

# Arduino Fire-Fighting Bot Algorithm

## **1. Initialization:**

- Initialize the microcontroller and necessary libraries.
- Set up I/O pin configurations.
- Initialize sensors, motors, and actuators.

## **2. Main Loop:**

- Continuously perform the following tasks:

## **3. Sensing:**

- Read values from flame sensors to detect the presence of a fire.
- Use ultrasonic sensors to detect obstacles and calculate distances.

## **4. Decision-Making:**

- If a fire is detected:
  - i) Stop the robot's movement.
  - ii) Activate the fire extinguishing mechanism.
  - iii) Wait for the fire to be extinguished.
- If no fire is detected:
  - i) Check for obstacle proximity.
  - ii) If obstacles are nearby, navigate around them.
  - iii) If there are no obstacles, continue moving forward.

## **5. Navigation and Movement:**

- Implement a navigation algorithm for obstacle avoidance and path planning.
- Control the DC motors to achieve autonomous movement.

## **6. Fire Extinguishing:**

- Activate the servo-controlled fire extinguishing mechanism.
- Ensure the fire is extinguished by directing the extinguishing agent toward the fire source.

## **7. Feedback and Status:**

- Monitor the temperature using the infrared sensor.
- If the temperature remains high (indicating a fire), continue extinguishing.
- If the fire is extinguished, mark it as such and resume navigation.

## **8. Loop Continuation:**

- Continue looping through these steps, enabling the robot to operate autonomously in search of fires and obstacles.

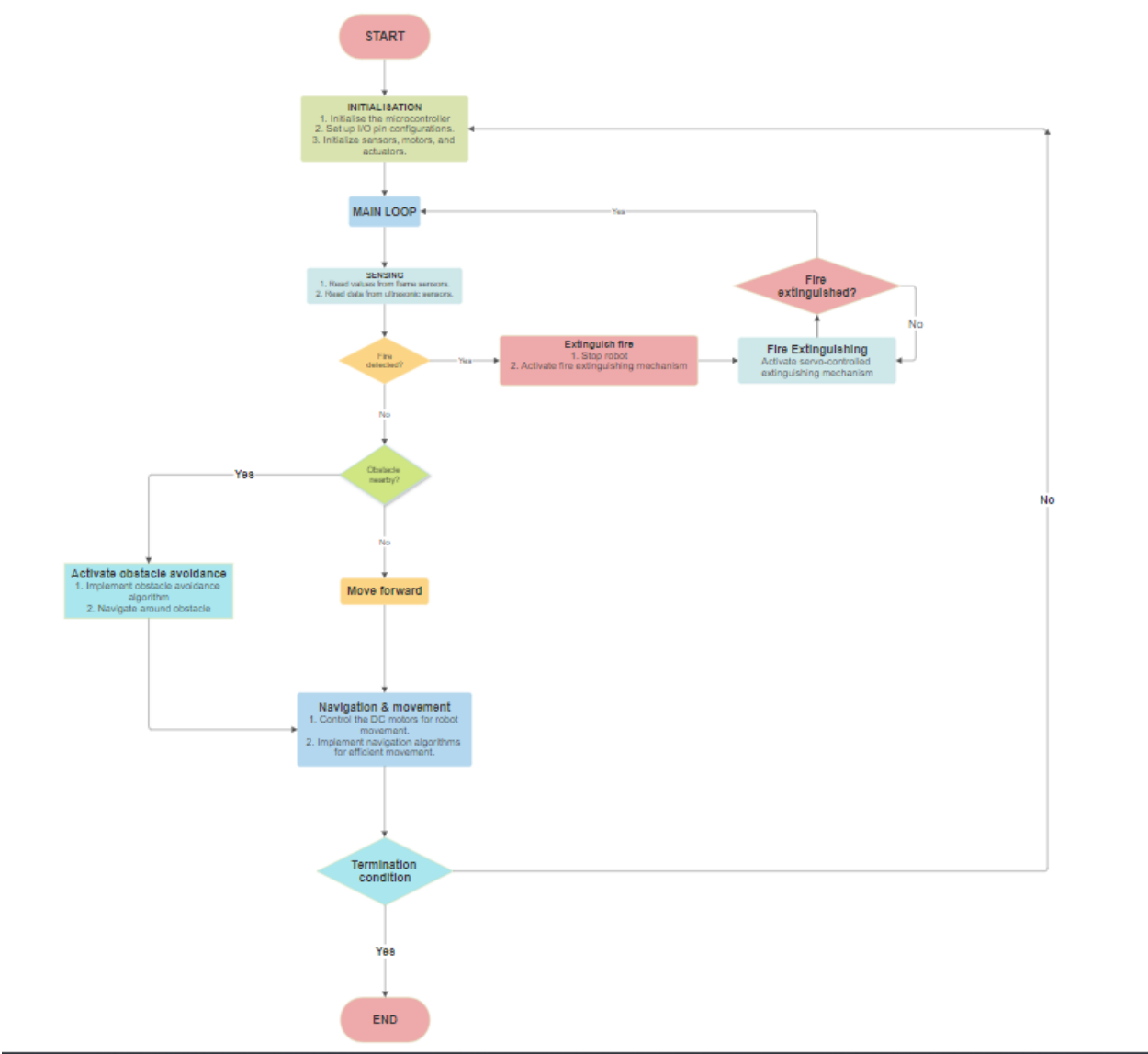
## **9. Challenges Handling:**

- Implement error-checking and fault tolerance mechanisms.
- Address any calibration or mechanical issues encountered during operation.

## **10. Termination:**

- Provide a mechanism to stop the robot when necessary or upon project completion.

FLOWCHART



Flowchart

