

Robotics

In this category the participants asked to design, build and program robots. Currently there is a huge interest in robotics worldwide. Companies as well as people have a certain interest in robotics and it is increasing rapidly. To make the new generation more curious and passionate about robots, several competitions have been held in different countries around the globe. “INFOMATRIX-ASIA” invites the best minds from around the world to compete in this category. In competition there are going to be these subcategories for Robotics: Lego Sumo, Arduino Mini-Sumo.

1. Registration requirements:

Participants should

- A) fill information about themselves and send project description file which includes code and information about components of robot (pdf format)
- B) upload video that shows robot in action on youtube and send link (title consists of team name and subcategory) duration min 3 min, max 5 min

2. Stage – I

In this stage teams present their robots and compete in the particular subcategory to earn as much points as they can. As explained above there are going to be these subcategories for Robotics: Lego Sumo, Arduino Mini Sumo robots.

Make sure to read all rules and specific requirements related to each subcategory in the documents. At this stage, participants can take 50% (percentage subject to change) of the total points.

3. Stage - II

The second stage of the competition will be a hackathon. In which participants must solve the given problem in the fixed amount of time. Participants must prepare and bring by themselves laptops, software, all components and details depending on the category of Lego Sumo or Arduino Mini Sumo. Participants can use components of their sumo robots. Each team member must be present, otherwise the work will not be accepted.

The task itself and all information about hackathon: conditions, criterias will be published on the website **infomatrix.asia** on the day the competition starts.

An **example task** for preparation for a hackathon: successful passage of a robot through a maze, mission completion or design task

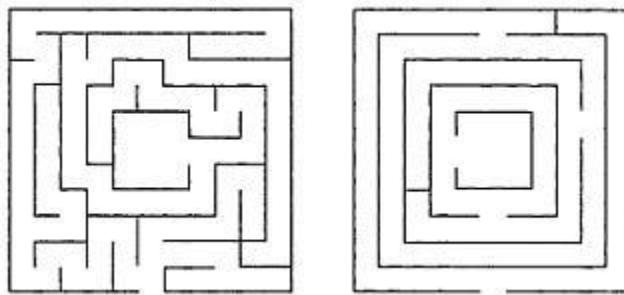


Figure 1: example of maze

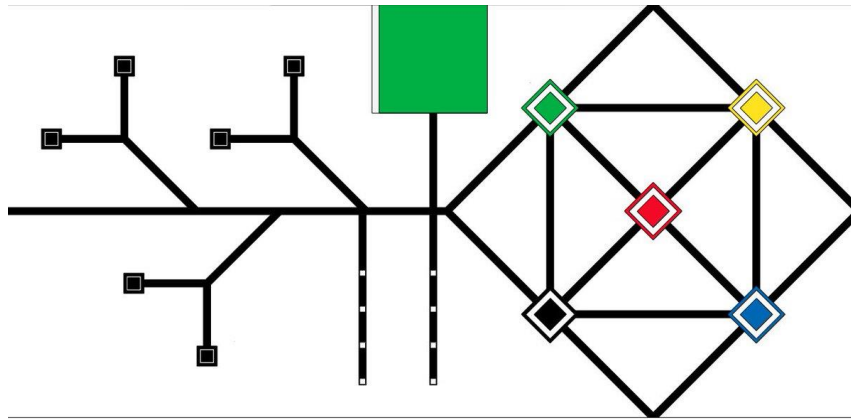


Figure 2: example of mission

Task for Lego Sumo category will be based on Lego Mindstorms and task for Arduino Mini Sumo category will be based on Arduino.

At this stage, participants can take 50% (percentage change) of the total points. These two stages will be added, and the final score will be determined, and the decision will be made on the basis of the points received.

Note: try to bring a full box of details.

4. Evaluation of projects and determination of degrees:

In the first phase all teams with their robots are going to compete. On the second day all team members will participate in the Hackathon to show their knowledge in robotics field. The evaluation process is going to be explained in the main rules and regulation section. Participants will be given their points based on two phases.

IMPORTANT NOTES:

1. Participants must bring their all needed equipments for the competition

Arduino Mini Sumo and Lego Sumo rules 2020

1 Robot classes

Arduino Mini Sumo and Lego Sumo.

2 Competition

Three operators can be registered for every robot. However, only the operator is allowed to guide the robot. All contestants must follow the competition rules, the terms and conditions of winning and participate using only self-made autonomous robots at the Dohyo area designated beforehand. The winner is announced by the judges.

3 Dohyo Jyonai - the match ring area

Match ring areas for Lego sumo and Arduino Mini sumo are same.

