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FIRE BUSTER – AN AUTOMATIC ALERT SYSTEM USING IOT

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ABSTRACT

According to the National Crime Records bureau (NCRB), on an average, in India, every year about 25,000 persons die due to fires and related causes. Female accounts for about 66% of those killed in fire accidents. It is estimated that about 42 female and 21 male die every day in India due of fire at 2010 to 2016. Looking at these statistics we see that fires in home or building are a part of our daily lives. To solve the problem caused by the fires. So we introduce devices "Fire Buster"(Automatic alert system).The existing system of fire alarms systems alert the occupants of a building or home by the sounding an alarm which is loud enough for everyone in the building to hear in order to evacuate. These alarm system are effective only if the fire alarm can be heard; otherwise if no one is near the home or building, the fire or smoke in building or home would go unnoticed. Our project differs from the existing system by able to send data to the fire department through sensor using IOT. As soon as fire detector detects any fire related event, after processing of event in fire panel dialer send out the information to the central station. This system is having less hardware components and the interfacing hence it reduces the cost as well and also we can make use of Reusability of the code that we have developed here.

1. INTRODUCTION

Technology has reached almost every aspect of our lives. After work place, it is our home. The repeated question is how technology can make your home more comfortable. Home automation is the answer to it. We probably live with a number of automated devices in our home already automated devices include heating and cooling devices, alarm systems, lights, blinds and shades, and even audio systems. In the past, automation was only available and feasible to commercial buildings and high-end homes. However nowadays with cheap microcontrollers like Arduino. NodeMCu which is within reach of consumers who wish to automate their homes. A typical fire alarm control system shall be capable of detecting fire and transmitting it to central monitoring station. Fire points (detectors or sensors) communicate with fire alarm control unit. As part of compliance in case of any fire related event information need to be communicated to monitoring station for just in time response. Current fire panels are making use of Digital alarm communicator transmitter (DACT) which is responsible for transmitting the information to the central station. Only some panels come along with the DACT, the remaining panels need to have external DACT unit for transmitting the information to the central station. There is obsolescence in using this DACT since it requires more hardware components and interfacing. So, to overcome the obsolescence of the DACT, the transmitting unit is designed to make the system cost effective and eliminate the obsolescence. The current life safety systems do not have any wireless connectivity to communicate with external world. Detectors or

sensors are reported only to Fire alarm control Panel (FACP). A person cannot know the situation inside a building in case of fire, by simply standing outside. Fire Fighter does not know the situation in the fire place till they reach spot.

1. LITERATURE SURVEY

An IoT based Fire Alarming and Authentication System for Workhouse usingRaspberry Pi 3
Author: AhmedImteaj,TanveerRahma,MuhammadK amrulHossain, Mohammed Shamsul Alam, and Saad Ahmad The propounded autonomous system uses Raspberry Pi 3 as main device, Arduino Mega as secondary device and consists of couple of sensors and module which is the Light intensity sensor, Gas sensor, ESP-01 WLAN Sensor Module, Servo motor, Camera module, GSM module and Relay module. The light intensity sensor has a photo-resistor that can detect the intensity of light in the particular place or environment. The output signal of this sensor is analog value. The value of the sensor depends on the brightness of light. Gas sensor can detect the existence of gas in a particular area. The Camera module takes the shot of the limited place and the servo motor rotates the camera module. The ESP-01 WLAN sensor module helps to send data to the Raspberry Pi 3 by wireless communication system. The Relay module is used to activate the alarm and the GSM module helps to notify the master user or the admin.If the light intensity and gas sensor have desire value, then the camera module takes snap of the location and sends it to the Arduino.

Development of Fire Alarm System using Raspberry Pi and Arduino

Author: Rosni Abu Kassim, Norlida Buniyamin The proposed fire alarm system that used Raspberry Pi as a master device and Arduino Uno as a slave device was implemented.The sensor was placed at the center of the room.It is sensitive to the ionization of the surrounding air, resulting in the changes of its resistivity. The value of the output voltage from the sensor circuitry varies linearly with the resistivity of the sensor, so any changes in the sensor resistivity will result in the changes output voltage. The output voltage of the sensor circuitry is read in 1024 bit resolution by the Arduino Uno. At start, the Arduino Uno read the first reading from the sensor and set the threshold value.

Automated Fire Detection and Controlling System

Author: Kausik Sen, Jeet Sarkar, Sutapa Saha, Anukrishna Roy, Dipsetu Dey, Sumit Baitali Proposed automated fire detection and controlling system is designed and implemented in this work.Experimental set up of this proposed system is shown. The subsections are discussed here in brief.LDR is used in the circuit of smoke sensor as shown in When the light is obstructed by smoke, the resistance of the LDR increases, therefore, the collector-base voltage increases, which makes the Q1 ON, making the Q2 also ON, which gives the signal of fire by loud horns.A tube consisting of light source and light sensing device used in our system for smoke sensing works almost as the smoke sensor. Instead of LDR, thermistor is used here. With increasing heat thermistor resistance decreases. Therefore increasing collector-base voltage respected to base-emitter voltage. This makes the sensor unit ON.

