Fire Fighting Robot Remotely Controlled by Voice based Android Application

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ABSTRACT:- Recognizing fire and extinguishing it is a perilous activity that puts the life of a fire warrior in danger. There are many fire mishaps, which fire warrior, needed to free their lives in the line of obligation every year all through the world. The innovative work in the field of Artificial Intelligence has offered to ascend to Robotics. Robots are actualized in different zones like Industries, Manufacturing, Medicines and so forth. Consequently, Robotics can be utilized to help fire contenders to play out this assignment of fire battling and in this manner diminish the danger of their lives. Fire Fighter is a robot intended to use in such outrageous conditions. It tends to be worked and constrained by the remote clients and can smother fire subsequent to finding the wellspring of fire. It is furnished with an observing framework and works through a remote correspondence framework. The fire identification framework is structured utilizing the sensors mounted on the fire contender robot. The robot is controlled self-sufficiently utilizing Android application. Android cell phone stage created by Google has picked up fame among programming designers because of its incredible capacities and open stage. In this way, Android is an incredible stage to control a Robotic framework. Android gives numerous assets and as of now coordinates part of sensors. This idea assists with creating enthusiasm just as advancement in the field of robotics while moving in the direction of a down to earth and possible answer for spare lives and moderate the danger of property harm.

Keywords—: Fire source detection, Autonomous Navigation, Sensors, Fire extinguishing, Android.

1. INTRODUCTION

Firefighting and safeguarding the unfortunate casualties is an unsafe assignment. Fire Fighters need to confront risky circumstances while extinguishing the fire. Fire Fighters quench fires in tall structures, drag substantial hoses, move high stepping stools, convey exploited people from one working to another. Notwithstanding long and sporadic working hours, fire warriors additionally face antagonistic condition like high temperature, residue and low stickiness. Moreover, they likewise need to confront hazardous circumstances like blast and breakdown structures. As indicated by the report of IAFF in the year 2000, 1.9 fire contenders per 100,000 structure fires have lost their lives every year in USA. In any case, this rate was expanding to 3 for each 100,000 structure fires. The various reasons for Line of Duty Deaths (LODD) are smoke inward breath, consumes, smashing wounds and related injury. Measurements shows that the passings of fire warriors are consistent consistently. This outcomes needing firefighting machines to help the fire warriors to maintain a strategic distance from passings by taking care of the perilous circumstances. So if a robot is utilized rather, which can be controlled from a separation or which can perform activities cleverly independent from anyone else, which will lessen the danger of this undertaking of fire battling. Robot is a mechanical gadget that is utilized for performing assignments that incorporates high hazard like fire fighting[1]. There are numerous sorts of robots like fixed-base robots, portable robots, submerged robots, humanoid robots, space robots, medications robot and so on. The fixed base robot has a restricted workspace because of its structure. The workspace of the robot can be expanded by utilizing a versatile stage. These sort of robots are called versatile robots. Versatile robots are utilized in mining, military, ranger service, security and so forth. Portable robots can likewise be utilized for extinguishing the fire in burrows, enterprises, medical clinics, research centers, and homes. A fire battling robot will diminish the need of fire warriors to get into hazardous circumstances. Further, the robot will decrease the heap of fire contenders. It is difficult to douse the fire and salvage numerous exploited people during a period of gigantic catastrophe. Robot innovation can be productively utilized in such cases to save considerably more exploited people. In this manner, robotics makes human life simpler and sheltered just as spare a great deal of

time. The fast advancement in innovation improves the instruments and supplies utilized in firefighting. These development apparatuses and types of gear can be progressively compelling and proficient. In addition, it decreases the least hazard level. This will likewise lessen the harms caused because of a fire occurrence.

Android depends on Java programming language and is stage autonomous. Thusly it tends to be utilized in understudy ventures. Android application is a program that can run on the Android working framework and give the necessary usefulness to the client. The Android stage incorporates support for Wifi correspondence. Utilizing the Wifi APIs, an Android application can examine for Wifi gadgets, associate with different gadgets, move information to and from different gadgets.

2. Literature Review

In the present period fire battling is a hazardous issue. Numerous creators are chipping away at various methods for fire battling. Creator Ratnesh Malik et al. has built up a methodology towards fire battling robot. The robot is planned and developed which can stifle fire. The robot is self-governing. It executes the idea likes ecological detecting and mindfulness, relative engine control. The robot forms data from its sensors and equipment components. Bright, Infrared and noticeable light are utilized to identify the parts of the condition. The robot is fit for battling burrow fire, industry fire and military applications are structured and constructed. Bright sensors are utilized to recognize fire. When the fire is identified, the robot sounds alert. At that point, the robot initiates an electronic valve which discharge sprinkles of water on the fire. Point by point idea of a robot is clarified which naturally identifies fire and quenches it in a brief timeframe by the utilization of sensors, microcontrollers and so on. This robot is utilized in places where human lives are at high risk[2].

Creator Kristi Kokasih et al. have created an astute fire battling tank robot. Tank robot is produced using acrylic, plastic, aluminum, and iron. Robot parts are two servo engines, two DC engines, ultrasonic sensor, compass sensors, fire indicator, warm exhibit sensor, the white finder (IR and photograph transistor), sound initiation circuit and smaller-scale switch sensor. The goal is to look through a certain territory, discover and quench the fire for various fire positions, room set up with unsettling influence. The robot is initiated through the DTMF transmitter and receiver[3].

