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DESIGN AND FABRICATION OF FIRE FIGHTING ROBOT WITH SPRINKLER USING ANDROID

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Abstract- ***Firefighting is not simply great but additionally perilous occupation. At the factor whilst hearth catastrophe happens anyplace it means lots to reach at there hastily to stop damage. Presently a days innovation has become at huge make bigger that makes hearth stifling extra efficient. In this venture, we're making plans firefighting robot utilizing android software. The robot contains of water siphon and Arduino Uno for controlling the perfect hobby. Sensor module is utilized to detect fireplace internal region by means of using temperature sensor, smoke sensor and fire sensor. Android utility has buttons for controlling the improvement of robot. The live video web primarily based is likewise given on the software that assists with giving route to robot. The robotic will arrive at location and bathe water to definitely smother fire.***

Keywords: Arduino Uno, Hub mcu, Temperature sensor, Fire sensor, Smoke sensor, Water siphon, Android utility

I INTRODUCTION

Fire mishaps in the firms like fuel tanks, substance intensifies production lines, oil, remedy centers, thermal energy station are inflicting serious outcomes. Robots are comprehensively utilized for purpose for wellbeing in view that human verbal exchange is diminishing constantly with progression in place of mechanical technology. The firefighting robot assists with halting hearth proper away and securely smother fireplace and salvage people from risky hearth and amp move to the comfier region. What's extra, the firefighting robotic gave to locate and discover the fire before it profits out of impact. This firefighting robotic is a substitution of firemen as it is not at a big gamble of having harmed. It is moreover treasured for modern-day,

homegrown and navy location. This project makes use of android software. Hence, the Arduino Uno based firefighting robotic is supposed to govern chimney via a mechanical automobile. In our undertaking, we can flow the robot vertical, in opposite, each approaches accurately with the aid of utilizing android software & there' s furthermore a starting button to siphon for fire quenching activity. The robotic has water bathe which is geared up for sprinkling water. The sprinkler may be moved this way and that. Microcontroller, Wi-Fi handset modules are rule controlling gadgets of the entire framework. Water shower DC engine, ringer and Pi digital camera are interacted to

microcontroller.

II COMPONENTS

1. Arduino Uno:

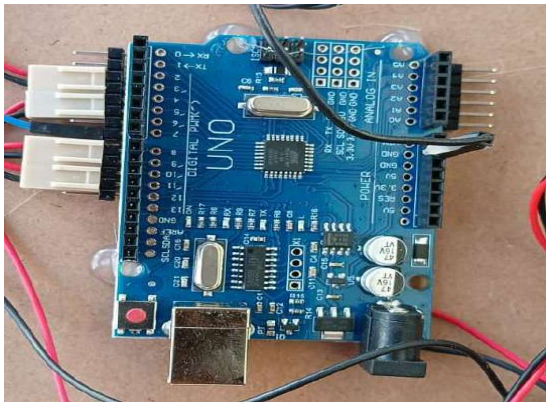

Figure.1 Arduino Uno

2. Node mcu:

Hub mcu is an open supply iot degree. Hub mcu is a firmware and minimum price gadget. It is utilized to make version and moreover to assemble iot packages. Hub mcu has ESP32 microcontroller alongside Wi-Fi, Bluetooth and Ethernet. It has operating voltage of seven to twelve volts. The Wi-Fi module utilizes IEEE 802.Eleven faraway business enterprise having clock velocity of 240 MHz and blaze memory of 4MB.The records detected with the aid of the sensors at the sensor module is gotten via hub mcu and ship it to robotic. As per that circulate may be initiated by the robotic.

3. Temperature sensor:

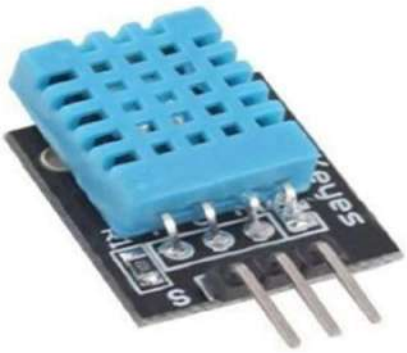

Figure. 2 DHT11

DHT11 is a minimum expense automated temperature sensor. It makes use of thermistor to display screen nature of air and incognito it to automated signal. The automatic signal is sent by means of

statistics pin. It is easy to utilize and calls for careful looking after. It calls for 4.7k or 10k resistor to pull up from records pin to VCC.

