

## A DETECTION AND EXTINGUISHING OF FIRE USING FIRE FIGHTING ROBOT

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### ABSTRACT

Now a days fire accidents are inflated and someday it becomes terribly tough for a hearth man to safeguard someone's Life and their properties. Within the difficult state of affairs, the robots are wont to management the hearth rather than fireman. This robots will sight fireplace and conjointly perished the fire victimization asphyxiate to cut back the extent of destruction and multiple sensors are liable for sensing the smoke fire detection. This project must style a system that helps to regulate the hearth victimization robot. Style of robots are able to move all told direction by victimization rotor motor, uses detector of MZ80 and flame sensor and conjointly exploit the hearth victimization water pump mechanism. It is controlled by Bluetooth wireless technology. For programming half, C languages is employed to see the golem action gain from detector input.

**KEYWORDS:** Detection of fire, Wall avoidance Extinguish fire, Autonomous and remote controlled robot, Bluetooth.

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### I. INTRODUCTION

Fire fighting and rescuing within the person is risky. Fireplace fighters face several dangerous things whereas extinction fire and they need to done their jobs for long and irregular operating hours. Fireplace man's fight against the life threatening things like explosion and collapse buildings. If we have a tendency to use the automaton within the fireplace prone space, it will pass away the fireplace quicker than human. It will reduces the losses of human life and risk. The movement and behavior of automaton may be totally controlled. This automaton relies on the PIC microcontroller during this robot are used IR sensing element and smoke sensor. The infrared sensing element is employed to live the warmth of the environment and conjointly the smoke sensor find the intense heat quicker than the heat detector. The smoke find or accustomed detect the smoke. The look and implementation of fireside fighting automaton is given during this paper by victimization the wireless technology (IOT). Bluetooth is employed to share info from mobile to automaton over short vary of frequency from two.400 to 2.485 GHZ. PIC16F877A belongs to category of eight bit microcontrollers of RISC architecture. It's 8Kb nonvolatile storage for storing a written program. This automaton may be operated in 2 ways that one is autonomous robot and another ways is remote controlled. The microcontroller controls automaton a lot of economical. The fireplace burst out may be detected by the automaton, it will extinguish the fireplace by victimization pump from the tank with the assistance of twin motor diver and pump. A automaton are observe the realm by playing absolute movement. It's Associate in Nursing higher medium to employed by the humans particularly by fireplace man. This project is to develop and style a hearth fighting automaton guided by these following objective:

- a) To determine the use of multiple sensors for various sensing on robot.
- b) To design a robot that is able to avoid obstacles, detect fire next extinguish the fire.

### II. METHODOLOGY

This project is pertaining to the look of automaton that capable to maneuver and extinguish hearth mechanically. Implementation of this automaton is tested with high hearth temperature to judge the sensitivity of police work, subsequently expunges the fireplace by exploitation water mechanism. Work space with barriers will be avoided by this automaton, in following its ability to extinguish hearth. Automaton can monitor the

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work space by activity random movements; it as another medium employed by humans, particularly the hearthman to fight fire.

a) Existing System:

The purpose of the automaton is directly access the hearth supply on behalf of fireplace fighters and perform the fire termination task. The hose sort robots are used, it's associate degree elongated form to enter inside. Its nozzle module controls the reactions force by ever-changing the water jet direction. The direction of the force will be modification exploitation brain disease.

**Drawback:**

- No monitoring system and lower data rate transmission.
- High cost

b) Proposed System:

The construct of the hearth fighting automaton is mechanically extinguishes the fire by victimization pump mechanism and additionally this robot is controlled by remote or mobile. The mobile to automaton communication is enforced victimization IOT technology. The camera is employed during this automaton to look at the hearth prone zone. It will reach the dense half wherever human cannot reach. The sensors are wont to observe the hearth and smoke within the prone space and to perished fire. The temperature device is feel the temperature rises and infrared sensor is employed to find the boundaries from 2-30 cm distances. Temperature is also measured additional properly than with a thermal resistor. It additionally own low self heating and will now not purpose bigger than zero.1 o C temperature upward thrust in nonetheless air.

