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An IOT based Evacuation system

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Abstract - With the advancement of technology, the internet is improving as well as the development of the internet of things. Buildings are getting clever and the trend is escalating. Wireless nerve networks play an important role in this concept. This concept deals with one of the most widely used applications for wireless sensor networks, that is, in the field of navigation. In the event of an emergency, the wireless sensors detect the danger and direct the evacuees to remote areas through physical contact on the Internet. Emergency navigation is essential to get rid of trapped users to get out of the vicinity. Our focus is not only on directing users who provide the shortest route but also the safest way. This helps to prevent congestion and leads to the use of alternatives that are often left unused thus improving the survival rate of exits.

Key Words: internet, Wireless Sensor, Emergency, navigation, wireless sensor networks

1.INTRODUCTION

Cities with a cold population increase the burden on energy, water, buildings, public spaces, transportation and much more. Therefore, we need to find "smart" solutions that mean they are effective and feasible for the economic growth of the city and society. With the advancement of science and technology, the design of modern buildings has become more complex and scale, and larger public buildings such as shopping malls, office buildings, and science and educational institutions are increasingly increasing. From the perspective of the occupant of the building, the fire-retardant process consists of three main stages: awareness, response, and movement. We recommend Smart Escape, a real-time, flexible, intelligent and user-specific exit system with emergency mobile communications such as fire. Unlike previous work, we examine the dynamics and calculate the route of a person leaving by considering his or her individual characteristics. Smart Escape, fast, low-cost, low-cost and mobile-backed, collects a variety of natural sensory data and takes into account individual output characteristics, uses an artificial neural network (ANN) to calculate the risk of personal use of each link building, eliminates risks, and it lists the best way to escape under the circumstances. Then, our system directs the exit to exit a specified route via voice and visual instructions on the smartphone.

2. LITERATURE REVIEW:

Subject: Mobile Fire Extinguisher Program for Large Public Buildings Based on Artificial Intelligence and IoT.

In this case, artificial intelligence technology is used to build an effective and intelligent exit solution solution model, as well as an intelligent mobile terminal recovery system designed for large public buildings based on artificial intelligence technology. A natural grid model has been developed, and the best exit route is planned by analyzing three different phases of fire with an ant-collection algorithm. Finally, the smart exit indicator is strongly indicated.

Using an advanced ant colony algorithm, traditional geometric methods are replaced with more effective lengths, and a more powerful fire extinguisher is obtained. The advantage of this paper is that in the event of a fire, the system can help guide people out of the building in real time and reach a safe exit quickly, in order to reduce injuries and economic losses. This paper has made a significant contribution to the field of fire protection.

Mobile terminal must be configured with ArcGIS Android SDK 10.1. rather used on paper.

Topic: Building smart urban applications using IoT and Cloud-based Architectures.

This paper focuses on the platform features of smart city deployments and ensures platform capabilities for IoT functionality using cloud middleware. Smart homes, smart buildings, airports, hospitals, universities or communities equipped with mobile terminals and embedded sensor devices or connected actuators. The value of this study is based on the fact that it has learned ways in which Cloud and Internet concepts of objects can be used in the context of intelligent cities.

This approach has the great promise of reducing the cost of capital and infrastructure while improving the efficiency of service delivery within the Smart City framework.

The whole challenge of collaborating to improve collaboration between different providers and users in the IoT domain: Provides alignment between different systems and use of ontology comparison solutions, using integrated efforts to design standard specifications and basic schema / reference models, providing metrics, tools and interface. with annotations, testing and verification and integration.

Subject: IoT Based Intelligent Fire Evacuation System.

In this paper, a clever IoT fire system is developed that guides people in the event of an emergency. The A * search algorithm was used to do so control the central module of the proposed model. This helps people get out of danger by directing them in the shortest possible way. This program will play a key role in saving lives in such situations. Implementation can bring about significant changes in the process of dealing with fire hazards. What's worse is the use of A * search algorithm that A8 search speed depends largely on the accuracy of the heuristic algorithm.

Subject: Smart Apparatus Fire Extinguisher - IoT-based fire alarm monitoring system and evacuation system.

In this paper, the IoT-based fire-based IoT system was developed with a focus on local firefighting rather than local people. The Meshed Sensor network was used to direct people away from the fire which we had to first alert a visual system that could detect a fire. Central Hub and Route Planning was a server-based operation that would receive all the sensory data from various locations, process the data to see the location of the fire, and learn about the power.

