

GSM AND GPS BASED FIRE EXTINCTION ROBOT

G. Chandra Sekhar¹

SK. Farheen², V. Mounika³, R. Ajay⁴, M. SandhyaRani⁵, B. Rajesh⁶

1. Assistant professor, Department of Electrical and Electronics Engineering, Sri Mittapalli College of Engineering, Tummalapalem, NH-16, Guntur, AP, India.

2,3,4,5,6. IV B.Tech. Students, Department of Electrical and Electronics Engineering, Sri Mittapalli of Engineering, Tummalapalem, NH-16, Guntur, AP, India.

ABSTRACT:

In this project, an autonomous fire extinguisher robot is designed. The robot has fire sensors interfaced in its control circuitry which senses the presence and intensity of fire and take the responsive action accordingly. The robot is designed to detect intensity of fire and operate first at place where the intensity of fire is more. It is also an automatic robot as it does not need to be operated from any remote control. One only needs to deploy the robot in a fire prone zone and the robot will automatically initiate action once it detects a fire breakout. This Robot finds its applications in Rescue operations during fire accidents where the possibility for service men to enter the fire prone areas is very less.

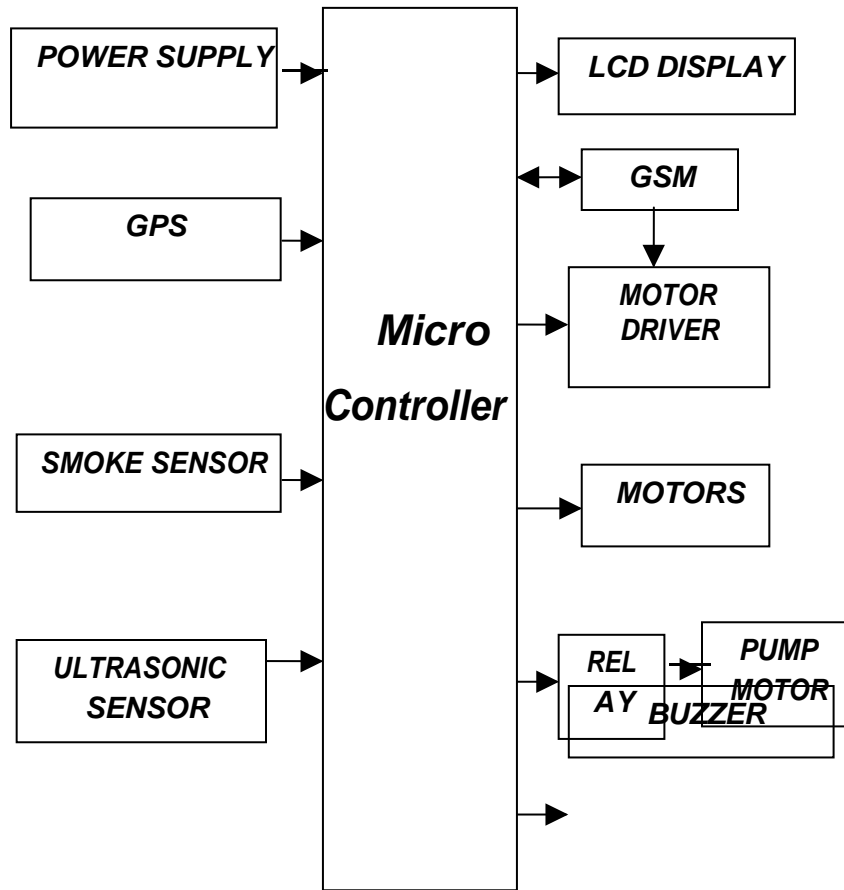
sketch is written and compiled using Arduino IDE.

