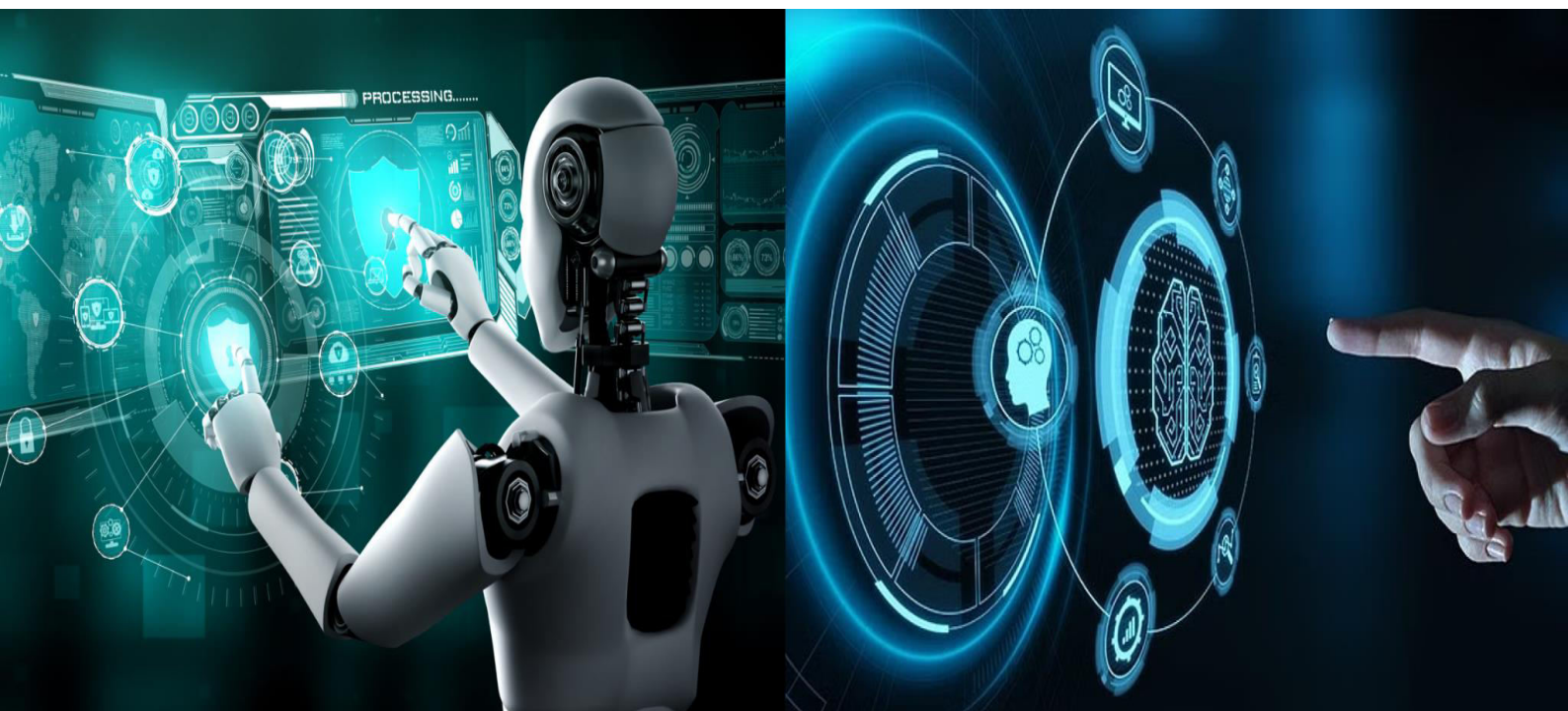


International Journal of Innovative Research in Computer and Communication Engineering

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)





International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

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IOT Based Air Pollution Monitoring System

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ABSTRACT: Air pollution is one of the major environmental problems affecting human health and climate. This paper presents an IoT-based air pollution monitoring system that measures air quality in real time using sensors and displays the data over the internet. The system uses gas sensors like MQ135 to detect harmful gases such as CO₂, NH₃, and smoke. The collected data is sent to a cloud platform using a microcontroller (like NodeMCU/Arduino). This system helps in monitoring pollution levels efficiently and can be used in smart cities for better environmental management.