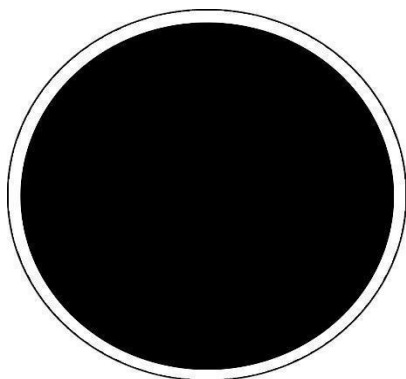


Figure 2: Match area

Class	Ring Height	Ring Diameter	White Border Width
Arduino Mini sumo ring	2.0-3.0 cm	77 cm	2.0-4.0 cm
Lego sumo ring	2.0-3.0 cm	77 cm	2.0-4.0 cm

4 Requirements for the robot

4.1 Requirements for the robot

1. Dimension and weight restrictions

Class	Mass	Length	Width	Height
Arduino Mini Sumo	500 g	10 cm	10 cm	unlimited
Lego Sumo	1000 g	15 cm	15 cm	unlimited

* The robot may expand after the start of the round, but must stay in one piece.

2. Autonomous robots – starting the movements

Starting method: 5-second timer. The timer can be activated by the operator of the robot by pressing a button or via remote control system.

3. Autonomous robots – stopping the movements

Stopping method: The operator of the robot stops the robot by pressing a button or via remote control system.

4. Requirements for blade use

It is not forbidden to use double blades. It is forbidden to use any components that may segregate from the robot when it moves or comes into contact with another robot.

4.2 Movements of autonomous robots

Movements of autonomous robots should be designed to detect the movements of the opponent and respond/attack accordingly. If there is any doubt in the autonomy of the robot, the referees have the right to inspect the control logic of the robot.

4.3 Use of remote control devices with autonomous robots

During the competition (round), the remote control devices must be placed on a previously designated area. The devices may only be used to stop the robot, when the referee gives a corresponding command. The official infrared remote control device is held by the referee.

4.4 Prohibited components of the robot

1. Any components that may disturb the operation of the opponent (for example, ashlights or jamming devices such as IR LEDs intended to saturate the opponents IR sensors).
2. Any components that may damage or scratch the surface of Dohyo. An exception is when the robots collide.
3. It is forbidden to use any liquids, powders and gas as a weapon against the opponent.
4. It is not allowed to use any inflammable materials in the robot.
5. The robot must not include any throwing devices (for example throwing a net on opponent).
6. The robot must not include any parts, which fix it onto the Dohyo (for example, glues, suction cups, etc.). Magnets that improve the grip of the wheels are prohibited.

5 Match principles

1. The match generally contains three rounds and lasts up to three minutes. The team who earns two Yuko points (effective points) first during the time of the match will be the winner. Match time is measured during rounds, not between them.
2. If only one Yuko point has been earned by the end of the match time, the winner is the team who earned it.
3. If neither team wins any rounds during the match time, the winner will be announced according to the situation of Yusei (dominance), see paragraph 7.3. If Yusei cannot be decided or the number of rounds that has been won is the same for both teams, the match

time will be extended by three minutes. If one team earns one or more Yuko points during the extended time, then this team will be the winner.

4. The contestants have a maximum of 30 seconds between the rounds to maintain their robot.

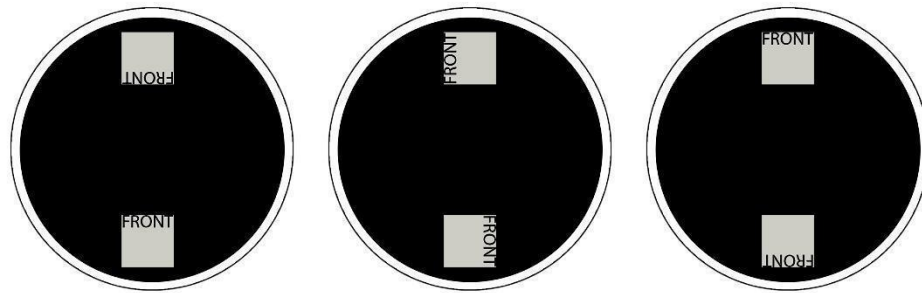


Figure 3:
directions in
beginning

First round

Second round

Third round

Robot's
the

6 The organization of competition

6.1 Starting the match

1. The match starts according to the referee's signal.
2. Before each round and according to the signal of the referee, the contestants place their robots simultaneously on the Dohyo. The robots are not allowed to move after they have been placed on the Dohyo.
3. After the signal of the referee, the operators start the 5-second timer in the robot and immediately leave the area of Dohyo Jyonai. The robots may start moving 5 seconds after they have received the start command.
4. In case the Dohyo area is scratched or becomes dirty, the referees decide whether to continue the match on the same Dohyo or replace it.

