* These rules are not final and may be updated up until the day before the competition.

Robot Line Tracer	Level	Team	Construction
Turbo	Senior	1-2 person	Pre-Made

Robot Line Tracer Contest is a contest which autonomous robot runs through the set course to compete for speed and intelligence. A robot participating in this contest is termed Robotracer.

1. Rules for Robot

1-1. Robotracer must be autonomous. Except for the starting zone, the contestant is not allowed to control over wired or wireless communication.

1-2. Robotracer must not have any hardware or software added, removed, replaced or modified by the operator during the contest. It is however permitted to make minor repairs.

1-3. The projection of the Robotracer on the floor while it is running must be contained in a circle with a diameter of 25 cm. The maximum height of the Robotracer is 20cm. This must be satisfied even when the shape of the Robotracer changes while it is running.

1-4. Robotracer should not add excessive adhesive force to the tires or other parts to increase ground contact force.

2. Rules for the set course

2-1. The board of the running surface is vinyl tarps painted in black. The course is made of white line and its width is 1.9 cm. The maximum length of the course is 60m.

2-2. The line is made from straight line and arch. The lines may cross.

2-3. The minimum radius of the arch is 10 cm from the center of the line. The distance of curvature change point is more than 10cm.

2-4. When the line crosses, the angle of the cross section is 90±5deg (see Fig. 1 for details). Before and after the cross section, there are 10cm of straight line.

2-5. The start line and the finish line will be placed on straight line section. The goal line will be placed 1m behind the start line. The start and the finish line will be placed on the right side of the course line (see Fig. 2,3 for details).

2-6. Between 20cm right and left from the start line to the finish line will be named start-goal area. On the start and finish line, there are start gate and finish gate. The width and the height of the gate is 40cm and 25cm respectably.

2-7. Before and after the start and finish line, there are at least of 10cm of straight line.

2-8. Where there are curvature change, there are corner marker on the left side to the running direction of the course line. Corner markers do not overlap with other corner markers.

2-9. Normally, the running surface is flat, but there will be 5deg of bank partially.

2-10. The outer edge of the course is at least 20cm from the center of the line.