I. INTRODUCTION

Air pollution is increasing rapidly due to industrialization, vehicles, and urbanization. It causes serious health issues like asthma, lung diseases, and heart problems.

Traditional air monitoring systems are expensive and not easily accessible. With the help of the Internet of Things (IoT), we can develop a low-cost and efficient system to monitor air quality in real time.

This project aims to design a smart system that:

- Monitors air pollution continuously
- Sends data online
- Alerts users when pollution exceeds safe levels

II. LITERATURE REVIEW

Many researchers have worked on air quality monitoring systems using IoT.

- Some systems use wireless sensor networks but lack real-time updates.
- Others use GSM modules for alerts but are costly.
- Recent systems use cloud platforms and mobile apps for better monitoring.

This project improves existing systems by providing:

- Low cost
- Real-time monitoring
- Easy installation



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III. PROPOSED SYSTEM

3.1 System Architecture

The system consists of:

- Gas Sensor (MQ135)
- Microcontroller (NodeMCU / Arduino)
- Wi-Fi Module
- Cloud Platform (ThingSpeak / Blynk)

Working Principle

1. Sensor detects air quality.
2. Microcontroller processes data.
3. Data is sent to cloud via Wi-Fi.
4. User can view data on mobile or website.

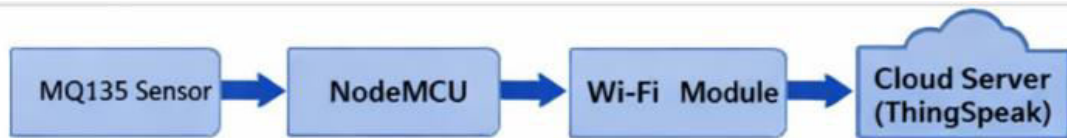


Fig 1: Block Diagram of IoT Based Air Pollution Monitoring System

3.2 Hardware Components

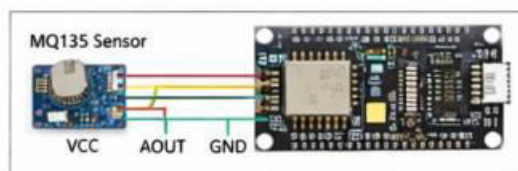
- **MQ135 Sensor** – Detects harmful gases



- **NodeMCU (ESP8266)** – Main controller with Wi-Fi



- **Breadboard & Wires** – For connections
- **Power Supply**





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3.3 Software Requirements

- Arduino IDE
- Embedded C Programming
- ThingSpeak / Blynk App

IV. METHODOLOGY

The system follows these steps:

1. Initialize sensors and Wi-Fi module
2. Collect air quality data from MQ135
3. Convert analog data into digital values
4. Send data to cloud server
5. Display data in graphs
6. Trigger alert if pollution level is high

V. RESULTS AND DISCUSSION

The system successfully monitors air quality in real time. The sensor detects pollution levels and sends accurate data to the cloud.

Advantages:

- Low cost
- Easy to use
- Real-time monitoring

Limitations:

- Sensor accuracy may vary
- Requires internet connection



Fig: Air Quality Data Graph from Cloud Platform

VI. APPLICATIONS

- Smart cities
- Industrial areas
- Traffic monitoring
- Indoor air quality monitoring
- Environmental research

V. FUTURE SCOPE

- Add more sensors (temperature, humidity)



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- Mobile app notifications
- AI-based pollution prediction
- Solar-powered system

VIII. CONCLUSION

The IoT-based air pollution monitoring system is an effective solution for tracking environmental pollution. It provides real-time data, is cost-effective, and helps in creating awareness about air quality. This system can play an important role in developing smart and sustainable cities.

REFERENCES

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