Fire Alarm Robot and Authentication System Using Raspberry Pi and Cloud

Katravath Ravi, M.Raju naik, S.V.S Prasad, Arulananth T S

Abstract--- Nowadays we are watching many fire incidents and mechanical gas setbacks underway lines and fire undertakings. To give slightest prosperity and security of the bits of attire experts has transformed into a vital issue now a days. The specialists of bit of attire present day workplaces are in front of some broken out of flame is necessary one of them. The arranging plant officials are losing their sureness and interest and the attestations of the part is trust less. In this assignment we have given a to see the gas and fire and it can give the area of the fire influenced section and it can send the message, at a comparable it can send the mail of fire picture to the manager and it is in like way show live status of the robot. Raspberry pi is used to control the diverse Arduino mega 2560 which is made with a couple out of sensors and camera and wifi module. a 360 degree hand-off motor is organized with camera so it can take the photo in which area fire is seen. We have to give an insistence of the fire of influenced structure.To butcher the fire we are added water spinklers to structure will rapidly send the message adjacent photograph of the influenced spot and robot's locale. With the genuine target that we will clear fire mischances and we can control the fire utilizing fire contender robot. We can in like way watch the advancement of the robot and we will see each see of the robot And in the interim the structure will give the ringer alarm. By then official can verify or refute the issue and if the director acknowledges the condition as braking out of the fire. After that framework will unexpectedly raise the ring caution and a tweaked message will be sent to the close to flame station and sends the mail and we can detect status of the robot,thus we can control the fire accidents

Keywords— Fire Detection; Raspberry Pi 3; mobile hotspot; Sensors; Arduino; USB web Camera; Flame sensor, Smoke sensor GSM module Authentication

Software-flask web browser, raspbion OS, arduino, python, MIT app inverter

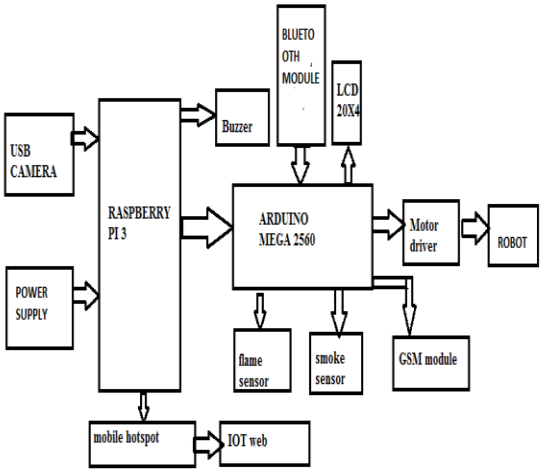
I. INTRODUCTION

In my project we are going to introduce how we are going to avoid and control the fire accidents and Gas accidents in major industries and factories and so on, Initially for this project we are using major Hardware components like raspberry pi3 and Arduino mega and GSM module for message sending, Flame, Gas sensors are using for detecting flame and smoke or gas in the surrounding areas, Bluetooth module and L298N Motor Driver with two 150rpm DC motors for robot. robot can move forward backward and left right at the same time robot is move depend on the voice command also these commands are are created by using MIT app inverter at the same time software are flask software for robot IOT based robot control and raspbion OS is included for raspberry pi and web camera and motion control, arduino ide2 software for arduino these are softwares and Hardware for robot. Finally robot can move depending on our direction such that it detect the fire and gas leakage and it sends message, gives the buzzer sound and also robot can give status and sensor values on the Display

II. PROPOSED METHOD

The main concept of this project is how to avoid and control the fire accidents by using arduino mega and raspberry pi 3 and different type of sensors are included for robot control the robot can move different type of directions when fire is detect by the sensors Gsm module will send the message to manager at the same time message is send to the more than one member according to the IOT based robot it will give the sensor value when the sensor value is high fire and smoke detection is happens and message and alarm will be given by the buzzer so manager can be alert also it will be gives the status of the robot thus we can detect the fire accidents and thus we can provide minimum security to the workers those who are working in fire factories at the same time we provide the fire garments to workers.

