IDEATION PHASE – LITERATURE SURVEY

Date	19 November 2022
Team ID	PNT2022TMID12767
Project Name	Industry-specific intelligent fire management system
Maximum Marks	

Paper 1:

Sensor Based Smart Fire Detection and Fire Alarm System

Published year: November 3, 2020
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Abstract

The use of different IoT devices for home automation has become very popular in recent years. Fire detection and avoidance of fire accidents is one of the necessary and important application of home automation using IoT. Traditional fire alarm system requires huge installation cost and labour. The proposed IOT based fire alarm system basically detects fire at an early stage, generates an automatic alarm and notify the remote user or fire control station about the fire outbreak. This also tries to +extinguish the fire. The use of Arduino is proposed to sense the surroundings for occurrence of fire with the help of fire and gas sensor. The development of home fire alert system is built based on Arduino board. The fire is detected at an early stage and the system generates an alarm and sends SMS or call alerts to mobile numbers stored inside the Arduino program, via the GSM module. Simultaneously, a water sprayer producing device is switched on for the control of fire. This prototype system can help users to improve their safety standards with immediate response by preventing accidents. This will eventually allow both the lives and the properties from the disaster. The functions of each module and its implementation is described in detail.

Paper 2:

Smart Fire Alarm System Using IOT

Published year: July 13,2020

Author name :
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Abstract:

The research paper proposes the “Smart Fire Alarm System Using IOT” in smart building by integrating IOT devices, including fire alarm devices (smoke and temperature detectors), Arduino and other complementary equipment. The idea of the research paper is when a fire occurs, the sensors will send a message to the security of the building and the official, and this massage includes location and time. The internet of things is predicted to provide businesses and people with better visibility and has the power to control 99% of environments and available objects that are at this time out of reach of the internet. So therefor, IOT make opportunity to people and businesses to be attached with the outside world even more than before that will achieve more meaningful work in higher levels. The traditional fire alarm system contains several types of devices each has a specific role in system operation to detect people and worn them through visual and audible devices if there is a fire, smoke, carbon monoxide or any other emergencies. This type of alarm can automatically have activated from heat and smoke detector and it could be activated by manual fire alarms such us manual focal point or intake station. Alarms can come as a motorized bell; horns or wall-mounted speaker they can also be luminous sound for speakers that actually sound an alarm, and add an audio evacuation message that for example will warn people against using elevator.

Paper 3:

CloudFAS: Cloud-based building fire alarm system using Building Information Modelling

Published year: 2020

Author name:
Xiaoping Zhou , HaoranLi , JiaWang , JichaoZhao , QingshengXie , LeiLi ,Jiayin Liu , Jun Yu

Abstract:

Building fires are a common urban disaster. The emergence of high-rise, large-scale and inner-complex buildings bring new challenges for fire safety and triggers new demand to upgrade traditional building fire alarm system (FAS). Different from current studies by deploying enormous smart fire sensors to replace FAS, this study addresses this issue from a novel perspective and proposes a cloud-based FAS using Building Information Modelling (BIM) on top of FAS, termed CloudFAS. Firstly, the system framework and the software architecture are designed. Secondly, two key technologies are presented to address two unresolved technical issues: private fire alarm data sharing and alignment of fire sensors with the BIM model. A cloud gateway for fire sensors is developed to address the first problem by capturing the fire alarm data from the fire alarm control unit through the IEEE 1824 standard. Noticing that the fire sensor locations are listed in a sensor installation spreadsheet using natural language, termed as sensor location table (SLT). A natural language processing (NLP)-based sensor-BIM alignment algorithm is proposed to automatically match fire sensors with the BIM model through SLT, which enables to display fire sensor statuses in proper places in the 3D BIM model. Finally, a concrete case study from the China Construction Library is presented, which verifies the effectiveness of our proposed CloudFAS. Our CloudFAS is built on top of traditional FAS. If the fire alarm control unit follows the IEEE 1824 standard and an SLT is available, then CloudFAS can upgrade the traditional FAS in existing buildings effortlessly with its BIM model. Moreover, the cloud gateway for fire sensors contributes to addressing the private data sharing problem using IEEE 1824 standard, and the NLP-based sensor-BIM alignment algorithm can promote the adoption of BMI in the building operation phase.

Paper4:

Design and Fabrication of an Automatic Sprinkler Fire Fighting System

Publication year: 2015

Author name:
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Abstract:

This paper attempts to integrate microcontrollers into smoke detector circuitry and other components for safety purpose. This can be achieved by placing some sensors and devices in the building. In the proposed system, a smoke detector upon senses smoke activates its alarm, sends a low voltage signal to microcontrollers. The microcontroller will activate the relays which are connected to other components to alert residents that one of the smoke detectors has sensed smoke by means of voice and flashing lights. At the same time, it will send signals to valves, air suckers and the water pump. The solenoid valve will operate the water pump which delivers water to the room through pipes installed inside the building to attack the fire. Meanwhile, the air sucker will suck the smoke from the room to prevent suffocation. The proposed design is aiming to have cost efficient system, compact design, easily expandable, simple to install and replaceable components.