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Intelligent Fire Extinguisher System

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***Abstract*— Fire accidents can take place more in areas like houses, industries, Movie theaters, shopping malls, hospitals, etc., which will lead to more loss in life along with properties. Generally waiting for a fire engine to extinguish fire, may be delayed which may increase the chance of loss in life. There are so many preventive mechanisms have been developed to prevent/reduce the fire accidents to some extent. But always automatic solution brings more accuracy to protect lives from fire accidents.**

Fire extinguishing system is an automated system, which is used for detection and removing of fire automatically without human being Effort. The System presents two type of facilities for fire detection. One is through Sensor technology and other one is through broadcasting of Video in that particular place. All these together are split into various sub-modules for step-by-step development and implementation. Those include Sensors' Module, broadcasting Module, IP based Communication (Through Wi-fi module), PC-based application.

***Keywords*: Techniques, Applications, Limitations, Case Study.**

I. INTRODUCTION

Intelligent buildings are expected to be safer, convenient, and efficient living environments for society in the 21st century. An intelligent building system (IBS) is integrated by many services and subsystems. One of the most important subsystems is the fire-detection function system in an intelligent building.[2] The purpose of our project "Intelligent Fire Extinguisher System" is to extinguish a flame in a certain amount of time. Our system detects the fire location and tries to extinguish the fire with the help of sprinklers. As begin a "Intelligent System" it cut offs the electricity of area where fire has been caught and starts the sprinklers only of that area.

II. TECHNOLOGY/METHODOLOGY

In this project, an automatic fire detection and extinguish solution is implemented by using Embedded systems and sensor technology. This automatic solution will respond in time, when fire is detected and will save many lives by sprinkling the water on the fire. The System presents two type of facilities for fire detection.

i. Sensor Technology:-

A smoke sensor is used to detect the fire occurred in the room and it will intimate to the control circuit via electrical signals. Now the control circuit will automatically drive the motor in the sprinkler and sprinkle the water on the fire. Generally this control circuit uses analog to digital converter to convert the analog output from the sensor into digital, processed and then finally drive the sprinkler system.

***ii.Broadcasting Technology*:-**

One Camera is used for taking live video of that particular area and it is fitted on the automated vehicle, which move automatically in that place. One wi-fi module is used for broadcasting the live video. Now the user will see the broadcast and if Fire will be there then user can be controlled through PC. The control circuit will automatically drive the motor in the sprinkler and sprinkle the water on the fire.

In this project, AVR family (ATMEGA 8/ ATMEGA 16) microcontroller is used as a main controller for the control circuit of the system. The Microcontroller itself contains inbuilt 10-bit ADC, so that, it will reduce the size and cost of the system. An uln2003 is used to drive the DC motor by allowing the motor current through, which is not allowed in the microcontroller. A gas/smoke detector sensor is used to detect fire and fed the information to the ADC which is available in microcontroller. Camera is used for Broadcasting through wifi technology and PC is used for tracking and controlling the fire extinguishing system.

Important tasks

1. Interfacing Gas sensor or fire sensor with Controller.
2. Interfacing Camera with controller.
3. Interfacing Wifi module with controller
4. Interfacing DC motor with MSP430 MCU using ULN2803.
5. Controlling through PC (Manual Control).

III. REQUIREMENTS

Hardware:

Microcontroller(Arduino Board)
DC Motor
Wheel
Motor Driver IC
Robot Base
Sensors

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Software:
Code in Embedded C

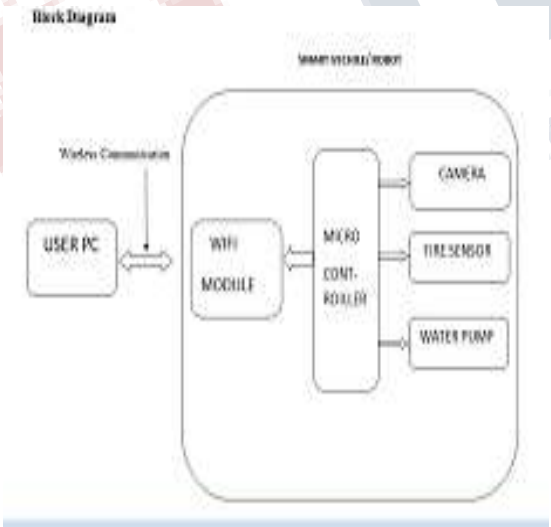
VI. ADVANTAGES

- To save people from injury or death, building.
- Automated Fire extinguisher for controlling fire in less time.
- ***Extra Feature***
- It sense the fire and information is given to the admin person of building through message communication.

V. APPLICATION

- We propose live video broadcasting using wireless communication through wifi technology
- We propose the system by control and monitoring using IP address (through wifi module and PC).
- It can be small automated system in every building for saving of life from fire.

BLOCK DIAGRAM



VI. CONCLUSION

The prototype we have planned will work as

- Fire detect through broadcasting and control through user command.
- Fire detect through sensor and remove automatically.
- The conclusion is to provide security of home, laboratory, office, factory and building is important to human life.

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