

Classic Line-Follower Rules

For precise (but maybe not super-fast) line-followers

This is the traditional line-follower race track popular in America, i.e. a black line made of electrical tape on a white board.

Object

The object is for a small autonomous robot to follow a line under various conditions (e.g. round corners, sharp corners, crossovers, up hills, etc.). Points are awarded for distance covered and for speed.

Robot Specifications

The robot should fit inside a 9" cube in order for it to navigate past or under specific obstacles that may or may not be present on the course. Also, it must be light enough to work on a table top. The robot must be safe and comply with the "General Rules for All Robots."

Track Specifications

The arena consists of a white semi-gloss painted surface, with a line made from standard 3/4" wide black electrical tape. The total length of lines in each stage that the robot needs to traverse is approximately 3m. **Lighting levels are unpredictable, so the robot must be able to operate over a wide range of lighting conditions!**

There are four stages, each of an increasing level of complexity. Completion of each stage adds points to your score.

The course may include (but is not restricted to) the following line configurations:

- Gentle rounded corners
- Sharp rounded corners
- Sharp obtuse angles (greater than 90 degrees)
- Sharp acute angles (less than 90 degrees)
- Crossovers
- Gaps in the tape (of several inches)
- Hills (both up and down)
- Bumps (small cracks may exist on the surface)

The Line Follower Contest

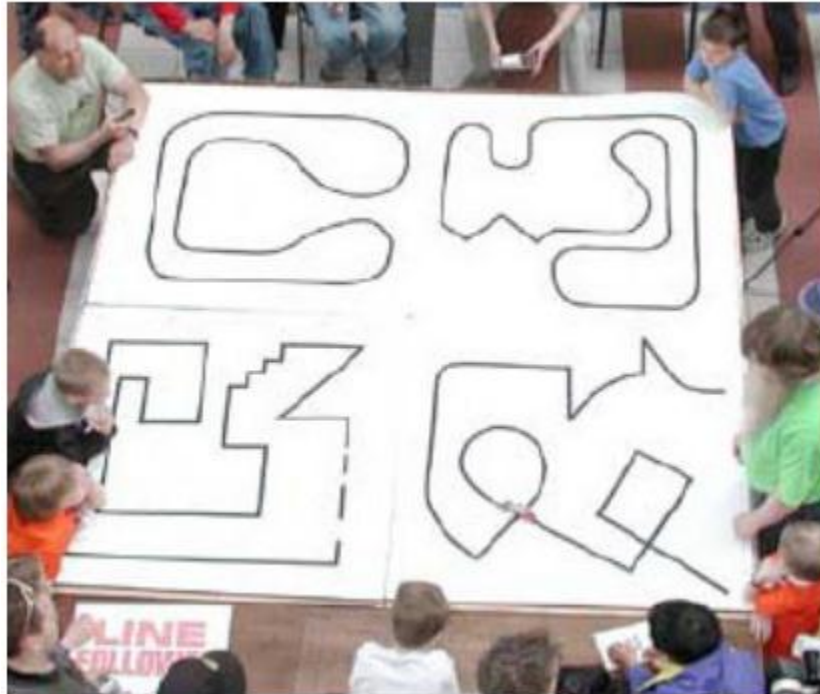
Your robot should follow the line to the end of each stage, as fast as it can. The robot will be placed at a pre-assigned starting point on each stage, and may be started by hand when directed by the judge.

Robot operators are allowed to pick up an errant robot and place it back onto the line, at the point just before the robot last left the line, but it will suffer a penalty for each replacement. For example, if the

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robot left the line at a 90 degree bend in the line, then the operator can place the robot at the point just before the 90 degree bend in the line.

A robot must have a positive score on the first stage, or it will NOT be allowed to attempt the other stages. As long as the robot gets a positive score on the first stage, it will be given the opportunity to attempt all of the other stages. The course layout will not be made available until the day of the event, but here's the 2010 course:



Scoring

All points are awarded per stage. The final score for the robot is the total of the scores from each of the stages.

Points Awarded

100 points, proportional to the distance a robot traveled, per stage.

100 points per stage.

3000 points divided by the time to complete a stage in seconds.

-50 points per violation.

A maximum of 100 points is awarded depending on the distance covered in that stage (to the nearest 10cm). A bonus is awarded for successful uninterrupted completion of the entire stage. There are more points awarded for faster robots; keep in mind that the timer runs even when a robot leaves the line and is repositioned. Picking up the robot and repositioning it on the line counts as a violation.

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Examples

If a robot travels 30% of the stage: 30 points.

If a robot completes one stage without being touched by the operator: 100 points.

If a robot completes one stage, but is picked up and repositioned by the operator once during that stage: 0 points.

If a robot completes a stage in 25 seconds: 120 points.

Operator decides to pick up his robot after it has left the line, and place it back onto the line (just before the point where it left the line): -50 points.