Subject: IoT-based Intelligent Modeling for Smart Home Environment for Fire Prevention and Safety.

In this paper, a wireless sensor network that uses multiple sensors for rapid detection of house fire is designed and tested. In addition, the Global System for Mobile Communications (GSM) is used to avoid false alarms. Some analyzes have been performed using different fire data sets. The work is divided into four parts. The first unit defines a sensor that collects information from a location and transmits it to a second unit, that is, a processing unit, using the ZigBee protocol. The third unit is the GSM communications unit, which alerts users to the event. The fourth unit activates the alarm.

The system designed for this paper works very well compared to other related systems. see event; (b) False alarms may be generated. Overall, the proposed approach in this paper provides a solution to these problems. The paper presented an effective strategy to overcome these problems. Use multiple sensors in each region in smart homes.

In the future, as they have used more sensors to detect fire and the amount of data generated by the sensors during the fire was higher, then further work will be to find a way to deal with this high amount of data effectively. One of the problems is that in communication they use the Zig Bee protocol. As ZigBee has a low transfer rate. In addition, it does not have many end-to-end devices.

Subject: Virtual Reality of Fire Examination.

This paper is about human behavior in fire. In this we find information about how we can test our system from real reality to real world. VR testing allows accurate recording of behavioral and lifestyle data with very high resolution and subjective data collection. Examples of studies refer to descriptive, experimental or descriptive analysis of a real fire emergency.

The great power of VR is certainly its ability to create highly immersive, outdoor, highly controlled, and secure settings.

The main weakness is the reduction of environmental suitability compared to field studies and models, as well as the lack of validation studies. Visual input and interaction methods are still limited. In particular, imitation of real people is still a challenge. This paper proposes Smart Escape, a real-time, flexible, intelligent and user-directed exit system with a fire-resistant portable system.

Subject: IoT-based Emergency Evacuation System.

The system uses BLE beacons, the mobile app, and smart exit signals to create a system that recognizes the context that automatically moves residents to the most secure exits. BLE beacon has a built-in temperature controller ESP32 connected to the MQ-2 gas sensor. Many peripheral devices include intelligent signals based on the ESP32 microcontroller as well as Wi-Fi support and the Digi Mesh network used.

This process in order to be a large efficient room requires only two BLE balconies in order to successfully locate and find its way. The system is robust as the Digi Mesh network takes over in the event of a Wi-Fi system error.

In our system users are equipped with mobile phones or PDAs that work with sensors via Wi-Fi. We also use an internal placement algorithm to get the shortest route.

Subject: Building a Resettlement with an Exit Control Information System and its implementation.

In this paper, the Building Fire Rescue framework with the Evacuation Management Information System (BFREMS) is structured in accordance with the appropriate Management Information System theory and features of the fire rescue structure and evacuation system. First, an appropriate exit algorithm was selected, which established the exit model. A management information system was then developed using the functions of the GIS platform for data integration, information query, location analysis, data review and optimization. A comprehensive development plan was developed by analyzing systems and an emergency evacuation plan.

With the basic knowledge of a building that extends to fire safety systems, fire safety systems can provide quick, effective rescue measures in the event of a fire.

The network model was adopted in this paper to develop an exit model but the network model is too complex and one has to understand it correctly to use or modify it

3.METHODS

Fire Alarm Systems are very common in commercial building and factories, these devices usual contain a cluster of sensors that constantly monitors for any flame, gas or fire in the building and triggers an alarm if it detects any of these. One of the simplest way to detect fire is by using an IR Flame sensor, these sensors have an IR photodiode which is sensitive to IR light.

A flame detector is a sensor designed to detect and respond to the presence of a flame or fire. Responses to a detected flame depend on the installation but can include sounding an alarm, deactivating a fuel line (such as a propane or a natural gas line), and activating a fire suppression system. The IR Flame sensor used in this project is shown below, these sensors are also called Fire sensor module or flame detector sensor sometimes.

The MQ 2 sensor has an electrochemical sensor that varies its resistance to different flammable gas concentrations. The sensor is connected to a voltage divider circuit in series with a variable resistor, and the variable resistor is used to change sensitivity.

The MQ2 gas sensor can easily detect smoke, liquefied natural gas (LNG), butane, propane, methane, alcohol, and hydrogen in the air.

