



# **NATIONAL ENGINEERING ROBOTICS CONTEST 2024**

**THEME: SUMO WARS**

CHANGE LOG

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The table below will list the pages on which changes have been made to the theme.

Revision Date	
21-04-2024	Section 2 added

# SUMO WARS

## 1. OVERVIEW:

Two remote-controlled robots are placed in a ring. The robots try to avoid falling out or avoid being pushed out by the opponent robot. The first robot that touches the outside of the ring loses the round.

The first robot to win two rounds wins the match. Different robots compete one-on-one against each other throughout the contest.

## 2. CATEGORIES

The NERC – SUMO WARS consists of only one category and all participants schools, colleges, universities/polytechnical institutions, and robotic groups will compete in the same pool.

**It is responsibility of the teams to understand and follow all provided rules, the FAQs, and all contest day briefings.**

## 3. ROBOT SIZE AND WEIGHT:

- Autonomous Sumo-Robots are self-propelled and remote controlled.
- As long as all other requirements are met, Sumo-Robots can be made out of any material. They can use any type or size of electric motor or electric-powered locomotion.
- They can contain any kind of processor, electronics, sensors, or batteries desired.
- The robot must fit within **20x20x20 cm** cube at all times of its operation.
- It is not allowed to extend any extensions at any time of its operation.
- Participants are allowed to embellish their robots with a flag, cap, or other purely decorative objects that have no practical purpose.
- It is possible to take down the decorations to take measurements.
- The robot's weight excluding decorations cannot weigh more than **5 kg**.

## 4. ROBOT RULES:

The Sumo-Robots are designed to be harmless to both human beings and other robots. Since they are only meant to push the other robot out of the arena, the Sumo-Robots **must not** have any sort of **weapon** mounted on them.

At all times, Sumo-Robots must not:

- Emit smoke or fire.
- Leak, stain, or soil.
- Disperse powder, grit, or grime.
- Spray, throw, or use projectiles.
- Jam, shock, or electromagnetically interfere.

- Snare, entangle, or employ nets/rope.
- Scratch, gouge, or scrape.

However, as for the last point, naturally some damage occurs from scoops, changes in starting orientation, and from the battles themselves. This is expected and acceptable to any reasonable extent.

Sticky wheels and magnets can be used in the design of sumo-robot. However, it should remain within the limits of size and weight.

## **5. THE RING:**

The Ring will be a circle made up of a rigid nonmagnetic material with a generally smooth, non-slippery surface. The Ring Dimensions are 154 cm diameter, and the ring height will be 5 cm or more. The ring is shown in the diagram below (to scale).

## **6. MATCH RULES:**

- Best 2 out of 3 – Robot that wins 2 rounds first will win.
- 3-minute rounds, after 3 minutes the round will restart.
- A robot is usually started by pressing a button.
- However, a robot may be started by any means, such as hand clapping, a whistle, a laser pointer, an infrared signal, or RF communication.
- Robots may even have multiple starting buttons or starting configurations if designed with more than one opening move. (Upon starting, no additional control, commands, configuration, or information may be communicated to the robot)
- Upon pressing the start buttons, the contestants immediately leave the exterior area around the ring.
- During the round, all people and objects must be kept out of the ring and exterior area to avoid distracting the robots or altering the outcome.
- During the countdown, if the contestant notices their robot has failed to start its countdown, the contestant may alert the referee and halt the countdown. Both robots are reset to start the round over.
- The contestant is given a warning. A second warning of any kind in a single round result in the robot losing that round.
- It is to the benefit of the contestant to stop the countdown if the robot fails to start the first time.
- It may still be to the benefit of the contestant to stop the countdown a second time (losing the round) if the robot is likely to suffer damage by failure to start.
- If a robot begins moving during the five-second period, the robot has committed a false start. A warning is issued, and both robots are reset to start the round over.
- A second warning of any kind in a single round result in the robot losing that round.

- A robot loses a round when any portion (including touch sensors, whiskers, scoops, or skirts) of the robot touches the outside of the ring. It doesn't matter if the robot falls out on its own or is pushed out.
- The first robot touching outside of the ring loses, even if the second robot subsequently touches outside of the ring.
- If the referee determines that both robots touched the outside of the ring at the same time, the round is nullified and started over.
- If any part of the bot falls off the ring, then that bot will lose the round.
- The bot must move every 5 seconds.

At the referee's discretion, the referee may choose to restart a round if:

- Three minutes have expired.
- No progress has been made in some period of time.
- The robots fail to touch each other for some period of time.
- The robots are hopelessly entangled or otherwise deadlocked.
- Both robots fail to start or both contestants signal stoppage.

At the referee's discretion, the referee may choose to end a round and choose the round winner if:

- Smoke, fire, damage, or any other violation has occurred.
- No progress is likely to be made even if the round is restarted.