Automated Robotics Challenge

Theme:

Seeking sustainability as an important issue for a long period of time now, though still a lot has to be achieved. Imagine yourself as a Super Couple, UTKARSH and UNNATI, to change and achieve goals like Gender Equality and Development in Industry and Infrastructure. A certain emergency has aroused in AIIMS, New Delhi seeking a heart transplant. At the moment only a single heart is available for donation in Lilavati Hospital, Mumbai. To transport it from Mumbai to New Delhi, HYPERLOOP Train System could be used but there is only ONE PROBLEM. It is still in construction!!! But for the construction to continue the waste from river STHIRATA (sustainability) has to be cleaned up. So, as a Super Couple, you both the bots (autonomous and manual) have a certain Super Power to remove all the waste from STHIRATA for the proposed Hyper Loop track to complete for transportation. Here UTKARSH and UNNATI, both have to help each other to accomplish the task.

Problem statement:

Task of manual bot is to clear the path of autonomous bot and auto-bot must be a line follower. Additionally, autonomous bot should glow a led whenever it detects an object because only then the manual bot can lift the object from the line. At the end autonomous bot should through laser on rival box and manual bot throws it into prison.

ROUND 1:

1- The autonomous bot will start from the start line in the autonomous zone itself.
2- And simultaneously the manual bot in the manual zone.
3- The autonomous bot has to follow the line (black line on white background).
4- The path of the autonomous bot contains some hindrances
5- The autonomous bot has to detect the hindrances and has to stop there as it is not allowed to drag the obstacle.
6-Also, autonomous bot may has to count the obstacles in his way and has to display the count on 16*2 LCD or by blinking led.
7- But team can use either LCD or LED for count. Simuntaneus use of both lead to disqualification.
8- In case team is using LCD , after detecting block /obstacle in path team has to display " DETECTED" and simuntaneusly increment the count And display the total count on LCD .
9-In case team is using led , then they have to blink led number of times they detect the obstacle.
10- The manual bot is prohibited to enter the autonomous zone and viceversa.

11- Regarding manual bot , it can traverse the manual arena number of times he want but scores will be given once .
12- Team can skip the task/hurdle no. of times he/she want . But negative points of two skip will be deducted at max.

ROUND -2

Details regarding round 2 will be disclosed on the spot.

General rules:

1. There can be a maximum of 4 members in a team.
2. The robots should not damage the arena in anyway. Defaulters will be disqualified.
3. The participants are required to be present at least 15 minutes before their run.
4. Co-coordinators reserve the right to disqualify any team indulging in misbehaviour. The teams must adhere to the spirit of healthy competition.
5. The rules may vary slightly as per coordinators decision.
6. The decision of the μCR team will be final and binding.
7. Teams can use both wireless and wired remote controls for controlling the bot. However, no extra points should be awarded even in case of wireless remote controls.
8. Machine cannot be constructed using Lego kits or any ready-made mechanism, but ready-made gear assemblies can be used. Violating this clause will lead to direct disqualification of the team.
9. The bot can use on-board or external power supply for manual bot only. However any fault or disconnection would be the responsibility of the participants. Participants will be provided with 12V DC and 24V DC power supply for manual bot only.
10. Power supply must be on bot for autonomous bot and is not provided by event organisers.
11. In case participants do not have their manual bot, they are provided with manual bot (wired remote) with sufficient mechanism to complete task. However, in this a penalty of 200 points is imposed on the team. (Bot is provided to respective team 10 minutes before their run in order to practice on controls)

Scoring rules:

MANUAL BOT:

