RADIX – AUTONOMOUS 1

LOCOMOTIVE 38

Problem Statement

The autonomous bot has to follow a track of two parallel lines, both of which may or may not be present together at all instances, and a track which may invert colour at any time.

Track specifications

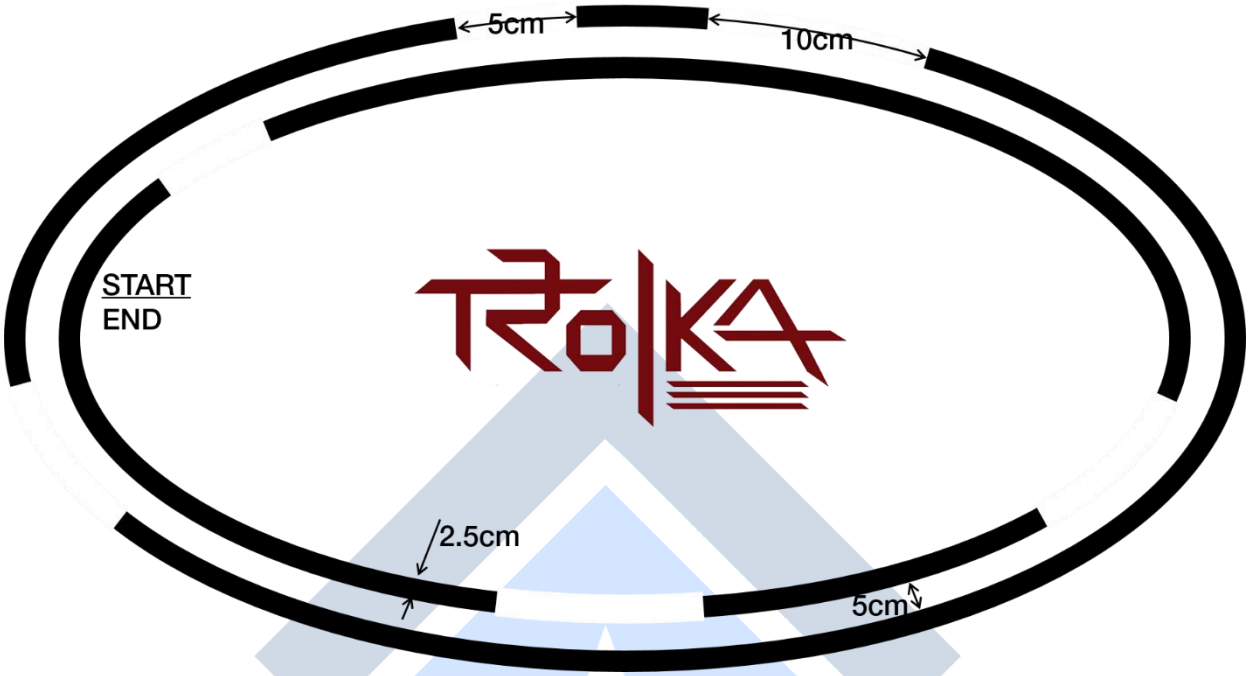
Round 1

1. This round shall check only the two-parallel lines following capability of the robot.
2. The width of the each line will be 2.5 cm.
3. The whole track will have various checkpoints at regular intervals. The teams shall be awarded marks according to the number of checkpoints cleared.
4. The teams completing round 1 successfully will go into the next round directly.

Round 2

1. The width of the each line will be 2.5 cm.
2. The constant distance between the two lines running parallel will be 5cm.
3. During the course of following the track, at several locations, the parallel double lines will be broken/discontinued to just one line. The bot must be capable of detecting all such breaks and indicating each of them by means of glowing an LED on-board. Each glowing LED will represent, one double-line break.
4. Each break may extend from 5cm to 10 cm in length.
5. There must be at least five LEDs on the bot that light up one by one as it traverses through the aforementioned track (double-lined) breaks.
6. Several other hurdles on the track may include **track-surface colour inversions, sharp turns, intersections with another set of lines** etc.

Sample Track



Robot Specifications

1. The bot must fit inside a box of dimensions 25cm x 25cm x 25cm during the whole course of line-following.
2. Machine cannot be constructed using readymade Lego kits or any readymade mechanism. Violating this clause will lead to disqualification.
3. In case the bot gets off the track, only two more runs will be provided. Also the robot will have to start afresh from the last checkpoint cleared.
4. The bot must not damage the track in any manner.

Power Supply and Propulsion

1. The machine cannot use an externally placed power supply but only on-board power supply. No external power supply will be provided. The on-board power supply used must be non-polluting and must satisfy the safety constraints determined by the judges.
2. In case the machine is using a non-electric power supply, the team must get it approved from the organizers beforehand via email. Organizers will not be responsible for inconvenience if approval is not sought.
3. Maximum permissible DC Voltage that can be used is 24V.

General Rules

1. All the students enrolled in high school, undergraduate, postgraduate (excluding PhD.) program at any recognized institute (identity card will be checked) are eligible to participate.
2. Team must declare a name for their machine at the time of competition.
3. A team may consist of max 4 members. The members from different colleges can form a team.
4. If the robot goes off the track in its first attempt, it will be given 2 more chances. The teams can make some hardware changes during this period, like changing batteries, adjusting sensors, but no extra hardware can be added and no changes in the code can be made.
5. The teams may take their robots off the track twice while running for calibration and adjustments which would result in time penalties.
6. In case of a tie, the team which covers the track successfully in the least time will be declared the winner.
7. Rules are liable to minor changes which will be updated on the site.
8. In case any kind of dispute arises the judges' decision will be considered final and binding to all and no argument will be entertained. Judges have the right to disqualify any team if they feel the team is not playing with fair interest.

Judgement Criteria

1. The extent to which all the specifications of the entire robot have been implemented.
2. No. of successful break detections by the bot.
3. Extent to which it performed in arena (check-points crossed).
4. Finesse in algorithm and hardware fabrication.

Please regularly check the website for further updates on the competition and the change in rules and regulations, if any.

All the Best!

#HappyTroika ☺