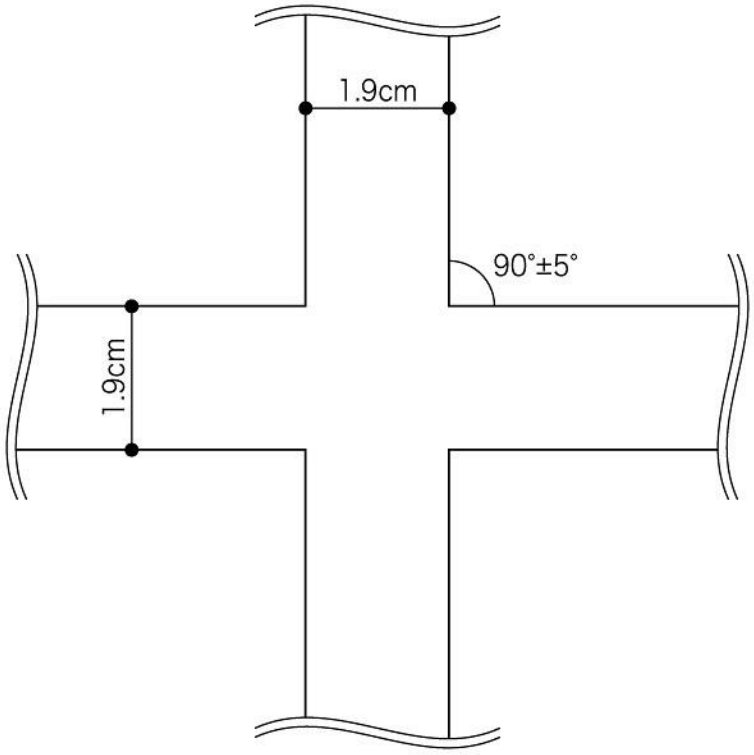

Fig. 1: Intersection

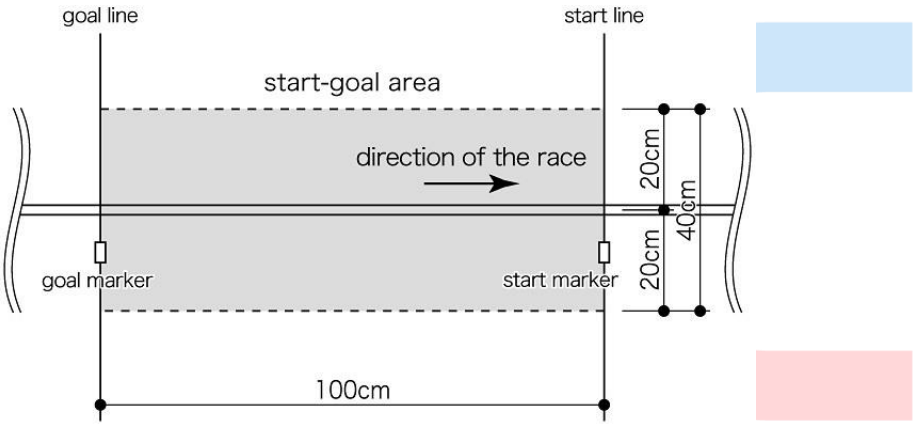

Fig. 2: start-Goal area

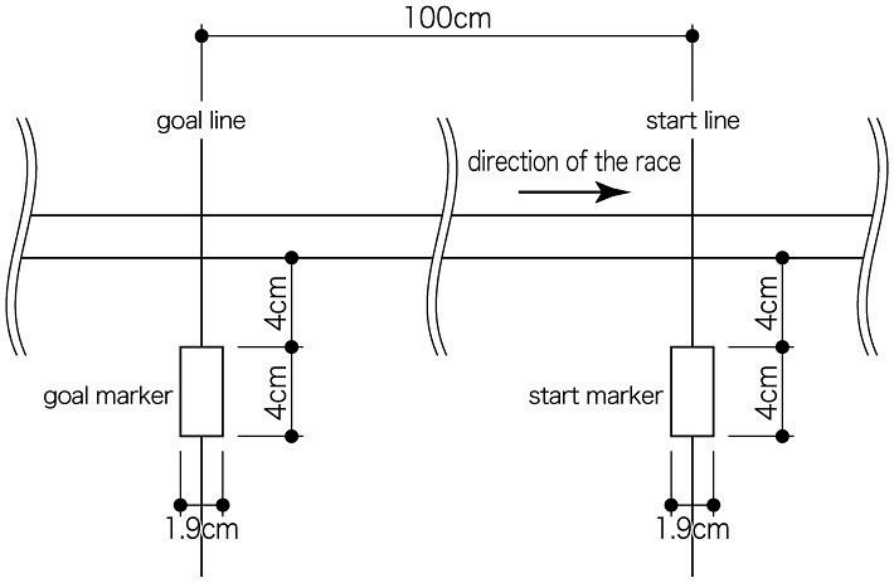

Fig. 3: Start marker and goal marker

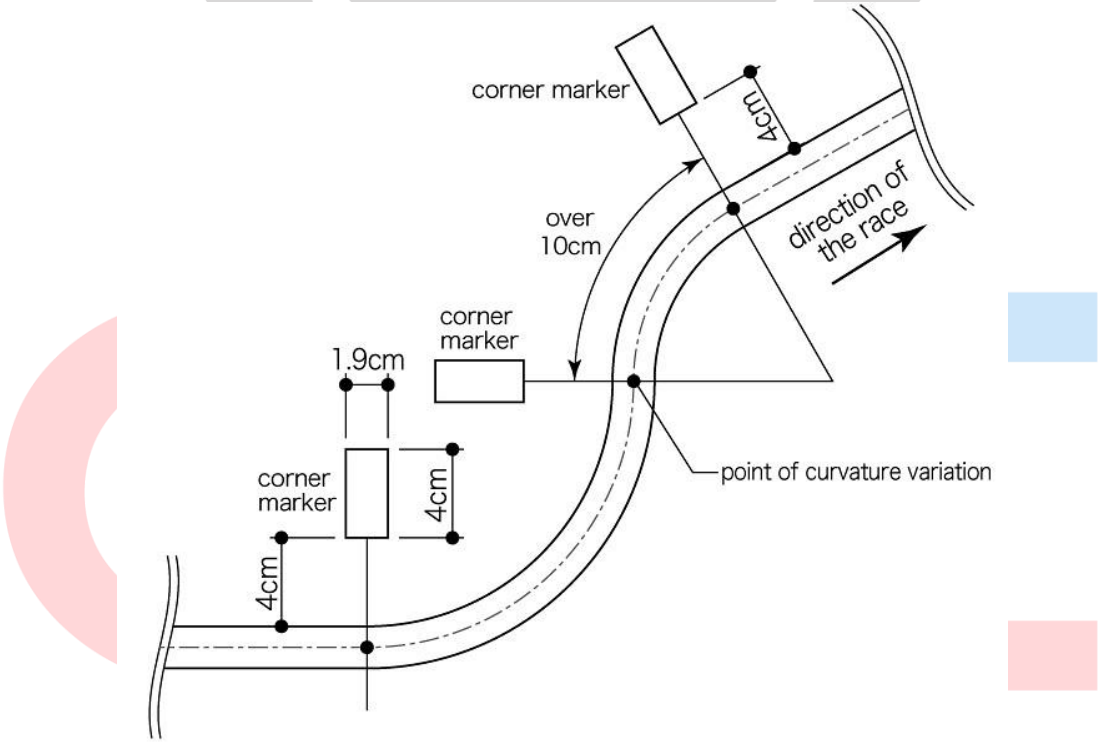

Fig. 4: Points where the curvature of the course changes and corner marker

3.Competition Rules

3-1. Each team has the opportunity to compete in 2 rounds.

3-2. The projection of Robotracer to the floor must cover the course line while the run. If Robotracer went off completely from the course line, it will be considered as a failure.

3-3. Each contestant has 3 minutes and maximum of 5 runs.

3-4. For each run, the Robotracer must start from the start-finish area in specified direction.

3-5. After the run, Robotracer must stop automatically in the start-finish area for at least 2 seconds.

3-6. The fastest lap will be recorded as its official time.

3-7. The lap will be recorded when the start sensor senses Robotracer and finishes when the finish sensor senses. In addition, the entire body of the Robotracer must be inside start-finish area. If this could not be done, the time will not be recorded.

3-8. If Robotracer went off from the course line or stops for more than 2 seconds, it will be considered as a failure.

3-9. After the maze is open to public, the operator is not allowed to feed any maze information to Robotracer. During the contest, the operator is not allowed to change any information about the course using switch or its kind.

3-10. The operator is not allowed to touch the Robotracer during the run unless instructed or given permission by a tournament chairperson to do so.

