GUIDE BOOK

ROBOT SUMO RC

BACKGROUND

In an era of increasingly rapid technological development, the role of technology cannot be ignored. Technological development has become a major driver of change in various aspects of human life. One of the culminations in technological evolution is the emergence of the Industry 4.0 concept, which marks an era where digital technology, automation, and high connectivity are at the core of various industries.

IISRO 2025 is a competition designed to stimulate the development of robotics technology and advance the Industry 4.0 concept in Indonesia. By emphasizing the development of human resource competencies, especially among university students, this competition aims to stimulate innovation in robotics technology and encourage the application of the Industry 4.0 concept in various sectors.

Through participation in IISRO 2025, participants are expected to develop a deep understanding and skills in robotics and foster a healthy competitive spirit, while supporting the growth of Indonesia's technological potential.

CHALLENGES

Participants build manual sumo robots that can push their opponents out of the arena according to competition rules. Robot operators control the sumo robots using wireless controllers.

PARTICIPANT TERMS AND CONDITIONS

- The competition is open to participants from Indonesia and the Indonesian Foreign participants through the following categories :
  1. Junior Category [age of Under 12 years old]
  2. Senior Category [age of under 19 years old]
  3. Open Category [age of Under 19 years old]
- Each team consists of a maximum of 7 participants including. Each participant (except assistant teacher/team manager) is only allowed to register join a team only.
- Team registration must be done online at the website.
- Eating & drinking are not provided.
- The Robot Kit is not provided by the committee

- Team or robot names are not permitted to contain elements of SARA or similar elements that may offend other parties.
- If participants have the same team or robot name, the team that has completed its administrative requirements first will be allowed to use that name.
- Participants are required to use their participant ID card during the competition.
- If there are changes to team members, revisions to team member names and team composition must be made no later than the end of the registration period, and all changes must be confirmed immediately to the committee. Any changes made after the Technical Meeting will not be recognized and are beyond the responsibility of the IISRO 2025 committee.

ROBOT SPECIFICATIONS AND PROPERTIES

ROBOT SUMO ½ Kg (JUNIOR)

- The robot used is an RC Sumo Robot, which is controlled using a wireless controller.
- Maximum dimensions of the robot: 15x15 cm.
- The robot weighs no more than ½ Kg (excluding the remote).
- The power source used is a 12-volt battery with a tolerance of ±1 volt.
- The battery, cables, and other components must be securely protected during the match.
- Robots are not permitted to have any moving mechanisms to overthrow the opponent's robot.
- Robots are not permitted to use any sensors (such as distance sensors, line sensors, orientation sensors, etc.), meaning the robots must be fully remote-controlled.
- Interfering with the opponent's controller by using signal jammers or similar devices is prohibited.
- Robots are not permitted to damage the arena.
- Robots are not permitted to throw liquids, powders, or other substances at opponents or the arena.
- Robots are not permitted to use devices that emit flames.
- Robots are not permitted to use systems for attaching themselves to the competition surface, such as suction cups, diaphragms, sticky surfaces, glue, or similar devices.
- Robots are not permitted to use projectile weapons or sharp weapons, except for sumo blades.

ROBOT SUMO 1 Kg (SENIOR)

- The robot used is an RC Sumo Robot, which is controlled using a wireless controller.
- Maximum dimensions of the robot: 20X20 cm.
- The robot weighs no more than 1 Kg (excluding the remote).
- The power source used is a 12-volt battery with a tolerance of ±1 volt.
- The battery, cables, and other components must be securely protected during the match.
- Robots are not permitted to have any moving mechanisms to overthrow the opponent's robot.
- Robots are not permitted to use any sensors (such as distance sensors, line sensors, orientation sensors, etc.), meaning the robots must be fully remote-controlled.
- Interfering with the opponent's controller by using signal jammers or similar devices is prohibited.
- Robots are not permitted to damage the arena.
- Robots are not permitted to throw liquids, powders, or other substances at opponents or the arena.
- Robots are not permitted to use devices that emit flames.
- Robots are not permitted to use systems for attaching themselves to the competition surface, such as suction cups, diaphragms, sticky surfaces, glue, or similar devices.
- Robots are not permitted to use projectile weapons or sharp weapons, except for sumo blades.

ROBOT SUMO 3 Kg (OPEN)

- The robot used is an RC Sumo Robot, which is controlled using a wireless controller.
- Maximum dimensions of the robot: 20X20 cm.
- The robot weighs no more than 3 Kg (excluding the remote).
- The power source used is a 12-volt battery with a tolerance of ±1 volt.
- The battery, cables, and other components must be securely protected during the match.

- Robots are not permitted to have any moving mechanisms to overthrow the opponent's robot.
- Robots are not permitted to use any sensors (such as distance sensors, line sensors, orientation sensors, etc.), meaning the robots must be fully remote-controlled.
- Interfering with the opponent's controller by using signal jammers or similar devices is prohibited.
- Robots are not permitted to damage the arena.
- Robots are not permitted to throw liquids, powders, or other substances at opponents or the arena.
- Robots are not permitted to use devices that emit flames.
- Robots are not permitted to use systems for attaching themselves to the competition surface, such as suction cups, diaphragms, sticky surfaces, glue, or similar devices.
- Robots are not permitted to use projectile weapons or sharp weapons, except for sumo blades.

