OBSTACLE AVOIDANCE FOR GROUND ROBOT

MidEval presentation
ESW PROJECT Group 9

TEAM 25 - GIGAHERTZ

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MOTIVATIONS AND OBJECTIVES

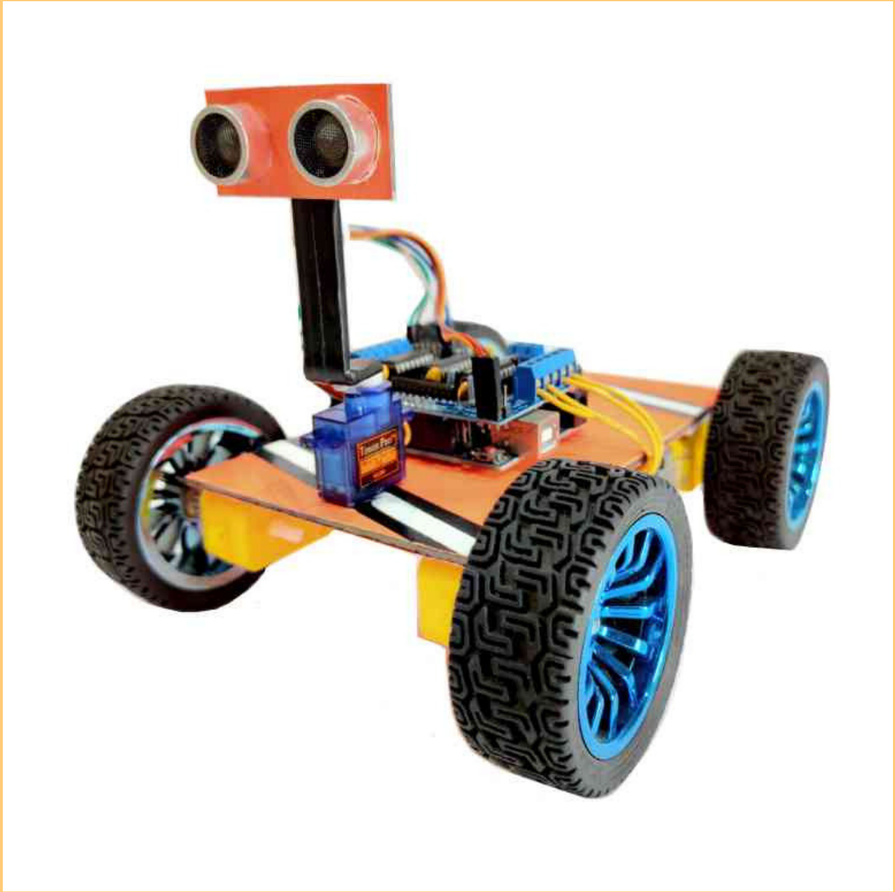
- Obstacle avoidance is the property which all the self-driving autonomous cars and delivery drones mostly rely on. Hence Our project is focused on developing a ground robot capable of seamlessly navigating through any obstacles encountered in its path, thereby achieving robust Obstacle Avoidance capabilities

- The motivation behind this project comes from a deep seated curiosity to explore the frontiers of robotics technology. Ultimately, The satisfaction of watching a robot successively navigating through Obstacles is itself the most powerful motivator for us, pushing us to overcome any hurdles in the project.

PROJECT IMPLEMENTATION

As you can see, the front of our car has an ultrasonic sensor and servo motor while the back has a motor diver that turns the wheels. We can integrate these 3 components using a microcontroller like ESP32.

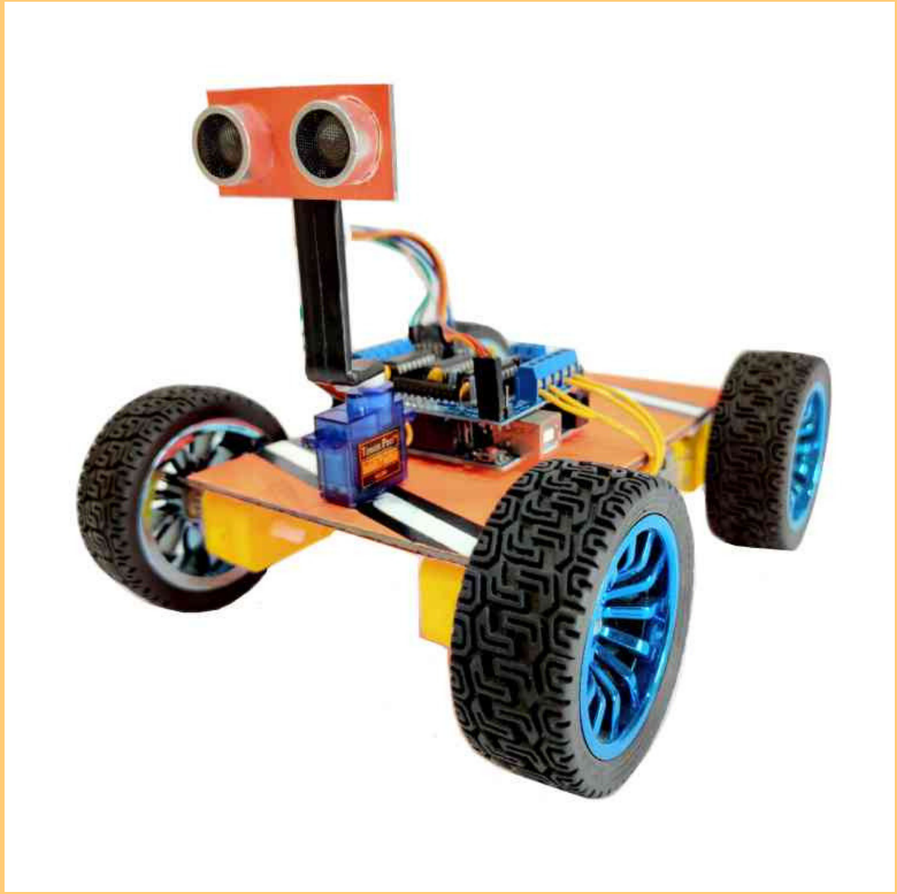
. Our singular aim is to engineer a car-shaped robot which is equipped with the capability of Autonomously navigate through intricate obstacles with grace and precision.



PROJECT IMPLEMENTATION

·The basic idea behind this project is to employ an energy efficient local path planning technique called “Predictive Artificial potential field algorithm” to successfully avoid the obstacles and move along the intended path to the destination

·For DATA ANALYSIS stage of our project, we intend to build multiple obstacle patterns of varying distances and determine the effectiveness of our algorithm in a range of actual world scenarios.



PROGRESS OVERVIEW

- Till now, we assembled the car with ultrasonic sensor, servo motor and motor driver. All that’s left is to include the potential field algorithm in our code and run the error corrections

1. Motor driver helps in the movement of the car forward or backward.

2. , Ultrasonic sensor which is fixed at the front of the car will gives us the location of the obstacle by calculating the distance of the object present in front of the car

3. Servo motor will be triggered when ultrasonic sensor detects the obstacle and helps in rotating the ultrasonic sensor to calculate the path where there is no obstacle. This is where Predictive potential field algorithm is used

Contributions by each member

1. SWAROOP AND SAI	Devising the potential field algorithm
2. CHANUKYA	Coding part of ultrasonic sensor and servo motor
3. PRATYUSH JENA	Assembled the car and integrated the sensors with esp32 along with motor driver.

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3. **Navigation:**
   Incorporating Obstacle avoidance into its navigation strategy, the robot will be able to move from one location to another safely.

PROJECT TIMELINE