3-11. The lightings, temperature and humidity of the room will be those of an ambient environment. Requests to adjust the lightings will not be accepted.

3-12. The tournament chairperson has the rights to ask the operator about the Robotracer if it is needed. The tournament chairperson also has the rights to stop a run, declare disqualification, or ask for instructions.

[Attention]

1. The contestant is not permitted to load programs or replace ROM during a contest. It is also prohibited to send any information to Robotracer from development unit or console box that is independent from the main Robotracer unit.

2. The contestant is permitted to remove dust and debris on the tires during a contest using adhesive tape, etc.;

However, no solvents and likely may be used for the purpose of increasing friction.

3. After start operation, if the Robotracer could not even reach the start line, it still be considered as one run.

4. After Robotracer has finished the run and came back to start-finish area, it must stop automatically. If this could not be done, the lap time will not be recorded.

5. Except the run, the contestant is not allowed to place their Robotracer out of the start-finish area in order to adjust the parameters.

6. In some cases, the arc of varying curvature comes up continuously. (see fig. 4)

7. The material of the course is vinyl traps backed with wooden planks. The running plane is made in a sensible accuracy. So that there will be errors to the maze dimension to some extent. So that, it may produce gaps or difference in level of approximately 1 mm. Any complain about the grip of the surface is not accepted.

8. Place of the start sensor and the finish sensor is shown in the figure.

Type: Transmission infrared sensors.

Optical axis placed about 1 cm above the floor.