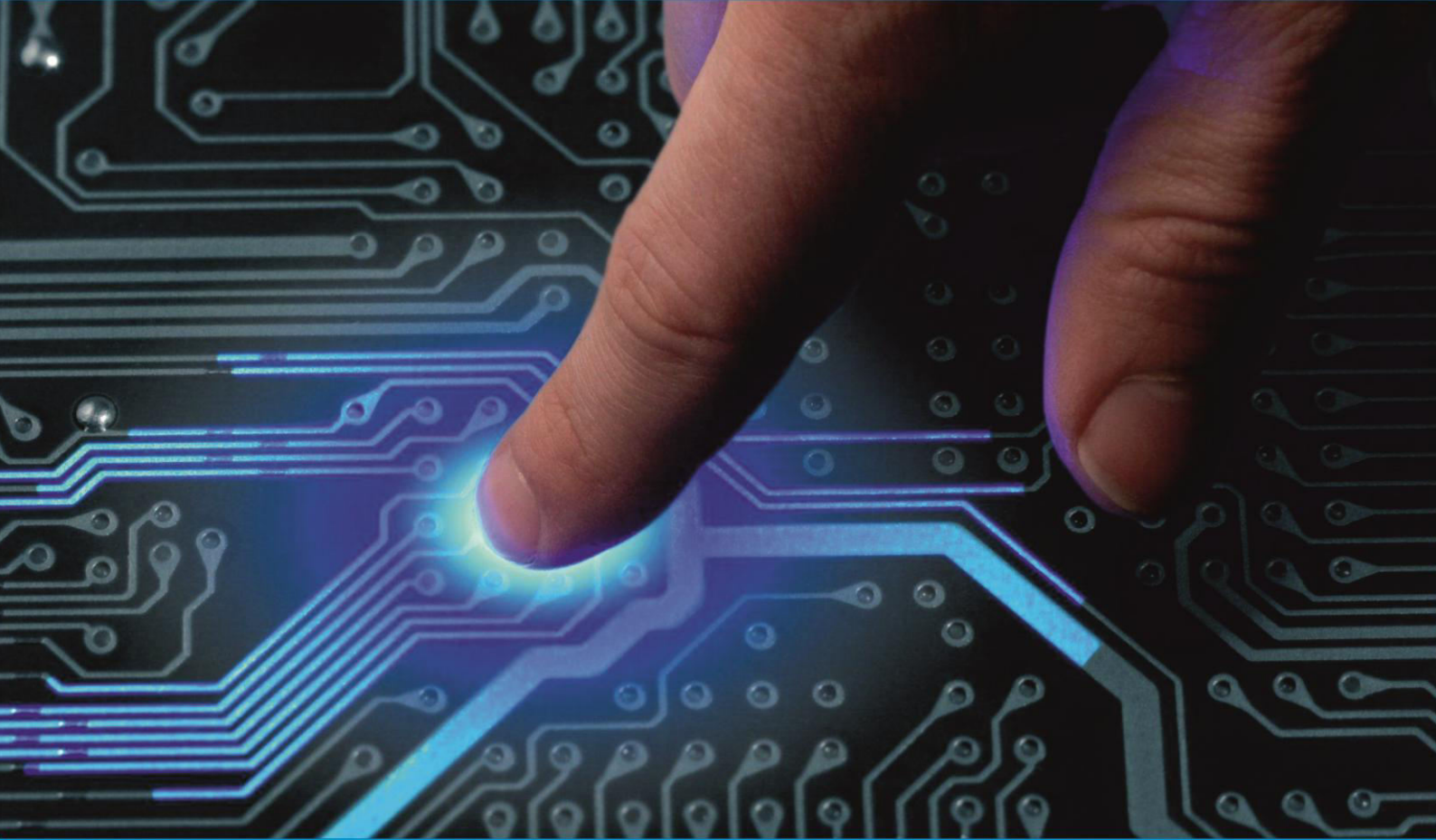




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# Gas/Smoke Detection Using Arduino

