FIRE FIGHTING ROBOT

TEAM MEMBERS

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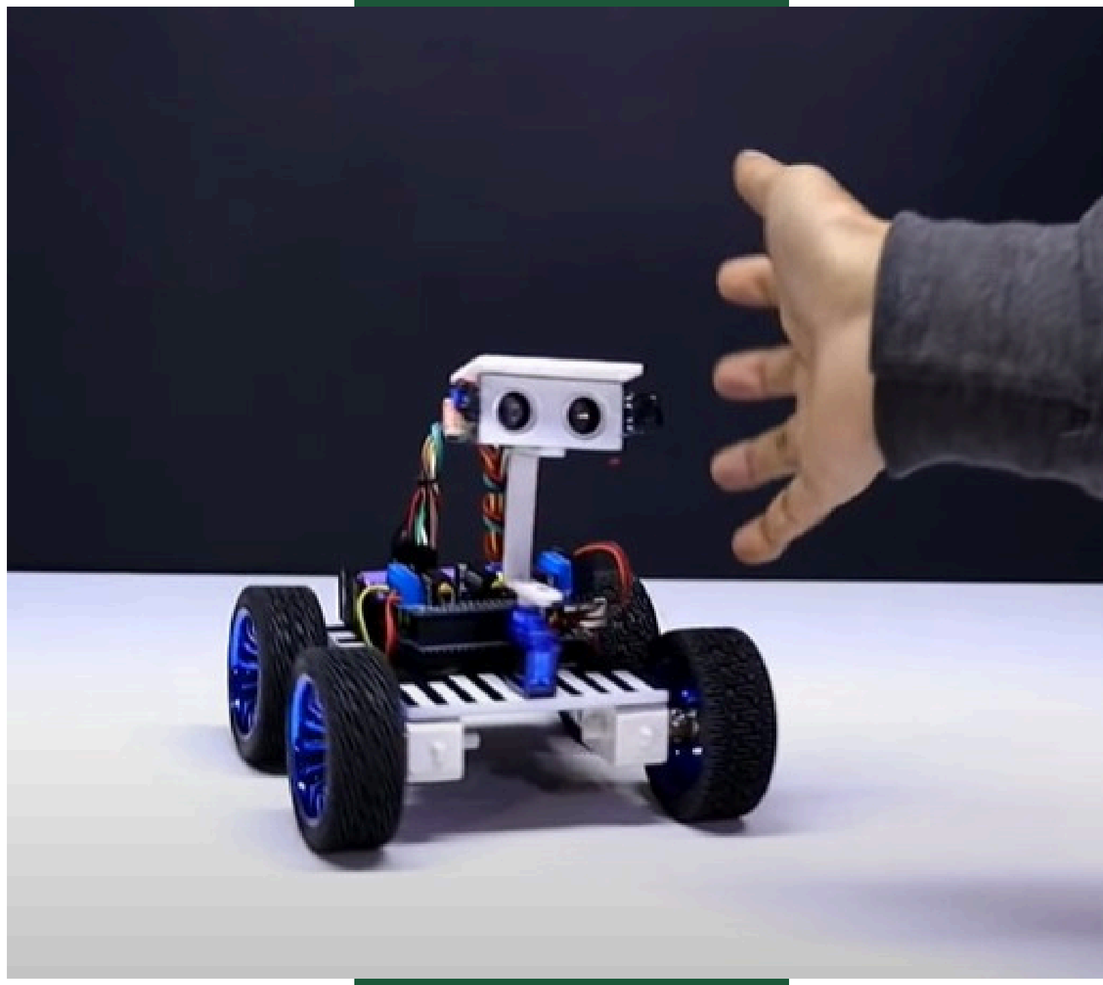

INTRODUCTION

- A fire-fighting robot is an autonomous or remotely operated robot designed to assist in combating fires.
- These robots are engineered to operate in hazardous environments where human firefighters might face significant risks. .
- They can be equipped with various sensors, cameras, and extinguishing mechanisms to detect, assess, and address fire incidents.
- Fire-fighting robots are increasingly used in both industrial settings and urban environments to enhance safety, improve response times, and manage challenging fire scenarios effectively

PROBLEM DEFINATION

- Objective: Develop a fire-fighting robot that can autonomously detect, approach, and extinguish fires in various environments, ensuring safety and efficiency.

- Key Problems to Address:
  1. Fire Detection and Localization: Accurately detect the presence and location of fire amidst smoke, heat, and varying lighting conditions.
  2. Navigation and Mobility: Move through complex and hazardous environments (e.g., smoke-filled rooms, debris-strewn areas) while avoiding obstacles and navigating safely.
  3. Fire Suppression: Effectively deploy fire extinguishing agents (e.g., water, foam, dry chemical) to put out the fire.
  4. Environmental Adaptation: Operate under extreme conditions like high temperatures, low visibility, and structural damage.

HARDWARE REQUIREMENTS

COMPONENTS REQUIRED:

1. Flame sensors x 3
2. Arduino UNO
3. Chachies
4. BO motors x 4 (+wheels)
5. L298 Motor driver
6. Solder-less Breadboard
7. Mini servo
8. 5-9 V Water pump + pipe
9. Water tank / bottle
10. 3.7 V batteries (18650) x 11. Jumper wires
12. TIP-122 Transistor + 104 uf capacitor + 1K Resister

SOFTWARE AND COST ESTIMATION

Software Requirements:

- Operating System
- Arduino IDE
- Navigation and Control
- User Interface

Estimated Cost:

- Flame Sensors (x3): ₹200 - ₹300 each
- Arduino UNO: ₹400 - ₹600
- Chassis (robot chassis): ₹500 - ₹800
- BO Motors (x4) + Wheels: ₹100 - ₹200 each
- L298 Motor Driver: ₹200 - ₹400
- Solder-less Breadboard: ₹100 - ₹200
- Mini Servo: ₹150 - ₹300
- 5-9 V Water Pump + Pipe: ₹500 - ₹800
- Water Tank/Bottle: ₹50 - ₹100
- 3.7 V Batteries (18650) x11: ₹100 - ₹200 each
- Jumper Wires: ₹50 - ₹100
- TIP-122 Transistor + 104 µF Capacitor + 1K Resistor: ₹20 - ₹50

THANK YOU