3.EXISTING SYSTEM

We have propounded a system which is capable to detect fire and can provide the location of the affected region. Raspberry Pi 3 has been used to control multiple Arduino which are integrated with a couple of sensors and camera. A 360 ż relay motor is assembled with the camera so that it can snap the image in whatever angle the fire is detected. We have provided a confirmation of the fire suspecting system to avoid any false alarm. The system will immediately send a message alone

3.1 LIMITATION OF EXISTING SYSTEM

From the above made inferences of various papers, there are quite a few drawbacks of the already existing systems here as follows:

1. Small surveillance capacity
2. Poor reliable in detection
3. Slow response time

It is necessary to design a system to overcome these problems and satisfy the application user requirement

4. PROPOSED SYSTEM

Fires are one of the most widespread causes of deaths by accident. Instant alerting to the fire department is necessary to ensure immediate action. Every minute can save many lives in such situations. So here we propose an IOT based automatic fire department alerting system that instantly and automatically alerts the fire department and informs about the situation so that immediate action can be taken. The system uses Fire sensor along with Gas sensor to efficiently detect fires and alert fire department over IOT. We use a raspberry pi in order to check if a sensor is triggered. Then it reconfirms if it really is a fire outbreak using temperature sensors in order to confirm of fire outbreak.The system now uses a Wi-Fi connection to access IOT server and transmit data about this incident

over internet. As soon as system receives the sensor data it checks the device id data was sent from and displays it. The system now displays the fire incident in the fire department over internet so that the fire department personnel are alerted about the incident to take necessary action.The developed system is having unit that transmits any on premise fire event to a dedicated phone number. As soon as fire detector detects any fire related event, after processing of event in fire panel dialer send out the information to the central station. This system is having less hardware components and the interfacing hence it reduces the cost as well and also we can make use of Reusability of the code that we have developed here. Developed system also provides the visual fire spreading indication to authorized person. Building owner sitting somewhere in the world can see the status for fire spreading in his building. The present work uses N-F-N Gateway, is an intelligent gateway interface for fire monitoring workstation.

5. SYSTEM ARCHITECTURE

The system architecture diagram enables you to graphically model the applications of a system, and the externals that they interface with data stores that they use

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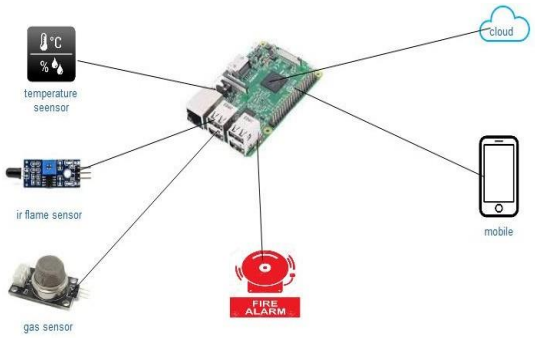

Fig 5.1 SYSTEM ARCHITECTURE

5.1 WORKING

The system uses Fire sensor along with Gas sensor to efficiently detect fires and alert fire department over IOT. We use a raspberry pi in order to check if a sensor is triggered. Then it reconfirms if it really is a fire outbreak using temperature sensors in order to confirm of fire outbreak and a fire alarm will be raised. The system now uses a Wi-Fi connection to access IOT server and transmit data about this incident over internet. As soon as system receives the sensor data it checks the device id data was sent from and displays it. This will alert users by E- MAIL and Notification

5.2ADVANTAGES

1. The new modern fire systems is based on internet of things (IoT)
2. Because of modern technology the systems minimize the loses due to fire
3. Sensor detects the fire conditional and transfers the data to the systems
4. The system now uses a Wi-Fi connection to access IOT server and transmit data about this incident over internet. As soon as system receives the sensor data it checks the device id data was sent from and displays it

6. CONCLUSION

The designed fire alarm system is simple but it has wide area of application in household and industrial safety, especially in developing countries like India where internet is a major issue.Using this system, quick and reliable alert response is possible to initiate preventive measures to avert danger of fire small scale industries where cost is the major issue for them to buy internet.This is a cost effective fire

alarm system which performs reliably to ensure safety from fire, and can be installed in houses, industries, offices, ware-houses etc. very easily. Large industrial or residential area can be monitored through the proposed system installing multiple modules, each for one floor or unit. The system can be further developed with added features like web server interconnect, fire area tracking and fire extinguisher interfacing etc.

7. FUTURE SCOPE

We can further extend this project by adding some more features which can make it more efficient and security oriented. The camcorder can also be used to track all the activities of the unknown person or intruders. The complexity of the algorithm of the system can be increased by introducing number of sensors to make the system more efficient. We can use voice command to convey the message more clearly about the unforeseen happenings.

inside house. Door locking system can be implemented at door which can be locked/unlocked using face detection and finger prints. This system can have the facility to predict the natural hazards and alert the people about it.

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