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**Abstract:** India has struggled with pollution for a long time. In fact, in February, India was home to six out of 10 of the world's most polluted cities. In contrast to atmospheric pollution, surrounding pollutants are about 1000 times more likely to be transmitted to the lungs, causing diseases. The main sources of air pollution are motor vehicle emissions, illegal industrial activities, harmful pesticides, and many times we see LPG gas leakages and cylinder truck accidents on road which are harmful for us and can take our lives. Thus, poor air quality causes several health hazards like heart disease, lung cancer, and respiratory problems. The need of the hour is not only to control air pollution but also materializing technologies, devices and software systems to keep a close check on air pollution. Our efforts in this project is to develop an application from which air quality monitoring can be done to take preventative measures to make our living environment safe. The application is user-friendly and works as a preventative mechanism to generate real-time alerts on air quality. Our main contribution is to develop air quality monitoring system that senses the real-time data of surrounding parameters like carbon monoxide, and PM level and alerts the people when the quantity of these elements goes beyond a certain limit and shows the data in an easily understandable format.

**KEYWORDS:** INTERNET OF THING (IOT), Yolo, evacuation, sensors

## I. INTRODUCTION

Development is occurring in each of the field today. As every sector is utilizing newly developed technologies the need to keep them safe and secure is more important. If there is no security measures available accidents will arise and ends in a big tragedy. Fire accidents is among one of them, as systems are there to control the spread of fire in each sector but it doesn't give a dynamic evacuation path. Countries like Australia, Canada, New Zealand, USA have provided a specialist group for unified, better conceptualized approach to fire safety engineering[1]. In some places mining is an occupation for most of the people, but deeper the mining occurs the chance of workers in protecting from fire disasters become less. So there developed a system that uses sensors, IoT, smartphones, detectors addition with two-way communication and 3D visualization for fire safety[2]. Another problem for increasing fire accidents are lack of knowledge on fire safety. In America 75 percent have a home evacuation plan. For this they developed a mobile evacuation having a fire safety plan informing them of the dangers of house fires[3]. In most of the cases there lack a good dynamic path.

We developed an App which will send count of the person to fire brigade team once the smoke sensor have detected the fire. Air pollution is one of the environmental issues that cannot be ignored. With deteriorating air quality all over the globe due to industrial and vehicular pollution, there is an increasing risk of breathing problems and lung diseases arising from it. This system implements an android app to sense the air quality of the environment and shows the real condition of air. The purpose of our project is to monitor Air quality using different sensors and notify the user. Solving the drawbacks of existing air quality sensors this device can be used to monitor various gasses at a time.

## II. LITERATURE SURVEY

Khyrina Airin Fariza Abu Samah, Burairah Hussin and Abd Samad Hasan Basari [1] developed an algorithm for finding the shortest and safest path during emergency evacuation by modifying the existing Dijkstra algorithm for an intelligent autonomous evacuation system. The methodology states the following changes: (1) modification of nodes direction: the nodes direction is restricted to one-way only so that people don't go near the fire affected and to direct them towards the exit nodes only and (2) modification of Dijkstra's algorithm: the blocking of the related nodes affected by the fire thus, rendering those unusable for exit route. This systems results presented that Dijkstras algorithm can be used as an effective navigation solution in emergency situations. Nor Amalina Mohd Sabri, Abd Samad Hasan Basari, Burairah Husin and Khyrina Airin Fariza Abu Samah [2] details about a simulation method using Dijkstras algorithm for evacuation in highrise buildings. The program was developed on MATLAB and the programs methodology consisted of inputting matrix data, source and destination nodes, removal of affected nodes and the path will be blocked, finally generating a safe exit route. The simulation program attempts to validate the Dijkstra algorithm for generating the safest and shortest path for

