FURIA

"Unleashing the fury within wins even defeated battles."

Problem Statement:

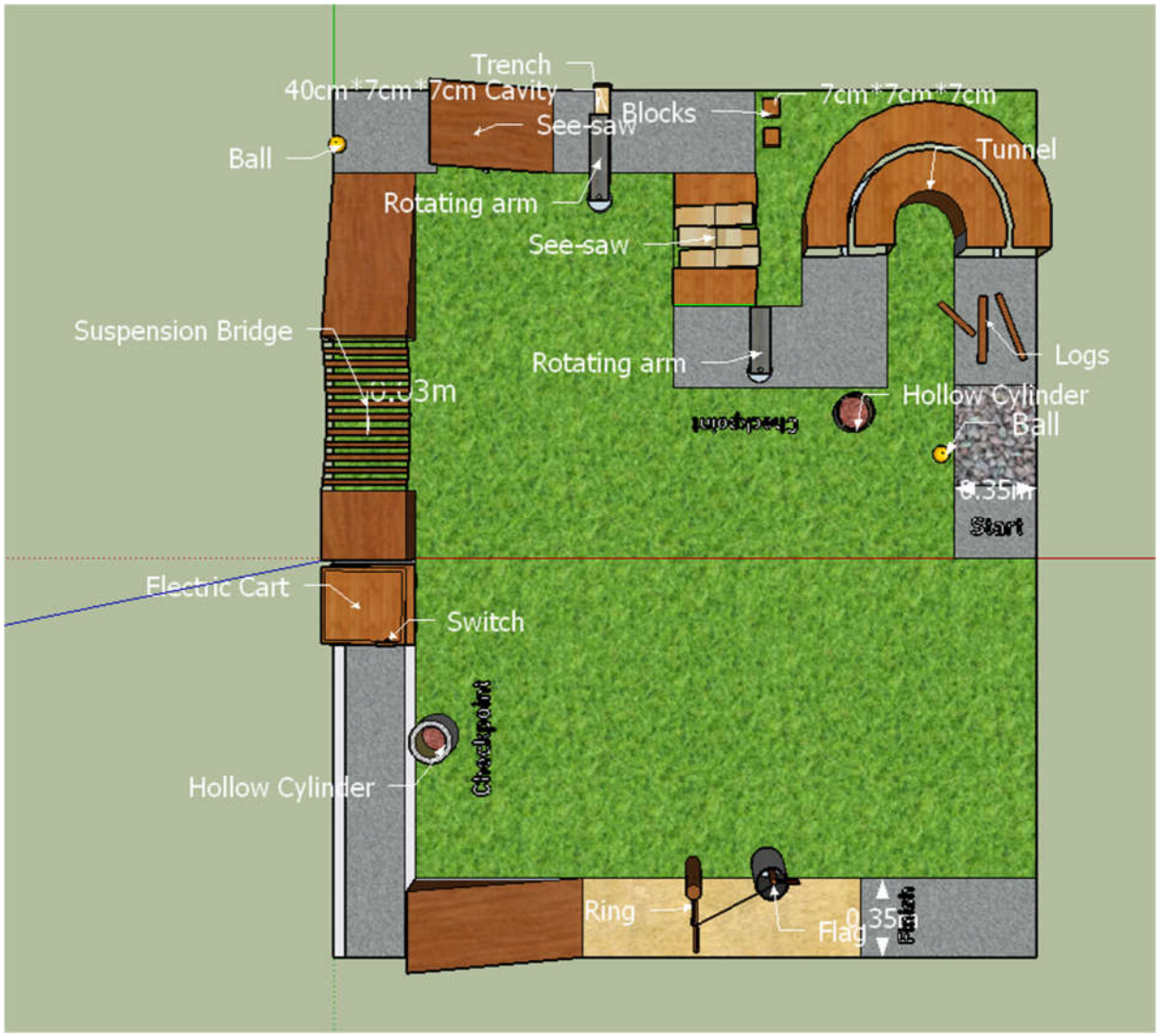
Design a manual robot having a strong hand mechanism and hook for gripping to compete in an epic one-on-one battle with your opponent team. This is a true test of your robot-making as well as motor skills to be crowned the champion of the arena!

Game Play:

The objective of this event is to cover maximum number of checkpoints in the minimum amount of time while negotiating a path full of obstacles.