Specification:

- Operating Voltage - 3.5V to 5.5V
- Operating Current – 2.5mA
- Temperature Range - 0 – 50C
- Accuracy - 1%

4. Flame sensor:

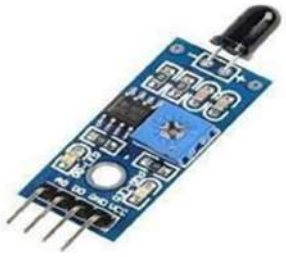

Figure.3 Flame sensor

Fire sensor is utilized to recognize occasions of fire. This sensor is commonly delicate to normal mild ultimately referred to as fire sensor. This sensor recognizes fireplace within the scope of 760nm to 1100nm.The end result of sensor is advanced. This sensor is applied in robot like alert. This sensor isn't always hard to make use of and moreover it has extremely quick response time.

Specification:

- Operating Voltage -2 – 36V
- Temperature - -25 to 85C

5. Smoke Sensor:

Figure.4 MQ22

The smoke sensor MQ22 is profoundly sensitive to smoke, PG, butane, propane, methane, liquor, hydrogen. In light of the kind of the fuel the opposition of the sensor is specific. It contains of inherent potentiometer

that lets in you to alternate the notice of the sensor. Because of that we will get the right perusing. The substantial fuel fixation can deliver us the exact end result voltage. This sensor having minimum fee, longer life and Basic drive circuit.

Specification:

- Measuring Range - -50 – 280C
- Accuracy – 2.5%
- Operating voltage – 5V

IV.BLOCK DIAGRAM

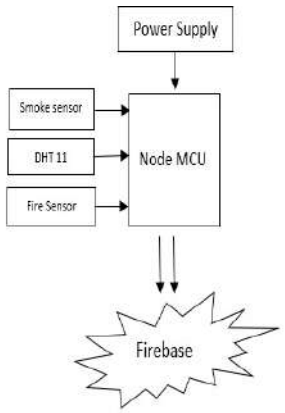

Figure 5 Block Diagram

V. WORKING PRINCIPAL

The sensor module is about in wherein there is achievable of a hearth catastrophe. The module accommodates of fireplace sensor, temperature sensor, smoke sensor and Hub mcu which plays out the transmission of facts. When the hearth is identified, hub mcu will ship records to firebase. The collector comprises of two sections, the preliminary phase is an Arduino Uno and other is android application. The Arduino Uno has input from pi digicam used to show video on the android application. Android application contains of a WIFI module this is

used to lay out affiliation between the robotic and android utility. Orders to push in advance, left, proper and to smother hearth are shipped off the robot through the android utility. The mechanical vehicle is stacked with water big hauler and a siphon that is controlled over far-flung correspondence to toss water. The speaking stop utilizing android software gadget, orders are shipped off the collector to manipulate the improvement of the robotic both to push in advance, in opposite and left or proper and so on. At the

much less than perfect quit three engines are interacted to the Arduino Uno wherein of them are utilized for the development of the automobile and the extra one to situate the arm of the robot. Far off pastime is executed by any PDA.