**Advantage:**

- Prevention from dangerous incidents
- Minimization of financial losses
- Minimization of threat of human life
- Not sensitive to weather condition

### III. SYSTEM ANALYSIS

#### A. Hardware Analysis:

a) PIC16F877A MICROCONTROLLER:

PIC16F877 belongs to a category of 8-bit microcontrollers of computer architecture. It's 8kb nonvolatile storage for storing a written program. Since memory created in FLASH technology will be programmed and cleared over once, it makes this microcontroller appropriate for devices development. it's knowledge memory that must be saved once there's no offer. it's typically used for storing vital knowledge that has to not be lost if power offer suddenly stops. as an example, one such knowledge is AN allotted temperature in temperature regulators. If throughout a loss of power offer this knowledge was lost, we'd have to be compelled to create the adjustment yet again upon come back of offer .Power offer voltage two.0-5.5V, Consumption: 220uA (2.0V, 4MHz), 11uA (2.0 V, thirty two KHz) 50nA (stand-by mode)



**Fig-3.1:** PIC micro controller

As seen in Fig. 3 above, the foremost pins are multi-functional For example, designator RA3/AN3/Vref+/C1IN+ for the fifth pin specifies the subsequent functions:RA3 Port a 3rd digital input/output ,AN3 Third analog input ,Vref+ Positive voltage reference, C1IN+ Comparator C1positive input. This little trick is usually used as a result of it makes the microcontroller package a lot of compact while not moving its practicality. These numerous pin functions can't be used at the same time, however are often modified at any purpose throughout operation. it's accustomed controlled the over all operation of the mechanism. The motor is employed to drive the water from cistern .Pump potency is outlined because the quantitative relation of the ability imparted on the fluid by the pump in relevancy the power provided to drive the pump. Core (CPU) registers - management and monitor operation and processes within the mainframe. albeit there are solely a number of of them, the operation of the entire microcontroller depends on their contents. Peripheral SFRs- management the operation of peripheral units (serial communication module, A/D convertor etc.). Every of those registers is principally specialized for one circuit and for that reason they'll be delineate in conjunction with the circuit they're up to the mark of. The PIC small controller carries with it eight channels, ten bit analog to digital convertor. The operation of ADC is controlled by special operate register. ADCON0 and ADCON1. The lower bit convertor are often hold on in ADRESL and also the higher bit stored within the ADRESH.

