REPUBLIC OF TURKEY

MINISTRY OF NATIONAL EDUCATION

The General Directorate of Technical and Vocational Education

14. INTERNATIONAL

MEB ROBOT CONTEST

LINE FOLLOWER-DRAG ROBOT CATEGORIES RULES

2020 - SANLIURFA

THE RULES OF LINE FOLLOWER DRAG RACING

1) Objective

Line follower robots are designed to follow the lines autonomously which are white on black grounds or black on white ground. Important matters of line follower robots are having an effective software, controlling hardware and speed to keep robots on the lines without leaving.

Autonomous line follower robots follow white line on black ground to finish runway in shortest time by taking one lap

2) Information for elimination and final runways

- Elimination and final runway are same.
- Lines are indicated by white color on black background.
- Tracks which have 1560mm width, 39000mm length (39meter), 5mm thickness are made by PVC foam which is opaque and black color.
- Joints between parts that make up the track are covered with black opaque foil.
- Lines are made by using white opaque foil with 20±2 mm width.
- For each robots , there are lanes which have 390mm width and straight white lines on their middles.

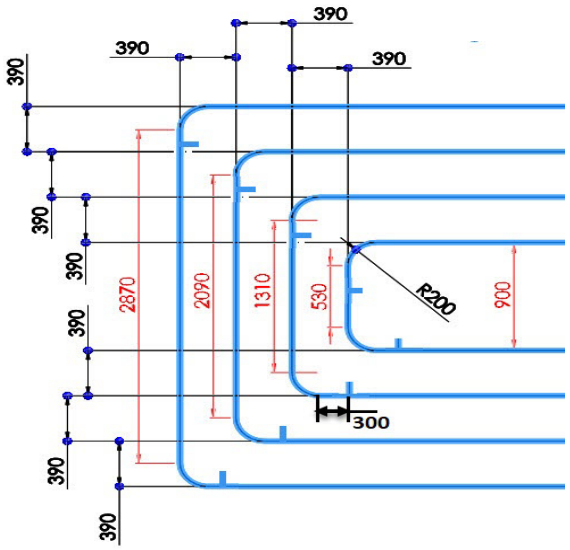

Figure-1: Lane dimensions

- There is a bridge on the runway. Lenght of bridge is about 3 meter and inclination angle is about 16 degree.

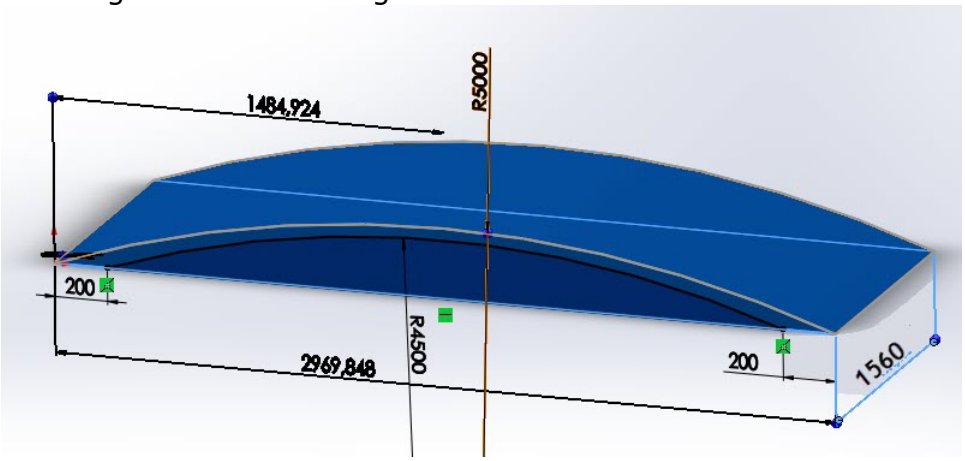

Figure-2: Bridge dimensions

There is start/finish line for robots

- There is an automatic gate which has dimensions 1560mm length x 200mm width and opaque white color.
- There are sensors which are placed 200 mm top on each line and 50mm in front of start/finish line. These sensors are reflection type. Therefore , reflection tape is sticked before start/finish line.
- There are white lines has dimensions 20±2 mm width and 35mm length. These lines are located right side of road , 300mm before curves which have 200mm radius.