4. Results

We attached three sensors to ardunio - vMQ2,thermistor and Flame sensor .We tried with normal air ,so MQ2 and flame didn't show any values ,whereas temperature sensor showed normal temperature. Candle, Paper and Smoke shows the value values around 10 to 25 as shown in table 1. We will sending alert as per the values mention table 1.

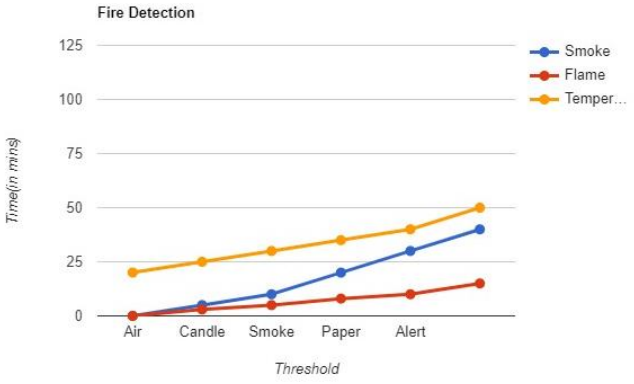

Fig 1. Chart

	Air	Candle	Smoke	Paper	Alert
Smoke Sensor	0	11	15	22	27
Flame Sensor	0	10	13	16	20
Temperature Sensor	24	25	27	30	35

Table 1. Sensor Statistic

5. DISCUSSION

ACO algorithm is widely accepted as a promising tool to many complex optimization problems due to its good global optimization capability and parallel computing features. This paper presents an improved ACO algorithm is used to solve the RWA problem. Simulation shows that the performance of blocking probability of ACO algorithm in Random topology is very less comparing with the traditional Dijkstra algorithm and simulation time of ACO algorithm in Random topology is very less compared with traditional dijkstra algorithm simulation time will increases as the number of data packets are increased. So, we have concluded that ACO algorithm is superior to traditional Dijkstra algorithm.

.6. CONCLUSION

The users equipped with mobile phones or PDA's interact with the sensors through Wi-Fi.GPS is inadequate for indoor location positioning. Wi-Fi is a technique used for location tracking with wireless access points(AP's).

REFERENCES

[1] Huixian Jiang," Mobile Fire Evacuation System for Large Public Buildings Based on Artificial Intelligence and IoT", National Key Research and Development Plan under Grant 2016YFC0502905, 2019.

[2] Maninder Jeet Kaur and Piyush Maheshwari, "Building Smart Cities Applications using IoT and Cloud-based Architectures", International Conference on Industrial Informatics and Computer systems (CIICS), pp. 1-5,2016.

[3] Afsana Khan, Afrida Anzum Aesha," An IoT Based Intelligent Fire Evacuation System", 21st International Conference of Computer and Information Technology (ICCIT) 2018.

[4] Swarnadeep Majumder, Sean O'Neil," Smart apparatus for _re evacuation | An IoT based _re emergency monitoring and evacuation system", 2017 IEEE MIT Undergraduate Research Technology Conference (URTC).

[5] Y. Zeng, S. O. Murphy, "Building Fire Emergency Detection and Response using Wireless Sensor Networks", 9th IT & T Conference, School of Computing, 2009.

[6] Guoquan Li, Enxu Geng, Zhouyang Ye, Yongjun Xu, Jinzhao Lin, Yu Pang," Indoor Positioning Algorithm Based on the Improved RSSI Distance Model", School of Communication and Information Engineering, Chongqing University of Posts and Telecommunications, 27 August 2018.

[7] Faisal Saeed, Anand Paul; J. Sens.," IoT-Based Intelligent Modeling of Smart Home Environment for Fire Prevention and Safety", Actuator Network 2018.

[8] Max Kinateder, Enrico Ronchi, Daniel Nilsson, Margrethe Kobes, Mathias Müller, Paul Pauli, Andreas Mühlberger

[9] Imran A. Zualkernan, Fadi A Aloul, Vikram Sakkia, "An IOT-based Emergency Evacuation System", 2019 IEEE International Conference on Internet of Things and Intelligence System (IOTaIS).

[10] X. Tao, M. Guozhu, L. Xin and Z. Lin, "Building fire rescue with evacuation management information system and its application," 2009 16th International Conference on Industrial Engineering and Engineering Management, 2009, pp. 2085-2090, doi: 10.1109/ICIEEM.2009.5344245.