LITERATURE SURVEY ON

INDUSTRY SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM

Domain:Internet of Things

Team id:PNT2022TMID29661

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Paper 1:IOT BASED FIRE DETECTION AND AUTOMATIC WATER SPRINKLER SYSTEM

Published year:2022

Author name:D Teja,M.Surajkhan,k Jyothi

Journal name: International journal of engineering applied science and technology

Summary: In this paper, Fire detection systems, particularly vision-based systems, identify flames before any loss or destruction occurs. In this model, a novel vision-based technology is created that uses a camera to detect flames over long distances. An immediate alert is generated on android application. The goal of the proposed system is to notify the remote user when a fire accident occurs. By using camera method, the report is automatically generated and delivered to the person immediately following the fire is detected in any part of the frame using Wi-Fi/GSM.

Methodology: Following the detection of a fire, our technology will take real-time photos of the surrounding area. The flame sensor determines whether or not there is a fire or flame present.A photo transistor is used in this explicit flame detector. The infrared spectral band is used by flame detection systems. Carbon dioxide, which is produced by the combustion of organic compound materials, has a resonance frequency in this range. Put anything that can catch fire in front of the flame sensor. The flame sensor is triggered when it detects a fire or flame. As temperature increases the temperature sensor will detect and it will trigger the buzzer and buzzer will blow. The

water pump is connected to a IC. If a flame is detected, IC activates the dc motor and water pump. The sprinklers connected to the pump will sprinkle the water throughout the fire affected

area

Paper 2:Fire Detection, Monitoring and Alerting System based on IOT

Published year: 2019

Author name : Shreya Gosrani, Abhishek Jadhav, Krutika Lekhak D Chheda

Journal name: International Journal of Research in

Engineering, Science and Management

Summary: Internet of Things refers to connecting things and people through internet, it has imposed itself as the New business practices in different sectors. To make quick and efficient response in real time, IoT enhances the way and provides emergency managers with the necessary information and communication to make use of those assets. In this paper it

is proposed that a quick response for fire hazards is evaluated and examined by using IoT based model. Fire is one of the major reasons of accidental deaths in the world. To implement this proposed system a low-cost Wi-Fi module, gas detection sensor, Flame detection sensor, buzzer to alert and temperature sensors are used. The sensors detects and alerts the local emergency with the data collected by the system, and alerts organizations like fire departments, police stations and hospitals by sending the exact location to both user and operator through module which all are well connected with.

Methodology: IoT framework concentrates on public safety and livelihood service sector The fire detecting system with IoT standardized design methods The spark Detection sensor PT333B is used to sense the spark, the Flammable gas sensor MQ-6 is used to detect the gases like LPG/LNG and the GPS module is to obtain device location. These sensors along with Wi-Fi micro-controller are connected via Internet.

Paper 3:IoT Based Automatic Fire Alarm System

Published year:2020

Author name:A.Jeevanandham,SivamuruganP

Journal name: Bulletin of scientific research

Summary: Fire identifiers are utilized to recognize the fire or smoke at a beginning time and can help in sparing lives. Right now, IOT based alarm has been planned utilizing temperature and smoke sensor. By utilizing the temperature sensor, smoke sensor and there is a simple to advanced convertor, which changes over the simple signs got at the sensor end to computerized and afterward transmits them to a smaller scale controller and to the Arduino. The small-scale controller is modified to turn on the ringer, when the temperature and the smoke arrive at an edge esteem. Simultaneously, Arduino sends the information to the Wi-Fi module ESP8266. ESP8266 will then the accompanying information to the IOT site, where, approved individuals can take fitting measure so as to check the fire. The gadget id is the one-of-a-kind id given to a gadget, which would enable the work force to get data identified with the area, where the fire is detected

Methodology: Iot must be self-contained for searchoperation, decision making based on the real-time data orcurrent condition (object detection), intelligent decision(software program) for the immediate surrounding environment **or condition is to perform the task or mission**

Paper4:Fire detection and alarm system

Publication year:2019

Author name: Trung Luong

Journal name:HAMK Journal of Electrical and Automation Engineering

Summary: The central target of this project was to study,analyse and design a fire detection and alarm system.This topic was suitable because it covered a basic and important aspect in our modern life.The objectives of the project were to provide information on fire alarm system in Vietnam and Finland,to show the similarities and differences with systems in both countries.For practical part,Arduino Uno was used as the control unit with other necessary components.Upon completing this project,the author has demonstrated how a fire detection and alarm system works and analysed the system standards in the above-mentioned countries.Moreover,the fire alarm system using the Aurdino Uno was tested and found to work successfully.

