Steel Striker (ROBOSUMO)

TASK

- Teams have to build a manually controlled Robo-Sumo bot, which should be able to push or drag the opponent bot, outside the ring.

BOT SPECIFICATIONS

- The dimensions of the bot should be less than or equal to **300 mm X 300mm X 300mm** (lxbxh) and the bot should be under **5Kg**. failing which the team will be disqualified from the competition (the dimensions includes tires). An error of (±5%) is permitted.
- The bot must be controlled manually.
- Teams can use both wired as well as wireless control mechanisms. In the case of wired bots, the length of the wire should be a minimum of **2 metres** so that the wire remains slackat any instant of time. If the participants use a wireless mechanism they have to use either a dual-frequency remote, Bluetooth, or Wifi.
- The dimensions of the remote are not included in the size constraint of the bot.
- The Bot may have an onboard power supply or remote power supply any case.
- Participants are not supposed to use any readymade Lego components or readymade gripping mechanism. However, the participants are allowed to use ready-made gear assemblies.
- The mechanism used should be such that only one person will control the bot.
- The robots should not have any attacking weapons on the robot; the robot should only push the opponent robot outside the arena.
- Use of wedges is allowed to push away the opponent robot.
- No lifting or flipper mechanism can be used.
- No moving weapon is allowed.
- Failing to meet any of the above specifications will lead to immediate disqualification.

POWER SUPPLY

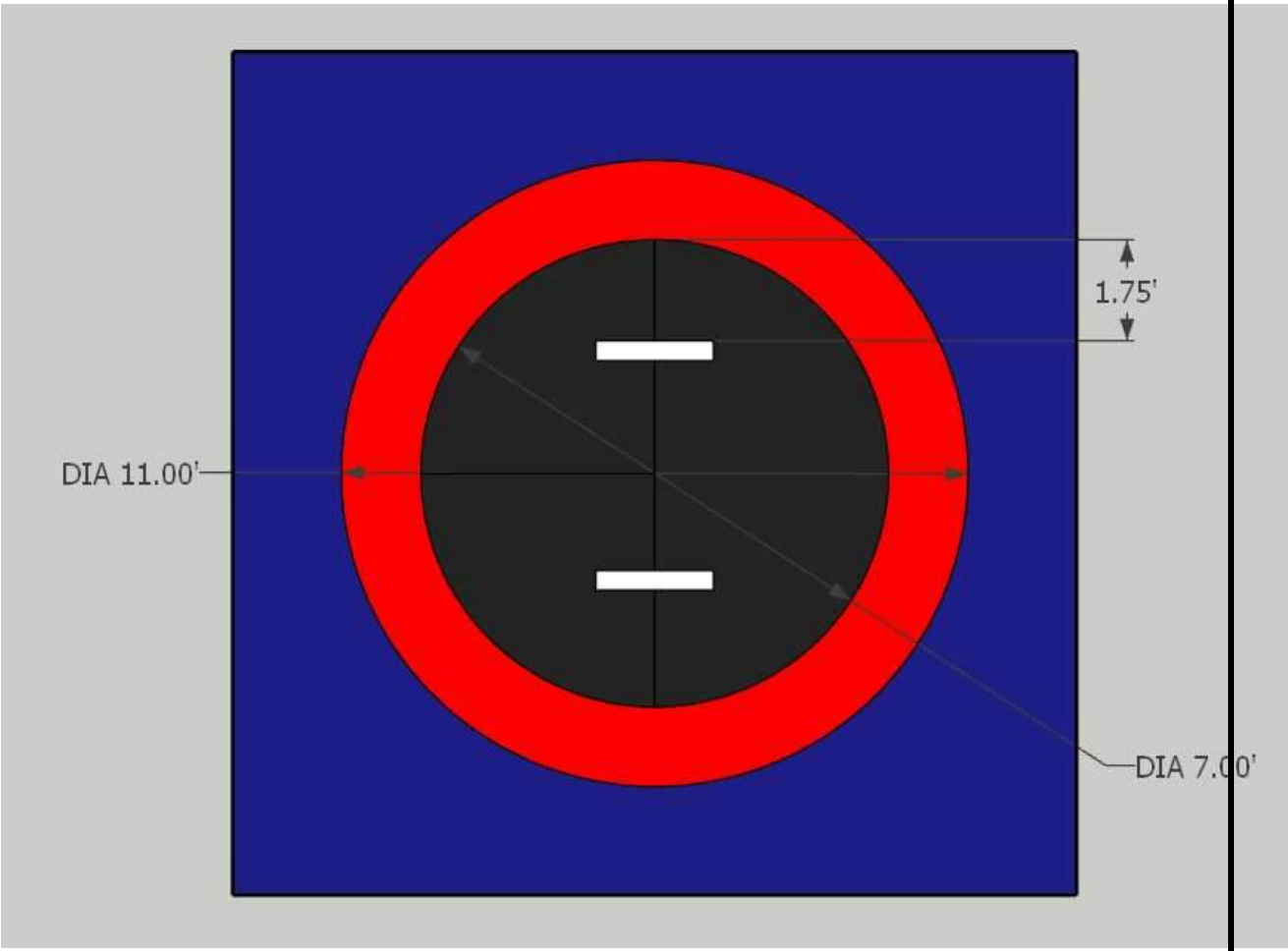
- The participants should use an electric power supply i.e. the power source should be on the bot or kept outside the arena. The power source must be non-polluting and must satisfy the safety constraints determined by the organizers.
- In the case of an electric power supply, the voltage between any two points should be less than or equal to 12V DC at all times during the run.
- AC power supply will not be provided and cannot be used in the competitio

ARENA

- The Arena consists of three area: - red area (inner region), black area (middle region) and blue

area(outer region)

- Arena size will be of 2 meters in diameter.



