

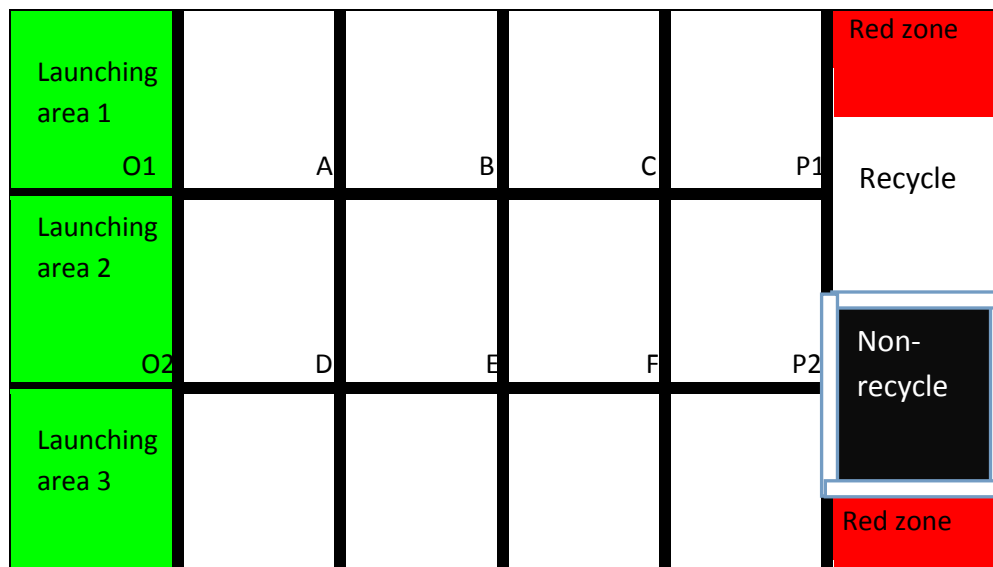
G-1

Smart Garbage Truck

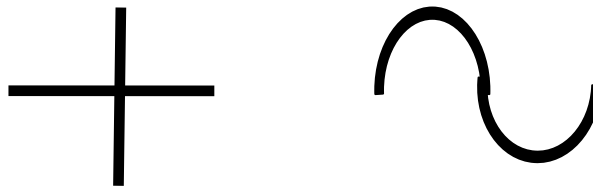
SCENE

In our daily life, garbage is everywhere. A empty beer can, banana peels, a piece of packing paper, are polluting our environment. A smart garbage truck will solve the problem for us. It will classify by the nature of the garbage. The truck will find and bury the organic ones and collect the recycles. As a result, we will have less contamination and renewable materials for our blue planet.

DESCRIPTION OF THE ARENA



- The surface is 180 cm in length and 120 cm in width.
- Each rectangular marked by the black line is 30 cm * 40 cm
- The black line is 15 mm in width
- There are 3 launching areas colored in green on the left side of the surface
- Recycle bin and Non-recycle bin locate on the right side of the surface



ROUTE TYPE 1 AND 2



GARBAGE: RECYCLE (left), NON RECYCLE (right)

- There are two types of route, straight lines and curves.
- Recycle garbage is represented by a white soda can whereas the non-recycle garbage is represented by a black soda can

DESCRIPTION OF THE ROBOT

Students can use any types of materials, but the robot need to meet the following criterions:

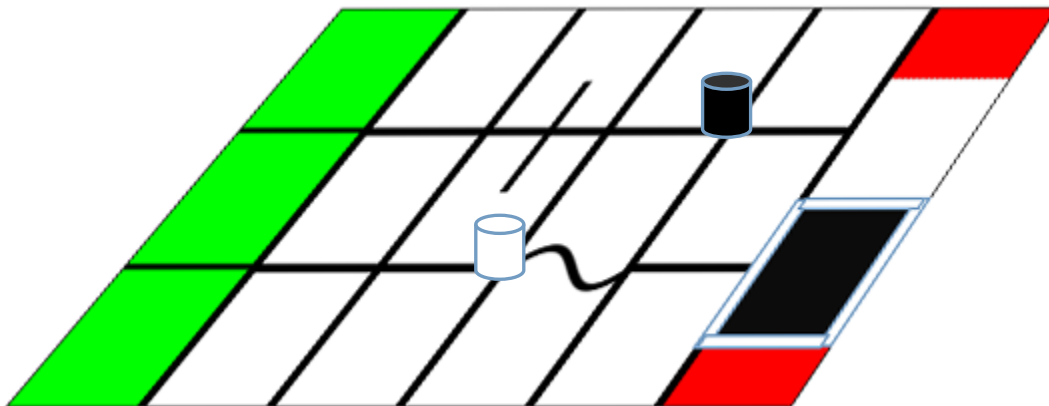
- Length * Width*Height must not exceed 25 cm * 25 cm * 25 cm
- Integrated sensor modulus cannot be used. Only individual sensors are allowed
- Programming need to be done on the spot before each round during the competition
- Robot cannot use auto line detecting modulus.

DESCRIPTION OF THE MISSION

- Robot need to follow the black line and find the garbage, identify the garbage and put the garbage to the corresponding bin.
- After put the garbage to the corresponding bins, robot need to return to its launching area.

DETAILED DESCRIPTION OF THE CHALLENGE

- Garbage will be randomly placed at point B, C, E or F by a referee prior to the beginning of the match.
- Two sections of the black lines among section AB, BC, DE and EF will be randomly replaced by the route type 1 and 2 (one type each) prior to the beginning of the match.



- Students have 2 hours and 30 minutes in total to build, program and practise.
- After launch, robots need to detect the black line as soon as possible.
- Time: 150 seconds maximum: total time used will be recorded for the situation of that two students have the same score. The one who uses less time will be the winner.
- two rounds
- The round ends in the following scenarios
 - Robot has been touched by student after launching
 - Robot is not following the black line after detected the black line
 - Exceeded the maximum time allowed

Challenge Step by Step
Randomly replaces two sections of black line using type 1 route once and type 2 route once
Randomly places garbage cans
Draw for launching area 1, 2 or 3
2h 30m: build, program and practise
Launch the robot
Robot is detecting black lines
Robot follows the black line and searching for garbage
Robot find the first garbage, identify its type and put it to the correspondent bin
Robot continues searching for the second garbage
Second garbage has been found. Robot put it to the correspondent bin
Robot returns to its launching area
Mission accomplished

Scoring	
	points
Structure design	max 10
Successful launching of the robot	10
Robot follows black line and cross the first cross section	20
Robot follows route type 1 or 2 (it is not necessary to follow both route types, but it's required to follow at least one route type during the challenge)	10
Robot picks up garbage	10 each
Robot put the garbage to a bin	10 each
Robot put the garbage to the correspondent bin	20 each
The garbage (can) is standing up in the bin	20 each
Robot returns to its launching area by following the black line (robot or its projection cannot touch the green launching area while returning)	15
Robot's part(s) left in the arena after each round	-5 each (max:-15)