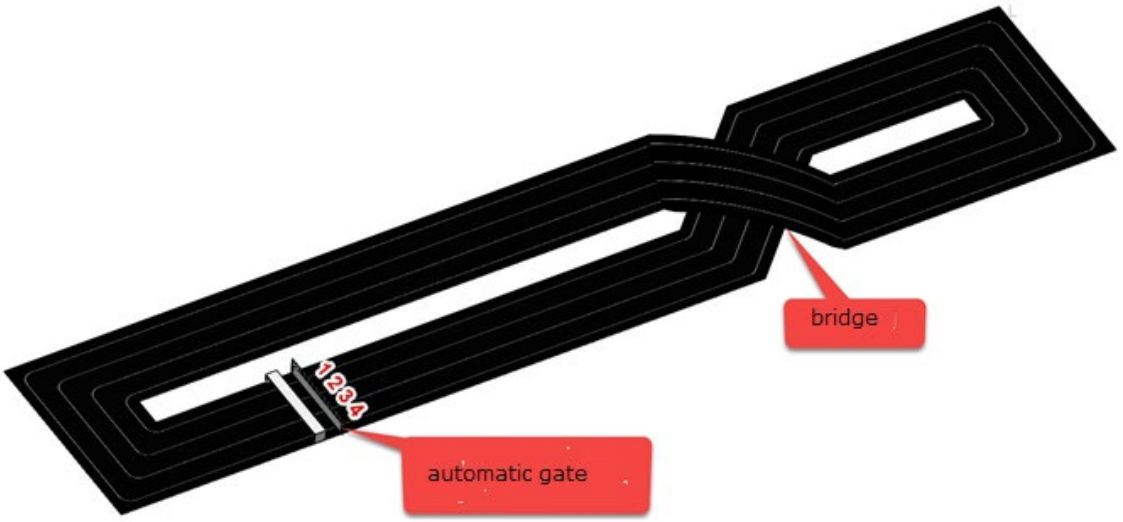

Figure-3: 3D view of Runway

3) Races

3.1) Elimination and Final Races

- Able to race in this category , robots ;
- Can be fitted into the box 120x160 mm easily.
- The height of robot cannot be over then 50mm. There is no limit for weight of robots.
- Robots cannot be fitted into the box 120x160 mm or has the height over than 50mm are disqualified.
- Robots race in groups of four
- Their groups are determined by computer drawing. According to results of drawing, the lines which the robots will run on are also determined for each robot.(as 1.line, 2.line, 3line, 4.line)
- Racing format will be determined according to robot numbers and it will be announced from official web site :robot.meb.gov.tr
- There are finish sensors separately in the end of each lane to make ranking
- Chronometer is used to determine best two robots.
- Two of robots in each group have best time can pass the next tour.
- Competitors in groups will place their robots which are in condition of working on starting line of their own lane.
- Automatic gate will open and race will start right after the sign of judge.
- Robot which starts before the signal and hits the gate will be disqualified.

  Other robots will be replaced again and continue to race.

- Robots which cross to other lane or cannot start will be disqualified.

- Robots must finish the race on their own lane. If robot cross to other lane , it will be disqualified even if it arrives the finish line.
- If all robots leave from their lines before any of them reaching the finish line, all robots are disqualified.
- During the race, if robot hits the other robot and take it out of runway, this robot will be disqualified. Race is repeated with other robots.
- Robots have to finish the race on their own lanes. Robot which finishes the race on different lane will be disqualified.
- Robots make two laps on the track. Chronometer time is registered at the end.
- Group racings will continue until the final race.
- Final race will be carried out like elimination races (group races) . Therefore, robot which came first to finish line will be the winner of final race. Second and third ranked robots will be also determined in this race.
- In case of equality at final race;
  - If robots have best time , another race for first and second ranks is performed.
  - If robots have second best time, another race for second and third ranks is performed.
  - If robots have third best time, another race for third rank is performed.
  - If there is still equality, the robot which is lighter than others will be the winner of race.
- No additional time will be given for charging batteries during group and final races.

4) Other Rules

- Any time for break or maintenance will not given.
- It is not allowed to put any sign or mark permenantly on the track or to damage it. Robots which damage the track will be disqualified.
- Robots can use an energy source such as battery or battery pack. Flammable or liquid type energy sources are forbitted.
- No any modification is allowed during the race except changing wheels and batteries. If physical changes such as changing body is determined, robot will be disqualified.
- If QR code is dismounted,changed or damaged , robot will be disqualified.
- If robot doesn't matched with its photo, it will be disqualified.
- If it is necessary to change electronic component, same component should be used on same place. QR code must not be damaged during this process. Otherwise , robot will be disqualifed.
- QR code must be sticked on robot body but not on detachable parts. Otherwise robot will be disqualified.

Dimensions of runways can be slightly different than images because of production process.

Competition organisation comittee has rights to make all kinds of modifications about the rules of contest in case of necessaries.