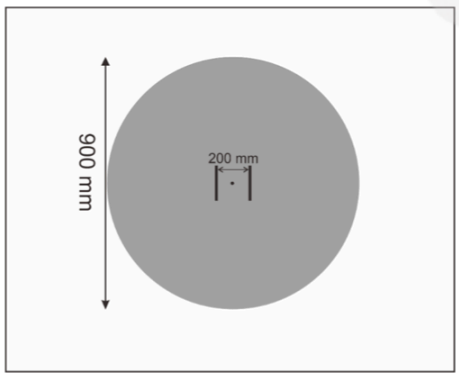
ARENA TERMS AND CONDITIONS

Sumo RC Junior and Senior

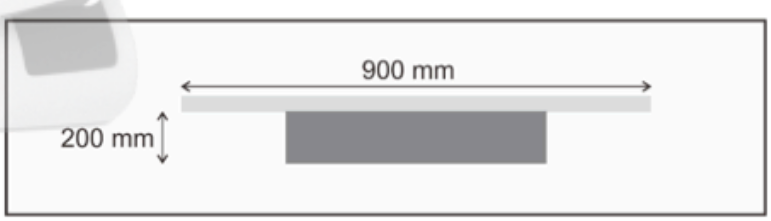
Field Sumo made of acrilic

Sumo field size is as follows:

a. Diameter [900 mm]
b. Thickness [3 mm]
c. Platform Height [200 mm]
d. Bridge Length [500 mm]
e. Bridge width [200 mm]



Picture 1



Picture 2

Picture 3 Track Robot Sumo RC Battle

Sumo RC 3 Kg Open

- The arena is made of 4 mm thick acrylic with a diameter of 120 cm.
- Starting line width = 2 cm x 25 cm.
- White edge width = 5 cm.

Picture 4 Track Robot Sumo RC 3 Kg Open

F. DISTRIBUTION GROUP

The match will be conducted in the form of a group filter.

1. Phase One (1) will involve 32 teams:
   It will be divided into 4 large groups containing 8 teams each.
3. The Second Phase (2) will involve 64 teams (if any):
   It will be divided into 8 major groups containing 8 teams each.
4. Team divestment will be conducted by the organizers randomly and regularly to those large groups.

Group 1	Team A	Team B	Team C	Team D	Point
Team A					
Team B					
Team C					
Team D					

IMPLEMENTATION OF THE MATCH

- complete match will take Five (5) minutes, which covers all the following levels:

1. Rank Team A, B, C, D [2 minutes]
2. Team Deluxe Stage [2 minutes]
3. Grand Team Stage [1 minute]

- Before the game starts, 60 seconds will be awarded all eight POINTS teams to place their robots behind their respective black lines and put "remote control" on the floor. Robot is in "standby mode".
- Only one participant is allowed to stay in the area and drive the robot. Other participants are not allowed in after 60 seconds.
- When the referee blows the whistle, the participants can take their "remote control" and start the match.
- Participants are not allowed to touch their robots after whistle sound is blown.
- Each team needs to make sure the opponent is refused Team ring each.
- If one of the sides is removed from the Team court then the winner can continue the match to the next Team ring and the score will be awarded.

- The next round of the match will only start after the two sides are in the ring. If no successful team goes on to the next stage after Two (2) minutes, then the free win will be awarded to the opponent (if any) and the winner can continue the game to the Grand Team stage.
- If none of the outgoing parties or both sides are out of the Team ring within Two (2) minutes at each level then they can not continue the match to the next Team ring and no scores are obtained. Free win will be awarded to the opponent (if any) at the next Team level.
- If the robot drops off the bridge while moving between the Team ring then the team is not allowed to continue the match. Free win will be awarded to the opponent (if any) at the next Team level

GAME SYSTEM

a. Sumo Games

A game consists of three rounds, each lasting one minute. The winning team receives one round point, while the losing team receives no round points. If the match ends in a draw, each team receives one round point. The winner of a sumo game is the team with the most round points. The winner of a sumo game receives three points, and the loser receives zero points. If the score remains tied after two rounds, the winner will be determined by additional rules set by the committee.

b. Round Winner

The robot that successfully knocks the opposing robot out of the arena (with its entire body touching the floor) will be declared the winner of that round. If both robots fall out of the arena, the last robot to fall (with its entire body touching the floor) will be declared the winner. A tie is declared if both robots remain in the arena until the round's time limit.

c. Group Round

- Participating teams will be divided into groups of five, each containing 1/2kg, 1kg, or 3kg.
- Each robot will compete in one sumo game against another team in the same group.
- The winning team will receive one point, while the losing team will receive no points (0 points).
- The winner of the sumo game is the team with the most round points.
- The winner of the sumo game will receive three game points, and the loser will receive zero points.

