Smart System For Expel People From Fire In Commercial Buildings

S.Salavudeen Sait
Assistant professor, Department of Electronics and Communication Engineering
NSN College of Engineering and Technology, Karur, Tamilnadu, India

Dr.P.Gomathi,
Dean, Department of Electrical and Electronics Engineering,
N.S.N College of Engineering and Technology,Karur,Tamilnadu,India

Abstract - In decade days the is no safety for peoples and any other important documents because of fire accidents in shopping malls, ware houses etc., for purpose of saving the peoples and important documents free from fire in case of little spark or any current leakages causes fire in commercial buildings the fire safety system could alert the people but it didn't bring any clue to the customer where is the safety exit actually., and which area didn't affect by fire. For this purpose we have implemented the concept of safely evacuating the peoples from fired area. To avoid these damages from fire accidents and also signify the precise location to both people and fire fighters. The flame sensor we have placed in the each and every floor and it senses the fire and it will be detected. When the fire is caused the electric tripper will automatically shut down and the emergency lights will ON. To save the peoples and important documents from fire.

Keywords— MQTT/IOT cloud, Flame Sensor

I. INTRODUCTION

With the event of science and technology, the planning of recent architecture is becoming more and more complicated and large-scale, and also the large-scale public buildings like shopping malls and science and education centers are increasing dramatically. Large public buildings are densely populated, with various structures and sophisticated functions. Just in case of sudden disasters (fire, earthquake, gas leakage, etc.), the evacuation is inefficient thanks to the shortage of effective evacuation guidance and panic psychological issues. When a hearth breaks out, the cooperative behavior of individuals finding out safe exit during evacuation is comparable thereto of ant colony. Supported this, it's reasonable to introduce the ant colony algorithm into dynamic evacuation designed during this paper. When there's no fire, that is, within the static environment, without considering the impact of fireplace, the most effective route calculated by ant colony algorithm is that the shortest path after avoiding static obstacles; within the dynamic evacuation process just in caseof fireplace, literature survey.

A wireless sensor network may be a collection of nodes organized into a cooperative network. The nodes communicate wirelessly and sometimes self-healing after being deployed in an advertisement hoc fashion. The topology offers simplicity of operation and low power usage. Attributable to its centralized network, nodes is added or removed easily without disrupting the whole network. However, the network completely depends on the functioning of the local center. Hence, the failure of the local center ends up in the failure of the whole network. Shu-guang constructed a wireless fire warning device supported network topology. The system structure consists of knowledge acquisition nodes, an information sink node, and a hearth center. The info acquisition node gathers the info and sends it to the info sink node choosing an optimal path that makes a mesh communication.

The fire place center consists of server to store readying data, electronic map, and supervision host for processing, statistical evaluation, and display of knowledge through peripheral equipment, and data query with the user. One among the benefits of network topology is that the data transmission from one node to a different lies with its neighboring nodes. If two nodes cannot directly communicate with one another, the neighboring nodes act as a bridge to pass along the info. As such, it's much easier to relay data to other nodes no matter presence of broken nodes. With this feature, additional nodes won't affect the whole network instead it'll add more data paths which helps the network handle high amount of knowledge communication traffic. This feature of network topology trumps the centralized network of topology which makes it more suitable for FDAS attributable to its capability to cater sizable amount of detectors.

II. LITERATURE SURVEY

The complex internal structure of the building limits the evacuation process and increases the difficulty of controlling the fire spread process. The study of fireside evacuation requires considering the personnel behavior, the form of the fireplace site, the rationality of the deployment of fireside fighting equipment and the integrity of the function, furthermore because the building structure and other factors. The model follows each agent individually and each agent has its own personal properties, like mass, walking velocity, familiar doors, etc. The fire and evacuation calculations interact via the smoke and gas concentrations. In China, with the continual development of urban fire protection, most preparation departments have established fire evacuation assistant decision-making system based on GIS and satellite positioning system. The fireplace evacuation emergency decision-making system centered on GIS is becoming an important a locality of recent fire engineering. Focusing on the key technologies of fireside prevention and control in large public buildings. At present, China's intelligent evacuation continues to be within the preliminary stage. An intelligent evacuation system must be studied and developed, which uses the intelligent algorithm to plan the evacuation route reasonably per the actual situation of the fireplace scene, and analyzes the building structure and therefore the information of the fireplace scene, so on guide see the fireplace scene in time and effectively.

III. PROPOSED SYSTEM

MQTT protocol may be a Machine to Machine (M2M) protocol widely employed in IoT (Internet of things). The MQTT protocol may be a message based protocol, extremely light-weight and for this reason, it's adopted in IoT. The majority IoT platforms support MQTT to send and receive data from smart objects. There are several implementations for various IoT boards like Arduino, Raspberry then on. This articles provides an in-depth MQTT tutorial covering how it works, the MQTT messages and the way to use it in IoT projects. Moreover, this MQTT tutorial covers another important aspects associated with the MQTT security. There are other IoT protocols accustomed implement IoT projects but MQTT is one among the foremost efficient.MQTT protocol implements publish-subscribe paradigm. This paradigm decouples a client that publishes a message (“publisher”) to other clients that receive the message (“subscribers”). Moreover, MQTT is an asynchronous protocol, which means that it doesn't block the client while it waits for the message. In contrast to the HTTP protocol, that's mainly asynchronous protocol. Another interesting property of MQTT protocol is that it doesn't require that the client (“subscriber”) and also the publisher are connected at identical time.

