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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.

KEYWORDS: internet, Wireless Sensor, Emergency

I. 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

1.1. ARTIFICIAL INTELLIGENCE

The field of artificial intelligence (AI) has shown an increase in growth in the 21st century. Evolution in AI has greatly improved the development of human society in our time, with dramatic changes created by both ideas and strategies. AI has been used in a number of major disciplines including computer vision, natural language processing, cognitive science, robotics, game theory, and mechanical learning since the 1980s. In simple terms, AI aims to broaden and enhance human capacity and efficiency in ecosystems and human resource management missions, with the ultimate goal of achieving a society where people and machinery coexist harmoniously. The most important goal of artificial intelligence research is to design a variety of operations that often require human ingenuity. Proving mathematical theories, learning to translate languages, playing good chess games, and learning to improve their performance are just a few of the things that are expected of such a machine.

1.2. Internet of Things (IoT)

The Internet of Things is a new paradigm that has transformed the traditional way of life into a high-tech lifestyle. A smart city, smart homes, pollution control, energy efficiency, smart transport, smart industries are such changes

due to IoT. The Internet of Things (IoT) is an emerging paradigm that enables communication between electrical and sensory devices via the Internet to make our lives easier [7]. IoT uses smart devices and the Internet to

to provide innovative solutions to various challenges and issues related to various business, public and private / private sectors around the world [6]. The Internet of Things has changed the way we use consumer electronics products in our daily lives. The real power of IoT comes in when the sensory network aggregates its data intelligently to achieve a meaningful result instead of simply collecting data for the purpose of displaying it. The concept of IoT is a combination of things like sensors, connectors, RFID (Radio Frequency Identification) that includes a visual connection and the ability to create a computer online. The things we use in everyday life (eg, refrigerator, window, heater, switch, washing machine, etc.) can be easily accessed, controlled and connected to the Internet using Internet-based policies (IPv6, UDP / TCP), HTTP). IoT is actually a platform where embedded devices are connected to the Internet, so that they can collect and exchange data. It allows devices to interact, interact, and learn from each other's experiences as much as people do.

II. PROBLEM DEFINITION

There is a problem with the route connection in the emergency evacuation of large intelligent structures. The timing of evacuation is important in saving lives in emergencies caused by urgent natural or man-made disasters and disasters. The usual methods of linking the expulsion route are set out and described in advance.

III. METHODOLOGY

Intelligent systems used in buildings increase user comfort and the management of construction resources becomes more efficient. These systems are called building automation systems (BAS). Automatic management of functions such as heating, ventilation, lighting, security, and power management are provided via BAS using hardware and software-based techniques. The Emergency Exit Service Model is proposed as part of a BaaS project and details of this model are explained. In emergencies, especially in densely populated buildings, evacuation is a very challenging task due to the complexity of the floor plans. The emergency service is directed at this study to resolve this issue.

IV. MODULE DESCRIPTION

User login: For login to the system, user will enter the Username and password, if entered details are correct then the system will redirect him to home page otherwise it will show an error message.

Registration: The user will register to the system with normal information. At the time of registration, password will be auto generated and it will be provided to user's mail.

Prediction system: It will predict the path based on the indoor positioning system. It will help if any of the path is block.

Hardware : In this part a sensor will check if any of the threshold level is crossed. If crossed buzzer will start.

V. EXISTING SYSTEM

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 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 A* 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 exit algorithm was selected, which established the exit model. A management information system was then 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 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.

VI. PROPOSED SYSTEM

The proposed system is especially for densely populated buildings, in emergency conditions where evacuation of people to safe places is a very challenging job because of the complexity of the building floor plans. In the proposed system, the emergency evacuation of large smart buildings is taken into account.

Here we aimed to design a Smart Escape, a real-time, dynamic, intelligent, and user-specific evacuation system with a mobile interface for emergency cases such as fire. Our system calculates a personal route for an evacuee by considering his/her features. Our system collects various environmental sensory data and takes evacuees' features into account, uses an artificial neural network (ANN) to calculate the personal usage risk of each link in the building, eliminates the risky ones, and calculates an optimum escape route under existing circumstances. Then, our system guides the evacuee to the exit through the calculated

route with vocal and visual instructions on the smartphone.

Our System includes the following 4 stages:

1. Initially, the user should get registered to the mobile phone application. The user will register to the system with normal information. At the time of registration, the password will be auto-generated and it will be provided to the user's mail.
2. On the occurrence of hazardous accidents like fire or gas leakage, the sensor value set goes beyond the threshold, and an emergency is triggered. In this part, the AME sensor will check if any of the threshold levels are crossed. If crossed buzzer will start.

3. Wi-Fi is a technique used for location tracking of the evacuee with wireless access points(AP's). It will predict the path based on the indoor positioning system. It will help if any of the paths is block. The centralized control/sever has the location details of the building (for path navigation and also mapping details to exit).
4. Using an ant colony optimization algorithm (ACO), the system guides the evacuee to the short path but also safe exit through the calculated route with vocal and visual instructions on the smartphone.

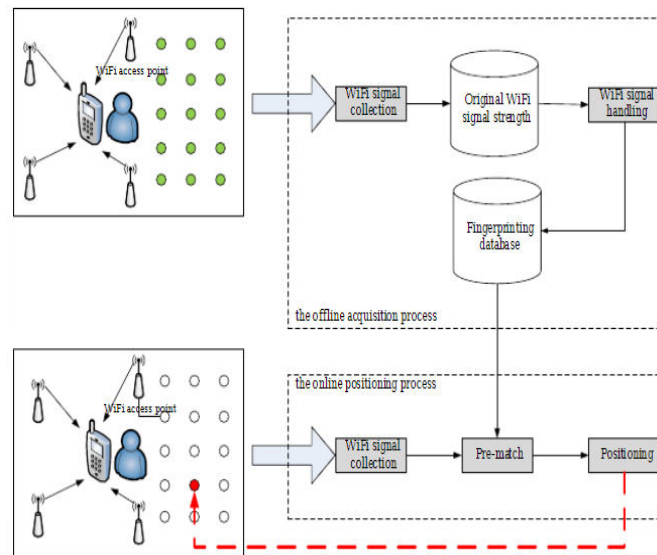


Fig 1. Indoor positioning

VII. 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).

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