

Iot-Based Intelligent Emergency Response System

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Abstract- In current situation are much aware of certain phenomena like fire disaster. Existing emergency exit guides do not consider the location of the fire and merely direct people to the nearest exit and poor evacuation guidance. This paper suggests that can a fire is to properly identify the incident, raise the occupant alarm and then automatically all door will be open. The fire is sensed a message is sent to relevant controlling authorities to take further action. For sending information to relevant controlling authority GSM technology can be used. It is display advertisement monitor and authority personal computer.

Keywords- Microcontroller, GSM, RF transmitter and receiver, Servo motor, Buzzer.

I. INTRODUCTION

Taking more than 20 minutes to evacuate from a fire. Fire is one of the most dangerous events possible. Somewhere in the world, one occurs every minute of every day. These hazardous events threaten people lives and force an immediate movement of people wanting to escape from a dangerous area. The important issues is fire occurred in the place to loss human life and resources. The field of fire detection has advanced to where fire detectors and alarm devices have combined to become life safety systems.

Particularly some emergencies happened in urban complexes were characterized by small occurrence areas, wide influenced range and easily panicked crowds. The occurrences and spread of the fire is a complicated and stochastic process. This paper suggests the role of the fire detection and alarm systems. This is primary function of alarm output aspect of a system and alarm signal to the people. Upon receiving an alarm notifications the fire alarm control panel must know tell someone that an emergency is underway.

The emergency response plan to fire disaster can make people save their lives. The goal is to build a wireless network connect everyone especially during incidents and emergencies and our vision that anyone can interact with their mall screen. If fires are occurred, the emergency doors open automatically.

It can reduce time to broken emergency glass. The additional features can be used GSM technology. If the authority not in the place and automatically the GSM technology send the message to the relevant authority. The relevant authorities are very useful in remote locations where human interaction is limited. Along with this project we will be able to know about fire, fire system protection and precautions.

II. RELATED WORK

This paper suggests the communications requirements for fire safety in buildings from the standpoint of the building occupant and the control operator. It traces the development of the problem of communications in buildings. The communications requirements of the building occupants are also covered with emphasis on the types of information communicated by signals and the integration of those signals into an overall system design. Personnel requirements for staffing a control center are also discussed along with common problems in several operational communications systems. Detailed examples of communications systems are provided. Portions of several model codes which cover communications systems are presented. Suggested areas for future research on fire safety in buildings are identified [1]. With the rapidly developing urbanization, large-scale public buildings, such as superstores, high-rise office buildings and urban complexes in cities are increasing sharply. Since such buildings are often convergences of crowds, distribution hubs or bustling areas of cities, with these multiple attributes, a series of potential safety hazards will be easily triggered for high population density per unit. Once emergencies happen (e.g., fire disasters, earthquakes and leak of hazardous articles and etc.), people inside the building will inevitably be in danger, which makes a safe and high-efficiency evacuation particularly important. It can be observed from building fire disasters happened before, many events with mass death and casualties were caused by people's improper evacuation behaviors. Particularly, some emergencies happened in urban complexes were characterized by small occurrence areas, wide influenced range and easily-panicked crowds. For example, when a fire disaster happens at someplace in a high-rise building, how to rapidly confirm the influenced range and make an emergency evacuation decision

