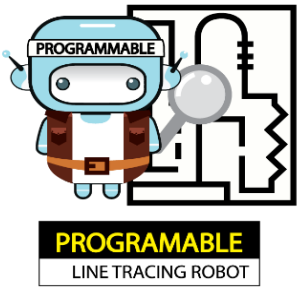
Programmable Line Tracing robot

SENIOR

GAME RULES



Section 1 Participants

Article 1

1.1 One member per team. Age is 15 to 19 years old.

1.2 Every team may or may not have teacher/mentor by each team must have only 1 person (1 teacher or mentor can supervise multiple team).

1.3 Each participant can play only one team.

Section 2 Playing field and components

Article 2 Playing field properties

2.1 The size of the playing field is 400 cm. x 250 cm. approximation.

2.2 The playing field is made of printed PVC or Vinyl.

2.3 The width of the black line is approximately 18 to 25 mm.

2.4 The actual playing field will be revealed on the day of the contest.

2.5 The field consists of a smooth, even surface has the black lines over a background of white or light hues, allowing for clear differentiation.

2.7 There are the designated intersection that possibly accompanied by a **green guide plate** to assist in determining movement direction. It is illustrated in Figure 1.

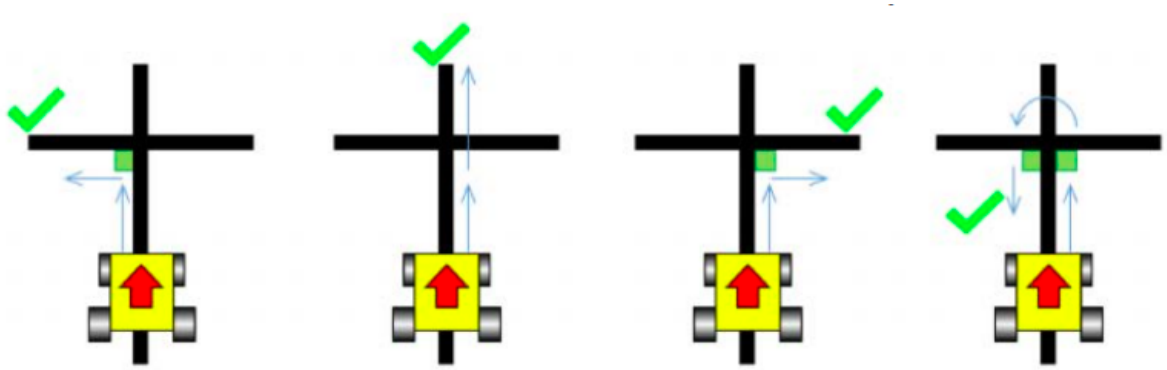


Figure 1: Criteria for robot movement upon encountering an intersection.

2.7.1 Should the robot detect the green guide plate on its left side before reaching an intersection, it is required to make a left turn upon reaching the said intersection.

2.7.2 In the absence of the guide plate, the robot is instructed to proceed straight at the approaching intersection..

2.7.3 Should the robot detect the green guide plate on its left side before reaching an intersection, it is required to make a right turn upon reaching the said intersection.

2.7.4 When the robot encounters two green guide plates on both sides prior to reaching an intersection, it must traverse the intersection and execute a U-turn upon arrival.

2.8 Prior to encountering the broken lines , there is marked with the **red guide plates**. An example of competition field is presented in Figure 2 for reference.

2.9 The robot must automatically detect the lines, intersections, and guide plates and trace the lines with changing directions on the conditions.