various different matrix input. Md Saifudaullah Bin Bahrudin and Rosni Abu Kassim [3] developed a fire alarm system with the help of a small single board computer Raspberry Pi and a microcontroller board, the Arduino Uno as a master-slave configuration. The system proposes to alert the user whenever a fire breaks out and ask permission from the user whether to report to the firefighters. The system uses an image captured from the home surveillance camera and sends the image to the user to check the validity of the alert. It was developed on Python and the captured image was displayed on a PHP page. This system demonstrated the use of a cheap and effective solution for detection and alerting users with the help of Raspberry Pi and Arduino Uno. 1. Ajitesh Kumar, Mona Kumari and Harsh Gupta “Design and Analysis of IoT based air quality monitoring system” Feb 28-29, 2020: This paper proposes a cost-efficient air quality observing framework that detects the continuous information of encompassing different boundaries like smoke, carbon monoxide and PM level and cautions the individuals when the amount of these components goes past specific cutoff and shows the information in a without any problem reasonable configuration. Later on, additionally detecting hubs can be added to expand the framework. The significant preferred position of this framework is that it is versatile, little and cost-effective. We have also introduced the execution of an ease IoT based air quality checking framework.

2. Pratishtha Agnihotri, Sonam Tiwari and Dr. Devendra Mohan “Design of Air pollution monitoring system using wireless sensor network” 2019: In this paper, the authors have proposed a novel scheme to conduct the fine-grained and real-time prediction of AQI based on asynchronous data collected by our monitoring system. They present the asynchronous sensing data and the spatial-temporal-meteorological relations. Based on the CG model, the prediction procedures are carefully designed and an optimization problem arises. They aim to solve the optimization problem by an algorithm combining a closed-form derivation and genetic algorithm. The advantage of the proposed solution over existing ones is evaluated over the data set collected by our monitoring system.

3. Ravi Kishore Kodali and Sairi pathuri Sasweth C. Rajnarayanan “Smart Indoor air pollution monitoring station” Jan 22-24 2020, Coimbatore India: In this paper the author has proposed a surrounding air contamination detecting framework can give ongoing estimation of five generally significant for human well-being air boundaries and move it to more significant level applications for examination and anticipating. Estimated information is reinforced along with timestamp and GPS position. The gadget spares information into on-board SD card with capacity to be moved to a have PC by direct USB association or through Wi-Fi transmission.

4. Zixuan Bai “Real time prediction for Fine-grained air quality monitoring system with asynchronous sensing”., Perking university 2019: The authors have stated that because of the disturbing degrees of contamination in a portion of the significant urban communities of world, persistent observing of air quality has become a significant issue. By utilizing remote detecting system alongside rapid web association, the checking and examination process has become effective. Such mechanized frameworks are precise, history of the boundaries is moreover put away which can be utilized. The WSN checking frameworks can likewise be executed for different sorts of contamination, water contamination, soil contamination or radioactive pollution.

### III. PROBLEM DEFINATION

The consideration about the exact location where humans are stuck in emergency evacuation of large smart buildings is taken into account. The building evacuation time is crucial in saving lives in emergency situations caused by imminent natural or man-made threats and disasters. We propose to made hybrid model for image recognition to identify victim stuck in building and hardware model to detect the fire.

### IV. PROPOSED SYSTEM

We propose an image recognition system which will help to identify humans which are stuck in fire. Once fire is detected with the help of sensors it will send notification to rescue team and alarm will be ring. If someone is stuck camera will take pic and will pass data to server. Server will process the image and will send notification to rescue team about the location of humans. This will help rescue team to quickly identify the location which will led to less death and quick rescue.