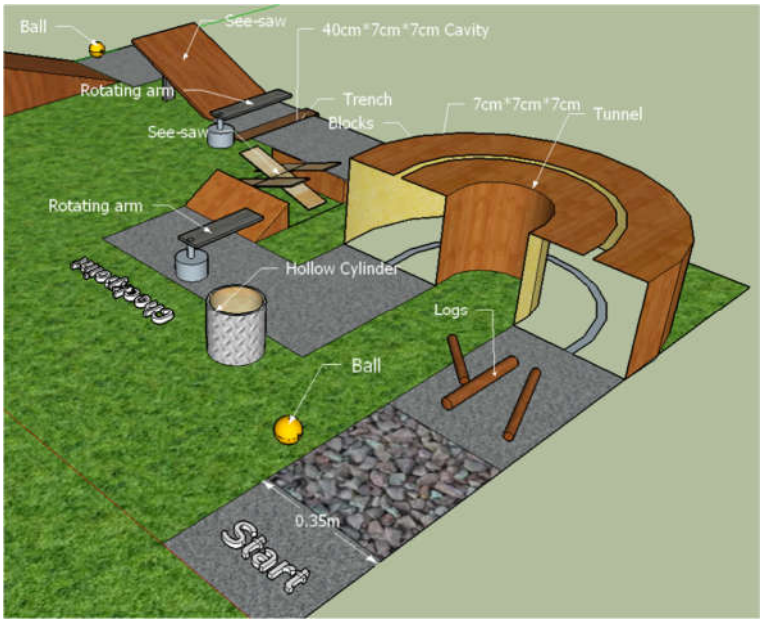
- Two teams A and B have to start simultaneously at the point marked "START" on the arena.
- The teams must complete one lap around the course in the minimum possible time while overcoming all the obstacles and covering checkpoints.
- Points will be awarded or deducted on the basis of the robot's performance in the arena. The "Scoring Scheme" is given later in this document.
- The winners will be decided on the basis of points scored.

The Arena:

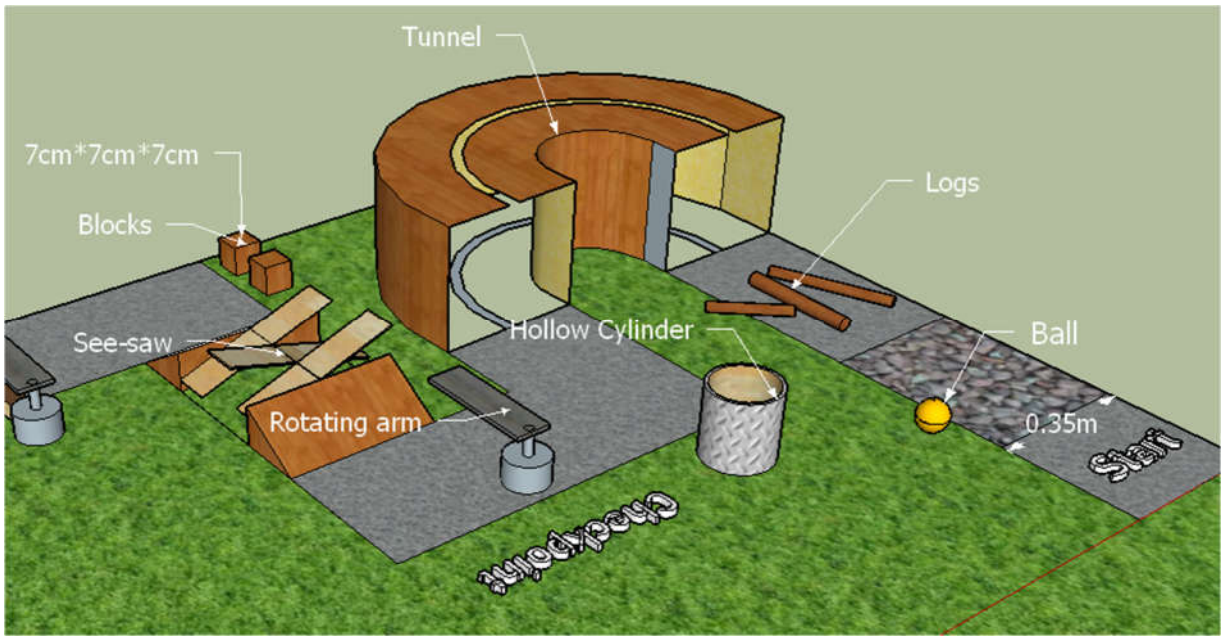


The arena will have exactly the same arena as its mirror image by its side.

