

Phoenix Area Robot Experimenters Mini Sumo Event.

This is a Mini Sumo event. It is intended to be a pushing event.

The following are the rules to be used for the event. Any questions which arise during the event that are not dealt with in a clear manner by these rules will be settled by the event director.

This will be a double elimination contest.

All contestants accepted will pay a \$10 entry fee.

General

A work area will be provided for each participant.

Dimensions

Each bot is to be no larger than 10cm length by 10cm width at the start. There is no limit to the height. The bot is not limited from deploying objects that make it wider or longer after the start. The Bot can weigh no more than .5 kg.

Harmlessness

At all times, robot behavior must be non-offensive, non-destructive, and non-harmful to humans, robots, and the facilities.

During inspection (and at any time during the event), the judges may require safety changes or other modifications to meet the harmlessness requirement. Harmful robots are either not allowed to compete at all or can later be disqualified if potential harmful issues are proven or revealed in battle.

Judges will examine each bot to determine if the design is sufficient to survive the expected pushing, shoving, and physical rigors of the competition. Suggestions may be made to avoid damage to the robot. A weak robot will be allowed to compete at its own risk.

Mini Sumo Robots must not:

- Emit smoke or fire
- Leak, stain, or soil
- Disperse powder, grit, or grime
- Spray, throw, or use projectiles
- Jam, shock, or electromagnetically interfere
- Snare, entangle, or employ nets/rope
- Scratch, gouge, or scrape

Mini Sumo Robots must not fly or generate lift to isolate themselves from the ring surface.

Suction and Sticky Wheels

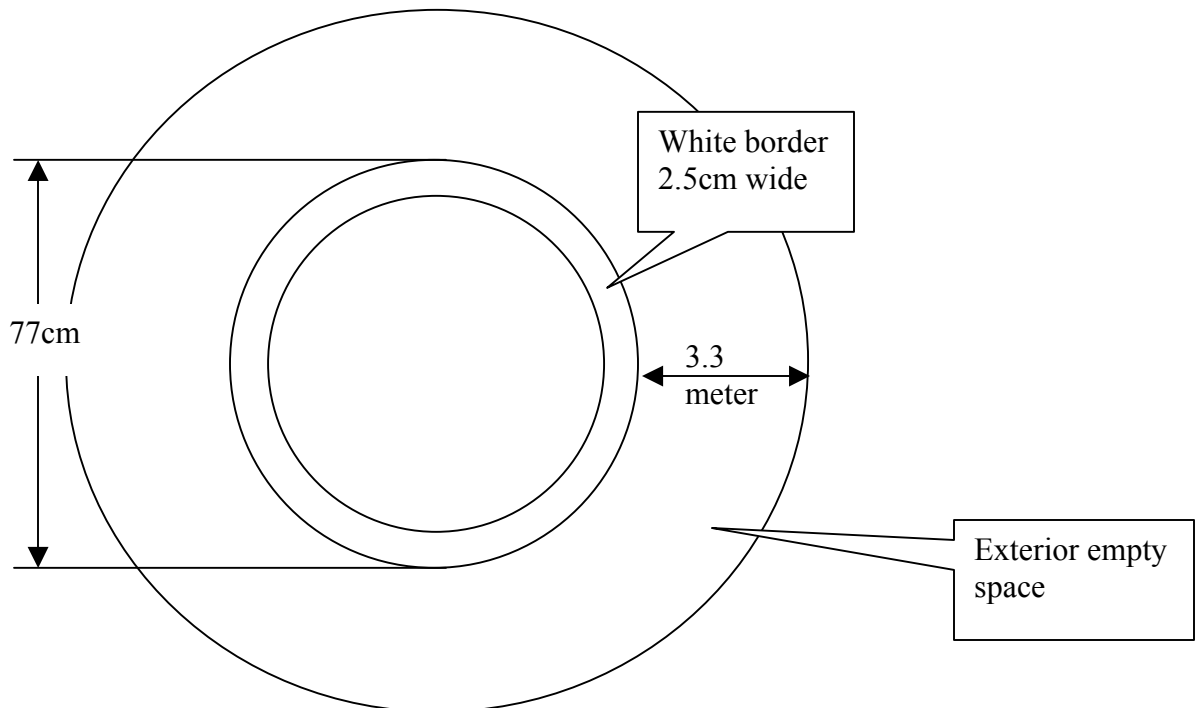
There will be no use of suction or sticky wheels allowed. The test for sticky wheels is to place the bot in the center of a 15cm by 15cm piece of white typing or copier paper (the official paper will be supplied by the judge at the event). The bot will then be picked up. If the paper lifts up (the paper must come completely off the ground) with the bot the wheels must be cleaned to eliminate the stickiness. The bot will be retested to ensure that the wheels are no longer sticky.

