IARC(*International Autonomous Robotics Challenge)*

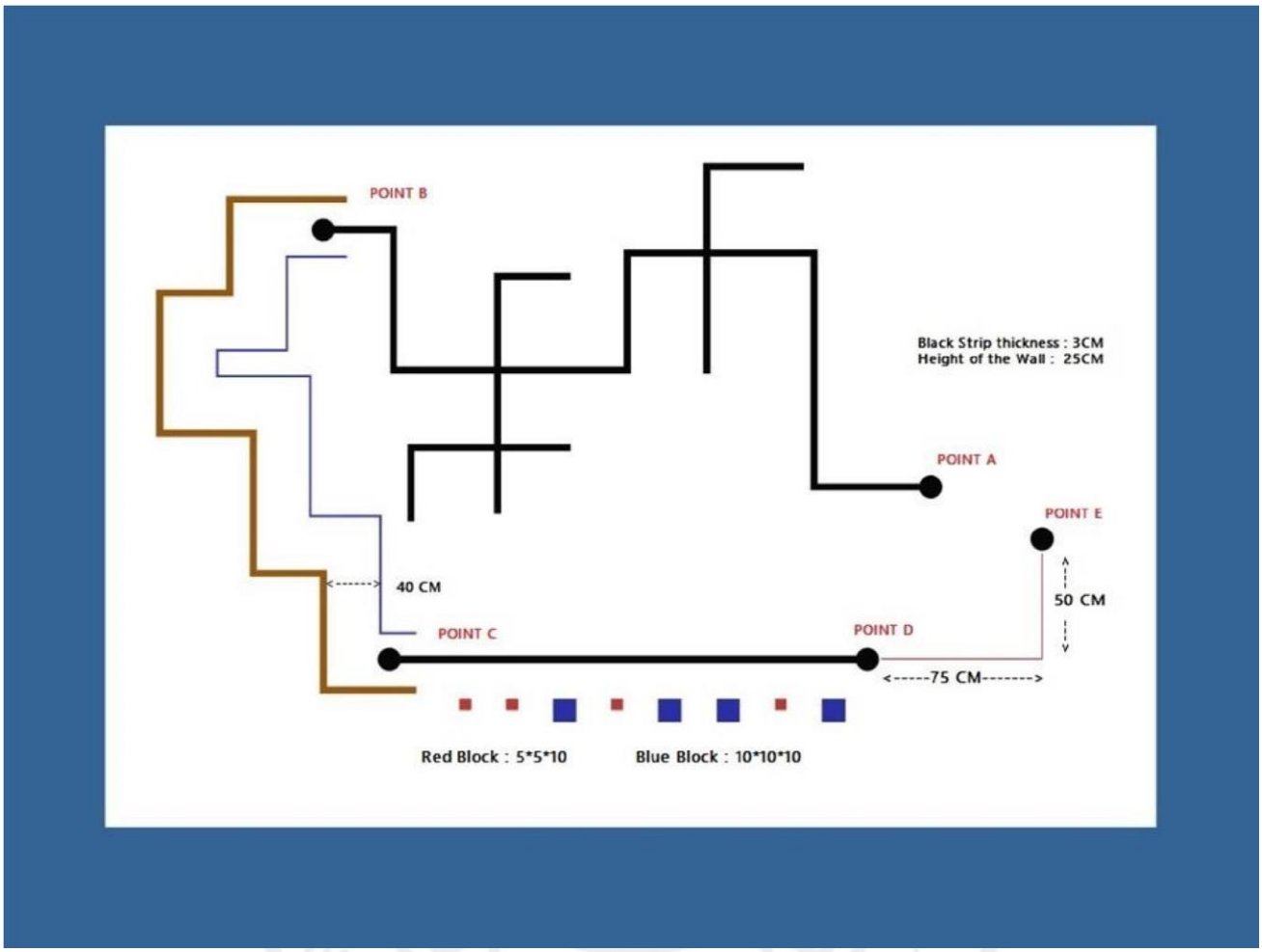
General rules:

