Industry-Specific Intelligent Fire Management System

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LITERATURE SURVEY

A literature survey or a literature review is that section which shows the various analyses and research made in the field of your interest and the results already published, taking into account the various parameters of the project and the extent of the project**.**

The following papers are studied in the following survey:

Fire Monitoring and Controlling System based on Iot

F. He; Z. Du; Y. Sun, "Indoor dangerous gas environment detected by mobile robot," in 2009 IEEE International Conference on Robotics and Biomimetic (ROBIO).
V. Jelicic; M. Magno; G. Paci; D. Brunelli; L. Benini, "Design, characterization and management of a wireless sensor network for smart gas monitoring," in 2011 4th IEEE Int. Workshop on Adv in Sensors and Interfaces (IWASI).

Abstract:

Fire is a very dangerous situation and it is very much necessary to monitor and give warning before anything untoward happens. In many developing countries, houses do not come fitted with fire alarm system as seen in developed countries like Singapore, USA etc. This results in fire being unattended and leading to lot of losses like property, human. This is the IOT (internet of things) based fire monitoring and controlling system which not only gives the real time information about the situation on the monitor but also takes the corrective action as per the need. In this system the sensors transfer data wirelessly with the help of MQTT (message queuing telemetry transport) networking protocol which is designed for constrained with low-bandwidth. MQTT allows us to send commands to control output, read and publish data from sensors nodes and much more. The first concept is the publish and subscribe system. In a publish and subscribe system, a device can publish a message on a topic, or it can be subscribed to a particular topic to receive message. Also, it is perfect solution for internet of things application. Due to this all data can be stored in server and this data can be access by the Application program interface which we can display on the monitor and with the help of software the operator can visualize the condition at the time of fire accident.

Iot Based Smart Gas Management System

Kumar Keshamoni, Sabbani Hemanth, "Smart Gas Level Monitoring, Booking & Gas Leakage Detector over IoT", 2017 IEEE 7th International Advance Computing Conference.

Rohan Chandra Pandey, Manish Verma, Lumesh Kumar Sahu, "Internet of Things (IOT) Based Gas Leakage Monitoring and Alerting System with MQ-2 Sensor", 2017 IJEDR, Volume 5, Issue 2, ISSN: 2321-9939.

Abstract:

The problem of gas leakage and fire is often encountered in our day-to-day life. LPG, Liquified Petroleum Gas, is highly flammable gas used as fuel in heating appliances. Leakage of this gas raises the risk of building fire, suffocation or an explosion. The mentioned problem can be solved with the development of reliable techniques to detect gas leakage. As soon as gas leakage will be detected, user will be notified via SMS and call so that he/she can turn off gas valve from anywhere in his work place. The issue of flame and fire at kitchen can be monitored with the help of fire sensor. The buzzer starts beeping whenever fire is detected. In addition to these, it is often found that a person forgets to book gas cylinder due to his/her busy schedule. The main aim of this paper is to design an IOT based Smart Gas Management System that will be able to detect gas leakage and fire. With the help of load sensor, automatic booking of a gas cylinder is also facilitated. Notification is sent to the booking agency to book a gas cylinder whenever load cell detects that the weight of gas cylinder has reached below a threshold value. At the same time, user will be notified about gas cylinder going empty.

A Smart Fire Detection System using IoT Technology with Automatic Water Sprinkler

Bu, F. and Gharajeh, M. S., "Intelligent and vision-based fire detection systems: A survey," *Image and Vision Computing*, vol. 91, 2019.

Mahgoub, A., Tarrad, N., Elsherif, R., Al-Ali, A. and Ismail, L., "IoT-based fire alarm system," *2019 Third World Conference on Smart Trends in Systems Security and Sustainablity (WorldS4)*, London, United Kingdom, 2019.

Abstract:

Implemented to provide the fire department with the necessary data. Finally, the main feature of the proposed system is to minimize false alarms, which, in turn, makes this system more reliable. The experimental results showed the superiority of our model in terms of affordability, effectiveness, and House combustion is one of the main concerns for builders, designers, and property residents. Singular sensors were used for a long time in the event of detection of a fire, but these sensors cannot measure the amount of fire to alert the emergency response units. To address this problem, this study aims to implement a smart fire detection system that would not only detect the fire using integrated sensors but also alert property owners, emergency services, and local police stations to protect lives and valuable assets simultaneously. The proposed model in this paper employs different integrated detectors, such as heat, smoke, and flame. The signals from those detectors go through the system algorithm to check the fire's potentiality and then broadcast the predicted result to various parties using GSM modem associated with the system. To get real-life data without putting human lives in danger, an IoT technology has been esponsiveness as the system uses the Ubidots platform, which makes the data exchange faster and reliable.

LPWAN Based IoT Surveillance System for Outdoor Fire Detection

S. R. Vijayalakshmi and S. Muruganand, ``A survey of Internet of Things in fire detection and fire industries,'' in *Proc. Int. Conf. I-SMAC (IoT Social, Mobile, Anal. Cloud) (I-SMAC)*, **Palladam, India, Feb. 2017.**
K. Mekki, E. Bajic, F. Chaxel, and F. Meyer, ``A comparative study of LPWAN technologies for large-scale IoT deployment,'' *ICT Express*, **vol. 5, no. 1, pp. 1-7, Mar. 2019.**

Abstract:

Many fire situations have represented the loss of lives and material costs due to the lack ofearly fire detection through smoke or gas sensing, which can become complex and critical. Meanwhile,engineers worldwide develop and test multiple systems for smoke and gas detection, commonly based onsensor networks, digital image processing, or computer vision. Furthermore, the detection system must workthoroughly with alarms and warnings that aware of a risk situation for prompt evacuation of the population inthe surroundings based on a reliable data network topology with adequate device deployments that will let usknow the moment a fire outbreak. This paper presents a low-cost Internet of Things (IoT) prototype for firedetection in outdoor environments based on sensors and Low Power Wide Area Network (LPWAN), focusedon the accuracy in the temperature and gas measurement at the moment a fire starts. For its achievement,we integrated wireless components, development boards, and electronic devices, following the managementof information updates through a database schema for the alarm settings based on the data gathered from the Sensors.

Application of NB-IoT in Intelligent Fire Protection System

Zhang Quan, Technological Performance and Application of the Cellular-based Narrow Band Internet of Things (NB-IoT), Science Communication, 2018

Huang Fengwei, Wu Rongwen. Applied Research of Intelligent Fire Control System in Intelligent Buildings, Electronic World, 2017, 7:10-12.

Abstract:

NB-IoT refers to a cellular-based narrowband Internet of Things, which has become an important part of the Internet of Things. NB-IoT is a new technology emerging in the field of Internet of Things in recent years. It has obvious advantages in technology and application. In addition, the application of narrowband Internet of Things (NB-IoT) technology in the field of fire protection can fundamentally enhance the combat capability of fire fighting forces, avoid fire and reduce the loss of life and property of the people. This thesis analyses and introduces an intelligent fire-fighting system based on the new industry standard, and a smoke-fire detection and alarm device based on the Internet of Things (IoT) platform and Nb-IoT technology. It also puts forward corresponding solutions to the problem of smart smoke, such as the value, advantages and future expectations of the solution.