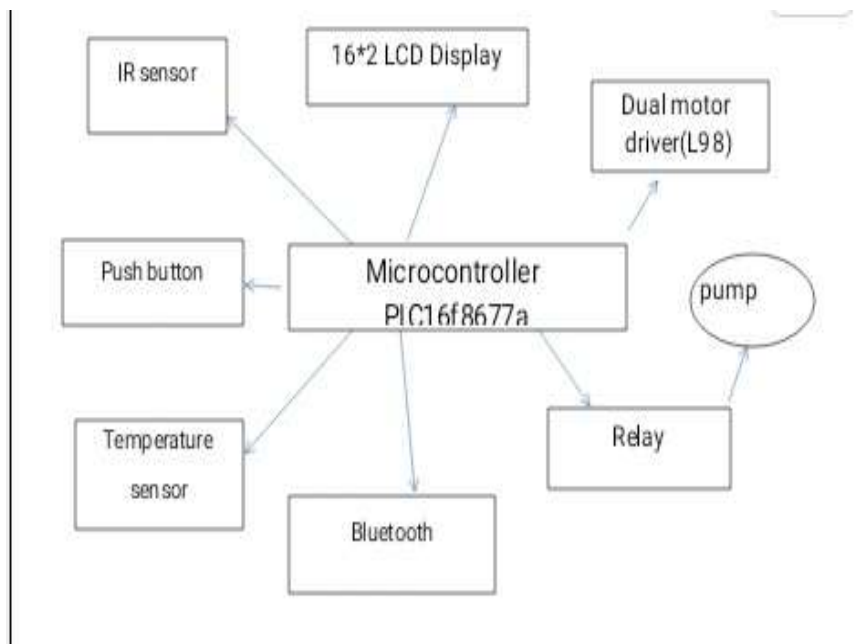


Fig-3.2: Block Diagram

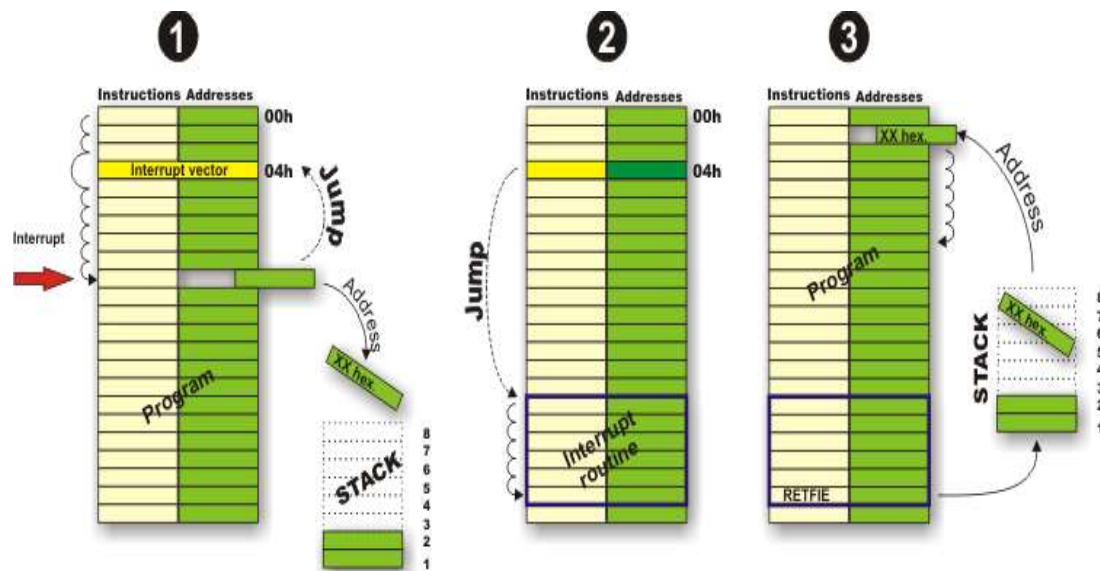


Fig-3.3: Interrupt system

LCD display:

LCD stands for liquid crystal; this may well be a output device with a restricted viewing angle. The choice of digital display as associate output device was because of its value of use and is healthier with alphabets once place next with a 7-segment diode display. We have such loads of designs of digital display these days and our application wants a LCD with a combine of lines and sixteen characters per line, this gets data from the microcontroller and displays constant. It's eight data lines,3 management line ,a give voltage Vcc (+5v and a GND).This makes the total device user friendly by showing the balance left inside the cardboard. This together shoes the cardboard that is presently obtaining used. the flexiblensness to indicate numbers, characters and graphics. this may be in distinction to LED's, that are restricted to numbers and few characters. Incorporation of a refreshing controller into the digital display, there by relieving the C.P.U. of the task of refreshing the digital display. In distinction, the diode ought to be recent by the C.P.U. to remain displaying the knowledge.



Fig-3.3: LCD description

IR obstacle sensor:

Infrared obstacle device module has inbuilt IR transmitter and IR receiver that sends out IR energy and appears for mirrored IR energy to sight presence of any obstacle in front of the sensor module. The module has on board potentiometer the lets user change detection vary. The device has excellent and stable response even in close lightweight or in complete darkness.



**Fig-3.4:** IR obstacle sensor

#### IV. RESULT AND DISCUSSION

The robotic hearth fighting system are designed with some task in mind. These embrace analyzing the placement of fireplace burst out, it will monitor the hazardous space and rescue the individuals and additionally suppress the fireplace. In our project we've pump mechanism to extinguish the fireplace. The automaton is either controlled by mobile technology or it's done a automatic operation. We are able to robots for hearth fighting rather than firemen and that we can cut back the economic losses, their properties and that we could save their lives.