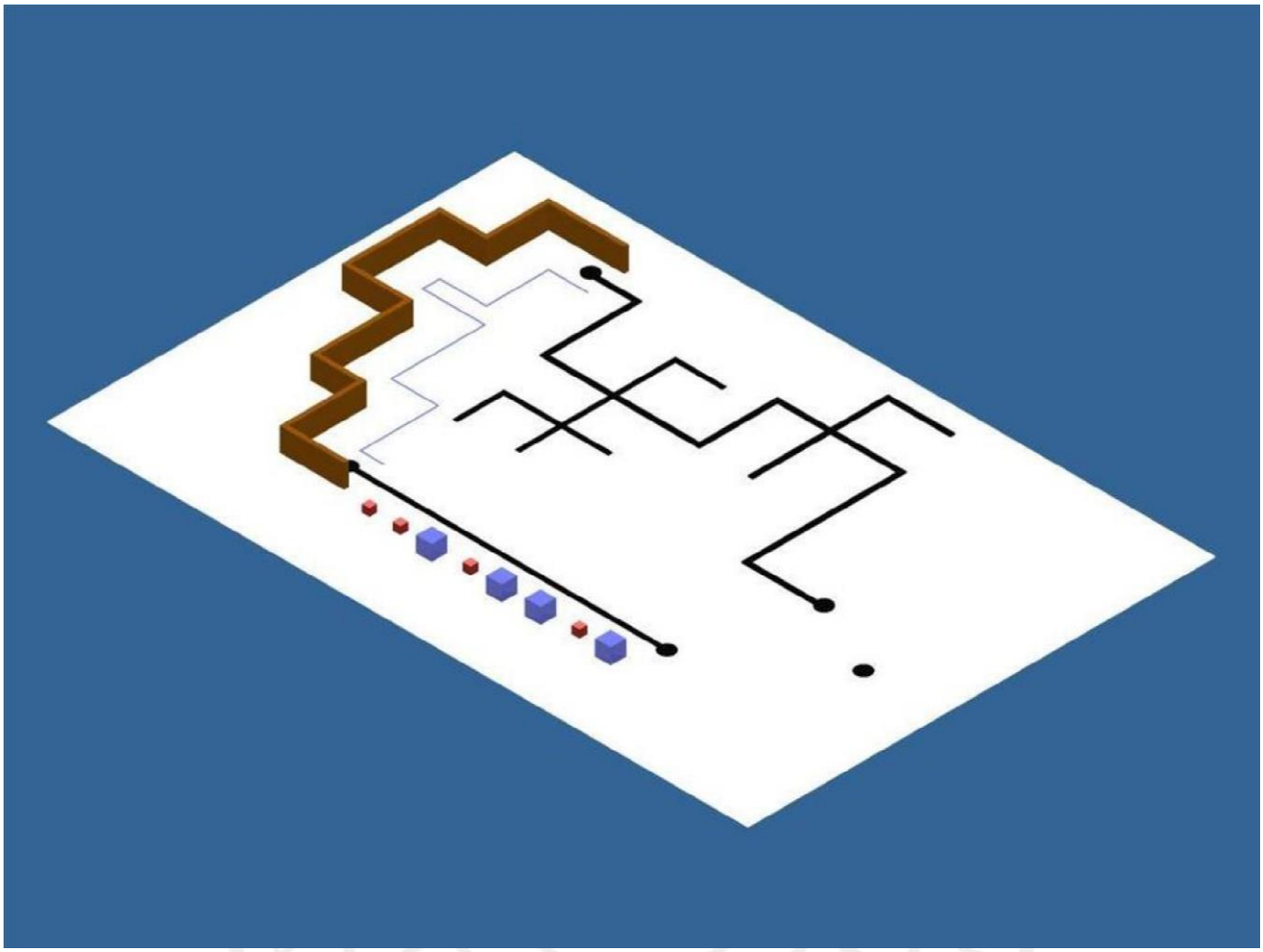
- Each team can have a maximum of 5 participants.
- A team may consist of students from different colleges.
- Certificates of Excellence will be awarded to the top three teams.
- No damage should be made by a bot to the arena or to other team's bots during the match any manner.
- Bots should not be disassembled until the results are declared.
- The organizers reserve the right to change the rules as they deem fit.
- When a team is called for match, they must report within five minutes.
- Judges decision will be final.
- During wall following, a line would be drawn at a distance of 400 mm from the wall. The bot must not cross this line at any cost. In case the bot crosses the line, then human intervention would be allowed and points would be cut for the same.
- The arena shown is just for reference .
- The Mat for line following , shape of the wall for wall following , the no of 5cm and 10cm blocks and their relative placing will not be disclosed before the event.
- The display boards must be marked or specified as to what it is indicating prior to the event.

