17/03/2024

Week-4:

Topics:

- To test stepper motor (Mini stepper motor - 28 BYJ 48), mini dc motor.
- To test gear reduction dc motor.
- To plan the project process and prepare a Gantt chart.
- To setup ubuntu and ROS to the raspberry pi
- Brainstorming about automatic charging

Participants:

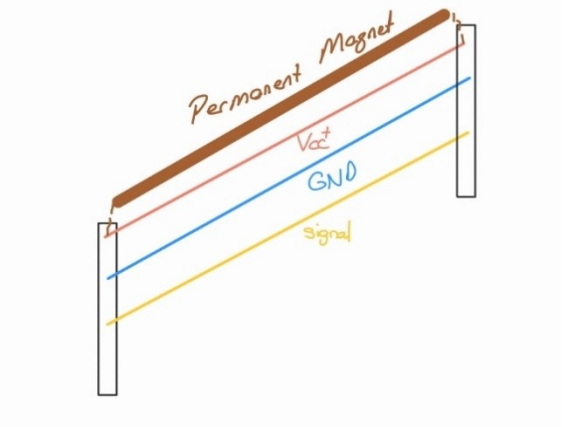
- All members of the group participate to meeting.

Conceptual Designs:

Automatic Charging:

1- Type of charger:

A. Rail type charging with uncoated cable:



All cables are installed without coating. The purpose here is to ensure that the robot can be charged directly from any point on the cable.

Advantages:

+ Ability to charge from at any point on the line.

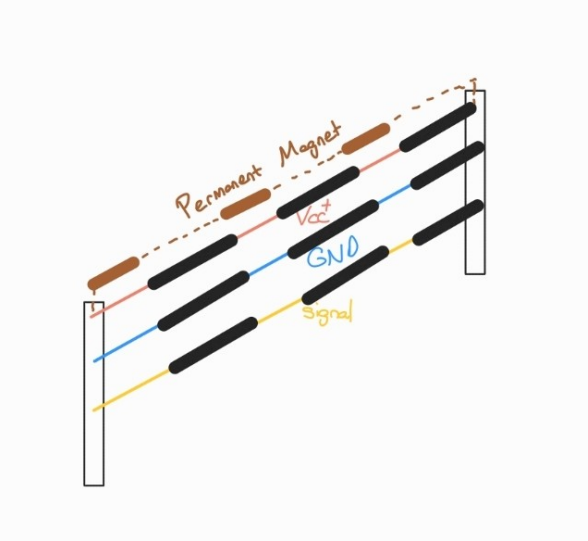
+ Facilitate writing software that is about finding charging place.

Disadvantages:

- Since the cables are uncoated, short circuits may occur after contact with foreign material.

- Since there is no designated charging area, incompatibility may occur between robots.

B. Rail Type Charging With Half Coated Cable:



All cables are installed with half coating. The uncoated location is longer than connecter of the robot. Purpose here is to facilitate connection of the robot to charging area. Charging areas are separated from each other.

Advantages:

+ Ability to charge from at relatively large point on the line.

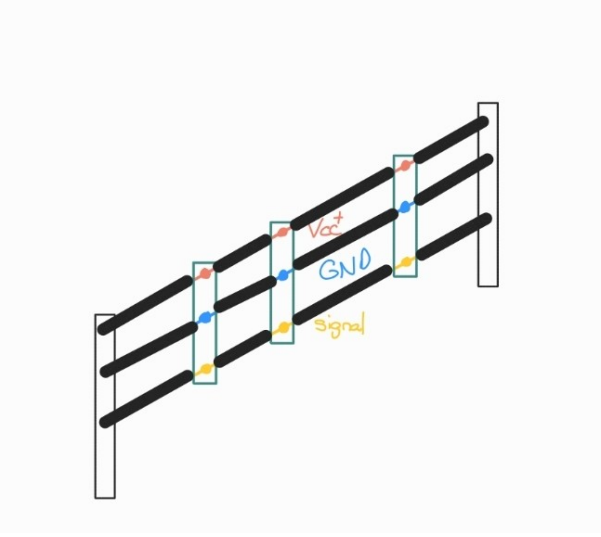
+ To facilitate writing software that is about finding charging place.

Disadvantages:

- Since the cables are half uncoated, short circuits may occur after contact with foreign material.

- Software still needs to find the available charging area.

C. Rail Type Charging With Connector:



All cables are installed with coating. To connect robot to charging station, connector is used. Purpose here is to prevent unwanted cable contact. Charging areas are separated from each other at specific location.

Advantages:

+ Ability to prevent unwanted cable contact.

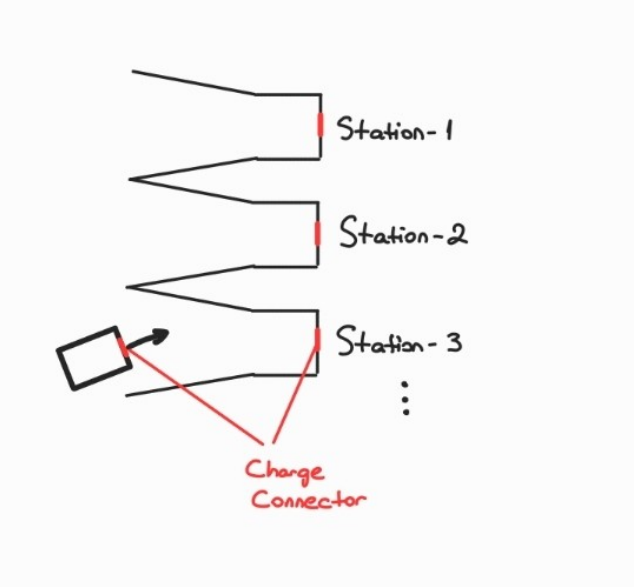
+ Life of the product is increased.

