[01] zone01.ca Open Robotics Challenge

Duel Challenge

Tactical Sumo

Image by 0fjd125gk87 from Pixabay

Introduction

Dazed, you stand up and see shadows. Branches crackle. Roars are heard. A battle is breaking out for access to a territory teeming with food. And the fighters have mastered the art of using decoys to fool their opponents.

When the rain begins to fall, the battle begins. The goal is to push the enemy out of the contested territory. Will you be the winner?

Go fight for the loot !

Description of the robot

The robots must respect the following constraints :

1. **Max dimensions at start :** 30 cm X 30 cm X 30 cm
2. **Max weight :** 1 kg (1000g)
3. **Max amount of motors :** 3
4. **Max amount of controllers :** 1 (ex: EV3 or Spike Prime)

The robot must be designed so that ONLY the wheels of the robot touch the ground. The wheels include the tracks and the ball 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.

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

Decoys (new for 2022)

Each robot can use up to 2 decoys in a match. A decoy is a piece or assembly of pieces that the robot drops on the playing field to fool the opponent.
The robot cannot hold a decoy in any way once it is released onto the playing field.

Warning

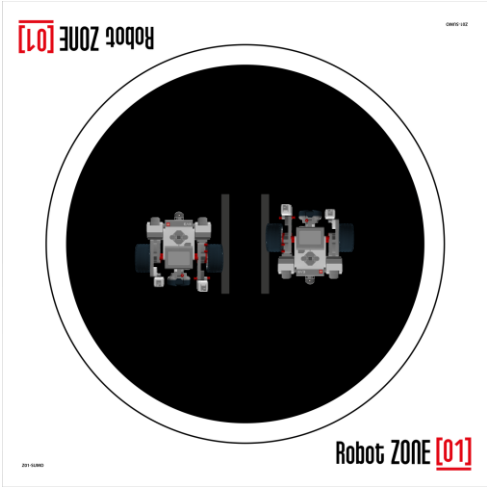
1. No LEGO parts can be modified.
2. The robots must operate autonomously without remote control.
3. The following robot actions are NOT allowed:
    a. Attempt to break the opponent
    b. Throwing projectiles
4. The following elements of a robot ARE allowed:
    a. Defensive elements such as bumpers, inclined planes, etc.
    b. Two parts or assemblies of parts voluntarily detached from the robot (decoys)
    c. LEGO type elastics or the elastics of model 3031507, i.e., 64 mm x 1.5 mm for something other than the friction between the wheels and the ground
    d. Offensive elements aimed at overthrowing the opponent

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 band 5 cm wide. In the center of the arena, there are 2 parallel gray lines that are placed 10 cm apart.

At the start of the round, each team's robot should be placed in the center of the arena next to the gray line with the robot touching the line. It should be easy to identify the front of your robot, so add a distinctive sign.



Description of a round :

Each team plays at least 3 different opponents during the day (3 rounds). Each round consists of 3 successive matches against the same opponent. The team can change the program for each match if desired.

1. Only two members of each team may approach the circle.
2. 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.
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.
5. The robot must wait 5 seconds before moving to give the students time to back up.
6. Each robot must move back in a straight line to the white line around the arena.
7. 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. Moving forward instead of backward after the 5-second delay from the start

Victory

A victory is defined by :

1. The opponent's robot leaves the arena COMPLETELY (all wheels)
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 ROUND OF 3 GAMES

	MAX PTS
1 point for backing up to the white line (3 games)	**3**
2 points for a win - Take out your opponent (3 games)	**6**
1 point for a draw (3 games)	3
Total	**9**

NECESSARY FOR THIS CHALLENGE

1. Color sensor
2. Loop
3. Concept of friction and mass
4. Defense and attack mechanisms
5. Distance or touch sensors (optional)
6. Decoys (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?

FREQUENTLY ASKED QUESTIONS (FAQ)

As the season progresses, there may be questions and clarifications to the challenge. Be sure to check out the FAQ below.