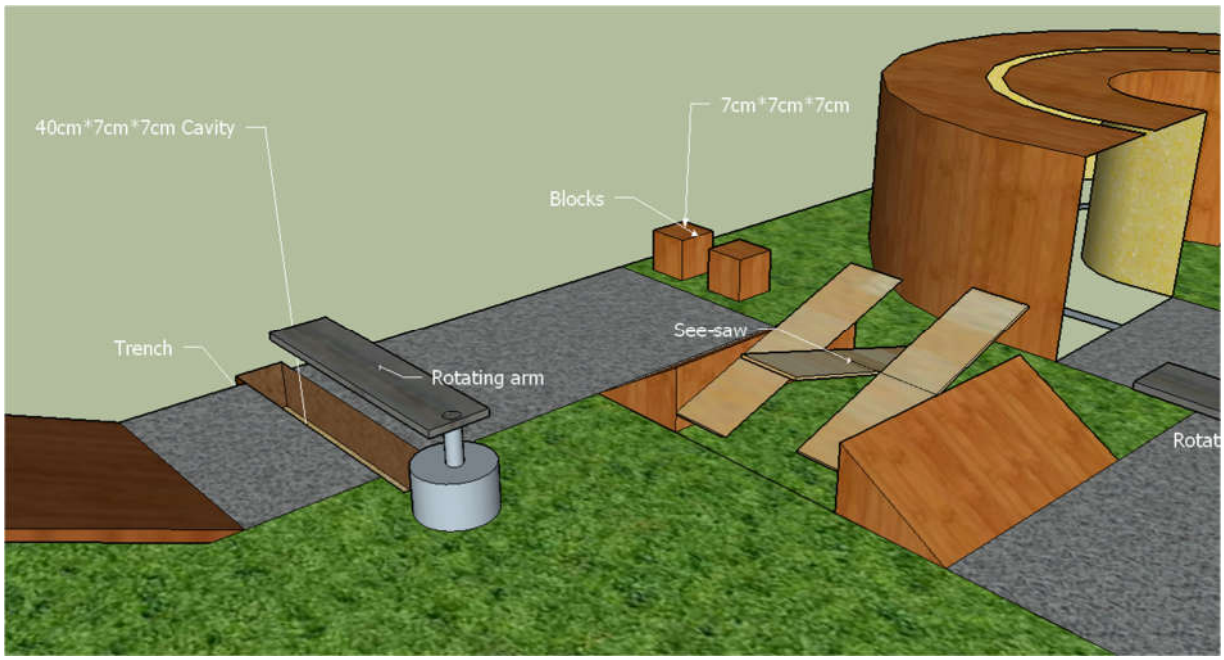
Description of Hurdles:



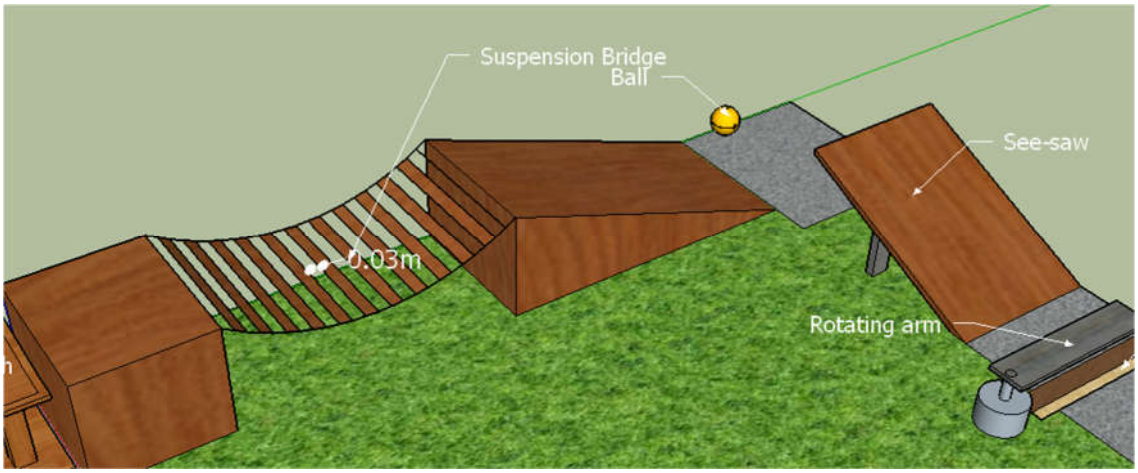
- The bot starts from the position marked as “START”.
- Then the bot faces a surface of gravel and stones from where it needs to pick the ball using its arms.
- Wooden logs are placed on the path which the bots need to remove using their hand mechanisms.
- Then the bot needs to drive safely through a tunnel while avoiding collisions with the walls.