+ Separated charging place.

Disadvantages:

- Software needs to find the available charging area with a specific point.

D. Road Type Charging With Connector:



There is a narrowing road at the entrance of the charging station. Even if the robot comes to the charging station at the wrong angle, it can sit on the charging station by sliding on the elevation at the border of the road.

Advantages:

+ Ability to prevent unwanted cable contact.

+ Life of the product is increased.

+ Separated charging place.

+ To facilitate writing software that is about finding charging place.

Disadvantages:

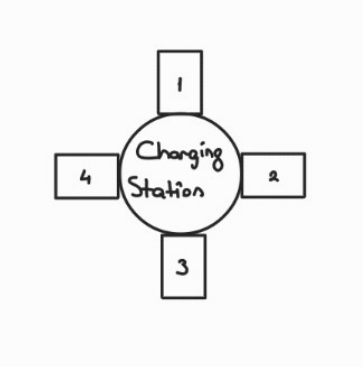
- Software still needs to find the available charging area.

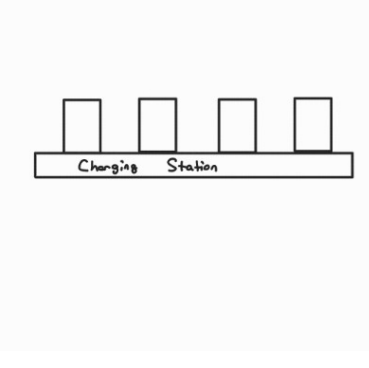
- Since robot may have distance sensor, the border elevation of the road may cause confusion of control software.

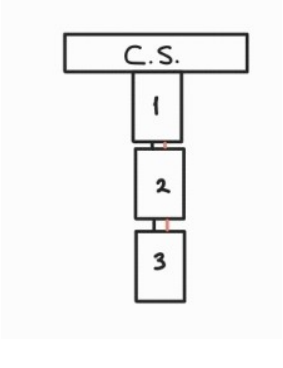
- The robot may get stuck while sliding on wall.

2- Geometric Configuration Of Charging Station:

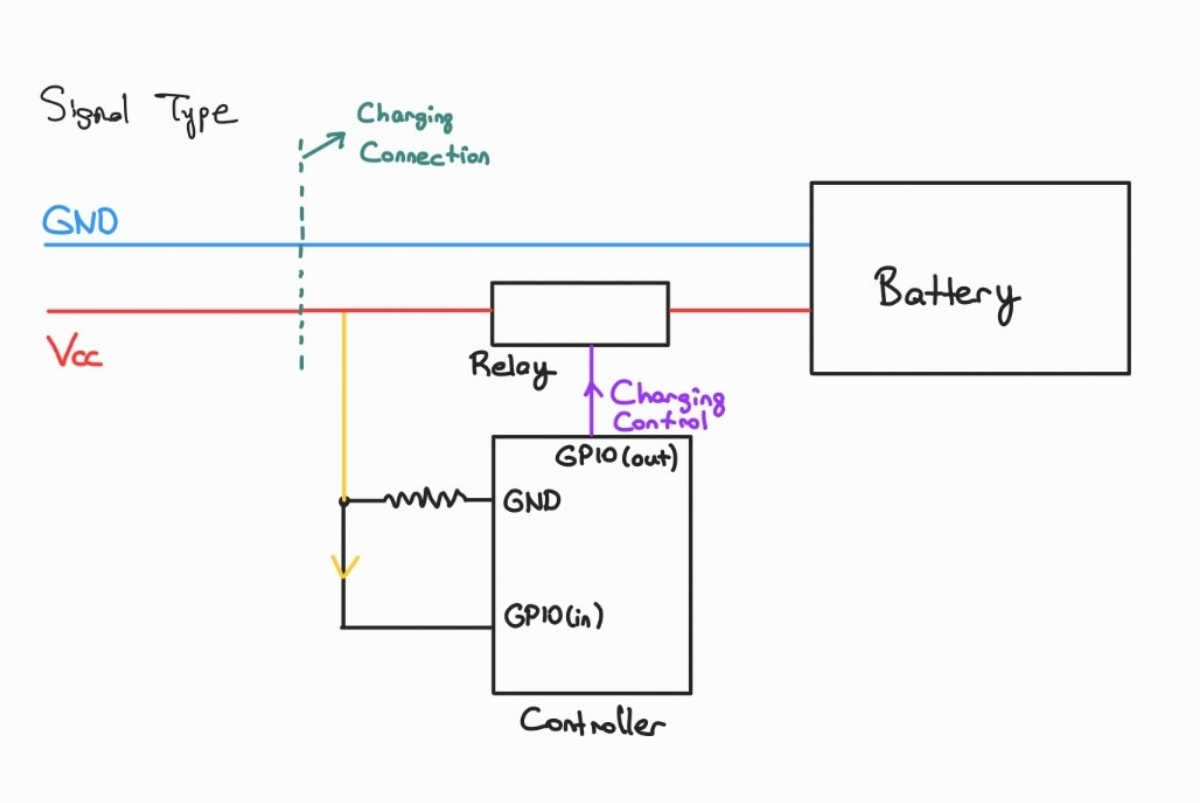
A. Circle Type: B. Continuous Line Type: C. Queue Type:







3- **How the Controller Is Informed About Charging:**



Next Meeting's Topic:

- Discussion about automatic charging ideas.
- Discussion about motor selection.
- Getting feedback about Gantt chart.
- Discussion about PCB base and body type of the modular robot.

The Aim Of The Following Week:

- Finalize the actuator selection.
- Finalize the sensor selection.
- Design 3D CAD model and create first prototype of the robot.
- Setting up ROS to controller card.