

# SapiLineTracer Robot Competition

## Santa Edition

### Announcement:

Santa's got a big problem this year: his reindeer got sick, therefore they can't pull his sleigh. He has to find another way to deliver the presents!

To overcome this issue Santa needs sophisticated technology. He already planned his route along which his targets are marked, but he needs a good vehicle capable of following it.

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 carry and place a given number of small objects in designated areas. The winner is selected in function of the number of delivered objects and time.

### Registration:

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

#	Name	Age	Class	Competition
1.	Example John	20	Informatics, 2 <sup>nd</sup> year	Speed / Agility / Both

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: **2015.11.20**

Game day: **2015.12.11**

**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 = 20, max. Height = 15 cm, max. Weight = 1 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 contains a dashed section (parts of the line are invisible due to the stormy weather) with gaps of 2-5 cm between the dashes.
11. The color of the line is white (tape). The color of the ground is grey. See image from last race.
12. The radius of the smallest turn angle is 17 cm.
13. The houses are marked with LEDs (one LED for each possible target).
14. The target houses (where the nice kids live) will be marked with wide angle green lit WS2812b LED glued to the ground (30mW, 120 degrees, size 5x5x2mm). The target houses can be on both sides of the track. See Illustration 2.
15. 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.
16. The race track will contain a bridge. The length of the bridge is selected in such a way that the max. Width of the robot can easily pass through. 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.
17. The items (presents) that you have to deliver to the target areas are regular dices (16x16x16 mm) and each team is allowed to carry 4 of these.
18. Once the robot passes the start gate 4 random target house positions will be illuminated.
19. A successful present delivery means that at least one dice will be dropped inside the marked area. (See Illustration 2.)
20. In the speed competition the robots do not have to carry any presents and fastest time wins.
21. In the agility competition the winner is the team which delivers the most presents in the least amount of time.



Illustration 1.  
Sample racetrack

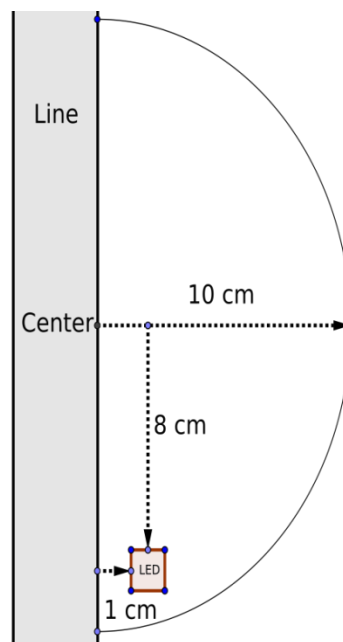


Illustration 2.  
The LED, line and target area alignment



# SapiLineTracer

## 2.0

SANTA'S GOT A BIG PROBLEM THIS YEAR: HIS REINDEER GOT SICK, THEREFORE THEY CAN'T PULL HIS SLEIGH. HE HAS TO FIND ANOTHER WAY TO DELIVER THE PRESENTS!

TO OVERCOME THIS ISSUE SANTA NEEDS SOPHISTICATED TECHNOLOGY. HE ALREADY PLANNED HIS ROUTE ALONG WHICH HIS TARGETS ARE MARKED, BUT HE NEEDS A GOOD VEHICLE CAPABLE OF FOLLOWING IT.

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!

INTERESTED? FOLLOW THE QR CODE!

Registration deadline:

2015.11.20

Contest date:

2015.12.11

