



# ROBOT CHALLENGE

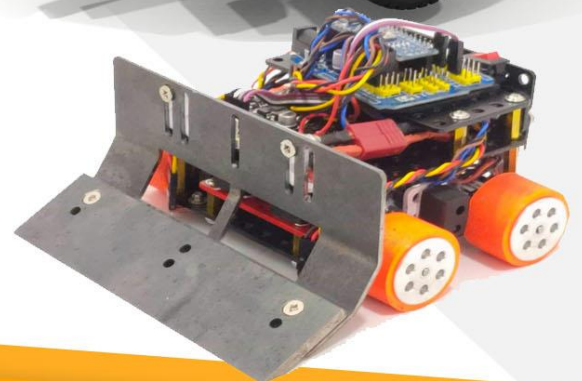
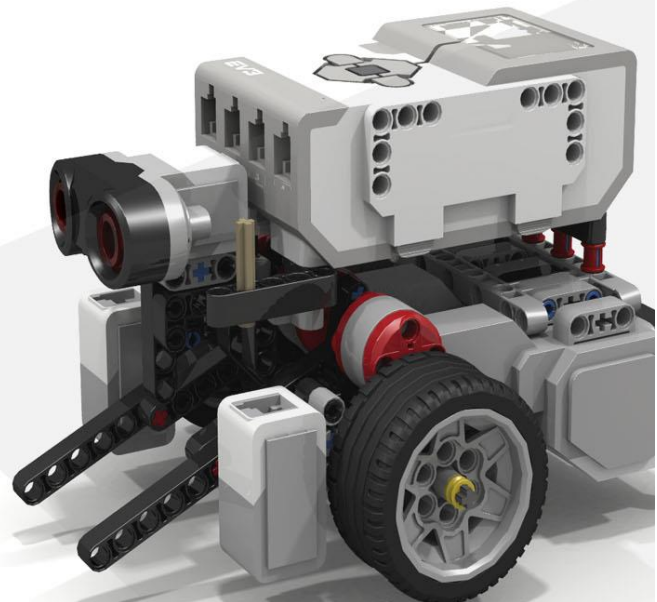
## Egypt 2022



visit our page

# SUMO

## Competition



# Robot Challenge Egypt 2022

## “ Sumo Robot Rules ”

**This Category divides into two sections:**

1. MEGA Sumo ( Open using any type of robot)
2. LEGO Sumo ( Using LEGO robot only)

### **Allowed Age**

- 1- Junior ( 9 – 13 ).
- 2- Senior ( 14 – 18 ).
- 3- Adult ( 19 – 24 ).

## **1. Definition of the Sumo Match**

### **1.1. Definition**

A match is fought between two teams, each team has one or more contestants. Only one team member may approach the ring; other team members must watch from the audience. In accordance with the game rules (hereafter referred to as "these rules",) each team competes on a Dohyo (sumo ring) with a robot that they have constructed themselves to the specifications. The match starts at the judge's command and continuous until completed three rounds or a contestant earns two Yuhkoh points. The judge determines the winner of the match.

## **2. Requirements for Robots**

### **2.1. General Robot Specifications**

**A.** The following are specifications for all robots. Additional specifications for Lego Sumo robots in section 2.2, and for Mega Sumo robots in section 2.3 respectively.



**B.** A robot must fit within a square tube of the appropriate dimensions for the given class.

**C.** The total mass of a robot at the start of a match must be under the designated weight for the given class.

Class	Height	Width	Length	Weight
Mega Sumo	Unlimited	20 cm	20 cm	3Kg
Lego Sumo	Unlimited	15 cm	15 cm	1Kg

**D.** A robot may expand in size after a match begins, but must not physically separate into pieces, and must remain a single centralized robot. Other robot parts with a total mass of less than 5 g falling off from a robot's body shall not cause the loss of match.

**E.** All robots must be autonomous.

## **2.2. Requirements for Lego Sumo robots**

The robot must only be built out of LEGO® parts. This includes:

- a.** Parts manufactured and distributed by LEGO®
- b.** LEGO® licensed parts from third party manufacturers

## **2.3. Restrictions for Mega Sumo robots**

**A.** Jamming devices, such as IR LEDs intended to saturate the opponents IR sensors, are not allowed.

**B.** Parts that could break or damage the ring are not allowed. Do not use parts that are intended to damage the opponent's robot or its operator. Normal pushes and bangs are not considered intent to damage.

