



AMALTHEA '18

ROBOVENTURE RULEBOOK

ROBOQUEST



PRIZES WORTH ₹ 20,000

Task :

The event's basic purpose is to build a fire safety robot.

There will be two bots:

1. Autonomous bot:

- The autonomous bot should be able to detect the smoke.
- Time when smoke will be given at the starting point will vary from participant to participant and will be decided by the organizer.
- It should also be a line follower robot.
- It will also need to climb some (small) wedge.

2. Manually operated bot:

- This bot can be operated manually (movement of the robot and the robotic arm).
- This bot needs to have some water throwing mechanism. In water throwing mechanism on D-day you will be only allowed to give one on/off command using one switch on the bot itself(not on the remote), which means that you will need to calculate the force, angle etc. for the water which you will be throwing beforehand (height and distance of the robot from the fire and length of the fire line will be given to you beforehand).
- Robot should also have one robotic arm or gripper which can pick up things from one place and put it on another place.
- And obviously bot should also be able to go from one place to another.

Description:

The autonomous bot will detect the smoke and start following the line. It will climb two wedges while following the line. Then it will reach to the first check point. On first check point manual bot will be already there. Manual bot's first task is to shut down the fire. Fire will be below the robot at some distance. For completing first task manual bot won't be allowed to move. Its position will be fixed. After shutting down the fire, manual bot will go down on the wedges. And reaches the place where fire was there. Then it will need to pick up one ball (size of the ball will be provided) and put it at final check point

Point system:

Detect the smoke and start following the line - 30 points

- Considered as skip when not at all able to start following the line when detect the smoke.

Line following (whole line) - 100 points

- Considered as skip when not at all able to follow the line. But points will be awarded only when it follows whole line.

Shutting down the fire - $(D/X) * 100$ points

- If length of the fire line is let's say X, and if you are able to shut down D length of fire then you will be given $(D/X) * 100$ points. These points will be awarded if and only if D/X is greater than or equal to 0.4. If D/X is greater than or equal to 0.1 it won't be considered as skip otherwise it will be counted as skip.

Picking the ball (with the help of robotic arm only) - 40 points

- Considered as skip if not able to pick up the ball in 3 attempts. Points will be awarded only when successfully picks up the ball with the help of the robotic arm. More than 3 attempts will be counted as skip.

Putting the ball (with the help of robotic arm only) - 20 points

- Considered as skip if not able to put down the ball in 1 attempt. Points will be awarded only when successfully put down the ball with the help of the robotic arm. More than 1 attempts will be counted as skip.

Time bonus - 20 points

- Fix for whatever time a participant saves greater than 10 seconds; if he saves less than 10 seconds he won't be awarded any bonus points.

Bot specifications:

Autonomous bot:

1. The autonomous bot must be completely autonomous with just one switch to start/reset it and calibrating the line follower.
2. The dimensions of the autonomous bot are such that it completely fits in a box of dimensions 25cm X 25cm X 20cm (l x b x h). The bot must be started individually by only one onboard switch. However, a team may have separate onboard switches for a restart. This switch has to be shown before the run to the organizers.
3. Weight of autonomous bot - less than 5 kg
4. The bot should not damage arena when running or performing any task. It should not also damage the line of the line following robot. If someone is found doing so the team will be disqualified or penalized. Decision rests on the organizers and will be final and binding for all.
5. Teams are not allowed to use readymade Lego kits or any such assemblies.
6. The starting procedure of the bot should be simple and should not involve giving the bot any manual force or impulse in any direction.

Manual bot:

1. Teams can use both wired as well as wireless remotes. In case of wired bots, the length of wire should be such that it always remains slack at any instant of time. If the participants use wireless mechanism, then it is mandatory to use a dual frequency remote. If someone wants to control the robot with the help of mobile using Bluetooth, he should first show it to the organizer (what controls are there in the mobile and how they are working).
2. Water throwing mechanism should throw water in range 0-30 degrees only at one time.
3. Only one member of the team is allowed to control the bot. And only two members are allowed to enter the restricted area.
4. The manual bot must fit within a box of dimension 40cm x 30cm x 20cm (l×b×h). The size of the gripper is not included in this constraint. The external remote control used to control the bot is not included in the size constraint.
5. Weight of the manual robot(maximum) - 7 kg
6. The bot must be stable and should be able to stand on its own at the beginning of the run when put on the first check point. Bots not fulfilling these criteria will be disqualified.
7. The manual bot should not split into two or more units during the entire match. This bot also should not damage arena when running or performing any task. It should not also damage the line of the line following robot. If someone is found doing so the team will be disqualified or penalized. Decision rests on the organizers and will be final and binding for all.
8. The manual bot should have an onboard power supply. The manual bot cannot be constructed using readymade Lego kits or any readymade mechanism.
9. However, readymade gear assemblies can be used. Violating this clause will lead to disqualification of the team.

Power supply:

1. Both the bots must use an onboard power supply. No external power supply will be allowed. Organizers are not bounded to provide the power supply plug or any extension board. Arena may be in outdoor environment so plug supply will not be given.
2. Each team should bring its own power supply for both the bots.
3. The potential difference between any two points should not exceed 24 V DC.

Arena specification:

1. Width of the line for line follower robot - 3 cm
2. Height of first wedge - 50 cm
3. Height of second wedge - 20 cm from first wedge (total height of first checkpoint - 50 + 20 cm)
4. Width of wedges - 60 cm
5. Length of fire line - 1 m
6. Horizontal distance between fire and first checkpoint (position of manual bot) - 60 cm
7. Radius of ball - less than 2 cm

Rules and regulations:

1. If you are not able to complete the task you can skip that particular task. At max you can skip one task. If someone skips more than 1 tasks he won't be considered as an eligible candidate to win the prize. But still if he completes at least 3 tasks successfully he will receive participation certificate.
2. You will be given fix amount of time to perform all the tasks. Points will be given to you on the basis of tasks you will be able to complete successfully. Which will be decided by judges.
3. **If some participant is able to complete all the tasks before the given time, then he will be given bonus points. (If you skip even one task you won't get any bonus points)**
4. Making two bots is not compulsory, participants can combine both the bots in one bot.
5. Use of any unfair means would lead to disqualification.
6. There will be one boundary near arena. When someone is performing the task only that team will be allowed to enter in that area.
7. All team's data will be entered in the excel and one random order will be generated. Teams will be called in that order to perform. After the team call, team should report in 10 minutes otherwise team will be disqualified.

*Details (size, shape, etc.) of arena will be updated soon in the rulebook.

***The organizers reserve the rights to change any of the above rules as they deem fit.**

***You are advised to regularly check the website for updates.**

Eligibility:

All students with a valid identity card of their respective educational institutes are eligible to participate in the event.

Team Specification: A team may consist of a maximum of 5 members. Students from different educational institutes can form a team. More than one team from one institute are allowed to participate.

Certificate policy:

1. Certificate of excellence will be awarded to the top 2 teams.
2. E-Certificate of participation will be given to all the teams whose robot has completed at least 3 task successfully except the top 2 teams. (All the members of the team will be given certificates)
4. Disqualified teams will not receive any certificate.
3. All other participants won't be entertained for any certificates.

For any doubts feel free to contact on below mentioned number.

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