Technical Report for ENDGAME Team

Team Members:

Mechanical:

- **Amr Labib Mohammed**
- **Mustafa Labib Mohammed**

Other Members:

- **Ahmed Ali Khalil Hamed**
- **Mostafa El-Sayed Mostafa Atya**
- **Nader Elsayed Eldiasty Saber**
- **Youssef Abdel-Ghani Mahmoud Al-Fawakhiri**
- **Youssef Mohamed Badawi Abdel Hamid**
- **Youssef Abdel Moneim El Sayed Ali El Bishbashi**

Final Render :

Introduction:

This report outlines the components needed for designing a robot adhering to the rules of the PLAZA competition. The objective is to design a robot that is compact, efficient, and capable of completing the competition's challenges.

Key Components for the Robot:

1. Mechanical Components:

Chassis:

Dimensions: 27 × 30 cm.

Material: Lightweight yet durable materials Wood

Design: Compact to fit within the specified dimensions and provide stability.

Structure (Frame):

The frame should accommodate the robot's height limit of 10 cm while maintaining structural integrity.

Wheels:

wheels designed for stability and adequate traction on the arena’s surface.

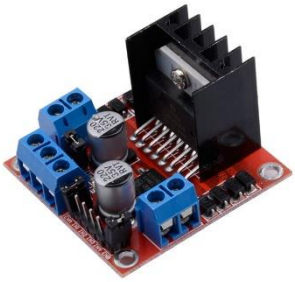
Arm & Gripper:

Extendable up to 35 cm for load manipulation.

Servo-actuated gripper with force feedback to prevent drops.

2. Electronic Components:

Microcontroller:



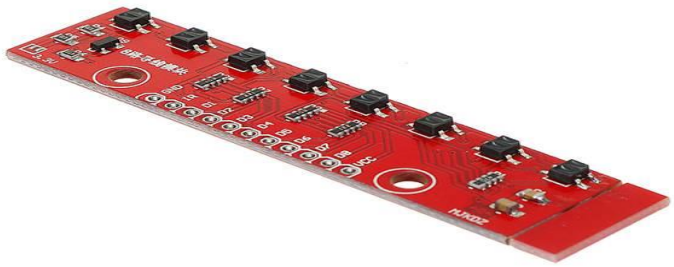
L298 Motor Driver Module

A compact and efficient controller ESP32 to save space.

ESP-WROOM-32 CP2102

Sensors:

Line Follower Sensors: For detecting and navigating the line track.



QTR-8RC 8 Channel Line Tracker

Display & Feedback:

A small-sized LCD

Buzzer for race completion signal.

Battery:

A lightweight 24V DC battery to power the robot

Wiring and Connectors:

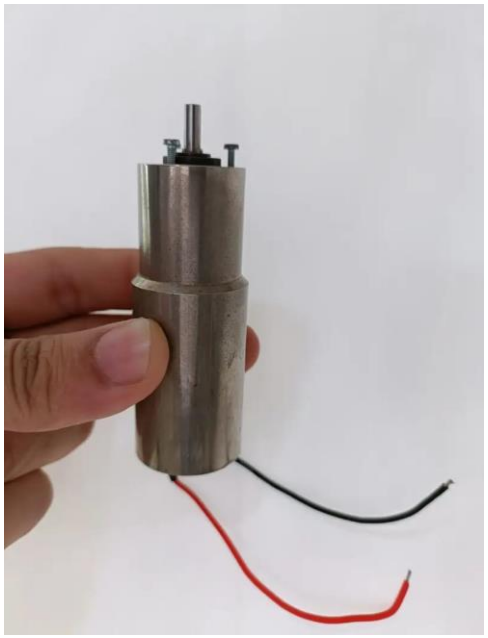
Short and organized wiring to reduce clutter and fit within the compact frame.

3. Motors:

DC Motors:

Compact motors to drive the wheels and provide adequate torque for movement.

12V-300RPM 7.5Kg.cm



24V-170RPM 12kg.cm

Servo Motors:

For precise control of the arm and grip mechanism.

Servo Motor MG995

Micro Servo Moto