A REVIEW ON FIRE FIGHTING ROBOT

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ABSTRACT— Extinguishment and the detection of fire are the hazardous work that puts the life of a fire fighter in risk. With the help of a fire fighter robot we can perform this job in fire bended area to avoid unwanted incidents. This research reveals the simulation and development of a fire fighting robot that was equipped with basic fire fighting equipment and would automatically detect a fire and activate the water pump over the flame. This robot is made up of flame and gas sensors that are positioned in various locations and are used to detect fire and smoke, respectively. When the source of the fire has been identified, the flame sensor quickly extinguished the fire by using the fire extinguishing system. Furthermore, the robot also consists of a container on the top of the servo motor so that the path of water spraying can be controlled. Also, two DC motors were used to drive the motors for the movement during operation mode for accomplishing the goal.

Keywords— Firefighting Robot, Arduino UNO, Sensors, Water Pump, Industry

I. INTRODUCTION

A robot is a robotized gadget which performs works as a rule ascribed to people or machines entrusted with the dull or adaptable arrangement of activities. Various examinations have indicated that robot can be useful in medication, restoration, salvage activity and industry Tele-robots, Tele presence robots, Mobile robots, Autonomous robots, and Android robots are some of the several types of robots. A tele presence robot is similar to a tele robot, with the exception that it can give feedback based on video, sound, and other data. The adaptable robot is designed to explore and run errands with the assistance of humans. A fire fighting robot is proposed in this work. This robot's principal function is to transform into an automated assistance vehicle designed to search for and extinguish fires. Our planned robot will have the ability to work on its own or be commanded remotely. This robot is intended for use in outrageous peril territories, for example, planes fires, handling production lines, substance plants or atomic reactors. In this examination, a conservative and little fireman robot has been created. This robot is named Fire Fighting Robot, which is the short type of Rescue Robot. This robot can dodge deterrents, look and douse the fire. Moreover, this robot

can expand the profitability, wellbeing, effectiveness and nature of the errand given. The robot is more minimal and more adaptable contrasted with Thermite and Fire Fighting Robot.

II. LITERATURE REVIEW

Aliff, Mohd, et al. have built a firefighting robot to extinguish the fire to escape the risk. Therefore, to eliminate obstacles on the route, a powerful controller is used to control and eliminate obstacles and to execute the processautomatically. The mechanism is designed to detect a fire and to stop at the highest distance from a fire where a person is controlling a robot using a monitor using a smartphone or remote computer. Ali et al. also built a firefighting robot to extinguish a fire using a water pump. The tone sense was used in this gas sensor and the robot was later navigated using the display to hit the target [1]. Rakib Sarkar has created a firefighter to locate and extinguish the flames. The robot is then constructed of 'Rashed Tree' wood and will have a water storage capacity of 1L. They used the Arduino controller to identify the fire and to extinguish the fire. The identity of the fire would depend on the distance of the fire with the wavelength of the light as the threshold [2]. There has been a lot of study on robotics leading to the advancement of robotics in numerous applications. This robotic application has a larger range of prototypes and sophisticated technology is used. The purpose of this work is, therefore, to provide firefighting robots to support the public by sensing a fire and to respond quickly to prevent significant loss of human life, construction or some kind of property.

III. BASIC IDEA

Robotics has gained popularity due to the advancement of many technologies of computing and non-technology making humanoid is easier and comfortable The programme The Proteus 8.9 Professional software and the Arduino IDE software were used to create a fire-fighting robot. It is a term that has subsequently been used to refer to a machine that assists people or does labour that humans find difficult or unpleasant. The fire-fighting robot is designed to look for a fire in a tiny residence with a certain floor layout. The robot will be beneficial as it will automatically detect the fire itself with its sensors and be the first to put it out. This will exclude the valuable times waiting for the fire rescue team and will also reduce the damage to a great extent. These robots are capable enough to perform repetitive tasks more quickly, cheaply and accurately than humans.

