

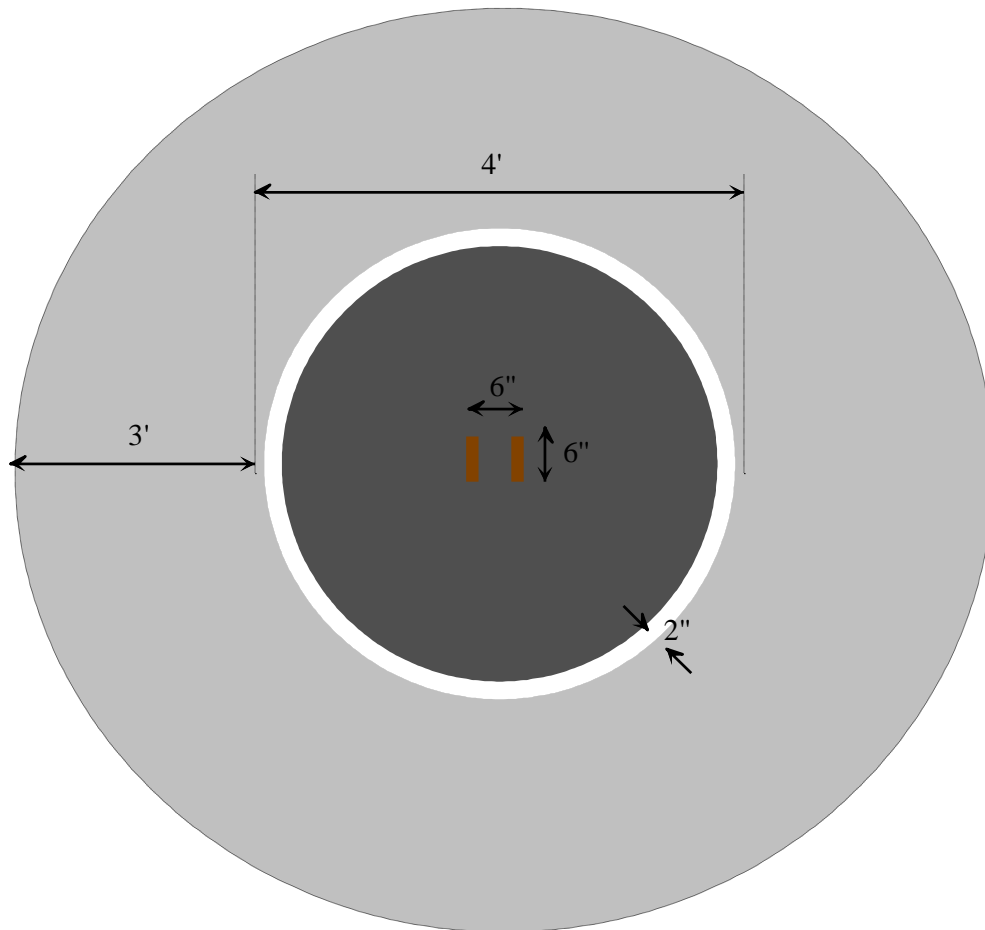
MICS 2023 Sumo Robot Contest

The robot contest will consist of a sumo-robot tournament. In a sumo-robot match, two autonomously-controlled robots try to push the other outside of a round ring. This may sound destructive, but any harmful behavior by a robot, whether it is intentional or not, will disqualify the robot.

However, contestants enter their robots at their own risk. Neither the Midwest Instruction and Computing Symposium, the steering committee of the Midwest Instruction and Computing Symposium, nor the MICS 2023 hosts (University of Northern Iowa) will be held liable for damage incurred by competing robots.

The Ring

The ring will be 4-foot in diameter and made from 3/4" plywood. The ring will be painted flat black, except for a 2-inch wide white border and two brown starting lines. Surrounding the ring is a 3-foot wide clear space. The ring will be raised 1.5 inches off the floor.



Robot Specifications:

- a maximum 1,200g weight limit including batteries and all attachments
- maximum starting dimensions: 12-inches width, 12-inches length, and no height limit
- after a 3 second delay at the start of a round, robots may reconfigure to any dimension
- no “too” sticky wheels or glue-like substances can be used (Each robot will be placed on a piece of standard letter-size (8.5”x11”) paper. If the paper lifts up when the robot is lifted, then the wheels are "too" sticky).
- during the match, robots must not employ hoops, ropes or nets to snare or entangle
- during the match, robots must not emit smoke, spray/leak any substance, or fire projectiles
- during the match, robots must not burn, shock, or electromagnetically interfere
- no flying or jumping by a robot is allowed so the opponent robot can push it out of the ring

- all power and processing must be on board (i.e., robots cannot be tethered physically or communicate wirelessly to an off-board computer, human-controller, or power supply)
- during the match, robots must not exhibit harmful behavior, whether it is intentional or not -- **harmful behavior will disqualify a robot from the competition!**

Robots are expected to push and shove during a round, but “high-speed” ramming is not allowed. Judges will determine if a robot’s behavior is harmful enough to warrant disqualification. All decisions of the judges are final!

Competition:

Before the competition starts, robots must be checked-in with the judges for weighing and dimension measuring. In the tournament robots will be seeded randomly with “Byes” also being awarded randomly. A robot advances in the tournament by winning matches. Each match is a best of three rounds.

Before a match, contestants will have at most a few minutes to prepare their robots. A robot’s algorithms, settings, batteries, and other components on the robot can be shaped, angled, or configured differently for facing each opponent robot. Pieces may even be added or discarded, but a reasonably identifiable core of the robot must be maintained. Judges may inspect a robot at any time to make sure that it satisfies tournament specifications. Preparation of robots must not delay the tournament.

At the beginning of a match, the contestants approach the ring and bow to each other. A robot wins a match by winning two rounds, or if the opponent robot is disqualified. A round consists of the following sequence:

- 1) Robots are positioned on their sides of the ring. In the first round, the heavier robot is positioned first such that it is anywhere behind its starting line, and then the lighter robot is positioned anywhere behind its starting line. In the second round, the lighter robot is positioned first. If a third round is necessary, the robot winning the second round is positioned first.
- 2) When both robots are positioned, contestants will place a finger on the “start” button of their robots. The judge will say “ready, set, go” before the buttons are pushed. After the word “go,” robots should remain motionless for 3 seconds while human contestants exit the playing area. During the 3-second delay, a robot may move early (a “*false start*”), or a contestant may alert the judge that their robot failed to start (a “*no start*”). In either case the judge will halt the round, and warn the contestant. The round will be restarted with the robots being reset to their same positions. If a contestant receives two warnings of any kind in a round, they lose that round.
- 3) After a clean start, the round continues until either:
 - a robot loses by being the first robot to touch outside of the ring. The raised edge on the side of the ring is considered outside the ring. If any piece of a robot becomes detached and touches outside of the ring, that robot loses. Robots may extend outside the ring as long as it does not touch outside the ring.
 - a contestant informs the judge to stop the round. The contestant stopping the round loses the round.
 - the judge stops the round due to a robot disqualification because it acts in a harmful manor, or violates any other rule.
 - the judge stops the round after 2 minutes expires. The judge will choose a winner on the basis of aggressiveness. The most aggressive robot wins.
 - both robots become immobilized simultaneously, hopelessly entangled, or deadlocked for a period of 20-seconds or more.

If a round is stopped without a clear winner, the judge will restart the round. Robots will be positioned in the same order, but may be positioned in different locations on their side of the ring.

- 4) At the end of a round, contestants retrieve their robots. If the round ends the match, contestants bow to each other just as they did at the beginning of the match.