



Smart Home Based Smoke Detection with Image Surveillance System

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ABSTRACT

Air is a mixture of solid particles and gases in air. In the house we have air pollution through the form of dust, smoke or any leakage of LPG gas from cylinder or leakage of fire extinguisher etc. predominantly here the major hazardous situation is leakage of LPG gas from cylinders and causes heavy damage to us and our surrounding. So we are focusing on the smoke detection and also gas leakage by the fire accidents. The methodology deals with the technology of IoT where the web server deals with the present sensor data given by the smart device. In this MQTT acts as communication protocol between device and server. It will alert the system when hazardous smokes are evolved from the particular area . In this proposed system it gives the alert to inform the authorities to take necessary actions and not to occur in any dangerous situation. Air is a mixture of solid particles and gases in air. In the house we have air pollution through the form of dust, smoke or any leakage of LPG gas from cylinder or leakage of fire extinguisher etc. predominantly here the major hazardous situation is leakage of LPG gas from cylinders and causes heavy damage to us and our surrounding. So we are focusing on the smoke detection and also gas leakage by the fire accidents. The methodology deals with the technology of IoT where the web server deals with the present sensor data given by the smart device. In this MQTT acts as communication protocol between device and server. It will alert the system when hazardous smokes are evolved from the particular area . In this proposed system it gives the alert to inform the authorities to take necessary actions and not to occur in any dangerous situation.

Keywords: AI Thinker board, Mq2 sensor , USB-TTL

1. Introduction

To provide a smart home based smoke detection with image surveillance to avoid accidental smokes securely, as well as know the root cause of the fire. so we are using air quality sensors to detect the smoke and gases and esp32 cam with flash light to capture the images at night. In this MQTT acts as a communication protocol between device and server. It will alert the system when hazardous gases are evolved from the particular area . In this proposed system it gives the alert to inform the authorities to take necessary actions and not to occur in any dangerous situation. when you click this button, the ESP32-CAM takes a new photo and saves it in the ESP32 SPIFFS. Please wait at least 5 seconds before refreshing the web page to ensure the ESP32-CAM takes and stores the photo. Bots are simply Telegram accounts operated by software – not people – and they'll often have AI features. They can do anything – teach, play, search, broadcast, remind, connect, integrate with other services, or even pass commands to the Internet of Things. The primary focus of this work is to design an IoT based monitoring system which keeps track of environmental parameters such as temperature, humidity, air pollution, sun light intensity. The design works in real time and captures the data for analysis. The description covers the creation of sensor networks, electronic devices, the functional software requirements, programming and development process, the implementation and testing as well as the end product of the prototype

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2. Proposed Work

We have made a device which will detect the smoke and gases. The device will detect them and also send us the signal and message through the server to the user's telegram accounts. If any dangerous gases or smoke near the sensor the cam will detect it and also take a photo of it and send it to the telegram

3. Methodology

The various kinds of systems have been created to send data through wireless.

CAPTURE PHOTO: when you click this button, the ESP32-CAM takes a new photo and saves it in the ESP32 SPIFFS. Please wait at least 5 seconds before refreshing the web page to ensure the ESP32-CAM takes and stores the photo. Setup SPIFFS Tool to upload files in ESP: ESP8266FS is a tool which integrates into the Arduino IDE. It adds a menu item to the Tools menu for uploading the contents of sketch data directly into the ESP8266 flash file system. After putting files in a sketch data folder upload flash, and never take a flash memory data in variables. Directly stream flash data to clients. **Telegram bot:** Bots are simply Telegram accounts operated by software – not people – and they'll often have AI features. They can do anything – teach, play, search, broadcast, remind, connect, integrate with other services, or even pass commands to the Internet of Things. The primary focus of this work is to design an IoT based monitoring system which keeps track of environmental parameters such as temperature, humidity, air pollution, sun light intensity. The design works in real time and captures the data for analysis. The description covers the creation of sensor networks, electronic devices, the functional software requirements, programming and development process, the implementation and testing as well as the end product of the prototype.

4. Project Description

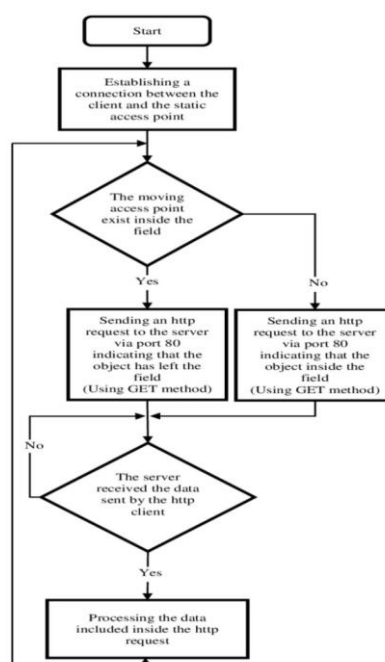
To implement this project, we use IOT, The AI Thinker board is Wi-Fi Module Bluetooth with OV2640 Camera Module 2MP For Face Reorganization has a very competitive small-size camera module that can operate independently as a minimum system with a footprint of only 40 x 27 mm; a deep sleep current of up to 6mA and is widely used in various IoT applications. It is suitable for home smart devices, industrial wireless control, wireless monitoring, and other IoT applications. This module adopts a DIP package and can be directly inserted into the backplane to realize rapid production of products, providing customers with high-reliability connection mode, which is convenient for application in various IoT hardware terminals

Software Requirements:

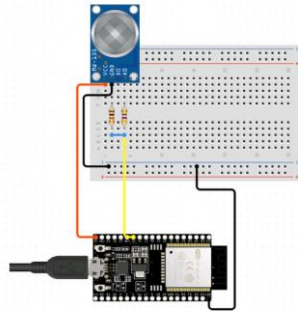
Coding Language : C++,Java

Operating System : Arduino

5. Flowchart



6. Block Diagram



7. Result and Implementation

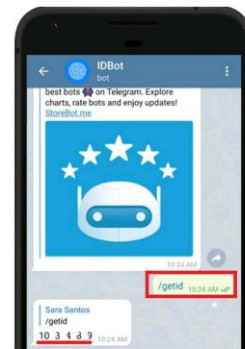
5. PROJECT WORK FLOW

- Go to Google Play or App Store, download, and install Telegram.



- Create a new bot in telegram.
- Get Your Telegram User ID in your Telegram account, search for "IDBot" (fig 2). Start a conversation with that bot and type /getid. You will get a reply back with your user ID. Save that user ID (fig 3).

Fig 2



- Install Arduino software.
- Install esp32 and esp8266 boards and required libraries to arduino
- Run the prepared code with right credentials into esp32 and esp8266
- Connect all the sensors and calibrate to get exact values of sensor --Section Break(Next Page)--

8. Conclusion

We designed a camera system with an ESP32 chip, which was installed on a house; the system is connected to its Wi-Fi network. The set was extended using input panels at the main entrance and the entrance to the boiler room. It was necessary to create a parent device that would serve as a data store and control for the entire report. And also the Gas leaks and cylinder blasts are some of the major issues in the neighbourhood societal problems, our smart device can detect the smoke within seconds and gets alert to the owner and the protection groups immediately with two types of interfaces (Adafruit and telegram) with low maintenance and low manufacturing cost, but if many sensors are added to the same module, the data rate of Adafruit is less, so we should maintain our own domain server to push the data, which enhances the efficiency in alert. This system has been experimentally proven to work satisfactorily by monitoring the values of sensors successfully. It also stores the sensor parameters in a timely manner. This will help the user to analyze the conditions of various parameters in the field anywhere.

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