fast to help people inside the building evacuate and minimize the loss of people and resources[2]. When a fire breaks out, it is frequent that large sized miserable death is happened by seriousness of poisonous gas and peculiarity of space because the building construction is recently more complex and diverse. So early countermeasure in preparation for evacuation escape linked directly with a loss of lives is pressing. Because escape light that mark fixing one-way of existing way is not efficiently extricated refugees from dangers when a fire breaks out, construction of system that can extricate refugees from dangers and suppress early a fire by grasping correctly fire point is required urgently. When a fire breaks out, all escape lights connected with fire sensor and reception group which have ill aiming in these point will lead people to safe emergency entrance of opposite direction of place that a fire is broken out after being calculated the direction and speed of flame and smoke. There is the purpose of my research in development of artificial intelligent directional escape light that can mark direction to most suitable pull-out and assist in early extinguishing a fire [3]. Wireless Sensor Networks (WSNs) have attracted much attention in recent years. The potential applications of WSNs are immense. They are used for collecting, storing and sharing sensed data. The architecture of a WSN system comprises of a set of sensor nodes and a base station that communicate with each other and gather local information to make global decisions about the physical environment. The sensor network is based on the IEEE 802.15.4 standard and a new multi-hop routing protocol was designed suited for monitoring and control applications. Wireless sensor networks are becoming more and more popular day by day as they revolutionize many segments of our economy and life. The research into this field has expanded to include all relevant topics imaginable [4]. Fire disasters happen every day all over the world. These hazardous events threaten people's lives and force an immediate movement of people wanting to escape from a dangerous area. Evacuation drills are held to encourage people to practice evacuation skills and to ensure they are familiar with the environment. However, these drills cannot accurately represent real emergency situations and, in some cases, people may be injured during practice. To understand how humans behave in emergency situations, and to simulate more realistic human behavior, this studies human behavior from fire investigation reports, which provide a variety details about the building, fire circumstance, and human behavior from professional fire investigation teams. A generic agent-based evacuation model is developed based on common human behavior that identified in the fire investigation reports studied [5]. In this paper, Wireless Sensor Networks (WSN), Radio Frequency Identification (RFID) and real time escape route guidance are integrated to accomplish a real-time fire evacuation system to guide along an evacuation route. When

the emergency event occurs, the system provides evacuation route guidance to people for them to be able to avoid danger. Moreover, in the proposed system, an intelligent evacuation route is provided by indicating in digital signage the best evacuation route as well as pertinent information to improve the chances of survival for users. The proposed system also supplies real time environmental information to fire fighters assuring better efficiency in their rescue operations. In this study, a Zigbee wireless sensor network, RFID indoor localization technology and real time evacuation guidance were integrated to set up real-time fire evacuation in order to guide people along evacuation routes. Also, in the study, an intelligent digital signage, provided via the central control system, was used to display the evacuation guidance to guide users in the building in case of fire leading to quick escapes and reducing casualties [6]. This paper presents a design scheme of early fire detection system in buildings based on WMSNs. We adopt the traditional fire detection sensors together with the CMOS image sensors, and process those data at the acquisition side, using DSP chips, instead of at the monitoring side, in which way less data need to be transferred through the wireless network. Thus, it makes a more reasonable and energy saving fire detection system. The traditional fire detection method used is to implement basic detection of suspicious fire area and a fire image detection method, based on the static image features and the dynamic image features of fire, is applied in the system to enhance detection precision[7]. Multi-sensor and information fusion technology based on Dumpster-Shafer evidence theory is applied in the system of a building fire alarm to realize early detecting and alarming. By using a multi-sensor to monitor the parameters of the fire process, such as light, smoke, temperature, gas and moisture, the range of fire monitoring in space and time is expanded compared with a single-sensor system. A building fire alarm system consists of sensors, data acquisition and processing modules. Fire detection sensors are the automatic components of the fire alarm system, including sensors for light, smoke, temperature, gas and humidity [8]. ACO is one of all-powerful meta-heuristics algorithms and some researchers have expressed the strength of some applications with the algorithm the evacuation route planning is the key aspect in case of fire disaster. There exists multiple route from source of fire to the exit, hence the selection of shortest path is the fundamental objective of evacuation route planning. The objective of the algorithm is to minimize the entire rescue time of all evacuees. The ant colony optimization algorithm is used to solve the complications of shortest route planning [9]. This paper seeks to propose and innovative the research approach, integrating some aspects of BIM and advanced GIS analysis. This may advance beyond state-of-the-art emergency response applications. The advocated research approach evolves beyond the simplistic 3D indoor

arises or temperature is increase the after sensing these problems Arduino send this problem to the GSM module.



3.4 Zigbee 204GHZ TICC2530-RSSI

The CC2530 has various operating modes, making it highly suited for systems where ultralow power consumption is required. Short transition times between operating modes further ensure low energy consumption. RSSI is usually invisible to a user of a receiving device. This device available to users. RSSI output is often a DC analog level. It can also be sampled by an internal ADC and the resulting codes available directly or through peripheral or internal processor bus. It can be transmitter and receiving the signal.



