



II. INTERNATIONAL GEBZE TECHNICAL UNIVERSITY KELEBEK ROBOT OLYMPICS

LINE FOLLOWER CATEGORY RULES

- *The specified ones are for only “Line Follower” category. Except of these rules the general rules must be taken into account.*
- *Gebze Technical University Robotics and Automation Club has the right to change the rules if necessary.*
- *According to the constitution of Republic of Turkey Law Nr.5846 on “Intellectual and Artistic Works Law”, it belongs to GTU Robotics and Automation Club.*

TASK DEFINITION

In this category it is expected to finish the track with black lines on a white based floor or white lines on a black based floor which is designed by us, in the shortest time with robots.

COMPETITION FORMAT

- Robots must be autonomous.
- Robots must fit in 250 mm width, 350 mm length, 200 mm depth featured box.
- There is no restriction on weight.
- Robots which damage the track is going to be disqualified.
- Competition time measurement is going to be manual.
- Competition queue is going to be decided by drawing of lots.
- There is going to be a starting line at the entrance of the track for robots to start.
- Starting command for robots is going to be given by the referees and time measurement will be started with the command.
- Competition consists of 2 parts such as ELIMINATION and FINAL.
- Robots which get out of the track or wait still for 5 seconds are going to be punished.
- There are 6 error/intervention rights.
- Robots which complete the track will be considered successful. Success ranking is prepared on the basis of shortness of the time of completing the track.
- Duration of call is 3 minutes.
- The ones who do not come in duration of call are considered disqualified.



- There is no right for technical break.
- Robots which get out of the 500 mm width road are considered deviated.
- Unless the robot gets out of the parkour it can be intervened only by the referee's decision.
- Robots which do not stop when they complete the parkour are going to be punished. The robots must be fully in the white colored finish zone and must not overflow.

TRACK FEATURES

- The track is consisted by banding black tape on white based floor or white tape on black based floor.
- Track's road width is 500 mm.
- Track's tape width is 20 mm.
- At the finish of the track there is a white based and lineless 500 mm lengthed finish zone.
- During the building session of the track changes may occur which are not going to affect the general structure of the track.

COMPETITION

- There will be dashed lines, zig zags, unlined roads and dashed-scattered lines.
- There is a door which triggers with a sensor. This door is going to be in a closed position for each robot. Robots may slow down or stop when they see the door. After some time the sensor is triggered and the door is going to open and robots will be given the right to pass through it.
- There is a hill which climbs upwards with 30 degrees and after a plain area it goes downwards with the same slope then a plain area lengthed 500 mm.
- There are 90 degreeed turns and/or circular turns.
- There are six double lines which intersects the path line vertically. After the first double line the robot should turn left. After the second double line, the robot must continue straight. After the third double line, the robot must continue to the right of the fork. After the fourth double line, the vehicle must take 3 turns in the spiral. After the fifth double line, robot is expected to turn to the right. After the sixth double line, the vehicle is expected to continue from the right side of the fork.
- There is a closed tunnel on the track. In this tunnel the path and base floor's color is going to be reversed, line may be removed or may be dashed. The road is going to be illuminated by RGB LEDs and the colors of these RGB LEDs are going to change randomly and momentarily.
- At the end of this part "Finishing Time Seconds * 0.35 * Intervention Number" is going to be added to the measured time.

PUNISHMENT

The time measurement is going to stop when the robot is intervened, the robot is going to be placed back on the track by the referee's sign and the time measurement is going to continue.

The robot which repeats the same mistake at the same place is going to be placed in right in front of the place where it did the mistake.

- **Not Starting of the Robot**
 - The robots which have not started after the referee's sign in 5 seconds are going to be considered faulty. At each right usage robots are going to be punished and considered as intervened.
 - The robot which have not started for the third time is going to be disqualified.



- **Stopping of the Robot**
 - Except the door's front line, stoppings more than 5 seconds are going to be considered deviated and the following rules are going to be valid.
- **Not Stopping at the End of the Parkour**
 - If the robot does not stop at the white zoned track end or gets off the line it is going to be punished and considered as intervened. The robot is going to be accepted as finished the track and gets a punishment.
- **Straight Line**
 - The robot is going to be placed at the point where it deviated. In this case the robot is going to be punished and considered as intervened.
- **Dashed Line**
 - The robot is going to be placed to the next dashed line from where it deviated. In this case the robot is going to be punished and considered as intervened.
 - The robot which deviates at the last dashed line is going to be placed at the previous one. In this case the robot is going to be punished and considered as intervened.
- **Zig zags**
 - When the robot deviates it is going to be placed at the starting of the zig zags. In this case the robot is going to be punished and considered as intervened.
- **Dashed Scattered Lines**
 - When the robot deviates it is going to be placed at the starting of the dashed scattered lines. In this case the robot is going to be punished and considered as intervened.
- **Spiral Bridge**
 - When the robot deviates or falls it is going to be placed at the starting of the spiral. In this case the robot is going to be punished and considered as intervened.
- **Vertical Turns**
 - If the robot will not be able to perform the sharp turns it is going to be placed 400 mm back of the turn. In this case the robot is going to be punished and considered as intervened.
- **Double Line**
 - When the robot deviates it is going to be placed at the start of double line. In this case the robot is going to be punished and considered as intervened.
- **Lineless Zone**
 - When the robot deviates it is going to be placed at 150 mm back of the lineless zone. In this case the robot is going to be punished and considered as intervened.
- **Door**
 - When the robot hits the door it is going to be punished and considered as intervened.
 - The robots which deviates in front of the door are going to start from 450 mm back of the door. In this case the robot is going to be punished and considered as intervened.



- **Spiral**
 - If the robot tours the spiral more than it is expected, the robot is going to get punishment at each tour and considered as intervened.
 - If the robot tours the spiral less than it is expected, the robot is going to be placed at the double line which specifies the starting of the spiral. In this case the robot is going to be punished and considered as intervened.
 - If the robot does not enter the spiral it is going to be placed at the double line. In this case the robot is going to be punished and considered as intervened.

- **Hill**
 - If the robot falls during the climb, it is going to be placed at the start of the hill. In this case the robot is going to be punished and considered as intervened.
 - If the robot falls over the hill it is going to be placed at the start of the plain of the hill. In this case the robot is going to be punished and considered as intervened.
 - If the robot falls during going downwards down the hill it is going to be placed at the end of the plain of the hill. In this case the robot is going to be punished and considered as intervened.

- **Getting in the Wrong Path**
 - If the robot gets in the wrong path at the parting of the roads it is going to be placed at 150 mm back of the separation. In this case the robot is going to be punished and considered as intervened.

- **Tunnel with Lights**
 - If the robot stops or hit to the tunnel it is going to be placed 150 mm back of the entrance of the tunnel. In this case the robot is going to be punished and considered as intervened.



EXAMPLE TRACK

