

# Robotic Fire Detector, Extinguisher and Emergency Alert

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**Abstract:** This paper show the outline and improvement of an automated vehicle which is utilized to discover fire and make the move to control the fire remotely through RF application in an Event of any real fire danger especially in businesses like oil Refineries, gas tanks, atomic power plants and substantial scale forming complex bringing about numerous outcomes. This undertaking control fire through a mechanical vehicle and perform other activity, for example, exchanging on water engine. The save team gets warning in genuine time with the data of area utilizing GSM.This specialized progress together with the necessity for high limit robots made more exact, quicker and more automatic robots to address this issue. Fire discovery robot ready framework was executed utilizing a Renesas microcontroller with contributions from smoke sensor with the creation of such a gadget, people and properties can be protected, all things considered, with moderately slightest damage caused by the fire. The goal is to outline and raise a framework that could naturally recognize and stifle fire.

**Keywords:** Renesas microcontroller, Smoke Sensor, PIR Sensor, DC Motor, GSM.

## I. INTRODUCTION

Fire is a procedure of consuming showed in fire, light and warmth. There are three fundamental components vital for flame to occur, these are; oxygen, fuel and warmth. These make up is acknowledged as flame triangle. The extent of these components decides the character of the fire. A portion of its side-effects being utilized in a great deal of helpful applications, for example, cooking, power generation and the assembling procedure, among others, it has potential for causing devastation. As demonstrated by the Centre of Fire Statistics of the International Technical Committee for the Prevention and Extinction of Fire (CTIF), in the region of 70,000 and 80,000 passings happen each year on account of fire flare-ups since the ascent of 21st century [1]. In making like Ghana, the situation is the same. In 2014, about GHS3.4M (894,761USD) [2] was lost as a result of fire emanation. Fire related injury of survives and assets continue expanding paying little mind to fantastic fire prosperity endeavours being finished by individuals as a rule workplaces. Regardless of the way that it is imperative to improve fire prosperity measures, setting up early acknowledgment structures phenomenally calms the outcome of fire breakout. This prompts an extensive measure of innovative responsibilities in the zone of fire affirmation. Former to the outline of development, fire distinguishing proof was done primarily by visual audit and certification. This conversely altered in the midst of the late 1930s when Walter Jaeger by chance found a sensor which prepared for recognizing smoke thusly planning for examine into introduce day smoke sensors [4]. Smoke locators are for the most part requested into photoelectric based and ionization based markers. Photoelectric based pointers use the light diffusing limit of smoke atoms to perceive the openness of smoke while the ionization based identifiers are arranged with ionization chamber containing radioisotope (as a rule Americium-241).In the non-appearance of smoke particles the ionized air iotas inside the chamber permit the flood of somewhat electrical current amidst the charged cathodes in the chamber [5].The accessibility of smoke particles coordinates the current in the middle of the terminals to fall. The need to deliver a more steady fire location framework without false cautions has prompts the acknowledgment of a multi-sensor approaches. Dissimilar to flame identification approaches depending exclusively on smoke, this approach depends on the location of extra fire signature. Because of the adequacy and productivity of multi-sensor based fire identification frameworks, momentum examine ablaze discovery is to a great extent concentrated on growing better calculations and handling strategies in light of the information got from the sensors, along these lines diminishing false alerts. A rising marvel in flame discovery is the utilization of various parameters and sensors in the recognition component. Fire location robot mindful framework was acknowledged utilizing a Renesas microcontroller with contributions from smoke sensor with the creation of such a gadget, human and properties are spared with less harm that was come about by the fire.

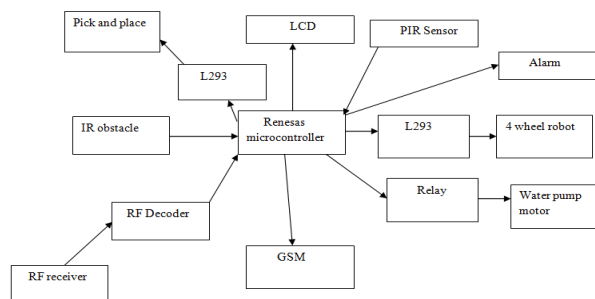
## II. LITERATURE SURVEY

This part is examining about an investigation on the past venture in light of flame discovery robot task and proposal. The whole task had been examined and investigated their standards, technique and applications. In rivalry which was held at Panitia Kontes Robot Cerdas Indonesia in 2006, the understood re-enactment of Fire Fighting Robot [9]

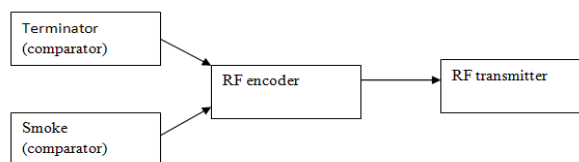
(Indonesia) is talked about as virtual adjustment robot. This mechanical vehicle shows up as an individual and performs numerous perplexing capacities. This mechanical vehicle was planned utilizing Virtual Reality Toolbox module. It is arranged to test starting states of controlling calculations. Since the robot has less thorough systematization of condition, it doesn't have enough level of usefulness. The robot works just in hall room condition, without abnormal articles. Just a single fire source is implied and there are assistant checks on floor that mean for instance room entrance. Pokey the fire fighting robot (USA) has advanced out of rivalries, and turned out to be more critical than different mechanical assembly. There are point by point depiction of utilized hardware and essential calculations of working. Working condition of robot is a building, so the robot is outfitted with mandatory sensors, for instance, with a line sensor, that could be un-helpful in states of thick smoke. The essential central purposes of robot are: using of dual sorts of fire sensors, working in different courses; using of composite fire fighting instrument; Fire Protection Robot (USA) – another restriction wander, created for, fifteenth Annual Trinity College Fire Fighting Robot Competition. Robot has more snared relationship, than one, showed up above and is organized lighting up greater combination of assignments. The essential system's inclinations are: more eccentric figuring's, used for fire revelation, using of sound sensor for activating and closeness of some additional course sensors. The orchestrating insignificant exertion is a system's guideline elbowroom. In extraordinary demand it is imperative to see fire fighting robots, participated in Russian administration of emergency results. Among them are ABR-ROBOT these models are isolated from competition wanders, they outfitted with a certifiable shield and fire fighting contraptions, however their genuine burden abides in remote controlling. They aren't independent.