The Ring

The Mini Sumo ring is 77 centimeters (2.5 feet) in diameter, 2.5 centimeters (1 inch) in height, with an exterior empty space at least 100 centimeters (3.3 feet) all the way around.

The surface of the Mini Sumo ring is flat black.

The border is gloss white and 2.5 centimeters (1 inch) in width.



The starting lines are centimeters (3.93 inches) in length, centered 5 centimeters (1.97 inches) from the middle of the ring. Therefore, the starting lines are a total of 10 centimeters (3.93 inches) apart from each other.

Edge Sensors

Any type of edge sensor may be used.

Inspection

All bots will be measured, inspected, and weighed to verify qualification.

A digital scale will be used for determining mass.

For width and depth, a square clear tube 10cm by 10cm inside dimension, will be placed over the robot. The robot must fit into the tube.

The robot must start each round of the contest in an orientation and physical position that will fit in the tube. After the start the robot may change form and size.

The robot will be inspected to be sure it is non-damaging and generally safe.

Testing

Each robot will be pitted against a block of wood. Each robot will have three opportunities of up to three minutes each to push the object out of the ring twice.

The time taken and number of successes will be used to determine initial seeding.

Acceptance

If the robot qualifies, an entry fee of \$10 will be paid and an identifying sticker placed atop the robot.

Playoffs

Depending on the number of contestants, the judges will determine the number of rings to be used.

The contest will be ***Double Elimination***: Upon losing two matches, the robot is out of the contest.

Records will be kept to facilitate dispute resolution and tie breaking. The number of match wins is most important, the tie breaking criteria are: round losses, round wins, total time taken per match win, and lightest weight.

Definition of A Match

A Sumo match consists of up to three rounds of up to three minutes each round. The first robot to win two rounds wins the match.

At the beginning of a match, the contestants approach the ring and bow to each other.

The robot must be ready at the appointed time. A referee may declare a round or entire match lost if a robot isn't punctually prepared to compete.

Throughout the contest, the algorithms, settings, and components on the robot can be shaped, angled, or configured differently for facing each opponent and being placed in different starting positions.

Positioning

The better-ranked robot or the robot that just won the prior round is positioned first.

The contestant may place his or her robot in any position, angle, or location on the ring except that no portion of the robot may cross the extended starting line nearest the contestant. The robot must fit within the required starting dimensions (10 cm x 10 cm).

The lesser-ranked robot or the robot that just lost the prior round is positioned second.

The second contestant may place his or her robot in any position, angle, or location on the ring except that no portion of the robot may cross the extended starting line nearest the contestant. The robot must fit within the required starting dimensions.

Starting

A robot may be started by any means, such as hand clapping, a whistle, a laser pointer, an infrared signal, or RF communication. Robots may even have multiple starting buttons or starting configurations if designed with more than one opening move. (Upon starting, no additional control, commands, configuration, or information may be communicated to the robot.)

Both contestants place their fingers on their robot's starting buttons and await the referee's signal. If a problem is encountered before the referee says, "go", a contestant may alert the referee, without penalty, that the robot isn't ready. (Commonly, a robot may fall or slip when a finger is placed over the start button.)

Clear Exterior

Upon pressing the start buttons, the contestants immediately leave the exterior area around the ring. During the round, all people and objects must be kept out of the ring and exterior area to avoid distracting the robots or altering the outcome.

Upon pressing the start buttons, each robot must not move at all for five seconds. This is the 5-second countdown. However, countdown lights, buzzers, sounds, or other entertaining motionless activity is encouraged.

No Start

During the countdown, if the contestant notices their robot has failed to start its countdown, the contestant may alert the referee and halt the countdown. Both robots are reset to start the round over.

The contestant is given a warning. A second warning of any kind in a single round results in the robot losing that round.

It is to the benefit of the contestant to stop the countdown if the robot fails to start the first time. It may still be to the benefit of the contestant to stop the countdown a second time (losing the round) if the robot is likely to suffer damage by failure to start.

False Start

If a robot begins moving during the five-second countdown, the robot has committed a false start. A warning is issued and both robots are reset to start the round over.

A second warning of any kind in a single round results in the robot losing that round.

