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Arduino Based Fire Fighting Car

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Abstract - In recent times fire accidents are very commonand it is very hard for a fireperson to do the job. Sometimes, it is difficult for a person to get inside the building, forest on their own to control fire accidentals but firefighting car can do that. Car can detect fire from a distance.

The designed vehicle by using temperature sensor can identify the source, and with water spray which is capable of sprinkling water in 180-degree angle. In case of facing obstacles during the movement it will detect and avoid those using ultrasonic sensors. The aim of this project work is to alleviate the burden and danger that falls on the firefighters. This project can save lives and can help in rescue operations.

***Key Words*:** Arduino, Fire Sensor, Water Pump ,S ervo Motor, Ultrasonic Sensor

1. INTRODUCTION:

Firefighting gears play a significant role within the firefighting operations. Each shoulder puts their life in peril to save lots of lives and assets of individuals and even natural resources. Every safety gear matter, everything which will facilitate in the time of crisis to save lots of lives is very important and valuable. It is also hindrance of any tragedies, death of civilian or firefighters.It becomes necessary to be able to perform rescue operations with no involvement of human at time and space of utmost dangers. Planning a system which will monitor, scan, facilitate in put

out fireplace could be a useful help that's currently the necessity of the hour.

Firefighting automotive style takes into thought of the hazards that involves within the rescue operations and becomes a part of the team.

Firefighter faces physical injury like burns, smoke inhalation and crush injuries from collapsing, prostration, further as illness like asthma, persistent coughing, heart condition, cancer and respiratory organ harm because of the sort of task

they physically perform on the duty.

As per the Standing Fire Advisory Committee INDIA ,on the basis of laid down norms, existing deficiencies as regards fire stations, fire fighting vehicles and personnel in the country are as follows:

- Fire Stations - 97.54%
- Fire Fighting and Rescue Vehicles - 80.04%
- Fire Personnel - 96.28%

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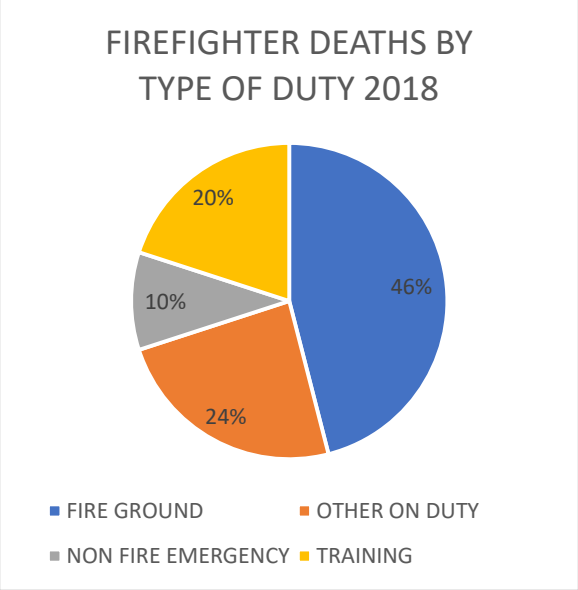
DESTRUCTION CAUSED DUE TO FOREST FIRE

country	year	Area (million ha)
Russia	2011-13	4.32
Canada	2011-13	2.45
Brazil	2011-13	2.16
Indonesia	2011-13	1.61

DEATH CAUSED DUE TO FIRE IN CITIES (NFPA STATS)

YEAR	TOTAL	CAREER	VOLUNTEER
2010	73	25	45
2011	61	21	35
2012	64	23	30
2013	98	26	41
2014	64	23	34
2015	68	24	32
2016	69	19	39
2017	60	21	32
2018	64	25	34



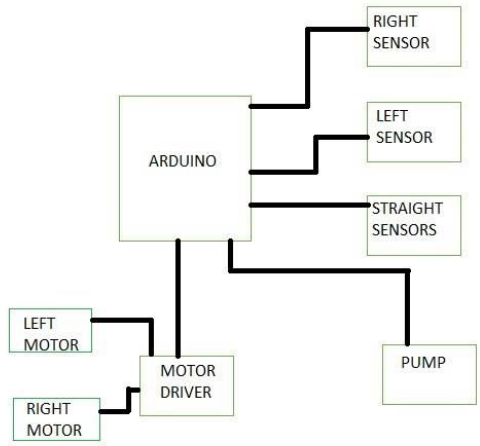
2. SCOPE OF THE PROJECT

The overall goal of this work is supporting the firefighters in rescue operation.

