Abstract
The aim of this paper is to describe the application of autonomous fire extinguishing robot design. The primary goal of this fire extinguishing robot is to detect fire and extinguish a fire. Due to day to day life more increasing demands for electronics in different domain like consumer electronics, automation and robotics applications. Our task as electronics engineers was to design and build a prototype system that could autonomously detect and extinguish a fire. Also aim at minimizing air pollution. We develop an intelligent multisensory based security system that contains a fire extinguishing robot in our daily life. Engineering students with the ability to incorporate and apply interdisciplinary concept is an important objective in engineering education.
1. Introduction

The security of home, laboratory, office, factory and building is important to human life. So main application of this design is to use for fire exhaust. The need of device that can detect and extinguish a fire on its own is long past due many house fires originates when some is either sleeping or not at home. With the invention of such robot, people and property can be saved at a much higher rate with relatively minimal damage caused by the fire. It is possible to detect the fire by connecting the LM35 to system. Also it is possible to detect the obstacle by using the obstacle detector module. Sensor network becomes more and more popular as cost of sensors gets cheaper and cheaper. The sensor network is a wireless network formed by a group of sensors deployed in same region, which can be used to measure air pressure, temperature etc. In engineering education the main aim of that system is to help students to gain the ability to engage in interdisciplinary teamwork. That is furthering robotics knowledge of group members and society and allowing team to use engineering skill and teamwork to solve multi tasks. This paper explains how designing fire extinguishing. It has been designed to provide following features:

1. Power consumption
2. Simply implemented.

The objective of the content is to develop an autonomous robot that can navigate in order to find and extinguish a lit candle in minimum time. Wireless smoke detectors are easily installed. When one alarm is activated it can send signal to all other alarms so they will be activated as well. They become more and more important for application like security, traffic monitoring, agriculture, etc. If we can connect wireless smoke detector all around our home, and they take together using RF module. They take together so when one smoke alarm sound, they will all sound at a time. They will provide warning to fire extinguishing robot. Such a fire extinguishing robot consist of detecting obstacle, walls and flames as robot move through the maze in one team designed a set of separate sensors for obstacle/wall detection purposes. The aim of this design is to build a robot, which will extinguish a fire in the minimum time possible. A candle will represent the fire, which is start in the home and which is find by robot and then extinguish. The temperature level of the surrounding in the testing area will a temperature sensor can be used to detect the fire. Robot is defined as a mechanical design which is capable to performing human tasks or behaving as a human manner. Building a robot requires expertise, smart and complex programming. It’s about design systems and connecting together motors, solenoids and wires, almond other important components. There is a no. of subsystems that must be building to connect together into and appropriate package suitable for caring out the robots tasks. By connecting a small fire extinguisher to the robot, the automation put out the fires it detects can be achieved. The fire detection method to be put into use is relatively free of false alarms, it is anticipated that it will not over react in non-fire simulation. As mentioned, the design of the robot is according to specification of the contest. Its purpose is to search a lit candle and then extinguish it in the shortest time possible. The specification and restrictions for the contest are measuring factor in the design process of the robot, its control, and its body. This robot will simulate a real word operation of a robot performing a fire security function in an actual home on a simulated floor plan and fire a team of mechanical and electronics engineering students have come together to implement and build a computer controlled fire extinguishing robot that can move through a mode floor plan structure of a house, find a lit a candle and then extinguish it in the shortest time possible.
2. Fire Detection Scheme

To detect the fire from the candle the team thought about designing a motion detector to detect the wavelength of the fire. The group is deciding on using infrared proximity detector (IRPD) kit from lynx motion. With this the robot would be capable to sense an object in the front left, front centre and front right. In order to identify the fire we will need to calibrate it to detect the flame of a candle. Another way, which we just recently find out about, is to use a silicon photo detector with a long pass filter and calibrate it to detect candle light. This is the signal spread of the detector. When the candle flame is spotted in the range of this detector it the robot will be able to come in on the position of the flame, come closer and put it out.

3. Navigation Scheme

Since, shaft encoders are very expensive and not within our budget the team planes on using a memory mapped out grid in the memory of stamp.

4. Hardware Implementation

The hardware implementation using ARM9 microcontroller we require total four blocks:
A. Input devices        B. Output devices        C. Control panel        D. Power supply

5. Methodology

![Block Diagram of Fire extinguishing robot]

A. Input Devices

In input devices we requires temperature sensor, smoke detector. These devices are applicable for detect the fire and alert to peoples as a security purpose. Opto-Coupler is useful for detect the smoke and LM35 Temperature sensor is useful for sensing the temperature. In input devices obstacle detector is also used as an input for fire extinguishing robot.
B. Output Devices
Output devices mainly consist of Buzzers or alarms which are for alerting peoples. Wireless module for sending signal to other nodes. For wireless communication RF module is used.

C. Control Panel
In this ARM9 is working as a control panel. The total functions and controlling is done by ARM9 controller. The speed of ARM9 controller is high.

5. Software Implementation
In this Design the heart of the control unit is ARM9 microcontroller. The ARM9 microcontroller has 64 pin. 45 pins are used for general purpose functions. That is general purpose I/O pins which pins perform multi functions. In this Keil software is used to convert Embedded C program into Hex file. Also in this design the flash magic is used to dump hex file into microcontroller. By using this we achieve the required functionality.

6. Conclusion
The annual fire extinguishing robot competition is an interesting event that challenges the contestants to design a small robot that is capable of finding and extinguishing a lit candle. This paper gives a detailed designing about the robot that continuously monitors, intimates the respective personal and extinguishes the fires. In the industry if any fire accident occurs, there is a need of person to monitor continuously and rectify it. In this process if any time delay takes place irreparable loss occurs since it is a cotton industry. In the present it can extinguish fire only in the way and not in all the rooms. It can be extended to a real fire extinguisher by replacing the water carrier by a carbon-dioxide carrier and by making it to extinguish the fires of all the rooms using microcontroller programming.

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