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FIRE FIGHTING ROBOT

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***ABSTRACT**--The motivation behind this project is that firefighter's death. Many fire fighters are struggling to perform their duty which causes much death while on a mission and the circumstances to each incident. Firefighters are our heroes and our sense of security in times of trouble. They put themselves on dangerous situation to protect us. At present, the world is moving toward the use of technologies software and hardware. This paper proposed a smart firefighting robot system which designed to detect the source of fire, extinguish it and increase the knowledge about fire behaviour from incident area. This robot will reduce the risk of injury for firefighters and possible victims and decrease the monetary losses which increase considerably as fire duration increases. It consists of the ultrasonic sensor mounted on a servo motor for obstacles detection and equipped with flame sensors for detecting fire. It also makes use of liquid-tank and spray mechanism for extinguishing the fire. The spraying nozzle is mounted on a servo motor to cover maximum area. The whole system is programmed using an Arduino UNO board which forms the brain of the system. In addition to this the use of air sensors make it more applicable. It helps to detect the presence of toxic gases in the firing area.*

***Keywords**—ROBOT, FIRE*

I. INTRODUCTION

This project is based on firefighting robotic. A robot is a machine that perform task usually human do it.it refer to a machine that performs works to assist people or work that humans which find difficult or undesirable. Robotics has gained popularity due to the advancement of many technologies of computing and non-technology making humanoid is easier and comfortable. The system is developed to support firefighters due to wide range of fire events including fire involving structures,vehicles,aircrafts,ships,and wildlands.These robots which we used for detect and extinguish fire by means of various sensor.The robot moves through a model structure and if fire still exists,it can be extinguished with the help of pump and sprays.A robotis system is designed to perform various tasks using sensors to perceive its environment,computer programs to control the robot,and a human operator to assist with robot operation.

The use of robots is increasing and it becomes very essential to save human life.since it reduce the risk of human injuries and losses it is a great achievement in modern technology.thus by the use of fire fighters ,fire detection and rescue activities can accomplish with higher security and dangerous conditions can be avoided.

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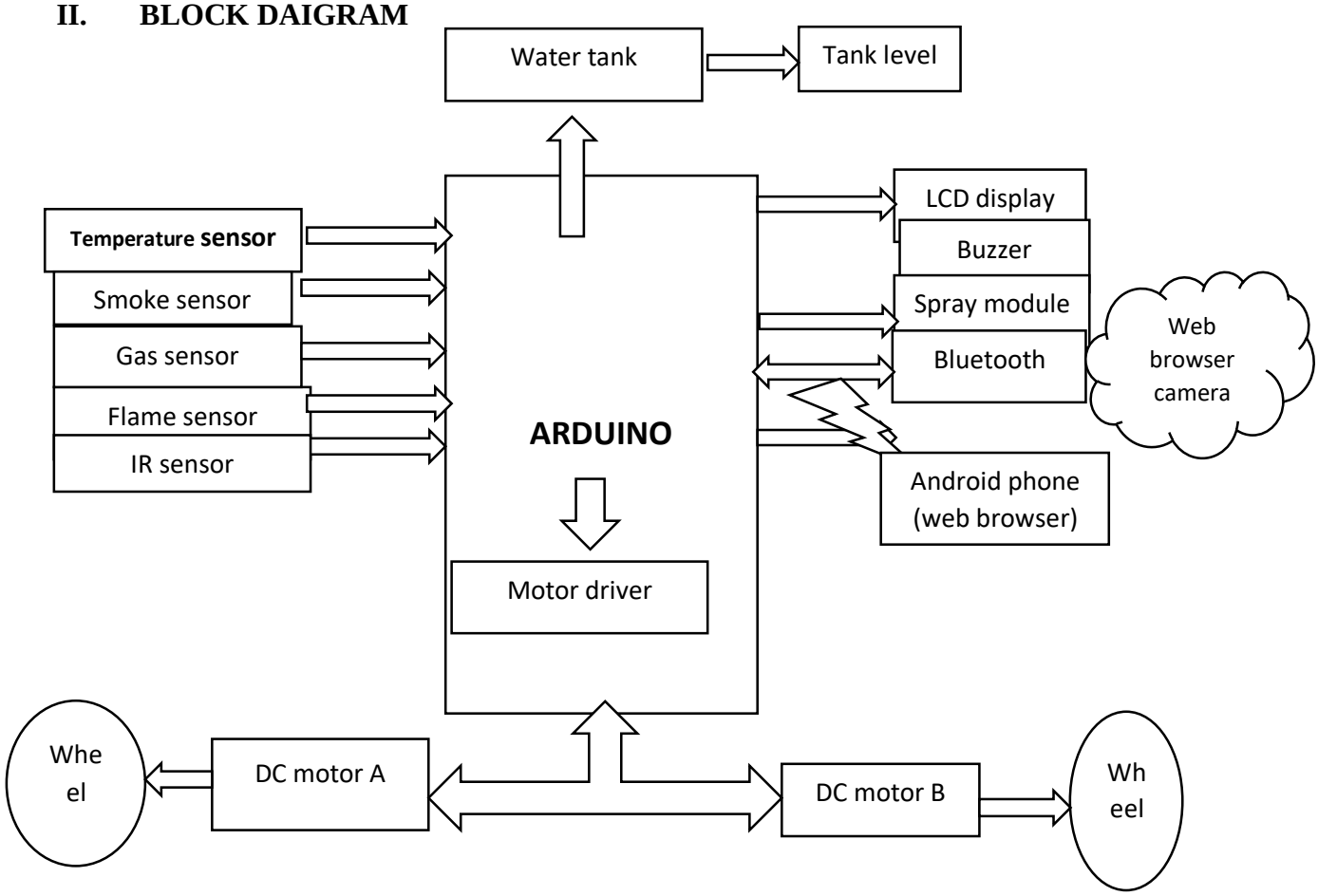
II. BLOCK DAIGRAM



