

Prairie Sumo Autonomous

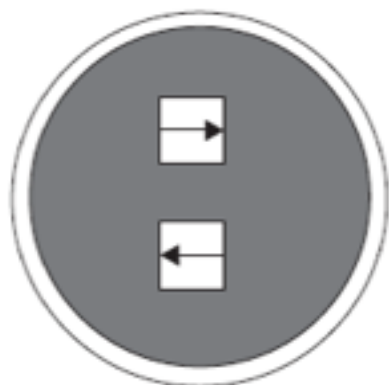
Effective November 26, 2015

- Code: PSA
- Control: Autonomous
- Open to: University (see below)
- Max Robot Size: 1 meter perimeter
- Weight limit: 3 kilograms*
- Size of Playing Field: 1.52 meters (see details below)
- Explanation: The object is for two robots to try to push each other out of the ring.

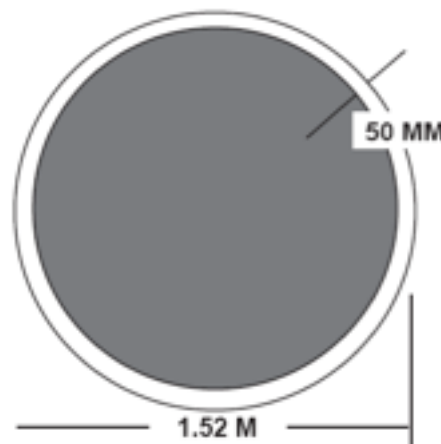
For robot size, weight, ring diameter and competitor eligibility [Top Grade Limit], consult the following table:

| Type | Class | Group | Max Size | Max Weight | Top Gr Limit | Ring Dia. |
|---------------------|-------------|------------|---------------------|----------------------|-------------------|---------------|
| Prairie Sumo | Tethered | PST | 1m Perimeter | 3 Kg | Gr 12 | 1.52 m |
| Prairie Sumo | Auto | PSA | 1m Perimeter | 3Kg or 3.2Kg* | University | 1.52 m |

*For the 2016 Robot Games only, a further 200 grams will be allowed for those robots that are equipped with an approved kill switch. (see *Restrictions*, below)



Starting Positions



Preface:

The Manitoba Robot Games (MRG) has opted not to follow the official FSI All Japan Robot Sumo Tournament (FSI-AJRST) rules. This has been done in order to tailor competitions to available components and facilitate greater competitor participation.

Match Definition:

A match shall be a competition between two robots. Each robot must have a designated driver, and an alternate driver if the driver is entered into other competitions. The driver may not be changed within a match unless they are injured or become ill and cannot physically continue. Each robot competes to push its opponent beyond the perimeter of the defined Sumo Ring (playing field).

Playing field:

The diameter of the playing field is as specified in the above table. The border consists of a 5 cm white border at the edge and within the diameter of the playing field. **The** interior of the playing field is black in colour. The surface of the playing field is made of laminate and sits approximately 7 cm above ground level.