Methodology: The project consist of smoke sensor,flame sensor,LED and Buzzer,Ardunio Uno as its primary components.The fire can be detected by the flame sensor and the smoke sensor also detect fires by sensing small particals in the air.

Paper5:Fire Detection and Intimation System

Publication year:2010/2011

Author name: Wambura Makongo

Journal name:DAR ES SALAAM INSTITUTE OF TECHNOLOGY

Summary: This report designing and implementing Fire detection and intimation system for Dar es salaam Institute of Technology hostel.The institute hostel use Fire extinguishers in hostel but these extinguishers are not totally working.So in case of fire outbreak,the Institute has no any system for fire detection which can detect smoke before it outbreak.Also all workshops,laboratories,offices,classes and Library fire detection systems.Thus,by desiging a Fire detection and Intimation system which detects smoke in case of fire outbreak in the hostel will encourage or be a starting point for the Institute.

Methodology: This project is being done under prototyping-based methodology.In this prototyping based methodology,the analysis,design,and implementation phases are performed concurrently and all these three phases are performes repeatedly until the system is completed.

Paper6:Fire detection System based on ZigBee Wi-Fi Networks

Publication year:2018

Author name: Mr.C.Santhana Krishnan,Akhilesh Galla,Naveen Arlapalli

Journal name: International Journal of pure and Applied mathematics

Summary: This paper presents a design of MEMS based structural damage,through some sensors as a single node.The sensor nodes are placed in important areas of the building, which we create a network and the mentioned data is transmittes to control unit through wireless sensor network and if the temperature or pressure reach above threshold value and building damage is detected automatically,alerts the surroundings and take necessary precautions to prevent the disaster.The sensor node detects the maximum level that it can withhold,in the mean time it calculates where the damage is occurring and remaining time that the building can offer further resistance to damage.

Methodology: Zigbee module,Temperature sensor,pressure sensor,Alarm are used as its components.Sensor send an interrupt signal through WSN from Arduino microcontroller.The

advantage of this device is that,it automatically detects the fire and offer faster response time.

Paper 7: IoT Based Automatic Fire Alarm System

Publication: 2020

Author name: A.T. Jeevanandham, P. Sivamurgan

Journal name: Vel Tech Rangarajan Dr Sagunthala R&D Institute of Science and Technology

Summary: A fire is a condition of consuming that delivers the blazes and warmth. The fire can possibly make hurt its inhabitants and serious harm to the property. Mechanical security survey magazine expresses that there are 25,000 people passed on because of fire mishaps in India in the time of 2001-2014[1]. The harm of structures and loss of human life can be occurred because of fire mishaps in the enterprises. This present examination endeavor□s for to discover the staff characteristics of business factors and work factors that include which prompts fire mishap in the business. Counteraction of fire mishap and fire hazard level control trouble are expanded step by step. Putting out fires and observing circumstances are intense today. They concentrate on improve the science and innovation in opposing fire debacles. They are worried about

the use of new innovation, for example, IOT and remote sensor arrange in putting out fires and observing field. IOT is truly appropriate for putting out fires with wide degree alongside remote sensor network .A key part of fire insurance in the business is to build up the wellbeing framework by utilizing alarm sign to the association by methods for IOT innovation to the encompassing territory in the business. The conceivable weighty harms and bothersome expenses on both condition and network calls for additional improvement of wellbeing methodology and selection of proper techniques in taking care of dangers in industry and fast activity on standard working strategy if there should be an occurrence of arrival of risks detected. The fire mishap from Hong Kong shipyard is a significant episode which passed on to look for regard for the unfathomable capability of perils like fire blast in term of ruin of human life, their wellbeing and resources and enduring effects. The forest fire can be controlled by using IOT based alarm framework is utilized in all the businesses to keep from the fire mishaps.