VI FLOW CHART

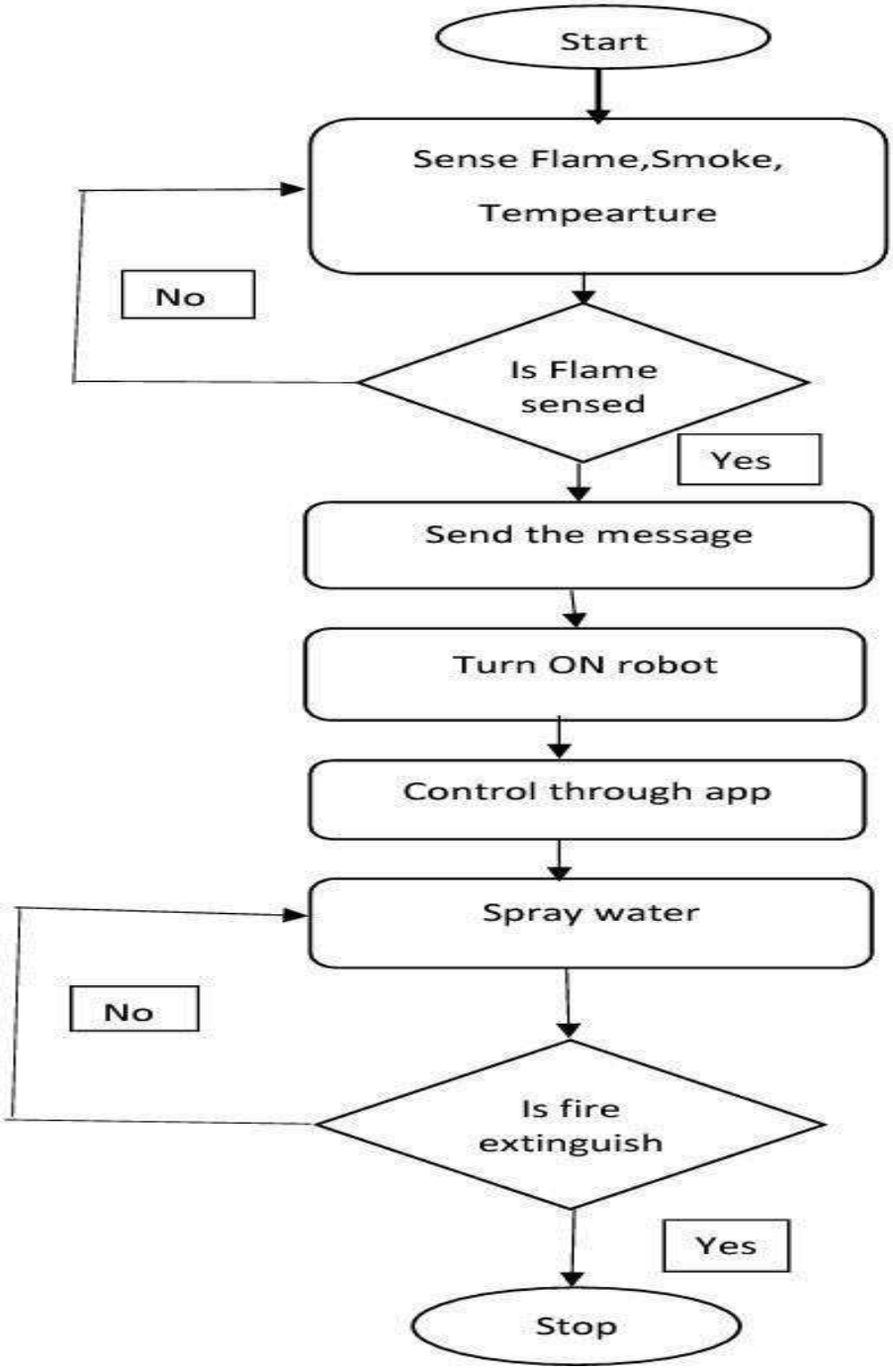

Figure.6 Flow Chart

VII FABRICATION PHOTOS

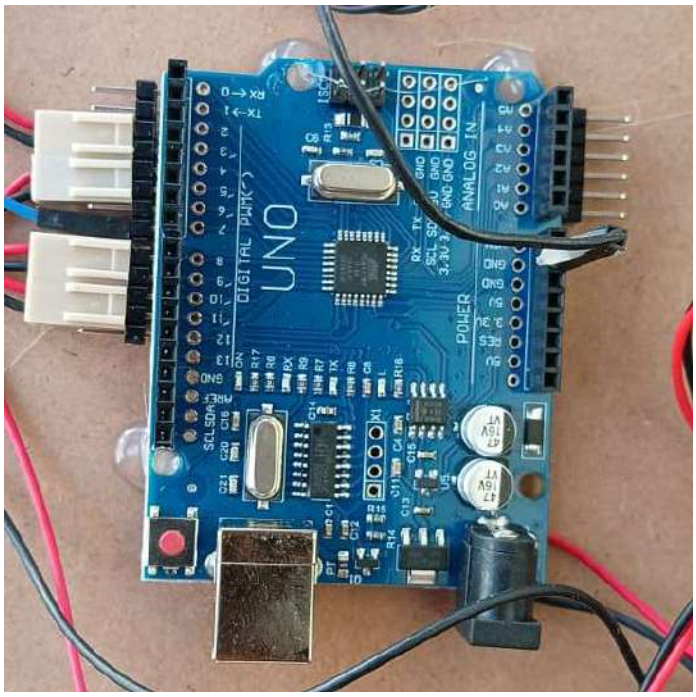

Fig:7 Arduino Uno

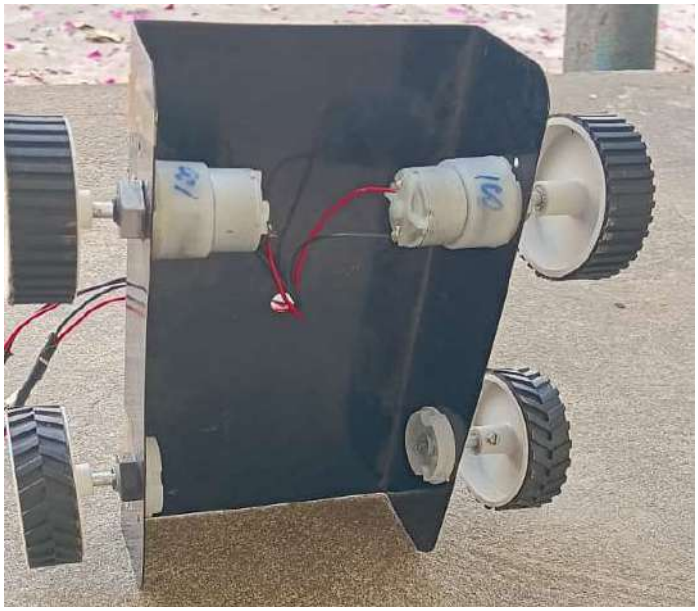

Fig:9 Gear Motors

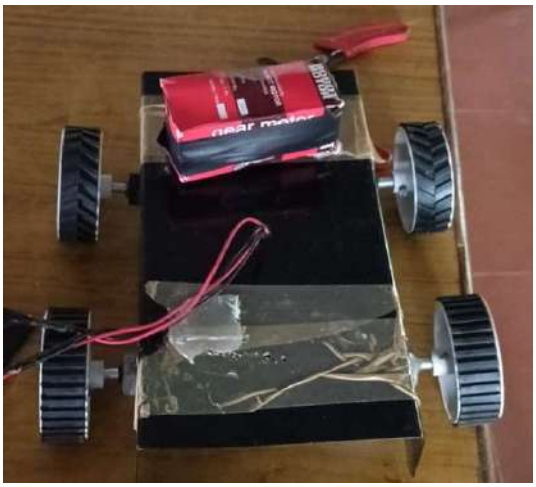

Fig:11 Body Setup

Fig:8 Buzzer And Bluetooth Module

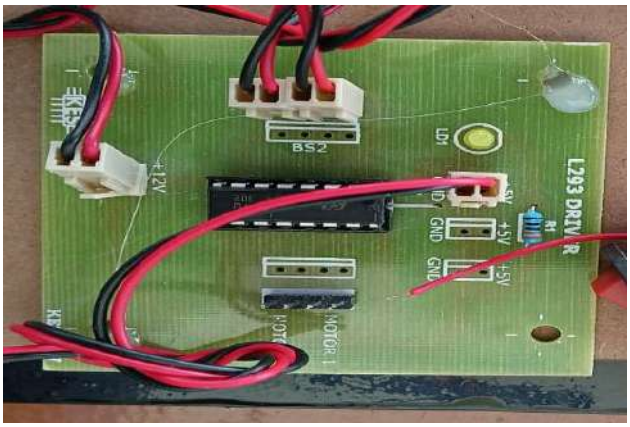

Fig:10 L293 Driver

Fig:12 Spraying Motor

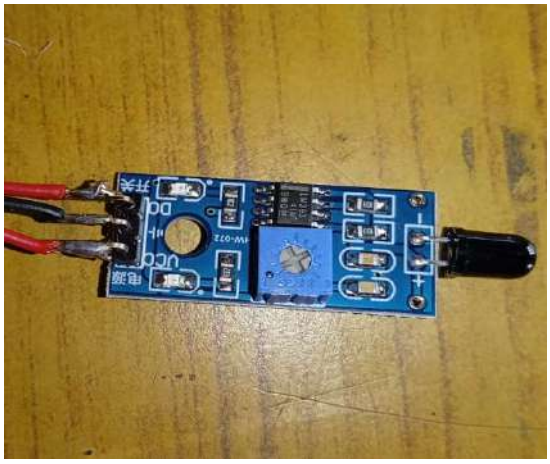

Fig:13 Fire Sensor

Fig:14 Final Setup

VIII APPLICATIONS

1. Smothering fire in which probability of blast is more is utilized.
2. It applied as home protection application.
3. It is utilized in server rooms in places of work.
4. It is helpful in disaster area checking and salvage.

IX CONCLUSION

This mission portrays about the regular firefighting robotic restricted via making use of android application that quench the fire. The recognition of fireplace is completed by sensor module which makes use of temperature sensor, fire sensor and smoke sensor. The fire smothering is finished by siphoning tool that bathe water ablaze and quench it. The robotic is associated with mobile phone thru WIFI module and cycles statistics were given from the sensors. All the device and programming are effectively acknowledged on this mission. Notwithstanding, in this mission, dousing of fire is completed with the water that is usually appropriate for both time and cloth paintings and furthermore it makes mission savvy. This fire dousing system is enormously effective and secure.

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