ZIGBEE 204GHZ T1 CC2530

3.5 Buzzer

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke. It connected with arduino and produce alerted sound.



Buzzer

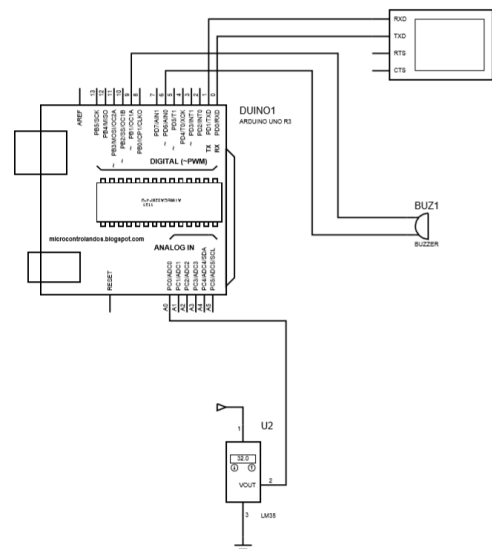
3.6 DC Motor

A DC motor converts direct current electrical power into mechanical power. DC or direct current motor works on the principal, when a current carrying conductor is placed in a magnetic field; it experiences a torque and has a tendency to move. This is known as motoring action. The DC motor are connected with arduino and it can be automatically all doors open



DC motor

Circuit diagram

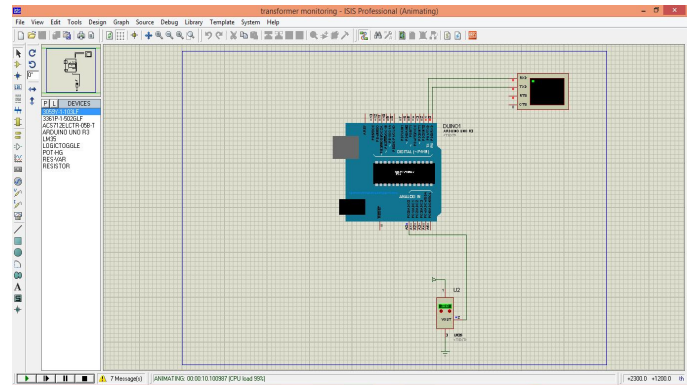
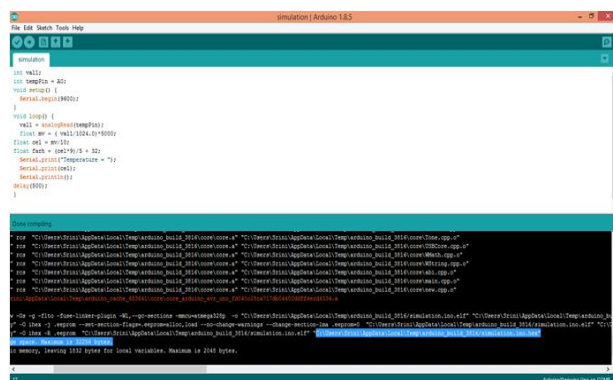


The above circuit diagram, if fires are occurred in the mall, it will detected by temperature sensor. The temperature sensor can be used for increasing the fire it will informed to the arduino. The arduino UNO are connected with two outputs, one is servo motor and another one is buzzer. The servo motor can be used to automatically all doors are open. The buzzer can be used for alerted the people to detected the fire.

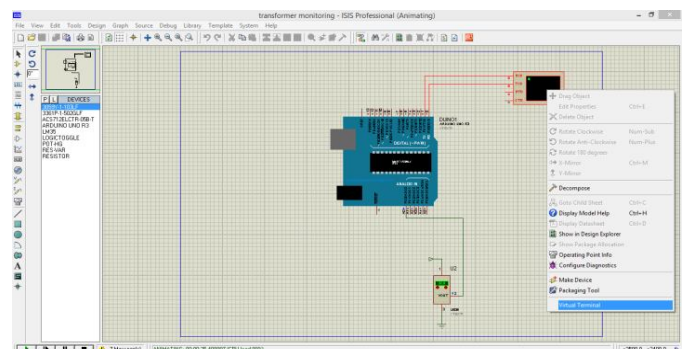
IV. MODULES

4.1 Arduino Modules

The arduino modules is used to detected the fire occurred or not in the mall. The arduino application is used to display the temperature increasing or decreasing. The Arduino microcontroller is an easy to use yet power full single board computer has gained considerable tracking the temperature. It is develop to low cost hardware for interaction design. In arduino are connected with adaptor to give a power supply. It will be displaying the value of the temperature. In this application to verify the code and then uploading the code. The coding is dumb into the arduino kit.