Methodology :. IoT must be self-contained for search operation, decision making based on the real-time data or current condition (object detection), intelligent decision (software program) for the immediate surrounding environment or condition is to perform the task or mission

Paper8: IoT based forest fire detection system

Publication year: March - 2018

Author name: M. Trinath Basu1, Ragipati Karthik, J. Mahitha, V. Lokesh Reddy.

Journal name: International Journal of Engineering & Technology

Summary: It has been found in a survey that 80% losses caused due to fire would have been kept away from if the fire was identified promptly. Node Mcu based IoT empowered fire indicator and observing framework is the answer for this issue. In this task, we have assembled fire finder utilizing Node Mcu which is interfaced with a temperature sensor, a smoke sensor and signal. The temperature sensor detects the warmth and smoke sensor detects any smoke produced because of consuming or fire. Buzzer associated with Arduino gives us an alert sign. At whatever point fire activated, it consumes protests adjacent and produces smoke. A fire caution can likewise be activated be-cause of little smoke from candlelight or oil lights utilized as a part of a family. Likewise, at whatever point warm force is high then ad-ditionally the alert goes on. Bell or alert is killed at

whatever point the temperature goes to ordinary room temperature and smoke level decreases. We have additionally interfaced LCD show to the Node Mcu board. With the assistance of IoT innovation. Node MCU fire checking serves for mechanical need and also for family unit reason. At whatever point it recognizes fire or smoke then it immediately alarms the client about the fire through the ethernet module. For this reason, we are utilizing ESP8266 which is from Arduino IDE. Likewise, the Node Mcu interfacing with LCD show is done to show the status of the framework whether the Smoke and Overheat is identified or not. What's more, Node Mcu interfacing with Ethernet module is done as such that client become more acquainted with about the predominant condition message. It insinuate the client about the fire identification. This framework is extremely helpful at whatever point the client isn't in the closeness of control focus. At whatever point a fire happens, the framework naturally faculties and alarms the client by sending an alarm to an application introduced on user□s Android portable or page open through web.

Methodology : Employing Sensors serving as Data acquisition center Temperature sensor and smoke sensor are utilized that should be set at specific separations with the goal that a look can be kept on the whole forest

territory keeping in mind the end goal to distinguish the start disturbing temperature and the level of carbon dioxide gas(CO2). These sensors will send the flag or the data to the microcontroller. These will all detect changes in the earth and respond naturally in case of a crisis. New advancements in programmed starting gadgets utilize cameras and PC calculations to examine obvious impacts of flame and development in ways that other discovery gadgets can□t number of terminate sensors are to be utilized in handy circumstance that are should have been set at specific separations with the goal that a look can be kept on the whole forest region.

Paper 9: IOT Based Smart Gas Monitoring System

Publication year: 2017

Author name: Anandhakrishnan S, Deepesh Nair, Rakesh K, Sampath K,Gayathri S Nair.

Journal name: IOSR Journal of Electrical and Electronics Engineering (IOSR-JEEE).

Summary: Nowadays gas leakage and gas detection is a major problem in our daily lives. Also gas wastage is a major issue that needs to be countered. LPG gas is highly

flammable and can inflict damage to life and property. To avoid such situations, a considerable amount of effort has been devoted to the development of reliable techniques for detecting gas leakage. As knowing about the existence of a leak is not always enough to launch a corrective action, some of the leak detection techniques were designed to allow the possibility of locating the leak. Our aim is to reduce the risks in Kitchen using Internet of Things. The main aim is to propose the design and construction of an SMS based Gas Leakage Alert System. Gas sensor are used to detect gas leakages in a kitchen. With the help of an infrared sensor the issue of gas wastage is also monitored. An alarm goes off whenever the sensor doesn□t detect any vessel over the burner beyond a particular time period Keywords: Cloud storage, IOT, Sensors, Android App