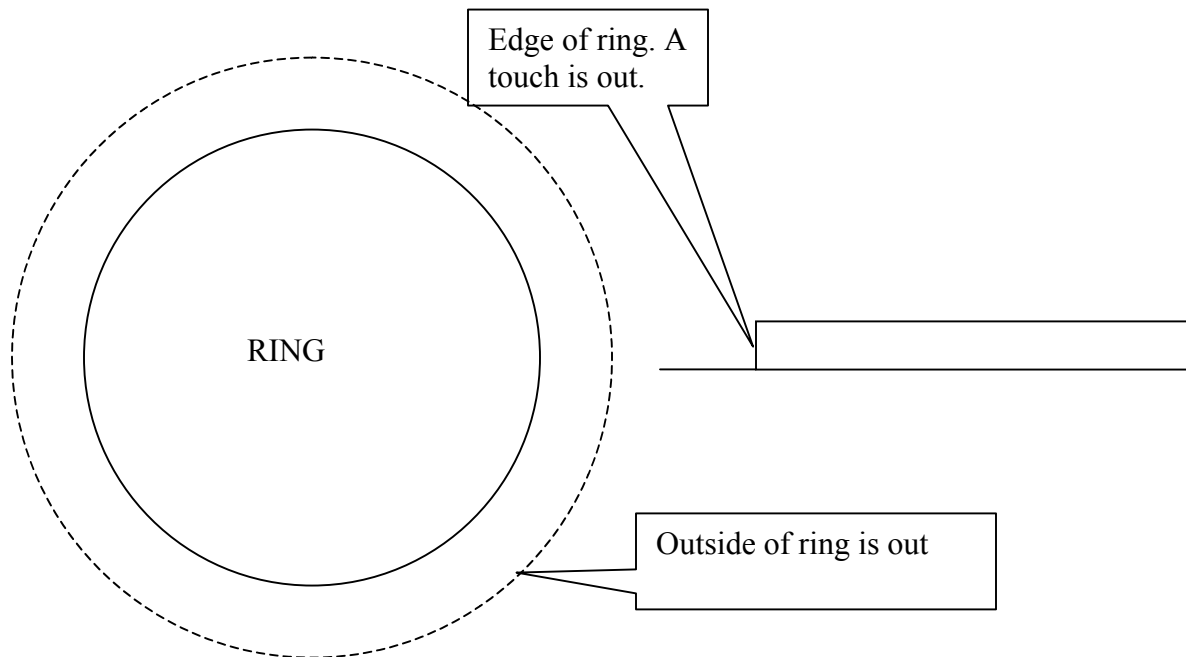
Out

A robot loses a round when any portion (including touch sensors, whiskers, scoops, or skirts) of the robot touches outside of the ring. It doesn't matter if the robot falls out on its own or is pushed out.

The first robot touching outside of the ring loses, even if the second robot subsequently touches outside of the ring. If the referee determines that both robots touched outside of the ring at the same time, the round is nullified and started over.

Touching the raised edge of the wall itself is also considered out.

If any piece of the robot, no matter how small or even if detached, touches outside of the ring, the robot is considered out.



For example, if a nut drops off a robot within the ring, the robot doesn't immediately lose. However, if the nut is then pushed out or rolls out, the robot loses.

If a robot lands outside the ring atop a whisker, scoop or any portion of the opponent robot, the opponent robot is out. This is consistent with the policy that the robot that touches outside first is out, even if the second robot subsequently touches outside the ring.

Not Out

Starting to fall or breaking the plain of the ring isn't considered out. Some portion of the robot must actually touch outside the ring.

Contestant Stoppage

Any time after the five-second starting countdown is over, a contestant may choose to enter the exterior space or otherwise signal stoppage to the referee. That contestant's robot loses the round.

If the robot is malfunctioning or in a position in which damage could occur, it might be in the contestant's interest to halt the round and take the short-term loss.

Communicating with a robot, attempting to distract (such as with an IR or laser emitter), or in any way attempting to interfere with the outcome is also considered signaling stoppage.

Referee Stoppage

At the referee's discretion, the referee may choose to restart a round if:

Three minutes have expired

No progress has been made in some period of time

The robots fail to touch each other for some period of time

The robots are hopelessly entangled or otherwise deadlocked

Both robots fail to start or both contestants signal stoppage

At the referee's discretion, the referee may choose to end a round and choose the round winner if:

Smoke, fire, damage, or any other violation has occurred

No progress is likely to be made even if the round is restarted

Brick, Dropped Parts, and Separation

The bot must move at least every 5 seconds. This is the "No bricks" rule, since a brick or other inanimate object doesn't qualify.

End Of Round

At the end of a round, the contestants retrieve their robots and prepare them for the next round.

End Of Match

The first robot to win two rounds, wins the match.

At the end of the match, the contestants bow to each other, just as they did at the beginning of the match. They then leave the ring area to prepare their robots for any additional matches in the contest.