

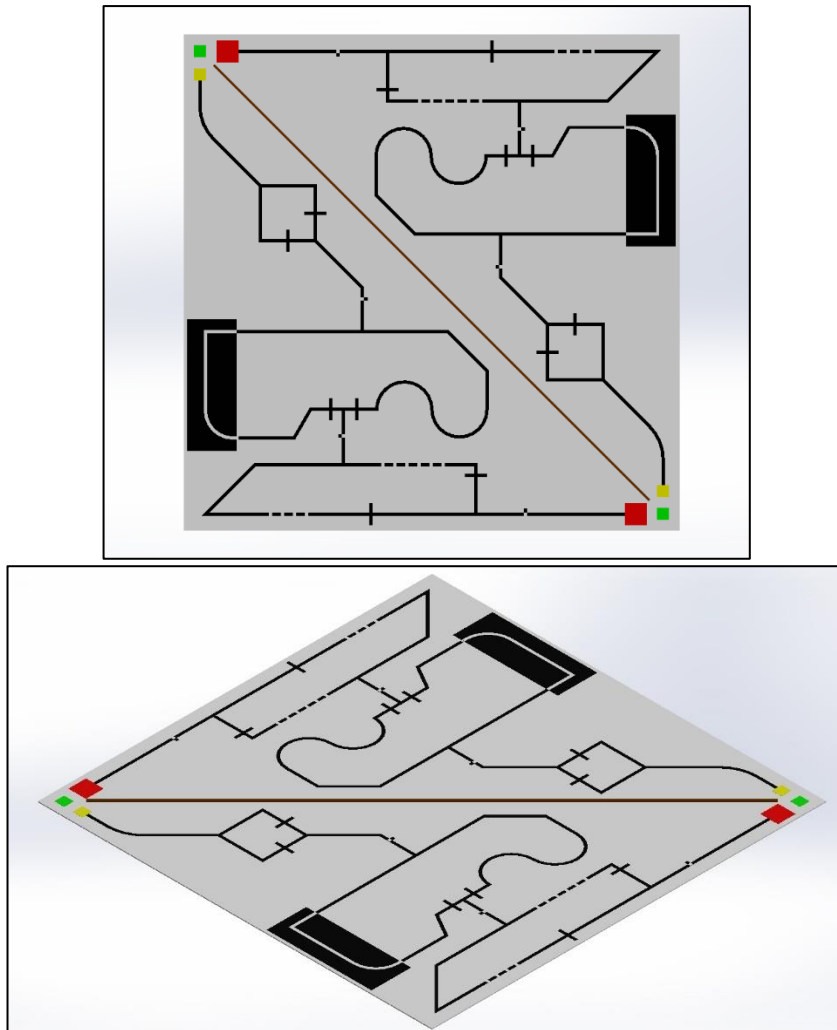
Search N' Destroy

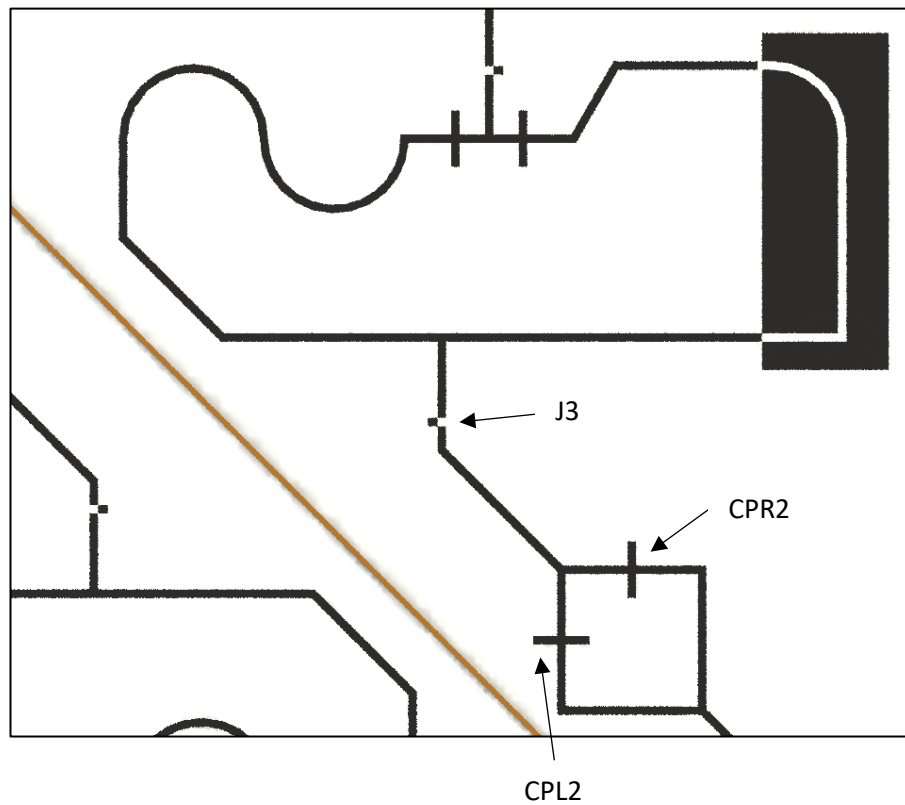
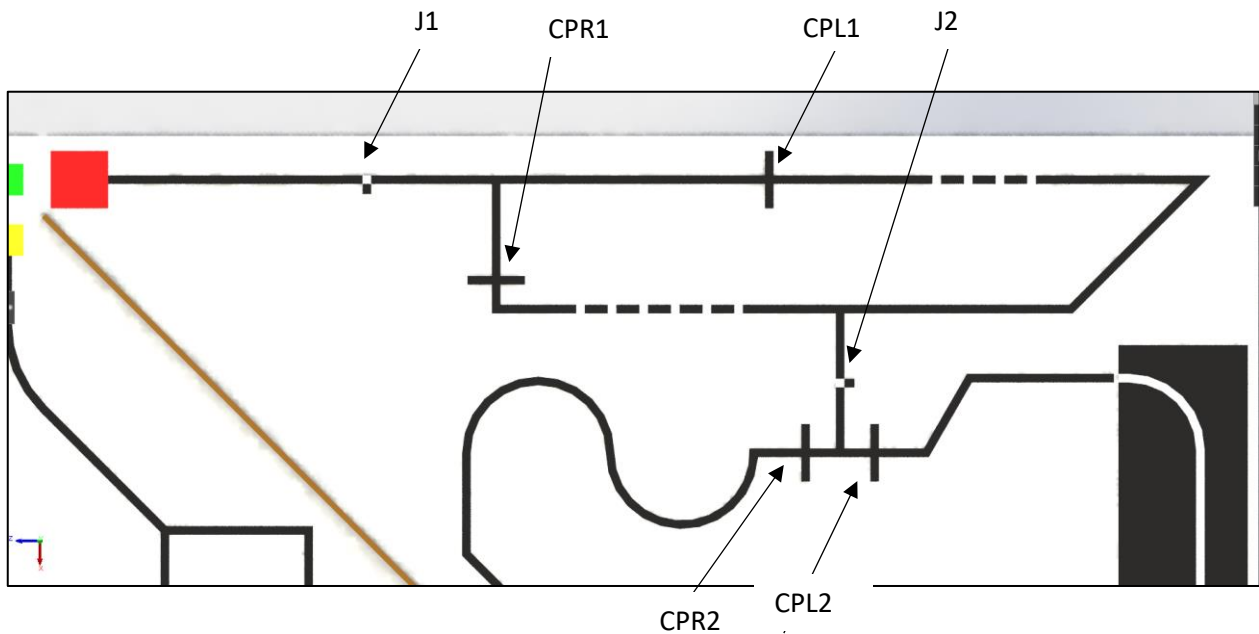
EVENT DETAILS:

Search N Destroy is basically a line-following and maze-solving competition. A track of white lines on black backgrounds and black lines on white backgrounds will be laid out and an autonomous robot must follow that line. The robot must complete a task. The path will have checkpoints. Each checkpoint will earn some points based on the number of checkpoints covered; the time taken to cover these checkpoints as well as the task completed will decide the points earned by the robot. The team which follows the correct path the fastest will be the winner.

EVENT STRUCTURE:

Arena:





1. All dimensions are in mm.
2. The maximum size of the arena will be 4500 x 4500mm.
3. The width of the track will be 30mm.
4. The dimensions of the start zone are 200 x 200mm.
5. The floor arena shall be made of wood (plywood) and finished by vinyl. Do not assume that the floor provides the necessary amount of friction.

6. Participants should not assume that the track is always black, as fading may occur.
7. The track will have discontinuities at some
8. All the possible checkpoints are marked as black stripes perpendicular to the track having the dimensions of 90 x 30 mm. The checkpoints are CP1x, CP2x & CP3x, where 'x' can be L or R depicting left or right respectively.
9. The locations with a white square on the track having an adjacent black square perpendicular to the track are known as junctions. The description of these junctions is given below:
 - The junctions (J1, J2 & J3) will contain information about the next path.
 - One black square will be placed either on the left or the right side of the white square perpendicular to the track.
 - The side of the square is equal to the width of the track.
 - The bot should decide the direction of the upcoming track.
 - Going in the correct direction will earn you extra points.
 - The first checkpoint that will be cleared after every junction, i.e., CPxL or CPxR (where, 'x' is either 1, 2 or 3), will be taken into consideration.
 - The choosing of the upcoming checkpoint is shown in the table below:

Junctions	Black square on the right	Black square on the left
J1	CP1R	CP1L
J2	CP2R	CP2L
J3	CP3R	CP3L

* Name of the checkpoints are mentioned in the figures.

10. The dimensions of the arena will be accurate to within 5%, or 20mm.
11. Do not make any assumptions about the amount of sunlight, incandescent light, or fluorescent light that may be present at the contest.
12. A cube of dimension 100 x 100 x 100 mm is kept in the yellow zone.
13. The arena consists of 2 areas for each team divided diagonally by a wall as shown in the images which will be made of plywood [colored(red/blue)].