## II. DESIGN

### Receiver section:



### Transmitter section:



### Video surveillance:



## III. WORKING

Above figure shows the building blocks of the proposed work "Fire Fighting Robot" which consists of a regulated power supply unit, Renesas controller a GSM module, DC motors, water pumps sensor alarm and etc. The power supply unit provides regulated supply of 5v and 12v DC. Renesas microcontroller commands the robot are automotive the fire is detected by the sensor and send the information to perform the necessity action.

**Video surveillance:** The video surveillance robot will continuously display the images using Android phone camera and are sent to control station. So the current situation of the area where the robot is present is analysed.



**Smoke detection:** Smoke sensor is used to sense smoke, prototypically as a sign of fire. Materialistic and suburban safety devices issue a signal to fire alarm control station as a component of the fire alarm structure.

**Motion detection:** PIR sensor detects difference in quantity of infrared radiation influencing upon it, which differs based on the temperature and exterior features of the objects in front of sensor.

**Water pump:** The robot has a water tanker to oust water and to sprinkle it on the fire. Its capacity is performed from the microcontroller yield utilizing the qualified flag from the transmitting end. The total activity is repressed by microcontroller. An engine driver IC is interfaced to the microcontroller from which controller drives the engine.

**GSM:** The fire dousing robot which depends on GSM is utilized to discount fire in houses, office and shops. This mechanical vehicle moves in cover fire region in our home, shopping centers, workplaces and so forth. This robot can detect fire utilizing IR sensor and afterward hold off without anybody. It at that point quickly passes on the reminder to the worry individual.

**Pick and Place:** Pick and place mechanical vehicle is a microcontroller subordinate mechatronics framework that recognizes the question, picks that protest from the begin area and spots at wanted area. For distinguishing proof of question, infrared sensor is utilized which recognizes the presence of substance as the transmitter to beneficiary course for infrared sensor is irritated by set protest.

#### IV. ADVANTAGES

1. It saves time
2. Manual operation has been minimized to great extent.
3. Low man power required.
4. Efficient distribution system.
5. Easy to use.
6. Efficient and reliable.

#### V. APPLICATIONS

1. The robot can be utilized to teach the visitants from the entry approach to primary office.
2. The critical reason for existing is to spare the general population by quenching fire in a building.
3. It can likewise help specialists to convey pharmaceutical starting with one compartment then onto the next.
4. Can be utilized as a part of record keeping up rooms where fire can cause loss of significant information.
5. It is appropriate in Server spaces for quick activity in nearness of flame.
6. The conceivable order of the multifunctional fire stifling framework has been resolved as a classification that contains the substance business, military stockpiling, atomic plants, offices, oil industry, mine fields and risky stuff transport.

#### VI. FUTURE SCOPE

For venture demo concern, we have made a model module. In future, this venture can be taken to the item level. To make this undertaking as easy to use and tough, we have to make it smaller and practical. Also the majority of the units can be embedded alongside the controller on a solitary board with change in system, in this manner diminishing the measure of the automated vehicle.

#### VII. RESULT

This robotic vehicle detects the fire with the help of thermistor or smoke sensor then the buzzer is activated and the vehicle moves to the particular location, if any obstacle or motion is detected then that living object is taken to the destination.



### VIII.CONCLUSION

The task is outlined utilizing organized displaying and can give the coveted outcomes. It can be effectively actualized as a real time framework with specific adjustments. Science is creating real development in various territories, and consequently innovation continues changing every now and then. In addition a large portion of the units can be embedded on a solitary board alongside microcontroller in this manner it makes the framework thick consequently making the overall framework more gainful. To make the framework material for ongoing proper parts with more noteworthy range should be connected.

### REFERENCES

- [1] World fire measurements (2013, June 9) (Online). Accessible: [http://ec.europa.eu/shoppers/cons\\_safe/introductions/21-02/ctif.pdf](http://ec.europa.eu/shoppers/cons_safe/introductions/21-02/ctif.pdf) [Accessed: June. 13, 2013].
- [2] Ghana National Fire Service records 110 occurrence cases,(2015,Sep,27),9(Online). Available: [http:// www.ghananewsagency.org/social/ghana-national-fire-service-records-110-incident-cases-84866](http://www.ghananewsagency.org/social/ghana-national-fire-service-records-110-incident-cases-84866)
- [3] 265 Fire Disasters recorded in 2 weeks, (2013, June 9).(Online). Available:<http://edition.myjoyonline.com/pages/news/201301/99904.ph>
- [4] Radiation and Smoke Detectors, (2013, June 9). (Online).Available: [http://open blog.nrc-gateway.gov/2011/07/15/radiation-and-smoke-indicators/](http://openblog.nrc-gateway.gov/2011/07/15/radiation-and-smoke-indicators/)
- [5] How Do Smoke Detectors Work? (2013, June 9). (Online). Available:<http://chemistry.about.com/cs/howthingswork/an/aa071401a.ht>
- [6] Chen S., Hovde D. C., Peterson K. A., Marshall A. W."Fire discovery utilizing smoke and gas sensors", Fire Safety Journal, vol. 42, pp 507- 515, 200