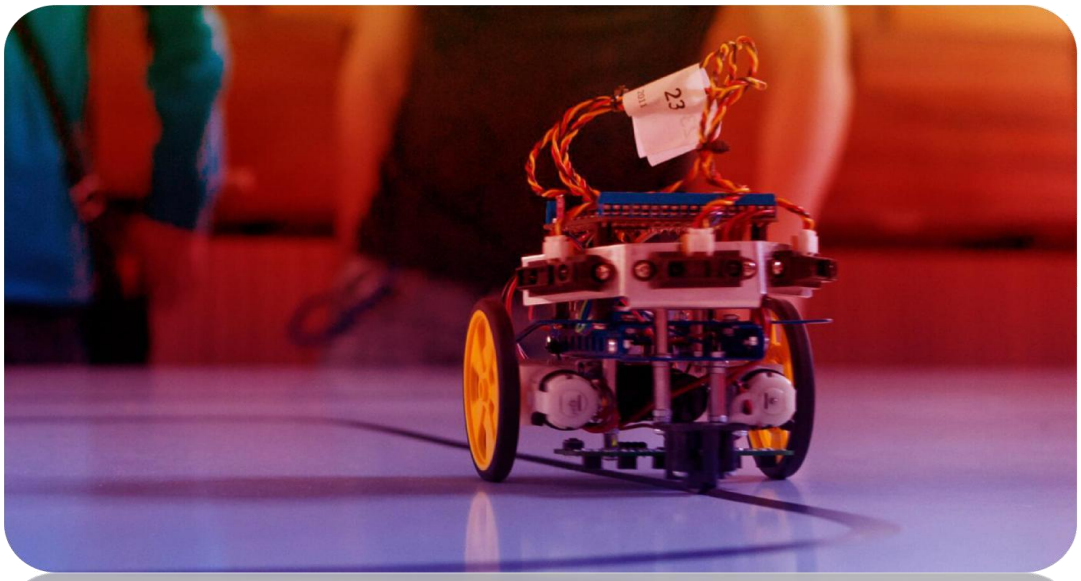
Exodia 2k17

presents

Line Follower



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Theme

These days Driverless Cars are one of the most trending topics in the tech Industry on which big tech giants like 'Google' are working.

A line following vehicle is in a way an entry level autonomous vehicle that can navigate any course while following a on a contrasting background.

Problem Statement

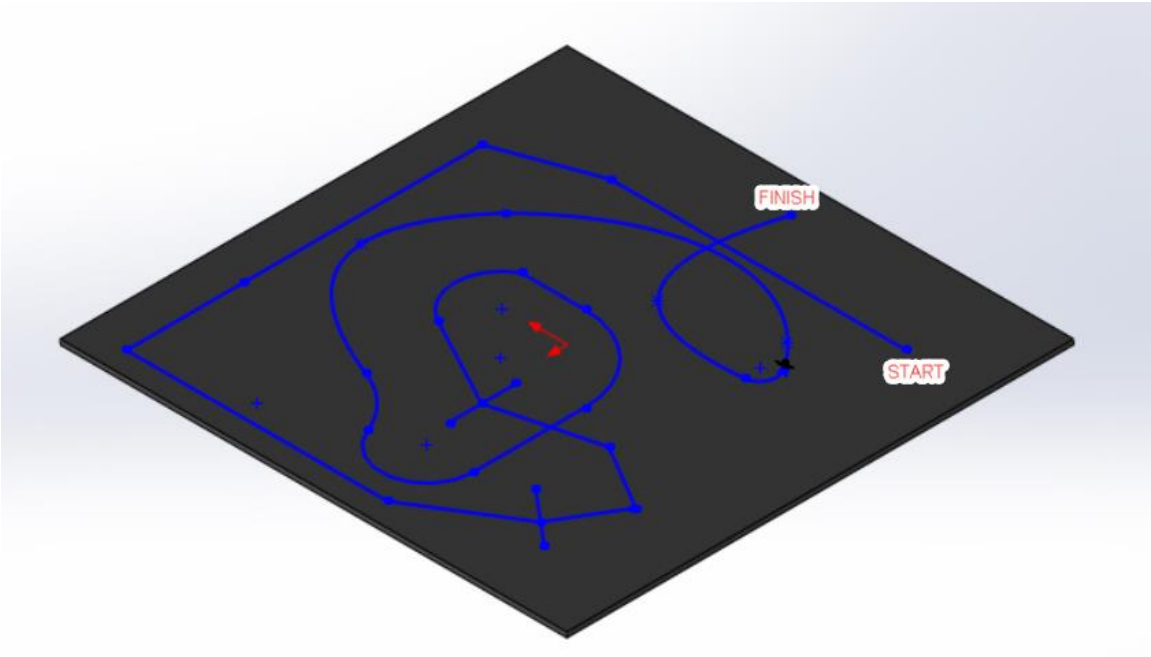
Design an autonomous bot which is capable of navigating efficiently through guided black lines on a white floor. The vehicle must be able to effectively follow the guided black path. The contestants will be judged on the basis of time of completion of path, how accurately the path is followed and the design of the robot.

