**FUTURE ENGINEERS DOCUMENTATION**

**1. Mobility Management**

Our robot uses one medium motor to power both wheels at the back to enable the robot to go either forward or backward. It is a rear-wheel drive robot with a servo motor at the front connected to the front wheels with gears. We utilized one medium motor and a servo motor to make it less complicated when coding the robot’s movement. The different parts of the robot are connected to its chassis with the help of bolts and screws and also some velcro patches. Our robot doesn't need to push anything at the tournament and it's just in a flat surface so we prioritized balancing the speed over torque to allow the robot to finish the task quickly but effectively

**2. Power and Sense Management**

Our robot is powered by three 3.7 volts Li-ion rechargeable batteries that is sheared by the different motors and sensors that is attached to the robot, it is placed at the back of the robot to balance the weight and to ensure that the three massive batteries will not be in the way of the wirings. The sensors that we have used is a color sensor that we used is to dictate a certain movement because of a certain color. Next sensor is the ESP32 Camera connected to ESP32 MB, it is the main source of information for our robot, it detects not only the color but it's also useful for detecting objects at a distance. All of the sensors and power system is connected to a drive motor that is connected to the ESP32 camera as you can see at the provided circuit diagram.

**3. Obstacle Management**

We used a color sensor, ESP32 camera, and servo motor in order for us to avoid those obstacle courses for the challenge.

For the obstacle, if the camera senses a red pillar, the servo motor will turn right to avoid the obstacle, and if it detects a green pillar, it will turn left in order to avoid the obstacle. For the phase 2 of the Future Engineer challenge, whereas the robot was in the quarantine zone and the toss coin determines the direction of the robot is facing. The color sensor helps detects an orange line, it will turn right, and if it detects a blue line, it will turn left, and the code will run 3 times, then park in the specific spot of the track.