GAMEPLAY

- Each game consists of three rounds. Each round will be based on a points system. Points from each round will contribute to your total score.
- Technical break can be used after a round by both the teams which lasts for 30 seconds and can be used only once per battle (including tie breaker round).
- Touching or entering criteria of areas in the arena is that the two wheels of the bot should be totally inside the required zone.
- If there is entangling of wires then the game is paused and the game will start from the same locations of the bots.
- The total points gained in the three rounds will determine the winner of the match.
- Hand touching during the game to avoid the bot from falling outside the arena will lead to the bot being considered as fallen and necessary points will be given to the opposite team.
- Final decision in case of some ambiguity will be in the hands of the judge.

- All 3 rounds are of 1 minute each:

- Initially both bots will be placed at their respective positions on the two opposite white lines.
- If a bot is pushed or enters the red area, the opponent team will get 2 points.
- However, if the opponent bot while pushing also enters the red area, no point will be given to the other bot.
- If a bot is pushed into the red area and it re-enters into the black area instead of going into the blue area i.e. outside of the red area, then the opponent bot gets 2 points and they can keep playing. If after that any of the bots enter the red area again points would be considered according to point 2 and 3.
- If a bot is pushed outside the red area, the opponent team will get 4 points.
- After this both the bots would be set back again to the start positions and the gameplay for that round will be continued as specified above.
- After the completion of all 3 rounds, if the total points of both teams are equal, then the winner would be decided through the tie-breaker round.
- The robot should exhibit linear motion along the arena floor during the match.
- Jumping, flying, and hopping are not allowed. The robot displaying such a motion will be disqualified.

JUDGING CRITERIA

- The bot would be checked for safety before starting and will be disqualified if found unsafe for other participants.
- Only one team member is allowed to handle the bot. No other team member is allowed to enter the arena.
- The bot will be liable for disqualification if it causes any kind of damage to the arena.
- A robot will be declared immobile if it cannot display linear motion of at least one inch in a timed period of 30 seconds. A robot with one side of its drive train disabled will not be counted out if it can demonstrate some degree of controlled movement.
- A robot that is deemed unsafe by the judges after the match has begun will be disqualified and therefore declared the loser. The match will be immediately halted and the opponent will be awarded a win.

- If the robots become entangled with each other, the robots should be taken back to initial positions and then the match will continue.

- **The organizers reserve the right to change any or all of the above rules as they deem fit.**

Change in rules, if any will be highlighted on the website and notified to the registered teams

TEAM SPECIFICATIONS

- A team may consist of a **maximum of 4 members.**
- Students from different educational institutes can form a team.

ELIGIBILITY CRITERIA

- All students with a **valid identity card** from their respective educational institutes are eligible to participate.

A. Mobility:

All robots must have easily visible and controlled mobility in order to compete.Methods of mobility include:

1. Rolling (wheels, tracks or the whole robot).
2. The robots should not secure itself on the ring surface by using suction cups,diaphragms, sticky treads, glue or other such devices.

B. Battery and Power:

1. The machine must be powered electrically. Use of an IC engine in any form is not allowed. Onboard batteries must be sealed, immobilized-electrolyte types (such as gel cells, lithium, NiCad, NiMH, or dry cells).
2. The electric voltage between any 2 points on the machine should notexceed 52V DC at any point in time. Participants will have to bring their own converters for standard power supply according to Indian standards.
3. Participants must protect the battery terminals from a direct short and causing a battery fire, failure to do so will cause direct disqualification.
4. The use of damaged, non-leak-proof batteries may lead to disqualification.
5. Special care should be taken to protect the onboard batteries. If the judges find that the battery is insufficiently protected, the team will be disqualified immediately.
6. Change of battery will not be allowed during the match.
7. Only bots with onboard batteries will be allowed.
8. A team cannot use the same bot with different names in the same categories more than once by just modifying certain components of the bots.
9. The supply from the battery to all the weapons and power systems should qualify the following fail-safes:
    a. A manual disconnect (switch) that can be turned off withoutharming the person doing it, i.e. No body parts or weapons should come in the way of the switch.
    b. Manual emergency stop that can be triggered through the radio controller

If teams do not show up during their allotted slot, they will be disqualified.

10. The following weapons cannot be used:

a. Liquid projectiles (Foam, liquefied gases)
b. Any kind of inflammable liquids
c. Weapons causing invisible damage (Electrical weapons, RF jamming weapons and others).
d. Weapons causing opponents' weapons (spinners) to entangle in them (Chains, Ropes or loose Fabrics)

A. Event Specific Terminology:

1. Disabled: A robot is not functioning correctly due to either an internal malfunction or contact with the opposing robot or Arena Hazard.
2. Immobilized: In the judges' opinion, a robot is not responsive for a specified period of time.
3. Pinning: Occurs when one robot, through sheer force, holds an opponent stationary in order to immobilize it.
4. Radio Interference: Refers to a situation where at least one robot becomes unresponsive or non-controllable due to the effect of the other robot's remote-control signal.
5. Restart: This occurs after a fault or a timeout has been declared and the competing robots are ready to continue.
6. Stuck: A robot is hung up in a part of the arena, an arena hazard or an opponent, such that it is effectively non-responsive.
7. Tap-Out: Occurs when a robot's operators decide that they no longer want to continue the match and concede the win to the opposingteam.
8. Technical Knockout: This occurs when a robot wins due to the immobilization of its opponent even though, in the judges' opinion, no action of the winning robot caused the opponent's immobilization.
9. Timeout: A temporary halting of a match. Timeouts are usually called to separate robots but can be called for other reasons as well.