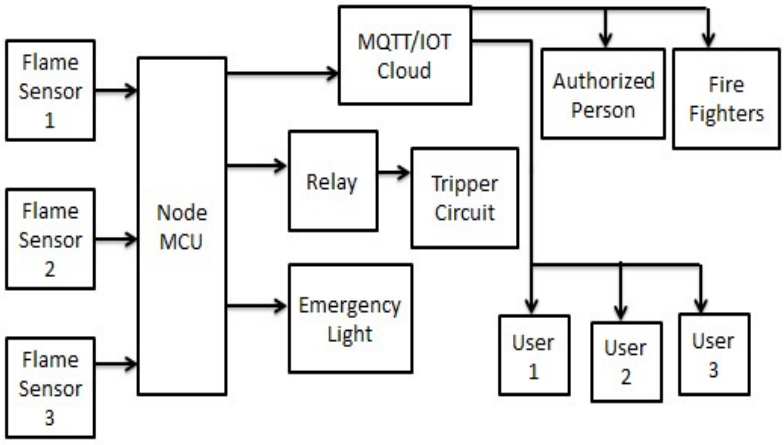

Figure-1: Proposed system MQTT

IV. EXPERIMENT AND RESULT

Dynamic Evacuation Path Simulation:

The dynamic environment indicates that the smoke concentration, temperature, and carbon monoxide gas concentration change continuously because the fire increases. The hearth development process is split into three stages: initial stage, growth and spread stage. Besides, the researchers use the ant colony algorithm to resolve the three-stage fire evacuation path, and to get convergence curve of shortest path length and average path length, and optimal evacuation route. The typical path length represents the typical length of all ants' paths, while shortest path.

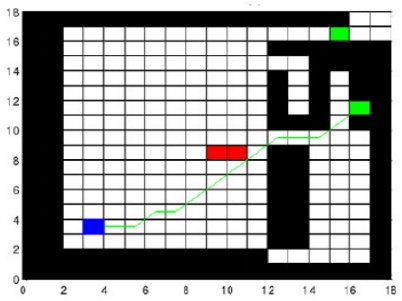

Figure-2: Fire placed area

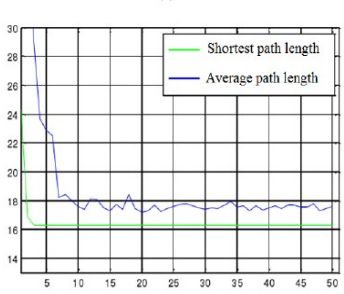

Figure-3: Shortest Path

Geometry building model

The building geometry module supplies the geometric information for the geometry within the fire sub-model and the environmental knowledge of the occupants in the occupant sub-model. The fireplace sub-model then organizes the fire simulation data which indicates the distribution of the combustion products over space and time. The toxic and physical hazards are then assessed as the input into the occupant sub-model. The behavior and decisions of the agents are influenced by the distributions of both the enclosures and therefore the combustion products.

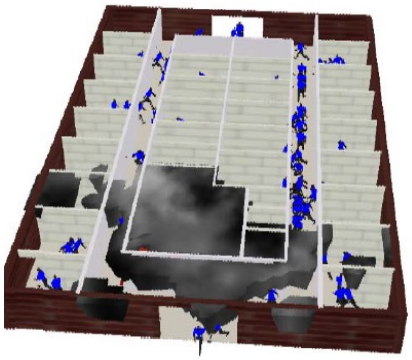

Figure-4: Fire Caused Area

IV. CONCLUSION

The complexity and variability of the inner environment of public buildings prompt to suppose the way to safeguard people in the fire and quickly reach the safe area. supported the relevant fire emergency evacuation strategies and ideas reception and abroad, this study uses computing technology to construct an efficient and intelligent dynamic evacuation path solving model, then builds an intelligent mobile terminal fire evacuation system for giant public buildings based on computing technology. In line with the results of the fireplace dynamic evacuation path calculation, when a fire breaks out, the improved ant colony algorithm can help effectively bypass the fireplace point, so it indicates that the improved ant colony algorithm used in this paper has good practical value within the appliance of dynamic evacuation in large public buildings. Through analysis of the results of the operation fewer than three conditions during a dynamic environment, for the three stages of the fireplace, the set starting point and end point (safe exit) are constant. With the development of the fireplace, smoke concentration, temperature, and monoxide concentration still increase, and they even have an increasing impact on evacuation.