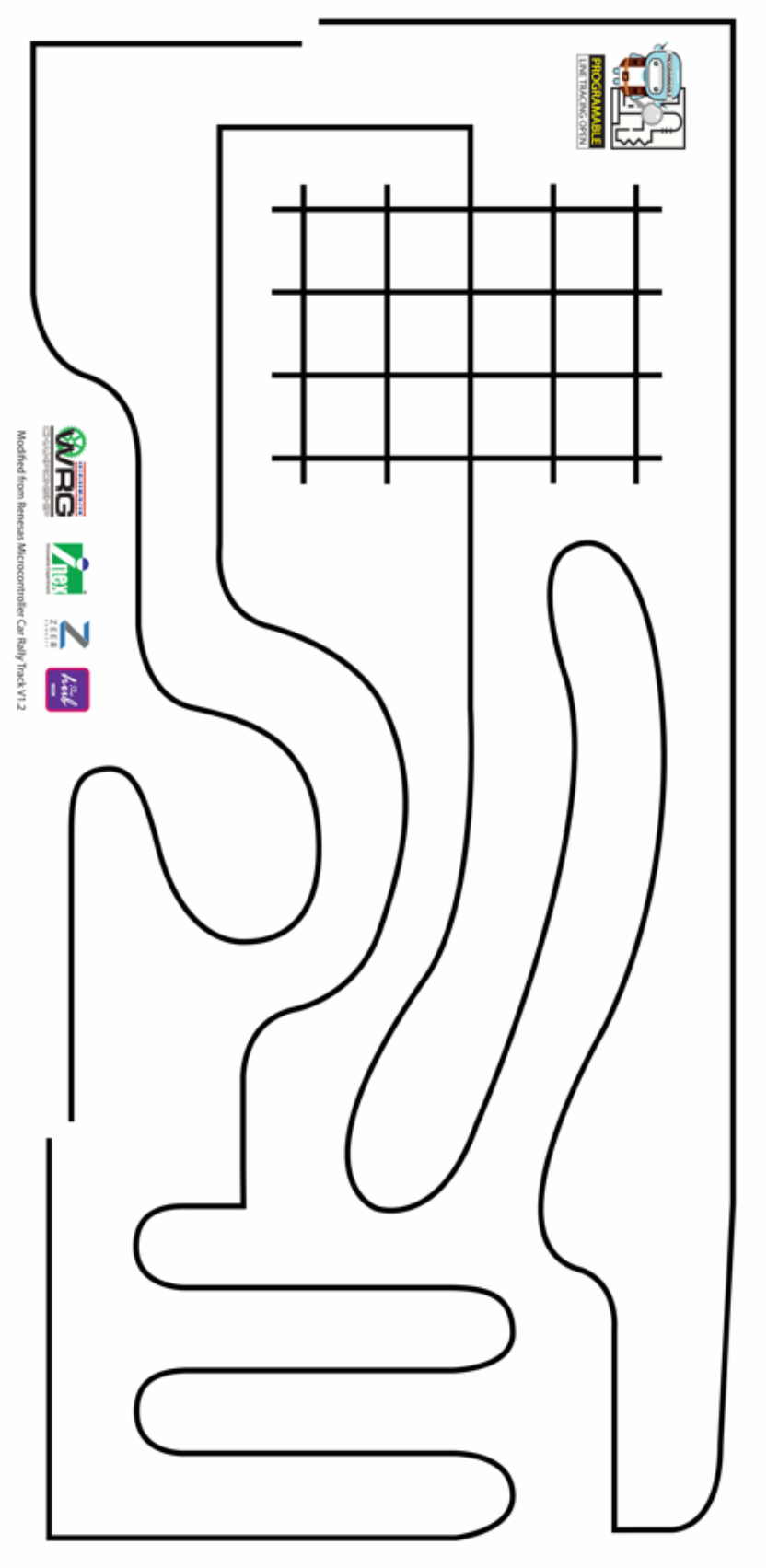


Figure 2 : An example of the competition field for Programmable Line Tracing robot – Senior category

Section 3 Robot requirements

Article 3 Technical Requirements

3.1 The robot's dimensions must not exceed 25 x 25 cm in width and length, with no height restriction. It must be designed to fit within a 25 x 25 cm box, which will be provided on the day of the competition.

3.2 For microcontroller rules, the sole decision rests with the individual country representative or the committee in the absence of a country representative. Please contact your individual country representative/committee for more information.