**C.** Devices that can store liquid, powder, gas or other substances for throwing at the opponent are not allowed.





**D.** Any flaming devices are not allowed.

**E.** Devices that throw things at your opponent are not allowed.

**F.** Sticky substances to improve traction are not allowed. Tires and other components of the robot in contact with the ring must not be able to pick up and hold a standard A4 paper (80 g/m<sup>2</sup>) for more than two seconds.

**G.** Devices to increase down force, such as a vacuum pumps and magnets are only allowed in the Mega sumo class. They are not allowed in all other classes.

**H.** All edges, including but not limited to the front scoop, must not be sharp enough to scratch or damage the ring, other robots, or players.

In general, edges with a radius of greater than 0,1 mm, as would be obtained with an unsharpened 0,2 mm thick metal strip, should be ok. Judges or competition officials may require edges that they deem too sharp to be covered with a piece of tape.

### **3. Requirements for the Dohyo (Sumo Ring)**

#### **3.1. Dohyo Interior**

The dohyo interior is defined as the playing surface surrounded by and including the border line. Anywhere outside this area is called the dohyo exterior.

#### **3.2. Dohyo Specifications**

**A.** The ring shall be circular in shape and of the appropriate dimensions for the given size class.

**B.** The border line is marked as a white circular ring of a width appropriate for the given class on the outer edge of the playing surface. The ring area extends to the outside edge of this circular line.



**C.** For all given dohyo dimensions a tolerance of 5% applies.

Class	Diameter	Border Width	Material	Minimum Exterior Space
Mega Sumo	154 cm	5 cm	Steel	100 cm
Lego Sumo	77 cm	2,5 cm	Wood	50 cm

### 3.3. Doyho Exterior

There should be a space appropriate for the given class outside the outer edge of the ring. This space can be of any color, and can be of any material or shape as long as the basic concepts of these rules are not violated. This area, with the ring in the middle, is to be called the "ring area". Any markings or parts of the ring platform outside the minimum dimensions will also be considered in the ring area.

### 3.4. How to Carry Sumo Matches

**A.** One match shall consist of 3 rounds, each round will be 1 minute.

**B.** The team who wins two rounds or receives two "Yuhkoh" points first, within the time limit, shall win the match. A team receives a "Yuhkoh" point when they win a round.

If the time limit is reached before one team can get two "Yuhkoh" points, and one of the teams has received one Yuhkoh point, the team with one Yuhkoh point shall win.

**C.** When the match is not won by either team within the time limit, an extended match may be fought, during which the team who receives the first Yuhkoh point shall win. Alternatively, the winner/loser of the match may be decided by judges, by means of lots, or by a rematch.

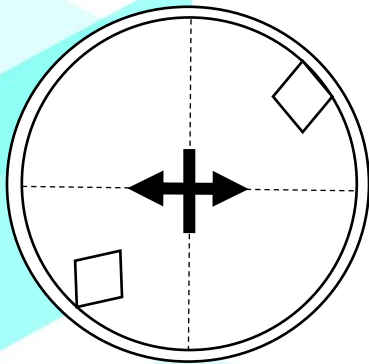
**D.** One Yuhkoh point shall be given to the winner when the judges' decision was called for or lots were employed



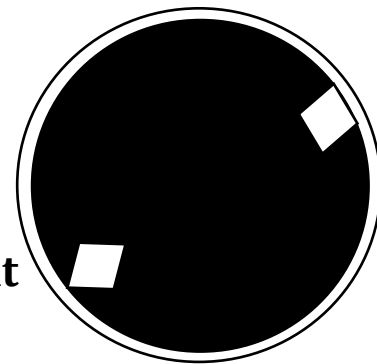
## 4. Start, Stop, Resume, End a Match

### 4.1. Robot Placing

Upon the judge's instructions, the two teams approach the ring to place their robots on the ring. A cross in the middle divides the sumo ring into 4 quadrants. Robots always have to be placed in 2 opposing quadrants.



Real Mat



The robots have to be placed at the border within the assigned quadrant. The robot has to cover the white border at least partially. The judge will remove the cross after positioning of the robots. After placing, the robots may not be moved anymore.

### -Playground

<https://drive.google.com/drive/folders/1uiEn2LanESLaTpG5jQdw4mhK89IjLCHY?usp=sharing>

### 4.2. Start

The judge announces the start of the round. The teams start their robots, and after a five second pause, the robots may start operating. During these five seconds, players must clear out of the ring area.



### **4.3. Stop, Resume**

The match stops and resumes when a judge announces so.