III. WORKING

The design of firefighting robot consist of microcontroller LPC 2138, LCD display,temperature sensor,smoke sensor,IR sensor,flame sensor,gas sensor,relay,pump,DC driver IC,DC motors,Bluetooth module and having one android phone.we can design a server for controlling the robot and can monitor the different parameters from web server.

The robot will continuously monitor the temperature with the help of temperature sensor interfaced to the controller and send these parameters on web from android phone via Bluetooth module interfaced to the controller.The LCD display present on the robot will display the temperature readings.

The fire is also detected with the help of smoke sensor.After detecting fire the robot will automatically turn on the pump in order to extinguish fire catches.

The flame sensor is designed for detecting as well responding to the occurrence of a fire or flame. This sensor detects flame otherwise wavelength within the range 760 nm-1100 nm from the light source.

The gas sensor detect the variation in the concentration of toxic gases in order to maintain the system safe and avoid unexpected threats.There are various gas sensors to detect gases like oxygen,carbon

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dioxide,nitrogen,methane etc.They are commonly found in devices that are used to detect the leakage of harmful gases,monitor the air quality in industries and offices.

The obstacles present in the path of robot is detected by IR sensor.After detecting an obstacle robot can change its direction.

All data from robot is sent to the android phone via Bluetooth module interfaced to the controller and is then sent to the web server from android phone.so one can control the robot movement left/right from web server.

IV. APPLICATIONS

- Automatic fire fighters are used in:
- Military vehicles
- Mass trasit systems
- Hazardous materials storage facilities
- Data centers and server rooms
- The pharmaceutical industry
- Disaster area monitorting and rescue
- Extinguishes fire where probability of explosion is high.
- Usable in power plant control rooms, captian bridges, flight control centers.

V. ADVANTAGES

- Reduce human effort
- Reliable and economical
- Not sensitive to wheather condition
- To detect the exact direction of the fire source
- Capability of sensing accurately with increased flexibility

VI. FUTURE SCOPE

Weight capacity can be improved.

VII. CONCLUSION

This project proposes a great chance for automation and will be useful at places where human cannot reach or is dangerous.This will be helpful in automation industry also.The designed robot can makes movements in all directions.hence it reduces the human efforts and also protect their property.The robot detects the fire with the help of a sensor and extinguish the fire with the help of a water sprinkler pump.This robot will reduce the risk of injury for firefighters and possible victims and decrease the monetary losses which increase considerably as fire duration increases.

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