3.3 There are no restrictions on the number of the motor and types of sensors to design the robot. The use of brushless motors and any fans that aid in robot movement is prohibited.

3.4 The robot must weigh not exceeding 1 kg.

3.5 The robot must use wheels for moving on the ground, floating above the ground is not permitted.

3.6 The robot may extend its size during the competition.

3.7 No limit on the source of all mechanical parts and accessories. It can be hand-made, formed from 3D printer, or modified from toy.

3.8 Fixing screws and nuts or any fixation component in the robot must be securely firmly. If during the playing have any piece dropped or broken onto the playing field, the referees will not remove it and allowed to continue the competition. Referees cannot hold responsible for consequences during removal of a loose piece from the playing field.

3.9 No limit for the computer properties used to program the robot.

3.10 No limit for power supply features.

Article 4 Prohibition

Any equipment used to damage the competition area is not permitted.

Section 4 The Competition

Article 5 Rankings

5.1 Each team is granted a minimum of 2 attempts, with the most successful run being considered for ranking.

5.2 Ranking will base on running time to complete the mission. If the best running time is equal, the referee will consider the based on

other competition round. The team who has better running time in other competition round will be get better rankings.

5.3 Teams placed within the 13th to 20th ranks (up to a maximum of 8 teams) will be honored as **3rd Runner-up**, earning them a Copper medal.

5.4 Teams placed within the 9th to 12th ranks (up to a maximum of 4 teams) will be honored as **2nd Runner-up**, earning them a Bronze medal.

5.5 Teams placed within the 5th to 8th ranks (up to a maximum of 4 teams) will be honored as **1st Runner-up**, earning them a Silver medal.

5.4 Teams placed within the 2nd to 4th ranks (up to a maximum of 3 teams) will be honored as **Gold award**, earning them a Gold medal.

5.5 The top-ranking position will be awarded **the title of "Champion"**, earning them a Champion trophy and Gold medal.

Section 5 Game competition

Article 6 Starting

6.1 Participant places the robot at the starting point (any direction is permitted) with all the pieces of the robot not over the start line.

6.2 Turn on the robot. The timer starts when the robot passes the start point.

6.3 The robot must move along the line to finish point. Timer will be stop immediately after the robot moves through the finish point. (possible the start point and finish point is same point.

Article 7 Pause

7.1 After the robot becomes out of track, it must be returned to the last checkpoint before continuing. During this process, there is no time pause.

7.2 If the participant touches the robot, it must be returned to the last checkpoint before continuing with no time pause.

Article 8 End of competition

The competition will end from :

8.1 The robot reaches the finish point. During the competition, the referee will record the times of the participant’s touching the robot to add with their running time for ranking purpose. Each touch results in 5 seconds time penalty.

8.2 Game time is 3 minutes.

8.3 The participant asks to end the competition. The referees will record the time as 3 minutes.

Section 6 Fouls

Article 9

Any participant who contravenes rules Article 4, 10, and 11 or all is considered foul.

Article 10

The participants who act insulting, abusing an opponent, whether verbally or physically, or letting the robot make noises, express messages, or act disrespectfully, will be disqualified.

Article 11

Any participants who commit any of the following is considered foul.

11.1 Interrupting the opponent's robot.

11.2 Entering the competition area during other team's competition.

11.3 Bring anything into the competition area during other team's competition

11.4 Disrupting the competition without valid justification

11.5 Acting disrespectfully to the competition.

Section 7 Punishment

Article 12

Any participant who commits the fouls according to rule Article 9, their time will be added more 5 seconds.

Article 13

If any coach commits the fouls, all the team under their supervision will be disqualified.

Section 8 Damage and Accidents

Article 14 Asking to end the competition

The participant may ask to end the competition if their robot is damaged so that it cannot be used.

Article 15 Repairing Time

The participant can repair the robot anytime during the competition. However, the time will not be paused. Every time of participant touches the robot, added time 5 seconds each.

Section 9: Robot Identification

Article 16

Naming or any identifiers must be obvious and easy to see all the time during the competition.