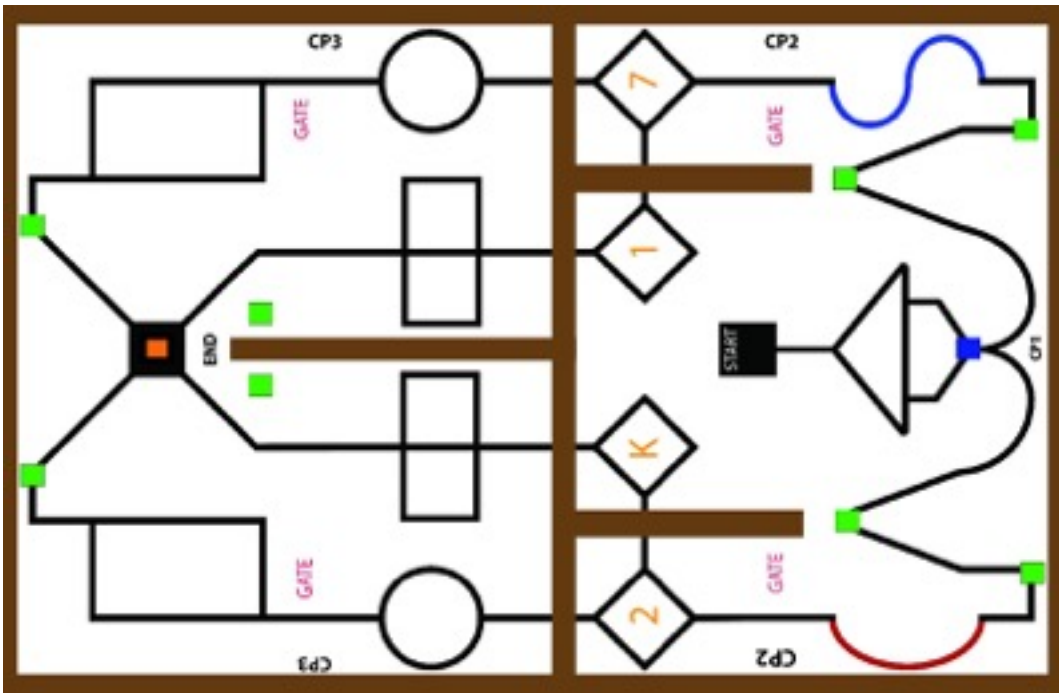
1. 50 points will be awarded for picking each cube.
2. 100 points will be awarded for placing the each cube in the cube pit.
3. 100 points will be awarded for crossing the marbles .
4. 100 points will be awarded for picking the cylinder.
5. 150 points will be awarded for placing the cylinder in the cylindrical pit.
6. 25*n points will be given on picking pattern block (n=number of blocks).
7. 50 points will be given on placing single pattern block.

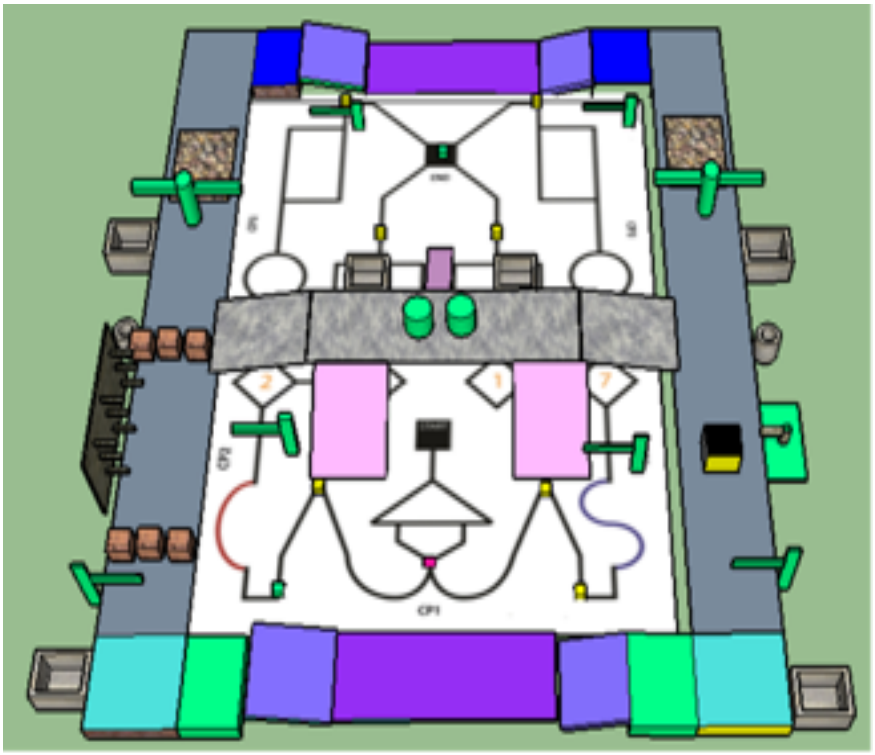
8. In case ,team form pattern (C , S , 1, 7) then points will be 300,350,200,250 respectively.
9. 100 points will be given in order to move coloured block by 90deg.
10. 150 points will be given in order to move coloured block by 180deg.
11. 50 points will be deducted in each man handling.
12. 200 points will be deducted for each skip.

