

SEAKEEPERS ROBOTICS COMPETITION 2023

SUMOBOT COMPETITION MANUAL

JOINTLY ORGANISED BY:



Association of
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新加坡人工智能教育协会



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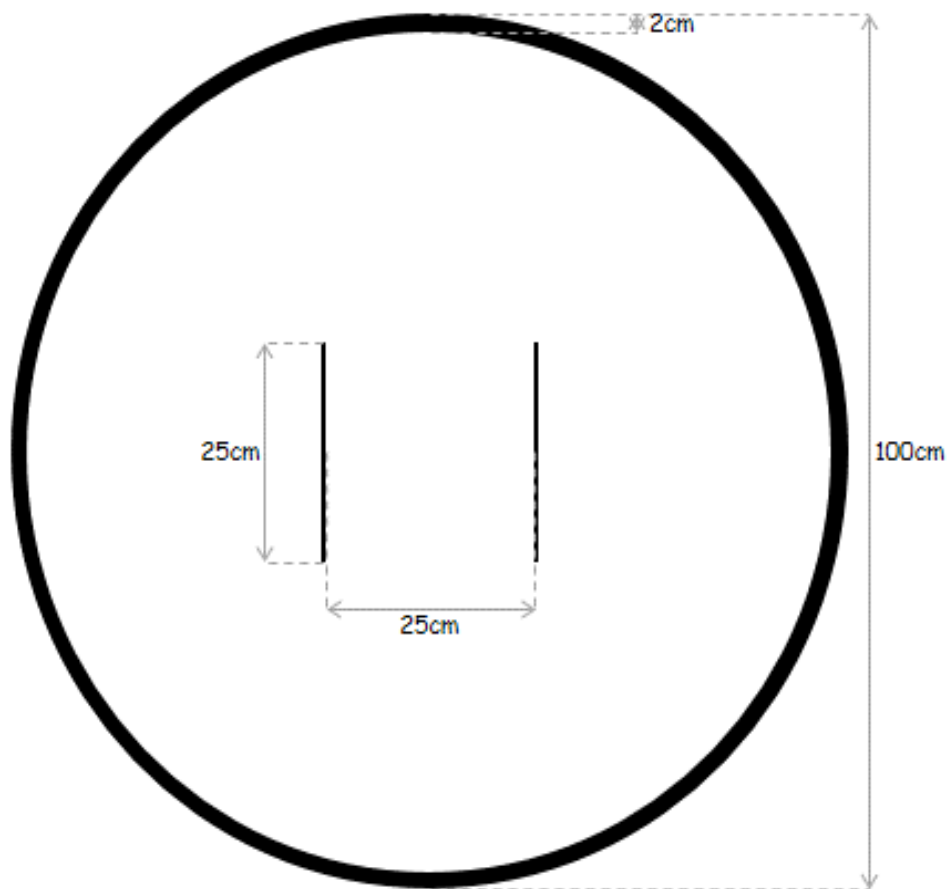
SUMO ROBOT COMPETITION

Introduction

Sumo is a sport where two competitors try to force each other out of a circular ring or into touching the ground with any other body part other than the soles of his feet. Sumo wrestlers can do these by throwing, shoving, or pushing within a specific set of rules (no punching/kicking).

In this Sumo Robot Competition, Robots shall compete against one another by attempting to either push other competitors out of the Sumo Ring or by flipping them onto their sides/back.

Ring Specifications



The Diameter of the Sumo Ring shall be **100cm** across, inclusive of a **2cm** thick **Black** border surrounding it. Two start lines (**0.5cm thick**) will be marked in the Ring, spaced **25cm** apart, and centred about the diameter of the Ring.

Robot Specifications

1. Robots should not be destructive to the playfield and/or other Robots;
2. Robots should be **autonomous** (programmed, not remote controlled, not wire controlled);
3. Robots should weigh **1000 grams** or less;
4. Robots should be at most **25cm by 25cm by 25cm** (bounding box of the Robot);
5. Robots should be built using only parts from the LEGO Education sets (NXT, EV3, SPIKE);
6. Robots should have a maximum of **ONE** Controller (NXT/EV3/SPIKE Brick);
7. Robots can have **ANY** number of Sensors and Motors (approved list below).






Controllers	
NXT	
EV3	
SPIKE	
Others	

Table 1: Approved Electronics

Flow of Run

Each Ring will be assigned **ONE** Referee. The Referee would conduct the entire run. Any disputes from any contestant should be referred to the Referee. Should the outcome be ambiguous, the Referee reserves the right to award the win to any contestant (in good faith) or have a Replay.

1. Pre-run inspection

Before the Start of the run, the Referee will conduct a final inspection of each competing Robot. For this inspection the Referee shall conduct FOUR (4) main checks, in order:

- a. Parts used are standard LEGO parts;
- b. Electronics used are in the approved list (Check Table 1);
- c. Weight of the Robot does not exceed 1000 grams;
- d. Total size of the Robot (in starting configuration) does not exceed 25cm by 25cm by 25cm.

After the check, before the start of the run, Robots will be kept in Quarantine and teams are not allowed to touch/interact with the Robots.

2. Run Start

When all checks are completed, the Robots will be moved by the Referee to their respective starting Position:

- a. One Robot shall be placed on **EACH** start line;
- b. Both Robots shall be centred with the lines as best as possible;
- c. Both Robots shall be faced towards the centre of the Ring.

When ready, the Referee shall call upon **ONE** representative from each team to reach into the Ring to help start the program of the Robot. When ready, the Referee will do a Countdown from THREE. After **ONE**, both Representative will start their programs and the Timer for **ONE MINUTE** will begin.

False starts: each team is allowed a **Maximum of ONE** false start per run. A false start will be called when a representative starts the program before the Referee counts to **ONE**. When a team exceeds the allowable number of false starts, they will be declared **LOST** for the Run.

3. Run End

A run will be considered over when either scenarios occur:

- a. **ONE MINUTE** is up;
- b. One Robot is out of the Ring (Any part of the Robot touches the ground outside the Ring);
- c. One Robot is flipped onto its side (Any part besides the main wheels of the Robot touches the ground);
- d. One Team executed a **SECOND** false start.

In the event of (a), both teams will be declared **DRAW**.

In the event of (b), (c), and (d), the robot/team involved will be declared **LOST**, while the other will be declared **WON**