Arena Specifications

- The arena will be 3m X 3m in size.
- The arena will consist of black lines on a white floor.
- The lines will be 3 cm thick uniformly and will be continuous free from any breakages.
- The path will be having smooth curves, U – turns and also sharp turns (angles between the edges will be in the range of 90-180 degrees).
- The number of turns will not be more than 100.

A sample arena has been shown below. The real arena would be disclosed at the time of the competition. The Arena will be strictly according to the specifications mentioned above.

However, all participating teams would be given enough time prior to the competition to make specific changes in their programs to suit the requirements of the given arena.



Game Play

The competition will take place in 2 stages.

Round 1

- There will be a simple track in this round having smooth curves and no sharp corners.
- There may be some discontinuity in the path measuring not more than 5 cm.
- Checkpoints will be there on the track at different places according to which the scoring will be done.

Judging Criteria

- Reaching a checkpoint will result in an addition of 100 points in the score.
- Reaching the finish line will fetch additional 200 points.
- In case, the bot deviates from the line, you can keep the bot manually back on track at the nearest crossed checkpoint and resume from there, but it will result in a penalty of 50 points. Also, these chances will be given only 2 times.
- The ranking of the teams will be done on the basis of scores. But in case, there is a tie, time taken by the bot to complete the track will serve as a tie breaker.
- But, if the time taken by the bots is also same, then design of bots will serve as a tool to decide the winner.
- In case, the required number of teams or no one is able to reach the finish line, then teams will be sorted according to the average speed of the bot.
    - (Average Speed = Total Distance Covered/Time Taken).
- The task will be assumed to be completed when the rear most wheels crosses the finish line.

Round 2

- This will be a bit difficult compared to the first round. The track will have more number of turns including sharp turns (Angle will be between 90-180 degrees).
- There may be some points where 2 roads can intersect but the bot should keep moving straight without moving on to any other path.
- Another challenge will be a Hinged inclined plane on which the bot should climb.
    - Just for reference see the below image. The inclined plane will be inclined at an angle of 10-40 degrees from the ground.

- Checkpoints will be there on the track at different places according to which the scoring will be done.

Judging Criteria

- Reaching a checkpoint will result in an addition of 100 points in the score.
- Reaching the finish line will fetch additional 200 points.
- In case, the bot deviates from the line, you can keep the bot manually back at the nearest crossed checkpoint and resume from there, but it will result in a penalty of 50 points. Also, these chances will be given only 2 times.
- The ranking of the teams will be done on the basis of scores. But in case, there is a tie, time taken by the bot to complete the track will serve as a tie breaker.
- But, if the time taken by the bots is also same, then design of bots will serve as a tool to decide the winner.
- In case, no one or the required number of teams are able to reach the finish line, then teams will be sorted according to the average speed of the bot.
    - (Average Speed = Total Distance Covered/Time Taken).
- The task will be assumed to be completed when the rear most wheels crosses the finish line.

Note: - Every Run will be allotted a maximum of 5 minutes. If the bot fails to complete the path within the stipulated time, then the score at the end of 5 minutes will be the final score. This time can be increased based on the situation at the time of the competition.

Important Points to watch out for!

- The robot must be able to fit inside a box with dimensions of 30 cm X 30 cm X 30 cm.
- Only proper Line Follower algorithms should be used. Any unfair way will lead to Disqualification.
- Hard coded bots are strictly prohibited.
- The external power supply is not included in the size constraint. However, in case of onboard power supply, the machine along with the power supply should fit in the above-mentioned dimension box.
- Teams are allowed to use ready-made micro-controller boards, sensor kits etc.
    - However, use of kits like Lego kits are not allowed.
- The batteries used can be maximum of 18V. More than that will not be allowed for the contest.
- If the bot damages the arena, the team will be disqualified.
- The organizers will provide a standard 230V/50 Hz AC power supply. Any eliminator, adaptor, etc. required will have to be arranged by participants themselves.
- No manual control is allowed for the bot. It should be fully autonomous.
- If the judges find any bot whose working mechanism or game strategy is faulty, they have the right to disqualify the team.

General Rules

- The teams shall report for their slots on time.
- Only 2-3 members will be allowed to handle and operate the bot.
- Participants are not allowed to keep anything inside the arena except bot.
- Only the points and the time recorded by the organizers will be considered.
- The organizers reserve the right to change any or all of the above rules (that is very rare thing to happen) without the prior intimation, however any change shall be promptly communicated to all the registered participants.

Team Registration and Composition

- A team must not have more than 6 members.
- More than one team can register from same college but the robots should not be identical.
- A team once registered cannot register again, even with a different name.

Note: - The decision of the organizers shall be final and binding in case of any disputes. If you find any loop hole in the rules, it's always better to have its legitimacy verified by us instead of being disappointed at the venue.