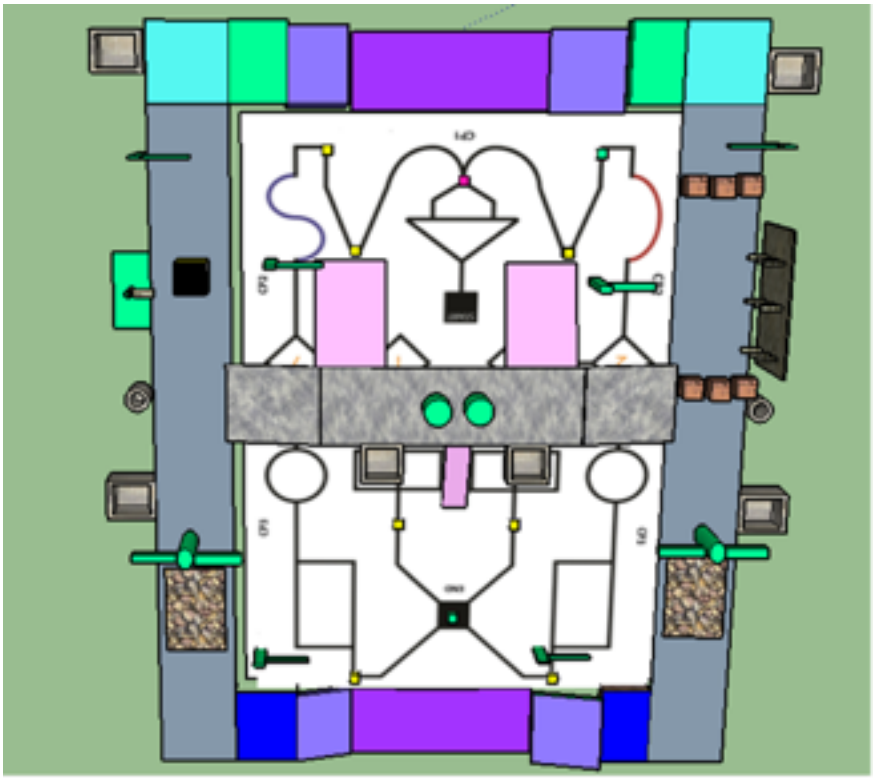
AUTONOMOUS BOT :