Our work is designed to the fire hazard states, conditions and the way the firefighting car will provide support in crisis.

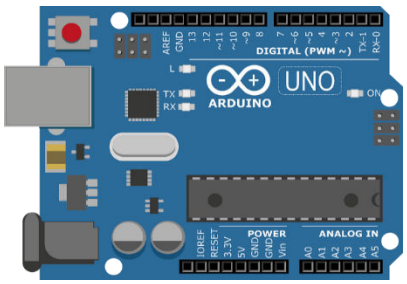
- Obstacle identification
- Fire control

3.CIRCUIT DIAGRAM



4. COMPONENTS

A. Arduino

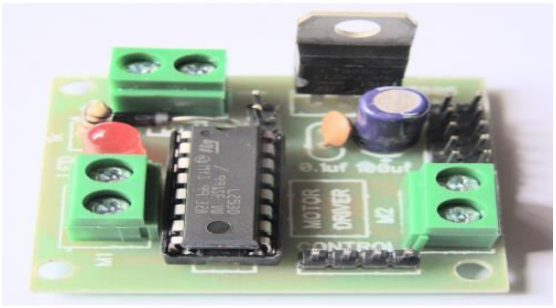


- Inexpensive
- Cross platform support-mac windows etc.
- Open source extensible software & hardware.

B. Servo motor

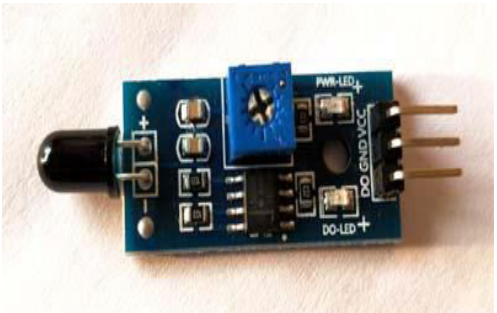
A servo motor is a used to convert the mechanical motion into digital pulses and through the pulses it determines and control location, torque and speed.

C. Motor driver



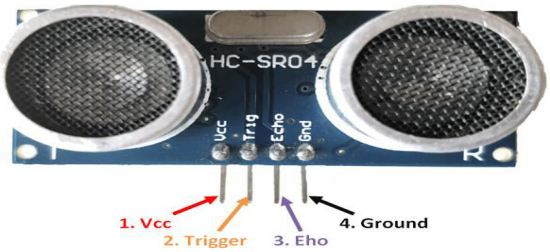
It controls speed and direction of two motors simultaneously

D. IR sensor



It is used to identify infrared signals and generate electronic pulses and transmit them to processors

E. Ultrasonic sensor



It is used to detect the objects present infront of it by ultrasonic waves.

5. WORKING

Arduino is an open source hardware platform that is used to run programs and multiple peripheral elements along with it. It works on C language and also contains its own built in libraries that helps in programming tasks. Arduino is the main component in the project as it controls all the other peripherals. The motor driver module is placed right over the Arduino. It is used to drive the dc motors responsible for the wheels of the car. Motor driver module is integrated right on the Arduino. Servo motor are placed at the bottom of the car and the locomotion of the car is responsibility of the servo motors.

It provides the 360-degree motion. Ultrasonic sensors and IR sensors are used for the purpose of obstacle and heat sensors. They are responsible for right path to reach the destination.Ultrasonic sensors can sense of object that comes in the way of the car then via Arduino and motor driver the car will try different path to get to another place. IR sensors are responsible to sense the heat presence and is responsible to set the target destination and then ultrasonic

sensor will be takeover to make sure the car gets to the target place avoiding all the obstacle. Once the car reaches the destination the water pump through water stream over the heat source extinguish it.

6. CONCLUSION

The project "Fire Fighting Car "is made to detect and extinguish fire. Car detects flame or temperature at the positioning where car exists. The vehicle is controlled by Arduino as per the program. This car helps in those areas where natural calamity and bomb explosions where occurred. Car uses water sprinkler to extinguish fire. The designed car has locomotive ability in all directions.It reduces human efforts and protects their property.

ACKNOWLEDGEMENT

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