III. HARDWARE COMBINATION



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Katravath Ravi, PG Student, Department of Electronics and Communication Engineering, MLR Institute of Technology, Hyderabad-43, Telangana, India (ravirathod494@gmail.com)

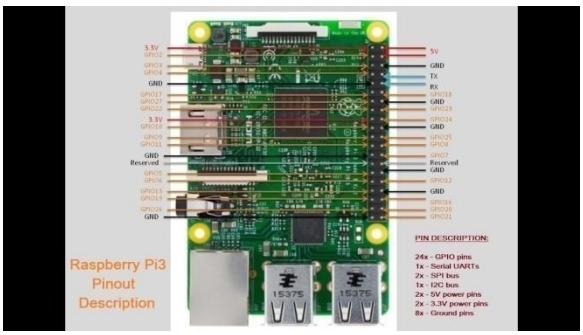
M.Raju naik, Assistant Professor, Department of Electronics and Communication Engineering MLR Institute of Technology, Hyderabad-43, Telangana, India (naik.raju1991@gmail.com)

S.V.S Prasad, Professor, Department of Electronics and Communication Engineering MLR Institute of Technology, Hyderabad-43, Telangana, India (prasad.sista@gmail.com)

Arulananth T S, Professor, Department of Electronics and Communication Engineering MLR Institute of Technology, Hyderabad-43, Telangana, India (arulanandh.ts@gmail.com)

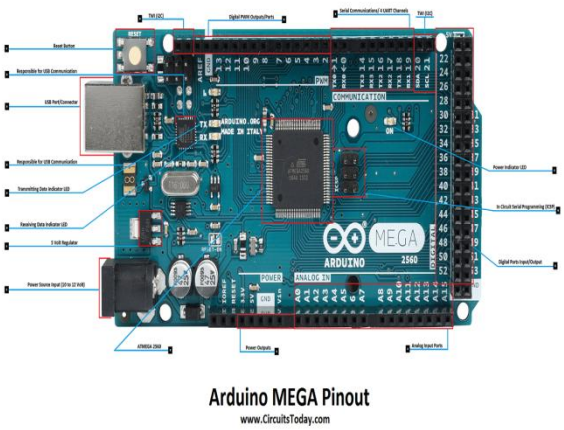
Hard ware implementation

Hardware consist of different types components and these are individually explained and the above block diagram shows the combination of all components and these components are works with their based on the sensitivity and below diagram is raspberry pi 3 it is mainly used in this project for IOT

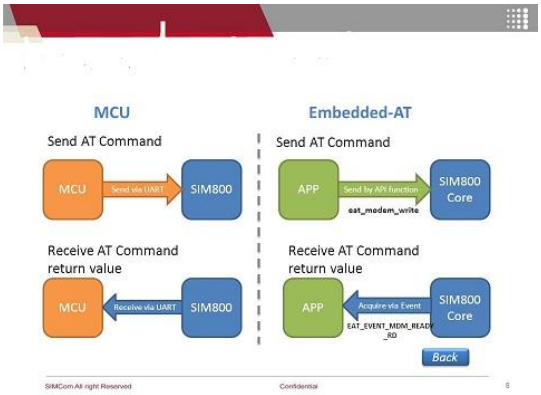


Raspberry pi 3 pin diagram

is Hardware consist of different types of sensors these are usb web camera is and power supply is connected to the raspberry pi and raspberry pi robot controlled by mobile hotspot thus IOT based robot will display status of whole system and simultaneously sensor value also display on the screen of mobile or any other display of the monitor and camera is capture flame image and it is send through mail of the administrator and arduino mega consist of smoke sensor



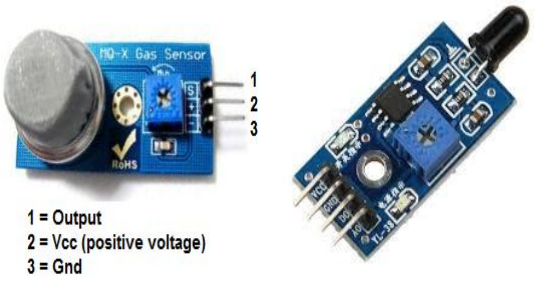
This is arduino mega it is connected to serially to raspberry pi with different types of sensors Below explain that how the GSM module works sim 800a works as MCU sends the data to sim800 by AT command



