Robot ZONE [01]

MICRO-SUMO

Duel

Image by Benoit Gauzere

Context

The lunabel is a rare white flower on Planet Z that contains enough nutrients to feed a colony for months. After weeks of searching, an insect finally comes across this legendary flower. He already imagines himself a hero to his colony, but when he reaches the flower, he realizes he's not alone. Two insects battle over a lunabel to be the first to feed on it.

Will you win the Micro-Sumo fight?

Robot Description

Robots must comply with the following constraints:

- **Maximum starting dimensions**: 30 cm X 30 cm X 30 cm
- **Maximum weight**: 850 g (new for 2024)
- **Max motors**: 3
- **Max controller**: 1 (e.g. EV3 or Spike Prime)

The robot must be built so that ONLY the robot's wheels touch the ground. Wheels include tracks and bead wheel. The other parts of the robot, excluding the color sensors, must remain at least the equivalent of the thickness of a LEGO Technic beam from the ground and remain there.

Robots must be equipped with at least one light/color sensor.

Robots must operate autonomously without remote control.

Defensive elements (bumpers, inclined planes, etc.) and offensive elements designed to knock down the opponent ARE permitted.

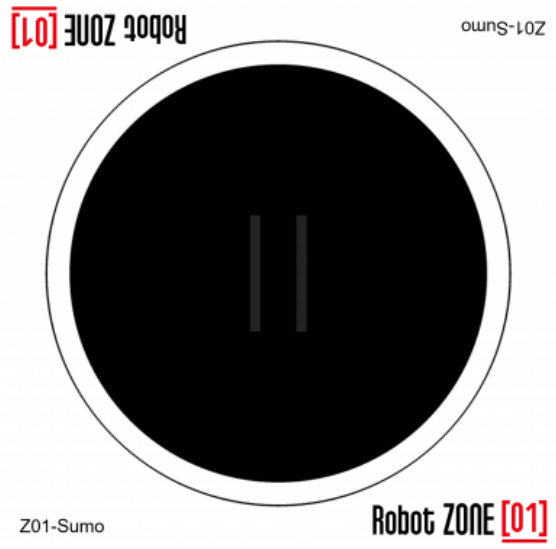
Rubber bands are permitted, except for use in ground friction.

Description of the Playing Field

Used surface: Z01-SUMO Mat

The surface is a black circular playing area, 90 cm in diameter, bordered by a white strip 5 cm wide. In the center of the arena, 2 parallel gray lines are placed 10 cm apart.

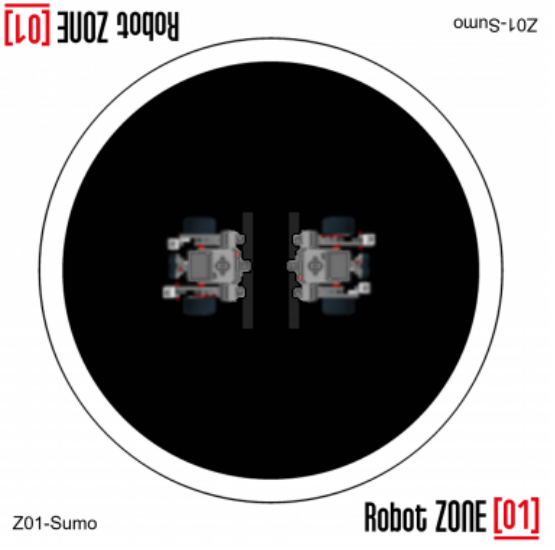
The mat is available at Zone01 shop.



Description of a Round

Starting Position (new for 2024)

At the beginning of the round, each team's robots must be back-to-back in the center of the mat, the back of the robot perpendicular to a gray center line. It should be easy to identify the front of your robot, so add a distinctive sign.



Pool System

Teams will be separated into pools, each corresponding to a table.

Each team will meet each of the other teams in its pool for a single match and accumulate points.

After all pool matches have been completed, an average of points per match will be calculated for each team and a ranking will be created.

The finalists will be determined from the ranking and placed in a bracket. Within the bracket, teams will compete in a best of 3.

Start of the Round

1. When two teams present themselves for the challenge, their robot must be inspected by a judge.
    a. Robots are weighed, measured, and inspected to ensure that they comply with the regulations.
    b. The judge checks that no part other than the wheels is within one beam of the floor.
2. Only two members of each team may approach the circle.
3. Both teams then position their robot in their starting area.
4. At the signal given by the judge, each team activates the program of its robot (see general rules for LEGO Spike Prime start-up procedure).
5. The robot must wait **5 seconds** before moving to give the students time to back up.
6. The robot must then move forward until it reaches the white border of the playing field.
7. From here, the robot then uses its own strategy to push the other robot out of the game area.

False start

The judge may request, for any reason he considers valid, a new start. A false start is normally defined as:

1. Failure to respect the 5-second delay from the start.
2. Starting the program before the judge's signal.
3. Failure to advance to the white border.

Victory

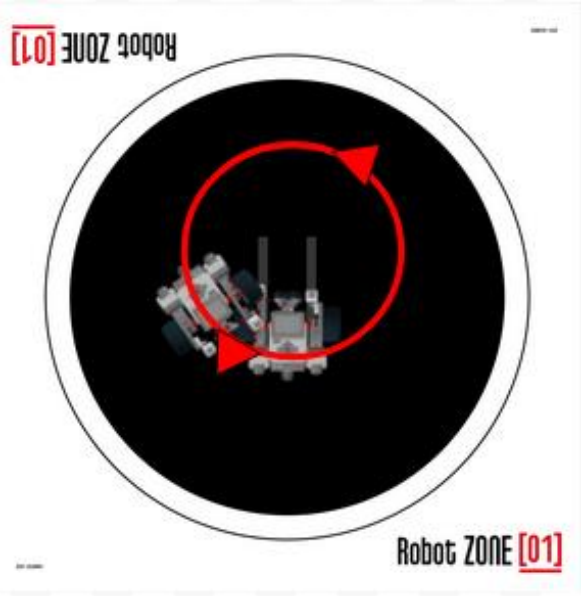
A victory is defined by:

1. The opponent's robot leaves the arena. The robot is considered to have left the arena when **its driving wheels** are outside the black zone.
2. The opponent's robot is knocked down and out of action.
3. The opponent's robot makes two "false starts" in a row.
4. A student from the opposing team touches one of the robots.

Draw

A draw is defined by:

1. The robots are entangled or rotate around each other for more than 10 seconds without any noticeable change.
2. The robots seem to have come out at the same time, and it is not possible to know which one fell first.
3. The robots remain motionless for more than 10 seconds.



Scoring Sheet per Match

	Points max
2 points for a win - Take out your opponent	**2**
1 point for a draw	**1**
TOTAL	**2**

Necessary for This Challenge

- Color sensor
- Loop
- Concept of friction and mass
- Defense and attack mechanisms
- Distance or touch sensors (optional)

Strategy Suggestions

- How important are mass and friction in this challenge?
- Do you have multiple programs or tactics?
- Do you use additional sensors or decoys?