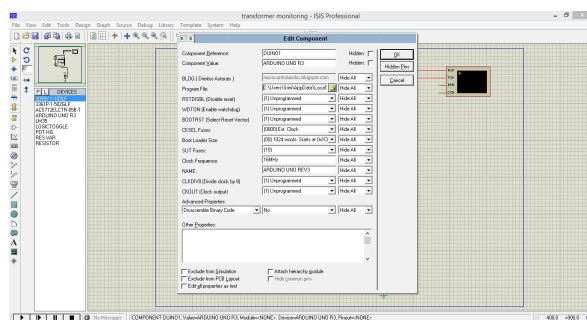


The virtual terminals are running to display the temperature value. If the temperature value is raises due to fire occurred.



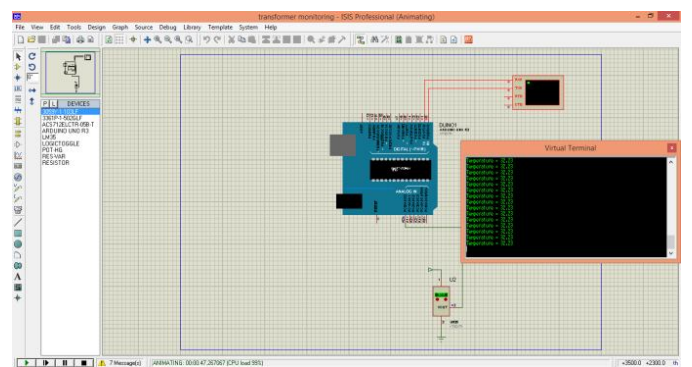
4.2 ISSI Module

The ISSI modules are connected with arduino. It is simulation of the arduino application coding. It can be creating the circuit diagram. We can able to drawn the transforming monitor. It is design the diagram for arduino coding. It has arduino, temperature sensor and buzzer. First we load the coding in the program file by using arduino component.



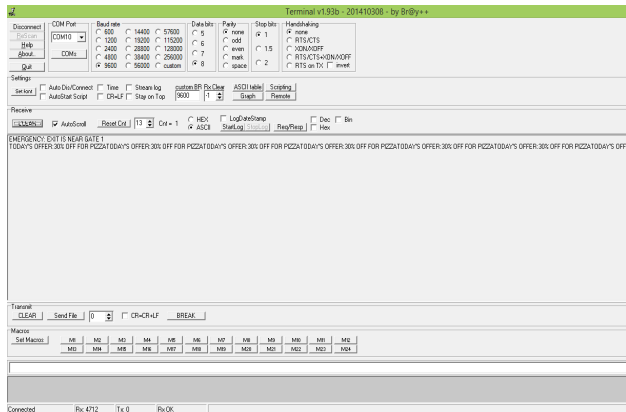
Finally we run the code, automatically temperature sensor and virtual terminal are running to indicate the temperature.

The below diagram is virtual terminal to display temperature value,



4.3 Terminal module

The terminal module is used to display the personnel computer and advertisement screen. The Zigbee competent are attached to the battery to given the power supply. The port is connected to the pc. The Zigbee components are receiving message from the Zigbee transmitter. In terminal we can uses COM port 10. Normally the mall screen to display the advertisement if fire is occurred, it automatically the emergency message send to the mall screen and mall admin.



V. CONCLUSION

The paper present user friendly and low cost home and industrial security systems. It's a real time security purpose system developed with simple hardware which simplifies the possibility of error free security system. The system can be easily implemented with maximum reliability and the high security with the low cost is a special enhancement from the existing systems for home security. This is often the function of the fire detection and alarm system. Several system types and options are available, depending on the specific characteristics of the protected space and human life.

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