Event Structure:

The event would be organized in two rounds – National Round and the Final Round.The teams selected in the zonal (national round) will be eligible for participation in the final Round of IARC , TECHKRITI ' 16 held at **IIT KANPUR.**

Arena:


POINT B
Black Strip thickness : 3CM
Height of the Wall : 25CM
POINT A
POINT E
40 CM
50 CM
POINT C
POINT D
<-----75 CM------->
Red Block : 5*5*10
Blue Block : 10*10*10



Robot Control:

- You can start the robot at the beginning of the trial and no human intervention is allowed thereafter. If human intervention is necessary, the ongoing trial will come to an end. Teams may go for another trial if they have sufficient time left.
- The judges can ask for an explanation of any mechanism on the bot and there would be an immediate disqualification of defaulters of any kind.

Mission Objective:

ZONAL ROUND : The bot must be fully autonomous and has to perform the specified tasks :

- It must start from point A and reach point B by the principles of line following. After reaching point B it must glow blink led indicating the end of the game.

FINAL ROUND : The bot must be fully autonomous and has to perform the specified tasks :

- INITIAL POSITION **:** you shall place your bot at point A in any direction , in order to perform line following .
- After reaching the point B by line following it then has to travel to another point C by following a path , bounded by continuous wall on one side and a 400mm line running parallel to the wall on the other side ,by the principles of wall following . It would then reach C .
- After reaching C it must again traverse on a black straight line .
- There would be any number of 5cm & 10cm blocks placed alongside the line .
- The bot must simultaneously count the no of 5cm and 10 cm blocks and give the output by displaying the information on the digital display system within the bot
- In addition to counting the no of various types of blocks it must also specify the type of block it passes by , by indicating it on the display board or by glowing 1 led for 5cm & 2 led for 10 cm block.(The latter is strongly suggested.) The bot would then reach the point D.
- After reaching point D it must reach point E only with the aid of the distances (relative coordinates) provided in the arena diagram .
- Reaching point E will mark the end of the game.

NOTE:

- The side of placing of the blocks with respect to the black strip is fixed and is according to the diagram of arena shown.
- For key dimensions (height of the wall etc.,) refer to the diagram of the arena shown.

Bot Specification:

- During the whole event the bot must fit within a square of 250X250X250 (lXbXh). Dimensions in mm.
- The Robot must be stable and able to move on its own. A bot not fulfilling these criteria will be disqualified.
- The bots s hould be able to follow the line according to event specifications.
- For obstacle avoidance team can use any short of technology/sensor as far as it fits in the dimension mentioned and also it should not be factory made or commercially available setup.
- The wire used to power/feed the bot should remain slack at all times.
- Each team has to bring its own power supply for its robots. The voltage difference between any two points on the bot must not exceed 24 volts.
- Teams are advised to use an on-board power supply. In case they are using external power supply they will be responsible for any problem created by entanglement of wires.
- Bot's code will be checked for hard coding before trail is allowed.

You can buy components from Sp Robotics

Point Structure:

ZONAL ROUND:

- Time taken for line following = t
- b = points for blinking the led after completion = 10
- p = penalties awarded e.g blinking of led before completion =5 (for each) points : (3600/t) +b - p

FINAL ROUND:

- Time taken from A to B = t1 (Line following)
- Time taken from B to C = t2 (Wall following)
- Time taken from D to E = t3 (Coordinate location)
- From C to D : No of 5 cm blocks detected correctly = n1
- No of 10 cm blocks detected correctly = n2
- No of times the indication was done correctly = n3 points : K1{ (n1) + (n2) + 2(n3) } + K2 { (500 / t1) + (200 / t2) } + K3 { 1/t3 } - K4 { x1 + x2 + x3 + x4}

where :

- x1 = no. of collisions with the wall
- x2 = no. of times the bot crosses the 400mm line
- x3 = no. of Human interventions x4 = penalties issued if any

where

- K1 = 16.5
- K2 = 35
- K3 = 1000
- K4 = 5