MACHINE SPECIFICATIONS:

Dimensions and Fabrications:

1. The machine should fit into a square of **200 x 200 mm** shown in red color in the fig. There is no height restriction.

2. The autonomous robot must be stable and must stand on its own at the beginning of the run when put at the starting zone. Robots not fulfilling this criterion will be disqualified.
3. During the run, the autonomous robot can expand itself, if it does not damage the arena in any way. However, the machine should not leave anything behind while tracing the path. The machine should not scratch, damage, or destroy the track or the accompanying parts of the arena.
4. If any bot found damaging the arena, the final decision is at the discretion of the organizers.
5. The teams are allowed to use ready-made sensor kits. However, they are not allowed to use Lego-kits, or any other similar assemblies.

Power Supply and Propulsion:

1. The machine must be completely self-contained and should receive no outside assistance. It should not use an energy source employing a combustion process.
2. The machine should have on-board power. No external power supply is allowed.
3. The potential difference between any two points on the machine should not exceed 24V.

Task:

1. Teams must build an autonomous robot that can follow lines.
2. All minimum possible paths will consist of 3 checkpoints and a finishing zone.
3. The bot can either follow the path given or it can choose its own path, though priority is given if the given path is followed.
4. The task will end when the cube (initially in yellow zone) is placed in the green zone behind the opposing team's red zone.

Note: In the following rules, the event of the robot pushing the box and causing it to land in the green zone is referred to as "Destroying the Opponents territory." The robot should not physically damage the walls or the cube.

RULES:

Competition:

1. Each contesting team will be given 2 minutes as a dry run on the arena.
2. In the dry run, teams can calibrate sensors and explore the entire arena to find the desired path.
3. Junctions will not be disclosed during the dry run.
4. After a dry run, the programming of the robot is **not allowed**.
5. The starting procedure of the bot must be simple and must not involve giving the bot any manual force or impulse in any direction.
6. The game will last 5 minutes. Even if the operator is still adjusting the sensors or the bot is searching for checkpoints, the run-time clock will start after 2 minutes of dry run and end after 3 minutes of game play.
7. Once the match is started, only one member of each team, i.e., the operator, will be allowed to enter the arena after obtaining permission from the organizers.
8. The match will start from the start zone. The machine will start only in one direction as specified by the organizers. It cannot start in either direction. The operator may abort the run at any time.
9. The robot can push the cube only after completing all the checkpoints.
10. The robot should not physically damage the wall or the cube.

Checkpoints:

As shown, the arena will have multiple checkpoints. All the checkpoints will be black in color. It is mandatory to cross through a minimum of 4 checkpoints, including the finish line. A checkpoint will be considered as cleared only when the **entire** robot crosses through it.

Hand Touch:

1. If an operator touches the robot during a run, this will be considered a hand touch and the robot must be put back at the last restart or checkpoint crossed. (Robots can be removed after the completion of a match, e.g., after placing the cube.)
2. The operator can take any number of hand touches with prior permission from the organizers, there is no penalty for a hand touch (with prior permission), though the robot must be placed back at the start or last checkpoint crossed.

3. Even if a participant takes a hand touch, the clock will keep running and will not be reset as the robot starts again from the previous restart point.
4. If a robot "gets into trouble," the operator can ask the judge for permission to take a hand touch and restart the robot at the start or last checkpoint. If the operator touches the robot without the prior permission of the judge during run time, 10 points will be deducted.

General Rules:

1. Any team that is not ready at the time specified will be disqualified from the competition automatically.
2. The machine will be checked for its safety before the match and will be discarded if found unsafe for other participants and spectators.
3. It should not make any marks on the floor, if any robot found damaging the arena will be immediately disqualified.
4. Only one member of the team is allowed to handle the robot.
5. Participants are not allowed to keep anything inside the arena other than their autonomous robots.
6. Laptops or personal computers are not allowed near the arena. Other Wi-Fi, Bluetooth, etc. devices must be switched off. The organizers retain the right to check for these devices and their usage.
7. No robot is allowed to use any flammable, combustible, explosive, or potentially dangerous processes.
8. The time measured by the organizers will be final and will be used for scoring the teams. Time measured by any contestant by any other means is not acceptable for scoring.
9. A max score of 4 checkpoints will be given.
10. The operator **must** wear socks

Judging Criteria:

Scoring system:

1. Each checkpoint carries 20 points.
2. On selecting the correct path, 15 points will be given at each junction.
3. Placing the box in the green zone carries 45 points.

Max points = 150

In case of a tie in scores between two teams, teams will be given preference based on the following criteria in the given order:

1. The number of junctions correctly followed the given by the organizers.
2. The minimum time taken by robots to cross the same number of checkpoints.
3. The minimum number of hand touches.
4. To be decided by the organizers.

Team Specifications:

1. A team once registered cannot register again, even with a different name.
2. A team may consist of a maximum of 5 members.

Note:

1. NO power supply will be provided during the match, but it can be provided for battery charging purposes.
2. We are NOT going to provide any type of computer, software, laptop, programmer, IC in any case.

TEAM AND FEE STRUCTURE