Methodology: The proposed system consist of atmega328 and it is interfaced to sensors like MQ2 sensor, load cell, infrared sensors etc. which are the input of the system. Here the wifi-module is interfaced to these which give the ability to communicate with each other. The proposed method takes an automatic control action upon detection of gas. The regulator valve (motor) would be switched off which completely stops the flow of gas leakage. Initialy if there is a gas leakage then the

electronic sensor i.e. the gas sensor that obeys the principle of LPG sensor senses any gas leakage from storage, if any leakage sensed then the output of this sensor goes high. This high signal is monitored by the microcontroller and it will identify the gas leakage. If there is a leakage, the consumer is informed through internet in his device and a signal is sent back to the microcontroller to turn off the valve. In this system, a sensor (load cell) is used to monitor the weight of the gas cylinder, if it goes below a critical value the sensor senses this condition and sends a notification via internet to gas agency for booking a LPG. The object detection sensor is used to detect the presence of any vessel over the burner. If a vessel is not detected over a predetermined time, then an alarm goes off and the consumer is alerted.

Paper 10: IoT Based Forest Fire Detection System using Arduino and GSM Module

Publication year: September 13, 2021

Author: Debasis parida

Summary: Forest fires are common hazards in forests that cause a lot of harm to Wildlife as well as the Environment. It could be avoided if a robust system could be deployed in forest areas to detect the fire and alert to

Fire extinguishing authority to take immediate action. In this project, the intention is to build a Forest fire detection system using IoT which would detect the fire and send an emergency alert to Authority through IoT. Here a GSM/GPRS module is used to communicate with IoT sever as usually in forest areas network bandwidth is very low or not available. Hence a 2G network is preferable to communicate with the server.

Methodology: The project consists of flame sensor Arduino Nano & SIM800L GSM/GPRS module as its primary components. The fire can be detected by the flame sensor which gives a digital output that corresponds to the Fire status and is received by the Arduino Nano. Arduino compares the signal and triggers the SIM800L in case of fire incidents. Through AT commands, SIM800L communicates with thing speak server.

Paper 11:FIRE DETECTION AND ALARM

Publication year: 2020

Author:DADI TIRUMALAN TARUN

Summary: Fire Alarm Circuit is a simple circuit that detects the fire and activates the Siren Sound or Buzzer.

Fire Alarm Circuits are very important devices to detect fire at the right time and prevent any damage to people or property. Fire Alarm Circuits and Smoke Sensors are a part of the security systems which help in detecting or preventing damage. Installing Fire Alarm Systems and Smoke Sensors in commercial buildings like offices, movie theatres, shopping malls, and other public places is compulsory.

Methodology: There are many expensive and sophisticated Fire Alarm Circuit in the form of stand-alone devices, but we have designed five very simple Fire Alarm Circuits using common components like Thermistor, LM358, Germanium Diode, LM341, and NE555. This is a very simple alarm circuit using Thermistor, LM358 Operational □ Amplifier and a Buzzer.

Paper12: Recent Advances in Fire Detection and Monitoring Systems

Publication year: January 2020

Author:RAFIK GHALI,MARWA JMAL,WIDED MSEDDI

Summary: Wildfires are one of the most impacting natural disasters, leading to a huge devastation of humans

and the environment. Due to the rapid development of sensors and technologies as well as the success of computer vision algorithms new and complete solutions for automatic fire monitoring and detection have been exposed. However, in the past years, only few literature reviews have been proposed to cover researches until the year 2015. To fill this gap, an up-to- date comprehensive review on this problem.we expose vision- based methods for fire detection. Our main focus was on techniques based on deep convolutional neural networks (CNNs).

Methodology: Traditional ground systems, also called terrestrial systems, are based on human supervision. Fire detection and monitoring is performed by supervising regions locally or by analyzing data provided from local sensors such as flame, smoke and heat detectors, and gas sensors.In order to increase systems efficiency and detect the exact location of fires, ambient sensors were also integrated. These sensors are used during the day and night to detect fire and smoke and identify their characteristics. The main sensors are employed interrestrial systems are vision or infrared (IR) camera, IR spectrometers and Light detection and ranging systems (LIDAR) [3, 4, 5].