As a result, the length of the optimal evacuation path is additionally increasing, but it can effectively protect personal safety. Therefore, with consideration of smoke concentration, temperature carbon monoxide concentration within the fireplace, the applying of ant colony algorithm in fire intelligent evacuation is affordable and reliable, and thus the aim of intelligent evacuation is achieved. Also, the implementation of the prototype system is described, including the functional module of menu bar, data query, path planning, one-click call, etc. When a fire breaks out, the system can help guide people to evacuate from the building in real time and reach the safe exit quickly, so on reduce casualties and economic losses.

REFERENCES

[1] Arduino based Smart Water Level Monitoring and Controlling for Domestic Applications, International Journal of Research in Engineering, Science and Management, Volume-2, Issue-2, February-2019.

[2] Advances in Greenhouse Automation and Controlled Environment Agriculture: A Transition to Plant Factories and Urban Agriculture, Redmond Ramin Shamshiri, Fatemeh Kalantari, K. C. Ting, Kelly R. Thorp, Ibrahim A. Hameed, Cornelia Weltzien, Desa Ahmad, Zahra Mojgan Shad, Vol.11, Issue 1, January 2018.

[3] Smart Green House Using IoT and Cloud Computing, Somnath, D. Bhagwat. International Research Journal of Engineering and Technology,Volume 05, Issue: 03 ,March-2018.

[4] IoT Based Smart Greenhouse Automation Using Arduino, Prof. D.O.Shirsath, Punam Kamble, Rohini Mane, Ashwini Kolap, Prof.R .S.More International Journal of Innovative Research in Computer Science and Technology, Volume-5, Issue-2, March 2017.

[5] Leaf Disease Diagnosis and Pesticide Spraying Using Agriculture Robot (Agrobot), G.R. Gayathiri, Dr. M. Sumithra. International Journal of Advanced Research in Electronics and Communication Engineering, Volume 5, Issue 4, April 2016.

[6] Adoption of the Internet of Things (IoT) in Agriculture and Smart Farming towards Urban Greening, A. Raneesha Madushanki, Malka N Halgamuge, W. A. H. Surangi Wirasagoda, Ali Syed, International Journal of Advanced Computer Science and Applications, Volume 10, Issue 4, 2019.

[7] Greenhouse Monitoring And Control Based On IoT Using WSN, Remya Koshy, M D Yaseen, Fayis K, Shaji, Harish N J, Ajay M, Dept. of Electronics and Communication Engineering,Volume 4, Issue 3, 2016.

[8] Green house monitoring using internet of things, S.Muthupavithran, S.Akash, P.Ranjithkumar International Journal of Innovative Research in Computer Science and Engineering, Volume-2,Issue- 3,March 2016.

[9] Pallavi.S.Marathe "Plant Diseases Detection Using Image Processing and GSM". G.H.Raisoni College of engineering, 2017, Savitribai Phule Pune University Ahmednagar, India.

[10] Esaki Madura, Venkatesa Kumar "Smart Agriculture System by using ZigBee Technology" Volume 6 Issue 4 April 2017. International Journal of Engineering and Computer Science.

[11] G.R. Gayathiri, DR. M. Sumithra" Leaf Disease Diagnosis and Pesticide Spraying Using Agriculture Robot (AGROBOT)"Department of electronics and communication Engineering, Volume 5, Issue 4, April 2016.

[12] Aiswarya Mohan, Farza Parveen"Automatic Weed Detection System and smart Herbicide Sprayer Robot for Corn Fields" International Journal of Research in Computer and Communication Technology, Vol 5, Issue 2, February- 2016.

[13] Sachin .D.Khirade, A.B.patil," Plant disease detection Using image processing,"2015, International conference on computing communication control and automation, IEEE.

[14] Vijai Singh, Varsha, A.K.Mishra,"Detection of unhealthy region of plant leaves using image processing and genetic algorithm", 2015, ICACEA, India.

[15] K.V. Fale, Bhure Amit "Autonomous farming robot with plant health indication" International Journal of Advanced Technology in Engineering and Science Volume No.03, Issue No. 01, January 2015.

[16] H. Chavan, Mr. V.Karande "Wireless Monitoring of Soil Moisture, Temperature & Humidity Using Zigbee in Agriculture" International Journal of Engineering Trends and Technology. Volume 11 Number 10 - May 2014

[17] Monica Jhuria, Ashwani kumar and Rushikesh Borse, "Image processing for Smart farming, detection of Disease and Fruit Grading," proceeding of the 2013, IEEE, second international conference on image Information processing.

[18] Anand. H.Kulkarni, Ashwin Patil R.K,"Applying image processing technique to detect plant disease," vol 2, Issue 5, sep.oct 2012.

[19] The Use of ZigBee Wireless Network for Monitoring and Controlling Greenhouse Climate Ibrahim Al-Adwan, Munaf S. N. Al-D International Journal of Engineering and Advanced Technology, Volume-2, Issue-1, October 2012.