- The total number of teams that will advance to the top 16 will be the 16 teams with the highest points from all participants in the sumo robot competition (their points will be ranked according to their games).
- If there is a tie in points, the teams will be ranked using the aggregate round points system. (The aggregate round points are the difference between the number of round wins and round losses.)
- If the score remains the same, the fastest time from the previous match between teams with the same points will be determined.
- The winning team's time will be determined by the time it took the winning team to win the round. The losing team will be calculated by the remaining time from the round.

d. Knockout Round

- The knockout round will be divided into two pools, with the winner of each pool becoming the grand finalist of RC SUMO IISRO 2025.
- At each level, robots will receive one sumo game (3 rounds), with each round given a time limit of 1 minute.
- To advance to the next level, the team that first scores 2 points is the winner (2 winning sets).
  1. If neither robot falls in a round, the round is declared a draw.
  2. If both robots remain motionless for 30 seconds due to damage, the round is stopped and both teams are declared a loss.
  3. If both teams have the same points, an additional round will be held until a winner is determined.

- Teams that lose in the top 8 will be relegated to the Lower Bracket for another chance to compete.
- The scoring system in the Lower Bracket is the same as in the Upper Bracket.
- Teams that lose in the Lower Bracket are disqualified from competing.

GAME CHALLENGE

Robots will compete against each other to knock their opponents out of the arena under various conditions (e.g., touching the floor or outside the white line). The robot that knocks its opponent out first will be declared the winner of that round.

COMPETITION RULES

BEFORE THE MATCH

1. Participants must meet the administrative requirements (forms and identification).
2. Participants must arrive 15 minutes before the match.
3. Robots must pass the robot specification test.
4. Team name tags provided by the committee must be attached to the front of the robot.
5. Participants may use the designated pit stop area as appropriate.
6. Participants who are not yet competing are not permitted to interfere with participating teams or other robots.
7. Both competing robots will undergo a 30-second test drive. This test drive ensures there is no signal interference between the robots.
8. Robot damage before, during, or after the match is not the responsibility of the committee, and participants are expected to bring their own repair equipment (e.g., screwdrivers, pliers, laptops, spare parts, cable reels, etc.).

DURING THE MATCH

1. Participants are advised to wear shoes and cloth gloves.
2. The time available for robot preparation in each round is 1 minute.
3. Operators are only allowed to operate one RC Sumo Robot during IISRO 2025.
4. In each sumo game, operators are allowed to alternate with their teammates, but they are not allowed to alternate with their team members during that game.
5. Participants are prohibited from littering or damaging the track.
6. Robot operators can only control their robots from the sidelines.
7. Robots must stand behind the line and must not move until the referee signals them.
8. Robots are allowed to start moving when the referee signals them.
9. Competitors are not allowed to change power supplies during the match. Power supply changes can be made during a timeout and must be checked according to specifications.
10. If a penalty is awarded, the round is stopped and restarted.
11. Penalty points are awarded if:
    - Participants touch their own or the opponent's robot during the match.
    - The participant physically interferes with the opponent.
    - The robot moves before the referee gives the start signal.
    - The robot remains motionless for 30 seconds after the referee gives the start signal. The participant is late to the game (the lateness limit is 10 minutes after the team's call).

- No words containing elements of race, religion, race, and intergroup relations (SARA).
- The participant or their companion disrupts the game.
- The companion enters the sterile arena.

12. Time Out Provisions:
    - Each team has a 30-second time out before the start of the round. (One time out per team in one Sumo game.)
    - Battery changes are permitted during time outs.
    - The robots of competitors who do not request a time out may not be touched or moved.
    - If neither competitor feels they need a time out, they can proceed directly to the next round.
    - The team requesting a timeout may only prepare the robot outside the sumo track.
    - Only participants may prepare or touch the robot during the timeout.

AFTER THE MATCH

1. Participants must maintain good sportsmanship during the match.
2. Non-competing teams are permitted to spectate, but must remain outside the sterile area and not interfere with the competing teams.

VIOLATIONS AND CONSEQUENCES

Participants will be disqualified if:

1. There is a sensor on the robot.
2. They incur three penalties during the event.
3. They do not meet the established specifications.
4. They add components to the robot that do not meet the robot's specifications.
5. They damage the field and/or existing facilities.
6. They commit physical violence against the committee.
7. The judges' decision must be accompanied by a clear rationale.

H. CONTRAVENTION OF THE TERMS

Any team that violates the following conditions will be recorded:

- Continue the "robot setup" after 60 seconds.
- More than one participant is in the court area.
- Moving the robot before the whistle is sounded by the referee.
- Not fighting even if both robots work
- Other matters defined by the referee as "violation".

I. DISQUALIFIED

- Pasukan akan hilang kelayakan untuk bertanding seperti berikut:
- Collect two (2) times of collision terms in each match.
- Built robot does not meet competition requirements.
- Not going to court when called for willingness