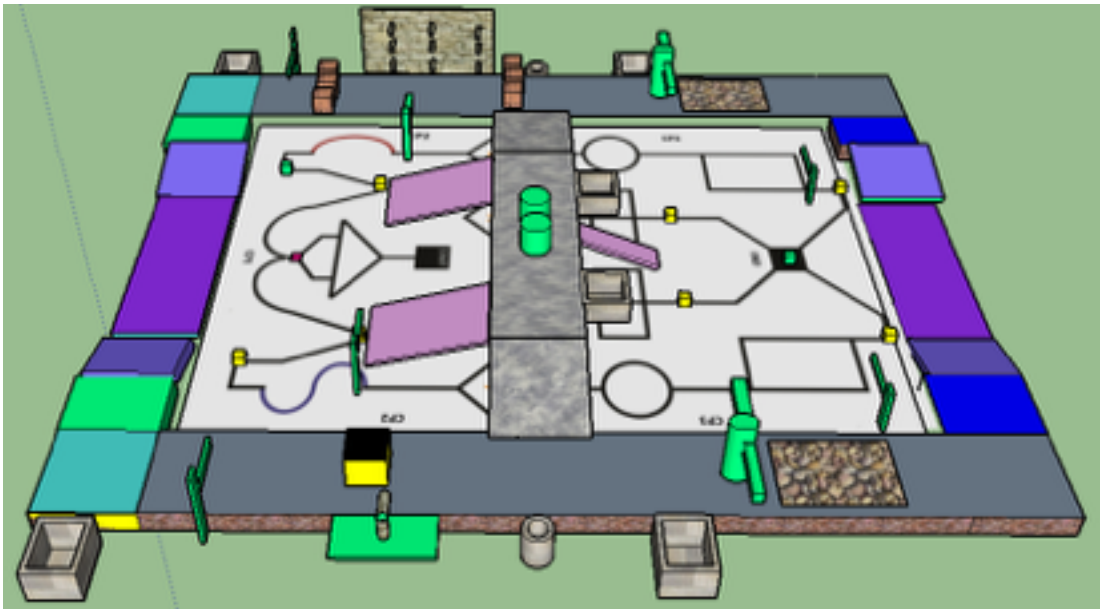
1. 200 bonus points will be awarded to the team if they display their team name and team id on 16*2 LCD at the start of event.
2. But team can use either LCD or led for count. Use of both on same bot lead to disqualification.
3. 100 points will be awarded for detecting the block.
4. 100 points for crossing Check Point 1 (either path).
5. 200 points for crossing Check Point 2 (either path).
6. 250 points for crossing CheckPoint 3(either path).
7. 50 points will be deducted in each man handling.
8. 200 points will be deducted for each skip.
9. 20 points will be deducted if led blink for false count.
10. Similarly,20 points will be deducted if LCD display a false count.
11. 200 points will be awarded to stop the autonomous bot at the end point.

Arena:









Bot Specifications

Autonomous bot

1. Only one autonomous bot per team is allowed which can travel as line follower.
2. The bot must be completely autonomous and it must fit into the box of dimension 220mm×220mm×220mm.
3. Bot must have on board power supply and is not provided by organising team.
4. When using the electric power supply, the potential difference between any 2 points must not exceed 12 V at any point of time during the game.
5. If the team is using LCD then it must be properly adjusted on the autonomous bot and in case team is using LED for counting then it has to be placed in such a way that it must be visible to the scorer.
6. During the run, the autonomous bot must not damage the arena in anyway. It is not allowed to leave anything behind or make any marks while traversing the arena. Any bot found damaging the arena will be immediately disqualified. The final decision is at the discretion of the organisers.
7. Ready-made gearboxes, sensors, development boards can be used but no other part of the robot should contain any ready-made components.

Manual bot

1. Each team is allowed to have only a single bot.
2. The robot must fix inside a cube of dimension 300mm X 300mm X 300mm before the start of event. The robot can exceed the dimensions once the competition commences.
3. The dimensions mentioned above are subject to a tolerance of 10%.
4. The maximum voltage difference between any two points should not exceed 24V DC.

5. The bot can use on-board or external power supply. However any fault or disconnection would be the responsibility of the participants.
6. Participants will be provided with 12V DC and 24V DC power supply.
7. The bot must be fully manually controlled with all mechanisms self-contained.
8. The bot cannot be constructed using readymade mechanism. But participants may use readymade gear boxes.
9. Remote controls both wired and wireless are allowed in the event.

Team Specifications:
A team may consist of a maximum of 4 participants. Students from different educational institutes can form a team.

CERTIFICATION POLICY:

1.Certificate of Appreciation will be given to the top 3 teams.

2.Goodies will be given to all the teams who qualify first round of the competition.

REGISTRATION PROCEDURE:

1-The registration shall be done through the Ucr website and cyberSrishti website (both).
2-The Team Details include the following details of all team members:

Name: E-mail:
Institute Name Contact No.:

QUERIES

For any queries regarding the Problem Statement/anything relevant, you can contact the coordinator:

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