Gsm working

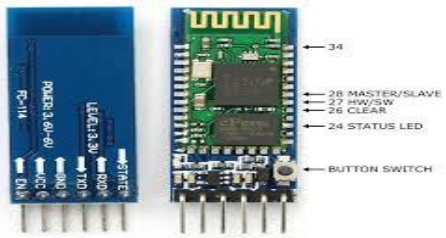
Gsm module

Gsm module is inserted with sim and it is connected to arduino gsm module is sends message mq-02,flame sensor for detecting of smoke and flame and hc-05 blue tooth module for robot control with different directions, gsm module for message sending and lcd module will display Robot status these are operation is doing by the robot system thus fire is detected by the robot



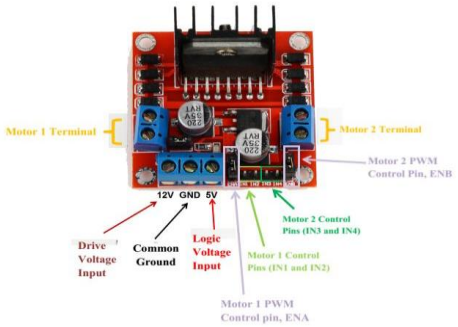
Gas and flame sensors

These sensors are mainly used for detecting smoke and flame



Blue tooth module and motor driver

Blue tooth module and msim otor driver are mainly used for robot moves Bluetooth module is used to without internet and motor driver is connected to 150rpm dc motors thus motor also move with the connection of iot based and it will be operate the robot in the various directions and iot based robot is one of extension of this project



IV. SOFTWARE OPERATION FOR ROBOT

Raspbion OS can be installed by inserting sand disk in the raspberry pi through HDMI cable and select raspbion os and write operation will be process thus raspbion OS can be installed in the raspberry pi web cam also install by the code pi@raspberry pi: "sudo apt-get install fswebcam" then followed by the enter thus web cam is installed,arduino software is installed in the raspberry pi by the code "sudo apt-get install arduinoide2" for python 2 thus softwares are installed in the raspberry pi3 and in the same process sending Gmail and motion of the robot also install

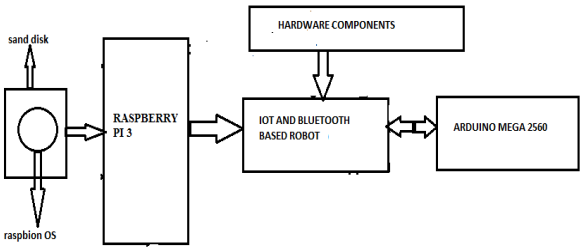
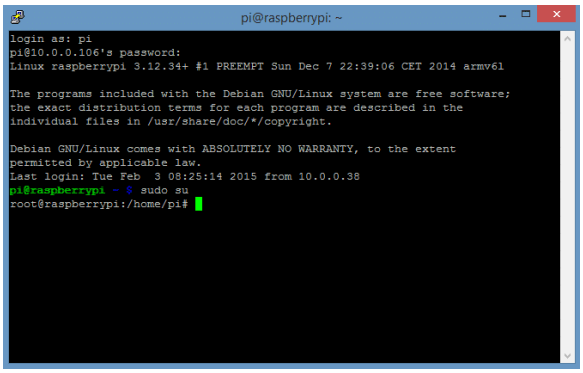


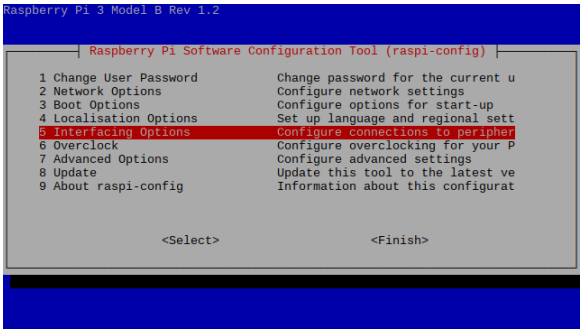
Figure 2 process Software Implementation