- The bot has to place the ball in the hollow cylinder to stop the rotating arm placed ahead such that the road remains unhindered by it. This is a checkpoint.

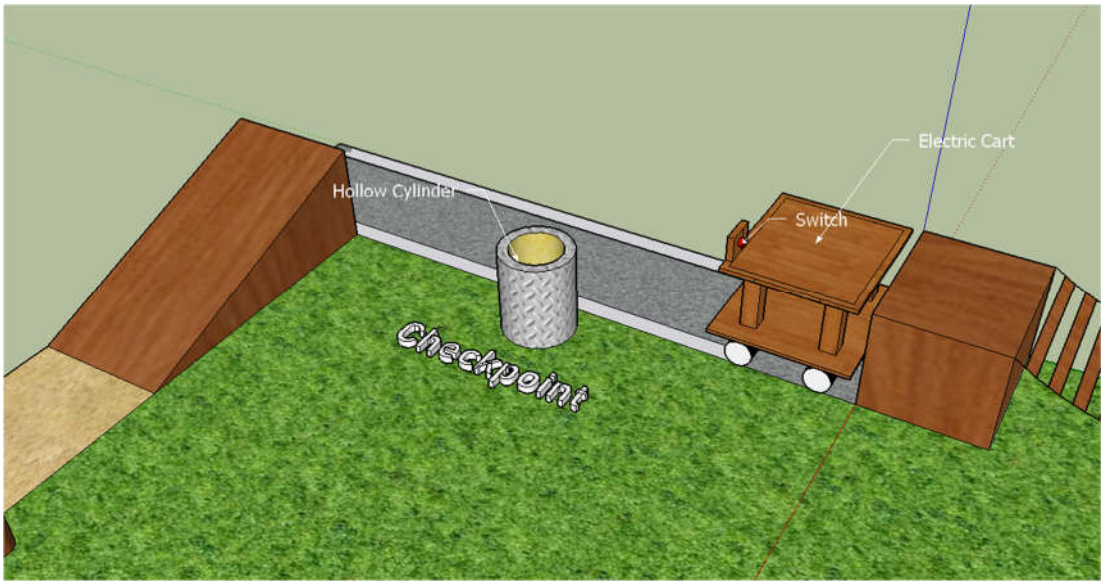


- Then the bot has to cross a series of see-saws by balancing itself.



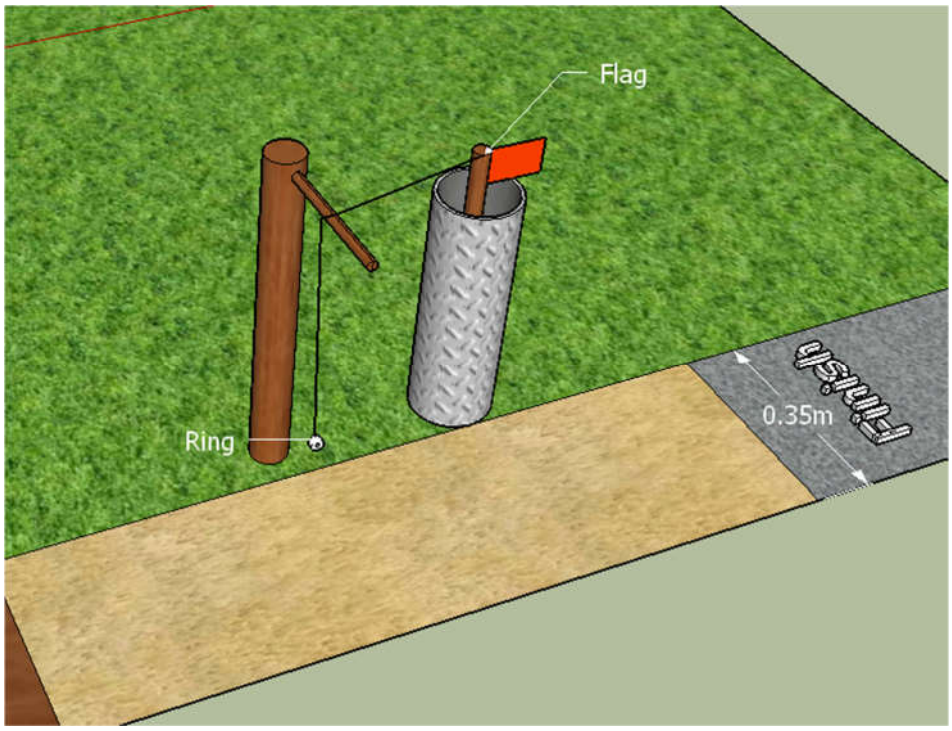
- `Then the robot needs to pick wooden cubes and use them to complete the path.

