PACISE 2020

Robotics Competition Details (*Tentative*)

If any issues are found that would make the contest too difficult or trivial then changes will be made and teams notified. Otherwise the contest and scoring will be very similar to what is outlined here.

Allowed Sensors:

1 EV3 Color Sensor
1 EV3 Infrared Sensor
1 EV3 Touch Sensor

Tape:

Effort will be made so that the color sensor registers the green tape as green and the black tape as not green.

Using 3/4" Black Electrical Tape for the black lines.

Using 3/4" Neon Green or Lime Green Duck Tape for the green lines.

Color Sensor Notes:

No Signal - 0	Green - 3	White - 6
Black - 1	Yellow – 4	Brown - 7
Blue - 2	Red - 5	

Color Sensor Position: ~ 1/2" from ground (***Data from 2018***)

- Black Tape: 1
- Black Tape + Surface: 2
- Surface: 6
- Green Tape: 3
- Green Tape + Black Tape: 1
- Green Tape + Surface: 2

Environment Notes:
Classroom and Hallway setting. Courses to be on a near white plastic non-smooth surface (so there is some traction) with course paths marked with tape. Drawing surfaces will be large sheets of paper that is either going to be near white or slightly brown.

Part I

Follows a black line approximately 1/4" wide around a race track twice. The starting point of the track will be marked by two green lines 1" apart. Each green line is approximately 1/4" wide.

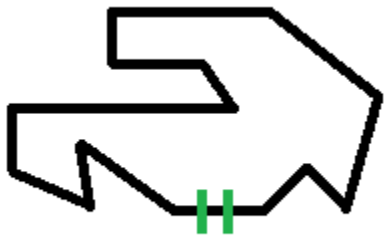

Figure 1 - Example Track for Part 1

Robots will be scored based on time it takes to complete two trips around the track. Robots that don't make it around the track in time (approximately 5 minutes) will be scored based on distance covered. Robots can choose to start just before or just after the two green lines. Robot needs to come to a stop after the second trip is completed.

Ranking (Part I):

First Tier: Robots that completed the objective, shortest total time gets highest ranking.

Second Tier: Robot that makes it the furthest around the track, or completed both laps but did not stop. Ties broken based on shortest time.

Part II

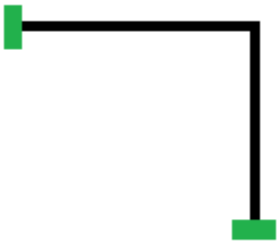

Figure 2 - Approximate Layout for Part II

Follow a black line approximately 1/4" wide to an end point. The green lines are approximately 1/2" wide and mark the ends of the track. After following the track, the Robot then needs to, while holding a pen draw the course on a blank sheet of paper. We will provide pens or you can bring your own. When mapping, the robot can choose to just go from the start to the end, or it can after reaching the end go back to the start on its own. Additionally, the robot can run the course multiple times, before going to the drawing phase. Each drawn edge must be within + or – ½ inch per 6 inches of the original line. So if one of the lines was 12 inches long the robot should draw a line from 11 to 13 inches long. The angle the

lines connect at needs to be within 10 degrees of the original angle. So, in Figure 2, the angle is 90 degrees, so the angle between the two lines needs to be somewhere from 80 degrees to 100 degrees. The two lines don't have to connect, but their ends need to be within ½ inch of each other.

Ranking (Part II):

First Tier: Robots that completed the objective, Time to map the course added to the Time to draw the course. Time between end of mapping to start of drawing not counted (e.g. picking up and moving the bot, added the pen, etc…). However, if the team needs to pick up and move the robot back to the start during the mapping phase (e.g. the robot needs to run the course more than once), then this time is counted towards the total time.

Second Tier: Robot mapped the course and drew a course that was not the course. Ranking based on time and amount of course that was correct.

Third Tier: Robot mapped the course, but could not draw any course. Ranking based on amount of course mapped and time to map.

Part III

Follow a black line approximately 1/4" wide to an end point. The green lines are approximately 1/4" wide and mark the start/end of the track. After following the track, the Robot then needs to, while holding a pen draw the course on a blank sheet of paper. As in Part II, the robot may go around the track more than once in the mapping phase. Each drawn edge must be within + or – ½ inch per 6 inches of the original line. So, if one of the lines was 12 inches long the robot should draw a line from 11 to 13 inches long. The angle the lines connect at needs to be within 10 degrees of the original angle. So, in Figure 2, the angle is 90 degrees, so the angle between the two lines needs to be somewhere from 80 degrees to 100 degrees. Lines don't have to connect at the corners, but their ends need to be within ½ inch of each other.

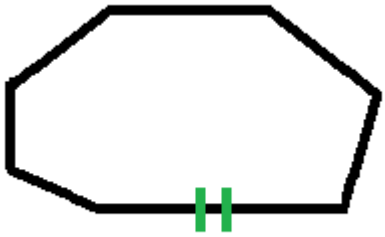

Figure 3 - Approximate Design for Part III

Ranking (Ranking Part III):

First Tier: Robots that completed the objective, Time to map the course added to the Time to draw the course. Time between end of mapping to start of drawing not counted (e.g. picking up and moving the bot, added the pen, etc…). However, if the team needs to pick up and move the robot back to the start during the mapping phase (e.g. the robot needs to run the course more than once), then this time is counted towards the total time.

Second Tier: Robot mapped the course and drew a course that was not the course. Ranking based on time and amount of course that was correct.

Third Tier: Robot mapped the course, but could not draw any course. Ranking based on amount of course mapped and time to map.

Rules for Overall Ranking (*Tentative*)

Stage 1 Ranking:

Overall 1st gets 3 additional points, Overall 2nd gets 2 additional points, Overall 3rd gets 1 additional point

First Tier: 3 points for reaching the tier.

Second Tier: 0 Points for reaching this tier.

Stage 2 Ranking:

Overall 1st gets 5 additional points, Overall 2nd gets 3 additional points, Overall 3rd gets 2 additional points

First Tier: 5 Points for reaching the tier.

Second Tier: 2 Points for reaching the tier.

Third Tier: 0 Points for reaching the tier.

Stage 3 Ranking:

Overall 1st gets 7 additional points, Overall 2nd gets 4 additional points, Overall 3rd gets 3 additional points.

First Tier: 7 Points for reaching the tier.

Second Tier: 3 Points for reaching the tier.

Third Tier: 0 Points for reaching the tier.