Figure 2 is explains block diagram of software installation in the above diagram it is clear that

Raspberry pi is inserted sand disk included raspbion os software it is installed in the raspberry pi such that pi is serially connected to the arduino mega 2560 and whole process is done by robot system



This is the format for downloading or installing of any software or device for allowing raspberry pi



Raspberry pi configuration

It is the configuration format and we can configure the any data through this raspberry pi software configuration tool

V. PROJECT IMPLEMENTATION

For implementation of this project we are mainly using two different types of controllers these are arduino mega and raspberry pi 3. The main code of the arduino and it is contain the specific IP address for identify the each of sensors and modules arduino mega act as server and arduino takes the analog values in this project different types of the sensor can take their values and message and buzzer is can do sound by using according to sensor values main implementation of the this project web camera can snap the image of the fire it can be sent to the Gmail at the same time robot can give IOT status and sensor values of the robot we can know the status of the robot anywhere by using IP address of the robot

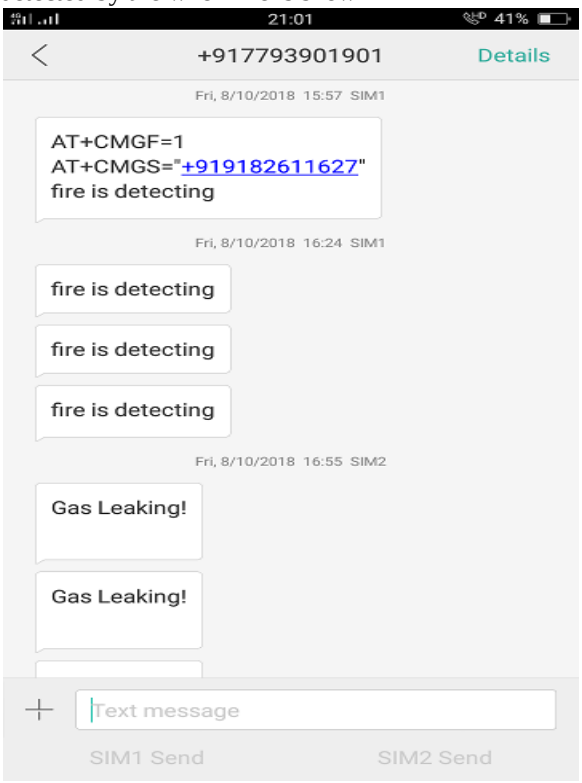
VI. RESULT OF THE PROJECT

In this project we recognize that message from Gsm module and robot gives the buzzer alarm thus robot is moves to different directions like right left and backward forward it has start stop buttons robot is moves IOT based robot gives the status of the robot along with the sensor values also web camera is snap the flame image this image is sent to the administrative mail id so that admit can be alert from the fire accidents

EXPERIMENTAL RESULTS

IOT based robot results

This is the result from iot based robot gives the status and values of the sensors And it will from IOT result This is the message result from robot given by the GSM module that is “fire is detecting” and “Gas is deteting” is shown in the liquid crystal display simultaneously the values of the sensors are also shown in the lcd display thus sensors are shows the various values of the smoke and flame sensors are detected by the when fire is show



VII. CONCLUSION

In this paper, we examined the most recent innovation that can diminish calamitous mischances caused by flame. We composed the entire framework and assessed its adequacy and in addition capability. With the change of sensor innovation, the framework will turn out to be more productive and valuable. On the off chance that this framework can be effectively incorporated in each industrial facility, at that point it is trusted that the death toll and property because of the fire mishaps will lessen strikingly and the nation's economy won't be lurched by such disastrous mischances

VIII. FUTURE SCOPE

Through mobile hotspot and ineternet from any place through world wide we will controlled the robotBy using the IP adress of the particuler mobile or any other device

This framework has an extensive variety of employments in different fields, for example, schools, workplaces, processing plants, control plants, and so forth... The reason this framework is tranquil valuable is because of the way that it is exceptionally conservative and it gives fire disturbing and validation framework.

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