- Then the bot confronts a see-saw.
- After that the bot has to pick up another ball and cross the suspension bridge carefully by balancing itself.



- Now comes the most challenging hurdle. The robot faces an electric cart which will have a switch, which when pressed, can move the cart only in forward direction. The switch can be pressed using wheels. The bot needs to get over the cart and drive it by pressing the switch. On its way it needs to place the ball in the hollow cylinder. The electric cart can move in only forward direction, so it should be carefully driven to drop the ball inside hollow cylinder. The top platform area of the cart is 35cm*35cm. This is a checkpoint.

- After that the bot must face the last hurdle where the bot needs to pull a ring suspended in air using its hook attached to its gripping mechanism which hoists a flag. After raising the flag, the bot reaches the final end point marked as “Finish”. The first team to host the flag gets extra points.



Scoring Scheme:

- Initially, all teams start with **1000 points**.
- **20 points** will be deducted each time when the bot deviates from the track.
- **50 points** will be deducted when manual assistance is provided to bot (In case it is struck somewhere or toppled).
- Each obstacle when skipped manually will cost **150 points**.
- **25 points** will be awarded for crossing the zone containing gravel.
- **50 points** will be awarded for placing all the wooden logs correctly outside the path.
- **100 points** will be awarded for crossing the tunneling bridge successfully without causing any damage to it.
- **10 points** will be deducted each time bot touches the tunnel wall.
- **50 points** will be awarded for successfully placing the balls in their corresponding hollow cylinder.

- If the balls are dropped down, bots can use their hands to pick them with a deduction of **25 points**.
- If the rotating arm is not stopped at the correct time by placing the ball, the bot has to skip the hurdle manually with a deduction of **100 points**.
- **25 points** will be awarded for placing each wooden blocks correctly in the trenches on the road.
- **20 points** will be awarded for crossing the inclined see-saw.
- **50 points** will be awarded for crossing the suspension bridge.
- If the bot falls down from the bridge, a penalty of **20 points** will be done.
- **200 points** will be awarded for riding and completing the task of electric cart.
- **50 points** will be awarded for correctly pulling the hook in order to hoist the flag.
- **150 BONUS points** will be awarded to the team who reaches the finish first.
- The time, t taken in seconds, will be deducted from the final score. However the total time for completion of the event is **900 seconds**.
- Any damage to the arena by bot or participant will lead to **instant disqualification** of the team.

General Rules and Specification of the Bot:

- The dimensions of the bot must be 30cm*25cm*25cm (l*b*h) throughout the event. It should not weigh more than 1.25kg. If a bot does not adhere to these, it will be disqualified.
- Changing any bot parts during event is not allowed.

- A team can consist of maximum four members out of which only two can step inside the arena.

- The bot must have a strong hand mechanism for gripping objects as well as a hook attached to it.

- The maximum power input to the bot will be 18V. The wire of bot should be slack at all times.

- A 220V supply will be provided at the arena.

- Two timeouts of 1 minute each will be available to each team to fix any technical issues. The bot must not leave the arena for debugging. Primary tools will be made available by the organizers; however, the participants may bring their own tools and equipment.

- The organizers can change the arena or scoring scheme as they see fit. The decision will be final and binding.

- No damage should be caused to the arena or other competing bots. This will result in instant disqualification.

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