The control circuitry of the robot is built on Arduino UNO. There is fire sensor interfaced in the control circuitry in the forward side of the robot. A motor is attached on the robot which will actually simulate the functioning of a water pump. This is a prototype model. In a production model, a motor pump should be attached in place of the fan. Apart from the component's interfacing in the circuit, the main significance is of the Arduino sketch running on the controller circuit. It is the Arduino sketch which provides the software intelligence to sense fire intensity using fire sensor, move robot in the direction where fire intensity is more and increase or decrease speed of motor pump. The Arduino

INTRODUCTION:

This robot is equipped with a single flame sensor used to sense environmental fire and feed the signals to the microcontroller in order to trigger the pump which sprinkles water in order to extinguish the fire. This robot implements the concepts of environmental fire sensing, proportional motor control. The motor river is used for the bidirectional control of the motors equipped in the robot. Thus, the robot processes information from its various key hardware elements such as flame sensor, The programming of the robot is done using the Arduino C which is derived from C and C++ languages.

BLOCK DIAGRAM:



BLOCK DIAGRAM DESCRIPTION:

When 12V power supply is given from battery to the voltage regulator then the voltage regulators step down the 12V to 5V supply. The step downed power will be goes to ARDUINO from there the power will be distributed to all other components.

In this robot the major role is done by motor drives these drives required 12V power supply which is getting the supply directly from the supply battery, like this GSM also requires 12V supply. From Arduino the motor drives have a connection which is used to drive the motor wheels as per the program coded.

The LCD also have a connection from ARDUINO which is used to display some major information like whenever fire occurs it will display it on the LCD, it shows the location of the robot too.

The GPS and GSM are connected to the ARDUINO, as per the program coded in the ARDUINO. GPS is used to find the location of accident place and GSM is used to send the messages to the user whenever the smoke is detected.

Ultrasonic sensor is also having a connection with Arduino which is used to find the distance between the robot and any other object. Smoke sensor is used to detect the smoke which is connected to the ARDUINO Board.

WORKING:

Whenever the supply is given to the kit through a 12V Battery the voltage regulators will step down the supply of 12V to 5V as per the requirement of the components in the kit. For example: Ultrasonic Sensor, GPS, Smoke sensor etc., these components requires 5V and coming to gear motors and GSM they requires 12V supply respectively as per the requirement the supply power will be converted. The supply power will be passes through the serial port to all the components in the kit.

Whenever the supply is given, The LCD displays as “WELCOME TO THE PROJECT” then it will show the present location of the robot. After that it will moves forward. If any obstacles were observed by the ultrasonic sensor the robot will take another direction. The robot will be in motion until the smoke is detected by the smoke sensor. Once the smoke is detected, the robot takes a step back and then motion will be stopped. At that moment the pump motor and buzzer will be on. The pump motor sprinkles the water to extinguish the fire. “FIRE IS OCCURRED” a message is sent by GSM and GPS sent the

location of accident place. After, fire is extinguished the robot moves and process will be going.

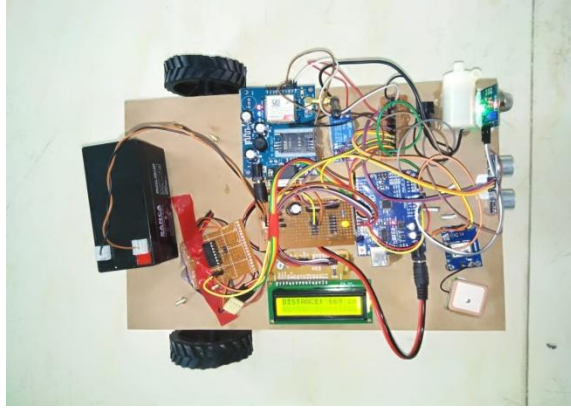


Fig: Robotis Roaming and capturing the data

LIVE APPLICATIONS:



Fig: Sprinkling the water to extinguish the Fire

CONCLUSION:

The Fire Fighting Robot employs SONAR and RADAR technology to control the directions of the robot. We design the fire detection system using flame sensor that is capable of sensing the flame of wavelength range 760 to 1100 nm, and the sensing range depends on the sensitivity and varies from 10cm to 1.5feet. The robot can operate in the environment which is out of human reach in very short time. The delay employed is very minimal. The robot accurately and efficiently finds the fire and within minimum time after the fire is detected it is extinguished.

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[5] *FIRE FIGHTING ROBOT* Sahil S.Shahl, Vaibhav K.Shah², Prithvish Mamtor³ and MohitHapani⁴ 1,2,3,4 D.J.Sanghvi College of Engineering, Vile Parle – West, Mumbai, India