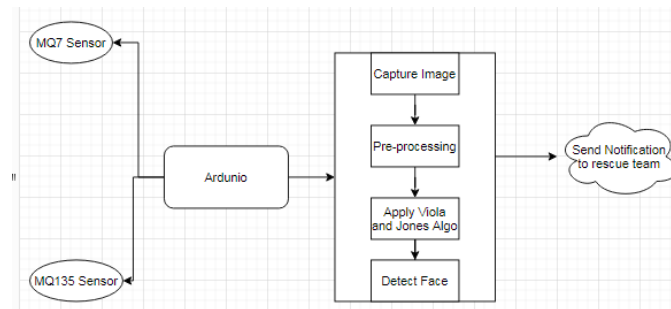


Fig 1. Architecture Diagram

## V. HARDWARE DESCRIPTION

### MQ7 Sensor:

The MQ-7 smoke sensor is sensitive to smoke and to the following flammable gases:

1. LPG
2. Butane
3. Propane
4. Methane
5. Alcohol
6. Hydrogen

The resistance of the sensor is different depending on the type of the gas.

The smoke sensor has a built-in potentiometer that allows you to adjust the sensor sensitivity according to how accurate you want to detect gas

### Working of Hardware:

The voltage that the sensor outputs changes accordingly to the smoke/gas level that exists in the atmosphere. The sensor outputs a voltage that is proportional to the concentration of smoke/gas.

In other words, the relationship between voltage and gas concentration is the following:

- The greater the gas concentration, the greater the output voltage
- The lower the gas concentration, the lower the output voltage

### PROJECT MODULES:

Project is divided into two main module

1. Hardware Module:

In this sensor will continuously sense any inflammable gas. If found it will alert the server

2. Software Module

- a. Alerting Fire team
- b. Send count of person in each room

Client: We have assumed that the person using this application is very much known and familiar with the mobile phones, and is capable of using basic functions including GPS. Provider: We have assumed that the application system will be running on a properly working web server and database system with an Internet connection that allows this system to update information for clients.

## SYSTEM REQUIREMENT:

### Database Requirements

Google Firebase

### Software Requirements (Platform Choice)

1. Operating System - Windows 7/8/10
2. Front End – Android Studio
3. Database – Google Firebase
4. IDE - Python

## V. CONCLUSIONS

The system deals with the finding of dynamic human count using yolo algorithm. It focus on the finding a humans with less difficulty. According to the project, whenever fire breaks out sensors will suddenly detect the spread of gases. Thereby giving alerts giving to the fire brigade team along the interphase to exit victim from the building safely.

## ADVANTAGES:

1. Can detect harmful pollutants and gases
2. Can create an effective warning system
3. Can connect user easily
4. Can ensure the safety of user in dangerous situations
5. Notifying user is a priority
6. Android app will help user to interact with application
7. The prediction phase helps in taking precautions.
8. Effective warning system
9. Has a user-friendly interface

## LIMITATION:

1. Can be used by android users only.
2. Any less than 10-15 observations then there's a risk of over fitting the model.

## REFERENCES

- [1] V. Adjiski, Z. Despodov, and D. Seramovski, "Prototype model for fire safety system in underground mining," *Amer. J. Mining Metall.*, vol. 4, no. 1, pp. 6267, Nov. 2017. [2] E. Bickel, "The effect of a mobile application on fire safety education," *J. Acad. Sci.*, vol. 15, no. 2, p. 10, 2017. [3] Y. Xin, J. Ma, Y. X. Shen, and L. Y. Lin, "Suppression effect of sprinkle system on fire spread in large commercial buildings," *Procedia Eng.*, vol. 135, pp. 455462, Jun. 2016. [4] Z. Yan, Y. Tian, and H. Zhu, "Tunnel fire dynamic earlywarning, evacuation and rescue system and its application," *Mod. Tunnelling Technol.*, vol. 53, no. 6, pp. 3135, 2016. [5] Z. C. Grigoras, and D. Diaconu-Sotropa. "System and subsystems used in the engineering approach of human evacuation in case of fire," *Adv. Eng. Forum*, vol. 21, pp. 108115, Jun. 2017. [6] M. X. Li, S. B. Zhu, J. H. Wang, and Z. Zhou, "Research on fire safety evacuation in a university library in Nanjing



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