Components

Equipment Quantity Used For Arduino UNO 1Execution

DC Motor2 To move the Robot

L293D 1 To drive the Motor

Flame Sensor3 To sense the flame

Gas Sensor1 To sense the smoke

Resistor 2 Safety purposes of LEDs

LED 2 For Indications

Servo Motor 1 Controlling the direction of the container in the Robot DC Pump 1 To Spray water over flame

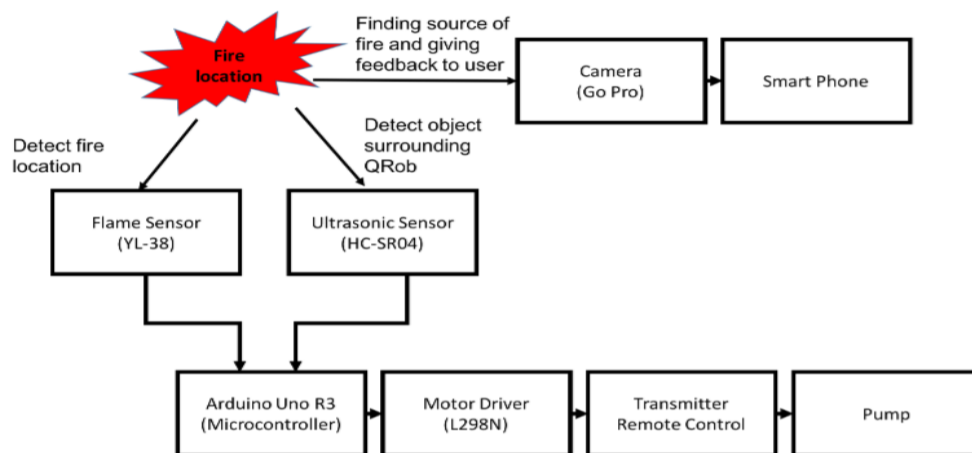The block diagram that has been followed for the implementation of this project is showed on Figure:

Figure 1. Block diagram

As per showed on the simulation, at first, in the Proteus Professional 8.9 software, the Arduino, Flame sensor and Gas sensor were placed. After that, we have placed the DC Motor, L293D Motor driver and Servo Motor in the same manner. After making all these placements, the connections were made on the Arduino UNO. Also, the flame sensors and gas sensors were provided with a 5V supply and the L293D were connected with a 12V supply. Moreover, TX and RX were connected to the virtual terminal. Once it is done, the code was provided as the input to the Arduino UNO and the desired outputs were successfully obtained.
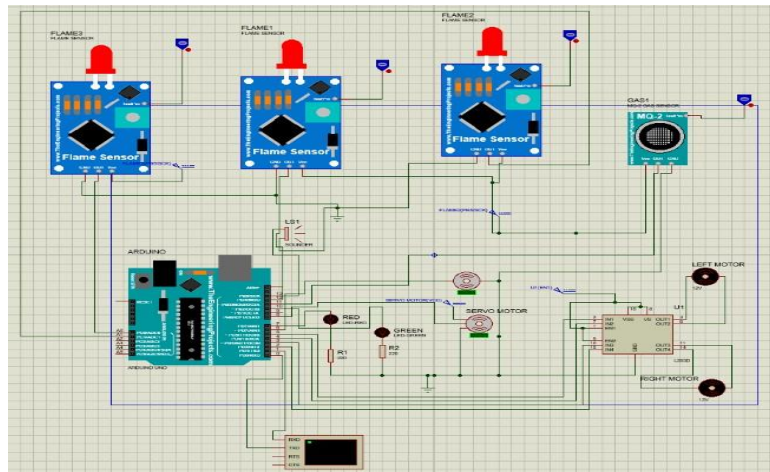
Figure 2. operational circuit

IV. RESULT

In this paper, a For industrial applications, a fire fighting robot has been built. All of the fundamental wall follower actions, such as moving forward, turning left, and turning right, work flawlessly. When the flame sensor or smoke sensor triggered, the display displayed a warning and the servo motor and water pump began to run until they reached the fire area. The fire was then put out. And the display also showed safemode. After going to the build project, the project was built.The simulation was run and the desired output was obtained. Proper snapshot of the results was attached individually. Overall, an autonomous fire fighting robot has been successfully built. Finally, the objectives of this paper were achieved.

V. CONCLUSION

From the simulation results, the putting out fires robot has accomplished its point and target effectively. The robots created to help firemen in their obligation. It has invaluablehighlights, for example, the capacity to identify the positionof fire, smother it and increment the information about fireconduct from the occurrence zone. Sensors, motors, pumps of smaller size and required very less pace in this procedure. This robot will diminish the danger of injury for firemen andpotential casualties and decrease the monetary losses which increment significantly as fire duration increases. The robot can be utilized in as little passage way little spaces since it has smaller structure.

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