ROS-Enabled Firefighting Robot

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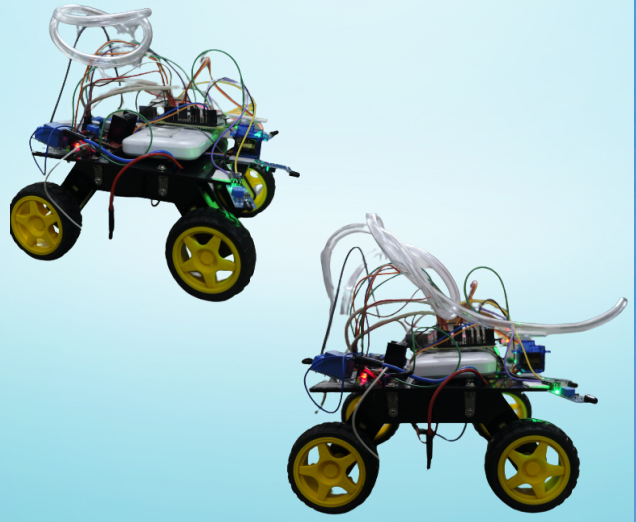
Branch: Computer Science And Artificial Intelligence

Introduction

A ROS-Enabled Fire Fighting robot is designed which navigates to a flame and extinguishes it when a flame is detected. It uses three flame sensors, and all four motors are powered by a single motor driver which is powered by a power bank.
There is a water pump and relay. The pump operates when it detects a flame the relay acts as a switch and will turn it on and when not detecting a flame it will turn off the pump. Robotic operating system is used in order to control the movement and the pump operations using publishers, subscribers and topics.

Images



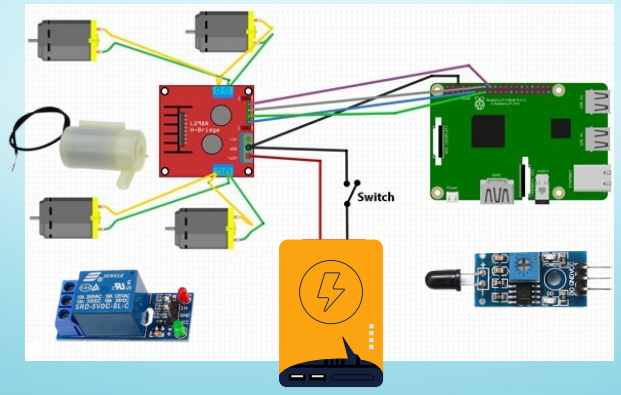
Software used

- Ros Melodic
- Rasbian Buster Version
- Remote Desktop
- Windows Disk Management
- SSH (Secure Shell)
- Python

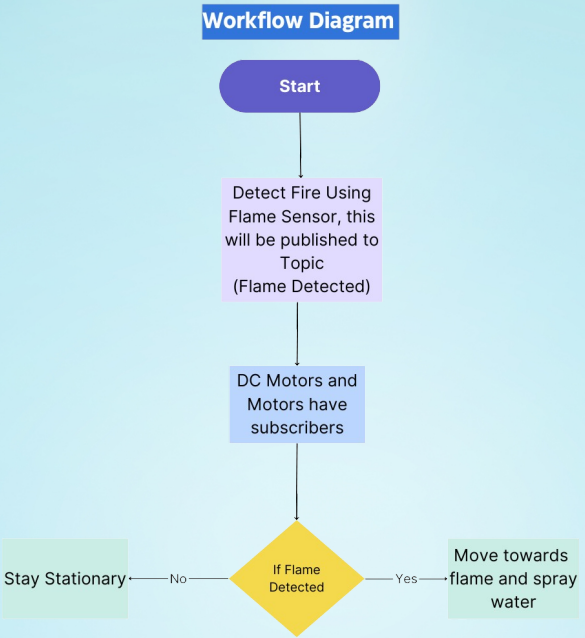
Hardware used

- Raspberry pi
- SD Card
- L298 Motor driver
- Flame Sensor
- Kit4 Curious Robot Chassis
- Power Bank
- DC Motors & Servo Motor
- Submersible Water Pump
- Jumper Wires
- Relay

Block Diagram



Flow Chart



Resources

- https://www.raspberrypi.com/software/
- http://wiki.ros.org/melodic/Installation/Ubuntu
- https://shubhamnandi12.medium.com/the-easiest-way-to-install-ros-melodic-on-raspberrypi-4-fa1e06237005
- https://components101.com/modules/l298-motor-driver-module
- https://www.electronicshub.org/raspberry-pi-l298n-interface-tutorial-control-dc-motor-l298n-raspberry-pi/