- Robot Specifications:**
- The** robot must be able to be constrained (surrounded) by a flexible sheath 1 meter in length. There are no restrictions on height.
 - The** maximum weight including accessories must be less than or equal to that specified in the above table as weighed on the scale provided by the MRG for registration for the competition. (It is highly recommended that a method be incorporated into the robot design to adjust the weight if the intention of the team is to attain the maximum weight at registration).
 - Any robot** found losing its body parts will also lose the match except for screws or nuts (each no more than one cubic centimeter) falling off.
 - A design** to stretch a robot's body, its parts, or opening up after the start of the round shall be allowed.
 - Autonomous** robots must contain all motivational intelligence within its structure.
 - No** cues or instructions may be provided from outside the playing field once the round starts.
 - Robots** may be turned on or initialized by hand at the beginning of the match, then after a minimum of a **five** second delay the robot may take control of its own movement.
 - Should** movement occur within the five second delay period, the robot will lose the match.
- Restrictions:**
- Power** - No Fuel Cells allowed.
 - Lithium** Ion, or Lithium Polymer may be used under the following strict conditions.
 - All** Lithium based batteries must be commercially available battery packs, unaltered, and identifiable to the judges (have the original label visible).
 - If using** Lithium based batteries, the robot is to be fitted with a removable fuse. (See "MRG General Rules 2016" page 3 for more information or online at mbrobotgames.ca & search = "Lithium")
 - Only** one Lithium based battery pack can be used on the robot at a time, although you may have replacement batteries if stored in a safe manner.(see General Rules)
 - Lithium** based battery packs are to be placed on or in the robot in such a way as to avoid direct contact by another robot or against any chance of being punctured or shorted.
 - The** charging of all Lithium based batteries shall be performed in the charging area provided. A volunteer will be available to monitor for excessive heat, leakage or eruption of the batteries but will not be responsible for theft. If any charging battery is deemed to be in danger of eruption, the supervising volunteer will cover the battery with sand and remove it from the building, therefore we recommend the battery be removed from the robot for charging if possible.
- The** robot shall be fitted with a single action **kill switch** prominent on the top of the robot, coloured red, and will, when pushed in a downwards motion and released, disconnect power to the motor(s), immobilizing the robot.
- The** robot shall not contain any electronic jamming devices to disturb your opponent's infra-red or ultra-sonic sensors.
- The** robot shall not contain parts that could break or damage the Playing field.
- The** robot shall not contain devices that can store solids, liquid, powder, or air and throw it at your opponent.
- The** robot shall not contain any inflaming devices.
- The** robot shall not contain any sucking devices or glue to stick the robot down onto the Playing field
- Robot Identification:**
- The** supplied MRG identification sticker(s) (as supplied while registering in the contest) must be easily readable on the robot's body while the robot is in competition.
- Game Principles:**
- Each** match consists of up to three rounds with a total time of three minutes.
 - Each** round starts at the judge's command and continues until a team pushes the opponent off the playing field or time expires.
 - The** first team to win two points within the time limit is awarded the match.
 - When** neither team can push the other off the playing field the winner will be decided by the judges. However, if no obvious superiority exists and a winner cannot be determined, an extra one minute match on a reduced size playing field **may** be played.
 - The** judges will decide when a point is scored.
- Game Procedure**
- Beginning of the Game:**
- At the** judge's instruction, the robots are placed in the playing field 20 cm apart and equal distance from the centre of the playing field .The robots are set down parallel to each

other and facing opposite directions so that autonomous robots must actively search for their opponent and not merely “steam roll” straight forward.

The team to place their robot in the playing field first shall select the direction their robot is to face (if both robots are facing the same direction, the second robot placed within the playing field will be required to be replaced facing the opposite direction).

When both contestants are ready, the judge will signal the start of the three minute match at which time the robots may be activated. No movement must occur before the official start (no posturing). There must be a five second delay from the start signal until any motion of the robot occurs.

A team may halt the start, just once, no later than 10 seconds upon the start of one round without penalty. This allows for last moment emergencies like forgetting to plug in a battery. The start can be delayed not longer than 60 seconds.

End of the Game: **The match** ends when the judge announces so.

Cancellation/Rematches: **The** round stops and resumes when a judge announces so. The round may also be cancelled and a rematch called for by the judges when:

Both robots are in a clinch and stop movements for 5 seconds, or move in the same orbit for 5 seconds with no progress being made.

Both robots move without making progress, or stop (at the exact same time) and stay stopped for 5 seconds without touching each other. If one robot stops its movement first, after 5 seconds it shall be considered not having the will to compete.

If both robots touch the outside of the playing field at about the same time, and it cannot be determined which touched first, a rematch may be called.

A successful round: One point shall be given when:

You have legally forced the body of your opponent’s robot to touch the space outside the playing field. A robot whose body, wheel, or other support hangs over the edge is not considered outside the playing field until it physically tips or touches the surface beyond the playing field perimeter.

Your opponent’s robot has touched the space outside the playing field, on its own.

Either of the above takes place at the same time that the End of the Match is announced.

Your opponent’s robot is disqualified or has had more than one violation or warning.

Your opponent’s robot become disabled (flipped on its back or side, for instance) and is unable to move in the playing field.

When judges’ decision is called for to decide the winner, the following points will be taken into considerations:

Technical merits in movement and operation of a robot.

Attitude of the players during the match.

Which robot exhibited the best effort.

Warnings:

Contests WILL start within a reasonable time, once announced.

A contestant who takes any of the following actions will receive a warning...

- In the event a contestant fails to respond to the announced start time.
- They enter into the playing field during the match, except when the team does so to bring the robot out of the playing field upon the judge’s announcement of a point or after the round/match is stopped. To enter into the playing field means a part of a team member’s body is in or directly above the playing field.
- Halts the start of a round more than the one time allowed for.
- A robot moves before the judges start signal.
- Tether control wire contact the playing field surface or the competitor’s robot.
- Tether is tugged or pulled to assist the robots progress. In the event that this is done to keep the robot within the playing surface, the opponent will be awarded the point as if the round is lost.

When a contestant receives two warnings, the contestant’s opponent will be awarded one point.

MRG General Rules:

Failure to follow the MRG General Rules may result in the following:

Warning being issued, **or**

Disqualification and loss of the pull, **or**

Disqualification from competition and or event.