### **4.4. End**

The match ends when the judge announces so. The two teams retrieve the robots from the ring area.

## **5. Time of Match**

### **5.1. Duration**

One Match will be fought for a total of 3 minutes, starting and ending upon the judge's command.

### **5.2. Extension**

An extended match, if called for by the judge, shall last for a maximum of 3 minutes.

### **5.3. Time Keeping**

The following are not included in the time of the Match:

**A.** The time elapsed after the judge announces Yuhkoh and before the match resumes.

The standard delay before the match resumes shall be 30 seconds.

**B.** The time elapsed after a judge announces to stop the match and before the match resumes.





## 6. Scoring

### 6.1. Scoring

One Yuhkoh point shall be given when:

- A. A team legally forces the body of the opposing robot to touch the space outside the ring, which includes the side of the ring its self.
- B. The opposing robot has touched the space outside the ring on its own.
- C. Either of the above takes place at the same time that the end of the Match is announced.
- D. When a wheeled robot has fallen over on the ring or in similar conditions, Yuhkoh will not be counted and the match continues. When judges' decision is called for to decide the winner, the following points will be taken into considerations:
  - A. Technical merits in movement and operation of a robot.
  - B. Penalty points during the match.
  - C. Attitude of the players during the match.

### Possible of games:

Possible	Round ( 1 )	Round ( 2 )	Round ( 3 )	Points
( 1 )	Win	Win	---	2
( 2 )	Win	Draw	Win	2
( 3 )	Win	Lose	Win	2
( 4 )	Win	Draw	Draw	2
( 5 )	Win	Lose	Draw	1
( 6 )	Draw	Draw	Draw	1
( 7 )	Win	Lose	Lose	0
( 8 )	Lose	Lose	---	0





## 7. Violations

### 7.1. Insults

A player who utters insulting words to the opponent or to the judges or puts voice devices in a robot to utter insulting words or writes insulting words on the body of a robot, or performs any insulting action, is in violation of these rules.

### 7.2. Minor

Violations A minor violation is declared if a player:

- A.** Enters into the ring during the match, except when the player does so to take the robot out of the ring upon the judge's announcement of Yuhkoh or stopping the match. To enter into the ring means: a. A part of the player's body is in the ring, or b. A player puts any mechanical kits into the ring to support his/her body.
- B.** Performs the following deeds:
  - a.** Demand to stop the match without appropriate reasons.
  - b.** Take more than 30 seconds before resuming the match unless the judge announces a time extension.
  - c.** Start operating the robot within five seconds after the chief judge announces the start of the match.
  - d.** Does or says that which disgraces the fairness of the match

## 9. Injuries and Accidents during the Match

### 9.1. Request to Stop the Match

A player can request to stop the game when he/she is injured, or his/her robot had an accident and the game cannot continue.



## **9.2. Unable to Continue the Match**

When the game cannot continue due to player's injury or robot's accident, the player who is the cause of such injury or accident loses the match. When it is not clear which team is such a cause, the player who cannot continue the game, or who requests to stop the game, shall be declared as the loser

## **9.3. Time Required to Handle Injury/Accident**

Whether the game should continue in case of injury or accident shall be decided by the judges and the Committee members. The decision process shall take no longer than five minutes.

## **9.4. Yuhkoh Given to the Player who Cannot Continue**

The winner decided based on Section 9.2 shall gain two Yuhkoh points. The loser who already gained one Yuhkoh point is recorded as such. When the situation under Section 9.2 takes place during an extended match, the winner shall gain one Yuhkoh point.

# **10. Declaring Objections**

## **10.1. Declaring Objections**

- A.** No objections shall be declared against the judges' decisions.
- B.** The lead person of a team can present objections to the Committee, before the match is over, if there are any doubts in the exercising of these rules. If there are no Committee members present, the objection can be presented to the judge before the match is over



## **11. Miscellaneous**

### **11.1. Flexibility of Rules**

As long as the concept and fundamentals of the rules are observed, these rules shall be flexible enough to encompass the changes in the number of players and of the contents of matches. Modifications or abolition of the rules can be made by the local event organizers as long as they are published prior to the event, and are consistently maintained throughout the event.

## **12. Liability**

**A.** Participating teams are always responsible for the safety of their robots and are liable for any accidents caused by their team members or their robots.

**B.** The RobotChallenge organization and the organizing team members will never be held responsible nor liable for any incidents and / or accidents caused by participating teams or their equipment.

**For further questions:**

**Technical Support: 01022758877**

**Good Luck**

