



Autonomous Fire Fighting Robot

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1.0 PROBLEM DEFINITION AND PROJECT OVERVIEW

With the advent of technology, humans are replaced with robots in life-threatening situations. Disasters can be avoided with minimal risk to human life.

Our project aims to design a robot capable of detecting and suppressing fires. In this report, we explain in detail the designing and implementation of an autonomous fire fighting robot capable of detecting and extinguishing flames using Arduino UNO.

2.0 THE SYSTEM DEVELOPMENT PROCESS

This Robot automatically senses the presence of obstacles in its path and deviates the direction of movement. The obstacle detection mechanism is done by an ultrasonic sensor that makes use of ultrasonic waves to find the presence of an obstacle in its path. It detects the fire through a fire sensor.

The robot is made of DC motors. The predetermined instructions are already loaded into the Microcontroller. The controlling device of the whole system is an Arduino Microcontroller which is aided with one ultrasonic sensor and a fire sensor. There are two DC motors used to drive the robot in the Left direction when any obstacle is detected. If the fire sensor detects the fire, water sprays get ON thereby extinguishing the fire.

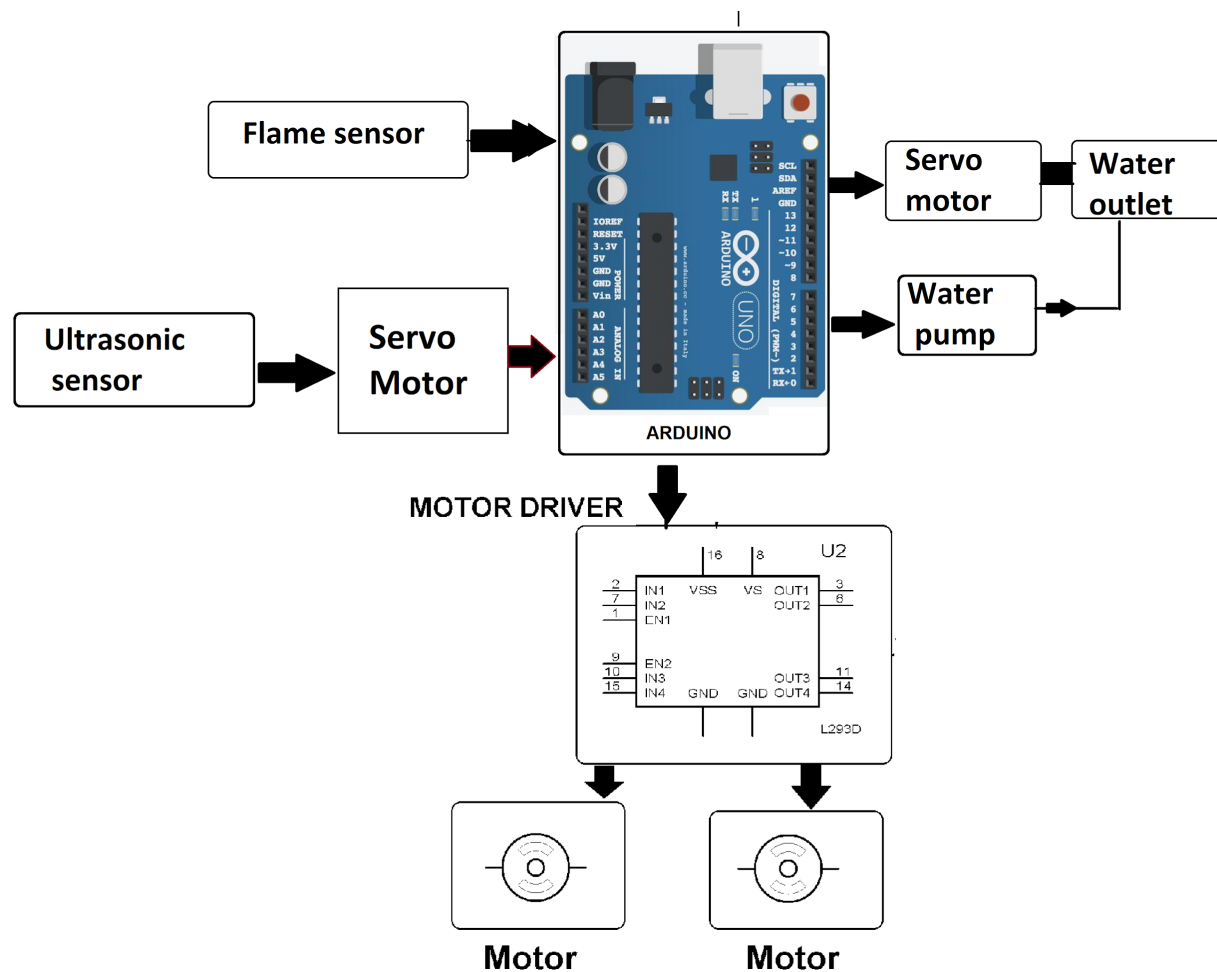
3.0 THE SYSTEM

The main blocks of this robot are

1. Regulated power supply

2. Arduino
3. Ultrasonic Sensor
4. Flame Sensor
5. DC motor with driver
6. LED indicators
7. Servometer

Block Diagram:



This project is implemented by using the following software

1. Express PCB - for designing the circuit
2. Arduino IDE studio compiler - Compilation Part
3. Proteus 7(Embedded C)- Simulation Part

4.0 SYSTEM EVALUATION

- ❑ We detect the direction of the fire and we can use the motors to move near the fire by driving our motors through the L293D module. When near a fire we have to put it out using water.
- ❑ Using a small container we can carry water, a 5V pump is also placed in the container and the whole container is placed on top of a servo motor so that we can control the direction in which the water has to be sprayed.
- ❑ Based on the robotic chassis that you are using you might set up the pumping system.
- ❑ We used a small aluminum can (cool drinks can) to set the pump inside it and poured water inside it. We then assembled the whole can on top of a servo motor to control the direction of the water.

Robot Model Picture

