Fire and Smoke Detector Alarm using Arduino and MQ2 Sensor

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Abstract*: The fire detection system integrates simultaneous monitoring of smoke, carbon monoxide (CO), and carbon dioxide levels. It also addresses campus security by monitoring intruders in areas like laboratories, classrooms, staff rooms, or washrooms. The system comprises fire detectors (such as smoke, heat, or infrared detectors), a control unit, and an alarm system. This fire detection solution is designed based on concurrent measurements of temperature and smoke levels. The alarm algorithm enhances fire detection by identifying fires that traditional smoke sensors might miss, and it provides quicker alerts.*

The primary aim of this research is to mitigate fire risks caused by electrical short circuits and LPG leaks. It offers insights into a fire and smoke detection system built on an embedded platform, utilizing components like an Arduino Uno board, MQ2 sensor, piezo buzzer, 16x2 LCD display, breadboard, and jumper wires. This system outperforms standalone smoke sensors by improving detection accuracy. Previous algorithms relied on sensor data for temperature, smoke, and combustion byproducts. The smoke sensor in this system triggers an alarm when its analog output meets or exceeds the defined threshold value. The node incorporates analog sensors to measure smoke, carbon monoxide, and temperature, ensuring timely and reliable notification to building occupants about potential fire hazards, such as smoke or high temperatures.

Keywords: Arduino UNO, MQ2Gas Sensor, DH-11sensor, GSM Module, LCD, Buzzer, Embedded System, Fire, Smoke.