H.P. Singh et al create control of an Autonomous Industrial Fire Fighting Mobile Robot. The paper depicts the development and plan of versatile fire battling robots. The framework contains two optically detached D.C. engines. The robot performs simple to advanced transformation of the information gave by infrared sensors. Five infrared sensor are utilized. Two sensors control the movement of the robots and three are for fire discovery. The douser includes a D.C water siphon and a water compartment. The fundamental subject of the paper is to detect the flares of fire and stifle it. This infrared sensor is utilized as an info sensor which detects the infrared beams leaving the fire. The microcontroller controls the extinguishing system.[4]

Swati Deshmukh et al create remote fire battling robot. It involves a machine that has the capacity to recognize fire and smother it. The fire battling robot can move in both forward and switch heading and can turn in left and right headings. Consequently, fire warriors can work the robot over a long separation and there is no requirement for humans close to the zone on fire. Light needy resistors are utilized for the location of the fire. These resistors are profoundly touchy gadgets and are fit for distinguishing extremely little fire. The robot gives security at home, structures, industrial facilities, and research centers. It is a smart multisensory based security framework which contains fire battling framework in day by day life.[5]

Wireless controlled robot with fire identification sensors created by Lakshay Arora comprise of the cell phone which controls a robot by making a call to the cell phone which is connected to the robot. During the call enactment period, if any catch is pushed on the telephone, the tone compared to the catch squeezed is heard at the opposite finish of the call that is put on the robot. The robot sees Dual- Tone Multiple-Frequency (DTMF) tone with the assistance of the telephone mounted on the robot. The got code is handled by the microcontroller and afterward, the robot performs activities as needs are. In the proposed framework DTMF innovation is utilized to situate the pole of the engine at a necessary point with various sensors, each playing out its very own errand. Rough, Simple and financially savvy framework is proposed here.[6]

Android Phone controlled Robot Using Bluetooth is created by Arpit Sharma et al. Different systems of Human Machine association utilizing signals are introduced. Motions are caught by utilizing the accelerometer. The paper investigations the movement innovation to catch signals utilizing an android advanced mobile phone which has an inbuilt accelerometer and Bluetooth module to control the energy of the robot. The microcontroller controls the signs of the Bluetooth module. Highlights like easy to understand interface, lightweight and transportability OS-based advanced cell has overwhelmed the complexity of advances like a programmable glove, static cameras and so forth making them obsolete.[7]

Creator Saravanan P has planned and built up an Integrated Semi-Autonomous Fire Fighting Mobile robot. The System controls four D.C. engines fueled by Atmega2560 and controlled independently by route framework. Route framework contains incorporated ultrasonic sensors and infrared sensors. The robot is fitted with a remote camera which catches the video and transmits it to the base station. The fire location contains LDR and temperature sensor. In the event that there is a fire the sensor identifies it and the robot will be moved to the source and quenches it.

The extinguishing framework comprises of a BLDC engine with water compartment. The SABOT can be worked physically for extraordinary conditions. It contains a GUI support through which robot can be controlled from the base station.[8]

Poonam Sonsale et al create smart Fire Extinguisher System. The paper proposes of a versatile combination calculation for fire discovery. It utilizes a smoke sensor, fire sensor, temperature sensor for fire location. It contains shrewd multisensory based security framework that contains a fire battling framework in day by day life. The security framework can distinguish strange and perilous circumstance and inform. Smart structures are relied upon to be more secure advantageous and effective living situations for society. The motivation behind Intelligent Fire Extinguisher System is to stifle fire in a specific measure of time. The framework identifies the fire area and douse fire by utilizing sprinklers. As being Intelligent System, it removes the power of zone where fire has been gotten and begins the sprinklers just of that area.[9]

Remote Controlled Fire Fighting Robot created by Phyo Wai Aung portrays the elements of remote control fire battling robot. It contains two primary parts that is transmitter and recipient in which two arrangements of RF modules are utilized. One RF module is utilized to transmit the information to the engine driver and another RF module is utilized to realize the condition on fire. Microcontroller PIC16F887 is utilized work the entire arrangement of the fire battling robot. The engines are driven by the L298 and ULN2003 drivers in this framework. The administrator controls the robot by utilizing remote camera mounted on the robot. On the off chance that the temperature of fire sight is over 40 degree Celsius, the alert will ring with the goal that administrator can control the fire battling robot and stay away from the harm of heat.[10]

3. Conclusion

Fire causes huge harm and loss of human life and property. It is some of the time incomprehensible for the fire contender staff to get to seeing fire as a result of unstable materials, smoke and high temperature. Through this we can infer that robot can be put where human lives are in danger. The robot can work in nature which is out of human reach in extremely brief timeframe. In such situations, fire battling robots can be helpful for extinguishing fire. These robots ought to be controlled remote administrators who are situated far away from the fire site utilizing remote correspondence frameworks. The robot precisely and effectively finds the fire inside least time after the fire is distinguished. In future work Project plans to elevate innovation advancement to accomplish a solid and proficient result. Portable robot that can travel through a model structure, discover fire and quench it. The development of the robot is constrained by the sensors, which are fixed on the portable stage .is to give security of home, research center, office, production line, and building is imperative to human life. We build up a wise multisensory-based security framework that contains a fire battling framework in our everyday life. We plan the fire discovery framework utilizing sensors in the framework, and program the fire identification and battling technique-utilizing sensor based strategy.

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