6.2 Ending the match

1. The referee gives a signal to end the match and stop the robots. The robot is stopped by the operators of the robot.
2. The match ends officially after a corresponding signal from the referee. The participants must take their robot from the Dohyo and leave the area of Dohyo Jyonai.

6.4 Repeat of round (Tarinaoshi)

The round is repeated in the following situations.

1. Both robots are facing each other and their movement is hindered or it does not happen.
2. Both robots fall out of the Dohyo at the same time.
3. Other situations in which it is not possible to determine who has won and lost.
4. If it is not possible to announce the winner after Torinaoshi, the referee may place the robots himself or herself and continue with the match within the allocated time.

6.5 Handling the robots between the matches

For the time between the matches in the same sub-group, the robots must be placed on a table given for it and can be removed from there only for the duration of the match. It is forbidden to leave the competition area with the robot between the matches, except for when a corresponding permission has been given (e.g. the robot needs xing). The purpose of this requirement is to guarantee the smooth course of the competition.

NB! If the robot cannot be found from the designated table at the right time or if the team itself is not present, the match will result in a loss.

7. Yuko (effective) point, Shinitai and Yusei (dominance)

7.1 Yuko (effective) point The winner is announced in the following situations.

1. If the opponent has been pushed out of the Dohyo (the robot touches the area outside of the Dohyo).
2. If the opponent falls out of the Dohyo and touches the area outside of the Dohyo.
3. In the situation of “Shinitai”.
4. In the situation of “Yusei (dominance)”.
5. If “Keikoku (warning)” is given twice to the opponent.
6. If there is a case of “Hansoku (violation)”.
7. If the winner is announced without a match, the winner earns two Yuko points
8. (if the winner already has one Yuko point, he or she earns only one more). The existing Yuko point(s) of the opponent who lost remain effective.

7.2 Shinitai

“Shinitai” situation means that one or several wheels of the robot roll out of the Dohyo and the robot is unable to return to the Dohyo. In this case, the opponent earns one Yuko point.

7.3 Yusei (dominance)

In a situation of “Yusei” (dominance), the referee may grant a Yuko point to the team according to the strategy, movements and skills of the robot.

8 Hansoku (violation) and penalty

8.1 Keikoku (warning)

A contestant who acts as indicated below gets a “Keikoku” (warning). If the contestant gets two Keikokus (warnings), the opponent earns one Yuko point.

1. If the operator or some item of the operator (for example, remote control) ends up in the area of Dohyo Jyonai before the round ending signal of the referee.
2. If the robot moves before the beginning of the round (movement or changing its shape).
3. If the participant violates the requirements for the use of remote control.
4. If the robot is replaced after it is placed on the Dohyo.
5. If the participant does not comply with the safety requirements.
6. In case of any other action that is considered unfair.

8.2 Hansoku (violation) In the following situations the opponent or both parties earn one Yuko point.

1. If some part falls off from the robot.
2. If the robot does not move.
3. If both robots move, but do not collide.
4. If the robot is on fire or a situation, which resembles that the robot is on fire.
5. If the participant wants to end the round.

8.3 Hansokumake (defeat due to violation)

The participant who violates the following rules, loses the match due to violation.

1. If the contestant fails to show up at the designated Dohyo at the beginning of the match or the participant exceeds the time given from maintenance, see paragraph 5 Match principles.
2. If the contestant sabotages the match. For example, deliberately breaking or deforms the Dohyo.
3. If the participant violates the requirements provided for in paragraph 4 Requirements for the robot.
4. If the robot does not make autonomous movements.
5. If the participant does not comply with the requirements provided for in paragraph 6.1 Safety requirements even after “Keikoku” (warning).

8.4 Sikkaku (disqualification)

In the following cases, the participant will be disqualified – he or she must leave the competition and is not added to the list of competition results.

1. If the participant’s robot does not comply with the requirements provided for in paragraph 4.1 Requirements for the robot .
2. If the participant behaves in an undignified manner. For example, swears or offends the opponent or the referees.
3. If the participant deliberately injures the opponent.

9. Suspending the match

1. If the participant is injured and the match cannot be continued, the participant may demand the suspension of the match.

2. In the event of the previously described situation, the referees make necessary arrangements for the match to be immediately resumed.
3. If the arrangements do not enable the match to continue, the opponent wins the competition without a match.