**Fig-4.1:** connect to Bluetooth device



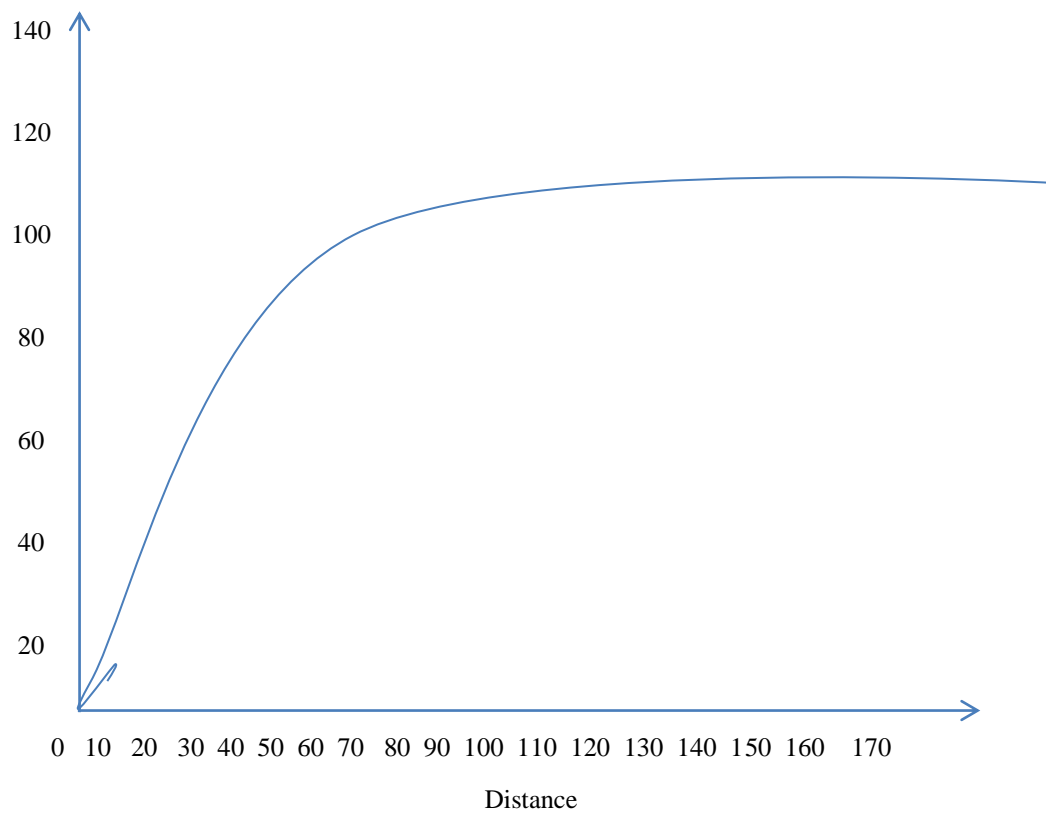
**Fig-4.2:** fire robot on

Temperature level of indication for fire fighting robot

Normal temperature	10-40 degree
Minimum temperature	40-100 degree
Maximum temperature	Above 100 degree

**Graphical Representation:**

Temperature



**V. CONCLUSION AND FUTURE SCOPE**

The conclusion is give security of home, laboratory, office, manufactory and building that is necessary to human life. We have a tendency to develop AN intelligent multisensory primarily based security system that contains hearth fighting system in our daily life. We have a tendency to style the hearth detection system exploitation sensors in the system, and program the hearth detection and fighting procedure exploitation detector primarily based methodology. The system is value effective, has a wide application that once implement will show smart and effective result. It is use deliberately in industrial application, industrial and in domestic sectors wherever the demand of automatic work demands. If we have a tendency to use this kind of golems we are able to management the loss of life and property and also the elements of the robot is broken we can solely amendment halficular|that specific|that exact|that individual} part itself. It's most helpful in dangerous state of affairs.

**Future scope:**

This future modifications of the mechanism is employed to attach with the net. If any fire accidents are detected it'll send the message to the hearth services and hospitals quickly and extinguish the fire. In future we will use magnetic force sensors and radical sensing may be used to observe the obstacle



**Fig-5.1:** Hardware prototype output

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