SapiLineTracer Robot Competition

Santa Edition

Announcement:

Santa is currently mapping his route. However, it seems that the roads are packed with hidden secrets. He needs somebody to locate these points as fast as possible.

Is your team able to help Santa?

Be aware, at this time of the year bad weather is expected, the road might not always be visible. Create the fastest vehicle and help Santa deliver the presents to the nice kids in the neighborhood!

Summary:

Each team is required to build a robot which is capable of following a line. We propose two parallel competitions: one for speed and one for agility. In the speed competition best time wins. In the agility competition: the robot has to be able to detect and display hidden signals along to route. The winner in this case is selected in function of the number of detected signals and time.

Registration:

Each team is required to fill the following table according to the given example:

#	Name	Age	Class	Competition	Email
1.	Example Jack	20	Informatics, 2nd year	Speed / Agility / Both	jack@example.com

The registration is done by sending the completed table via email to: **linetracer@ms.sapientia.ro**

The team member who submits the registration is considered the team leader. All further game related announcements will be sent to the team using the team leader's email address.

The team leader will receive a notification regarding the registration.

Venue:
The Aula of the Sapientia University.

Important Dates:

Registration deadline: **2016.11.20**

Game day: **2016.12.09**

Rules:

1. Each team consists of 2-4 members from Sapientia University.
2. The race has 3 rounds.
3. In each round, every team is allowed to race once.
4. Only one robot is allowed to be on the racetrack during a try.
5. Only the organizers are allowed to enter the field.
6. During the breaks the teams are allowed to modify the robots.
7. The robot's max. Width = 20 cm, max. Length = 25, max. Height = 20 cm, max. Weight = 3 kg. If the robot fails to fit in these limits the team will be disqualified.
8. On the racetrack the remote control of the robot is strictly prohibited (bluetooth, wifi, voice and so on). Any team found to do so will be disqualified.
9. The width of the line varies: 2-4 cm.
10. The line might contain a dashed section with gaps of 2-5 cm between the dashes.
11. The color of the line is white (tape).
12. The ground is covered with black carpet (See Illustration 1).
13. Laser gates will be used to measure the time of an attempt. The timer is started when the front of robot blocks the laser of the start gate. The timer is stopped when the front of the robot reaches the stop gate. The same system is used in both competitions.
14. The race track might contain a bridge. The incline and decline angle of the bridge is 20 degrees. The path of the bridge will be painted with a rubberized paint that offers a good grip for the tires.
15. Along the route there are 4 gates which are positioned over the track in such a way that the robot is able to pass through. On top of each gate above the line an infrared LED (see Link here) is positioned that emits light at a given frequency (square waveforms, 1kHz, 2kHz, 3kH, 4kHz; the order is random and each frequency is assigned to one gate only). The infrared LED is pointing towards the ground and it is located at approximately 25 cm above the line.
16. The objective in the Agility competition is to identify these unique frequencies. A successful detection involves the following: the robot stops at the detection of the signal, the robot illuminates 1-4 LEDs of its own based on the detected frequency of the signal (for ex. in case of 3kHz: 3 LEDs will be lit), the robot is also required to play a beeping sound (for ex. in case of 2kHz: Beep for 1s, Silent for 1s, Beep for 1s, Silent for 1s), and than move along the line. Please use big and visible (can use multiple colors) LEDs. Also please use strong beepers so the jury will recognize it.
17. In the Speed competition the fastest time wins.
18. In the Agility competition the winner is the team with the most signal detections in the least amount of time.

Illustration 1.
Sample racetrack

SapiLineTracer

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For more details follow the QR code!

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