

SUMO ROBOT CHALLENGE 2009

Registration Form



Name(s) of Contestant(s): _____

Address: _____

Telephone: _____

Email: _____

Robot's Name: _____

Approximate Weight of Robot: _____

Class(es) of Competition (B,C,D,E,F,L, or Tug of War): _____

Registration Fee Included: \$ _____

Class L = \$10.00. All other classes = \$20.00. Late registration (all classes) = \$40.00

Please email or drop off this form and registration fee to **Denise Gagnon** in the **OCAD Faculty of Art office, Suite 401, 100 McCaul Street, Toronto, ON, M5T 1W1. 416-977-6000 x337, dgagnon@ocad.ca**

Please make cheques payable to: **Ontario College of Art & Design**



SUMO RULES 2009

Within the Challenge, there are these classes of robot competition:

"Sumo Classic" (Class 'B') - The original heavy-weight "no-holds-barred" class, except that scarring of the playing surface is no longer allowed. This new restriction eliminates saw blade wheels and the resultant danger to the audience.

"Sumo Clever" (Class 'C') - The second OCAD class of combatant to be created, with a weight restriction and a slightly modified field, so as to encourage designs featuring more subtle tactics.

"Robot Dancer or Robot Painter" (Class 'D') - A departure from violent head-to-head combat in favour of aesthetic solo displays.

"Sumo Autonomous" (Class 'E') - Sumobots fight their battles by themselves.

"Sumo Lightweight Autonomous" (Class 'F') - An autonomous class with rules in line with those of other popular robot tournaments.

"Sumo Lightweight" (Class 'L') - Designed to encourage participation by entry-level builders with limited funds, and no access to Metal Shop facilities.

RULES: General Rules:

1. The competition is open to everyone, and is sponsored by the Ontario College of Art & Design, Integrated Media Program and the Ontario Science Centre.
2. Neither the Ontario College of Art & Design, the Ontario Science Centre, nor any of the staff at those institutions will be held liable for damage incurred by competing machines, or by any systems involved with such machines, during the course of the Tournament.
3. The judges may bar from the contest any machines which they feel pose a real threat of injury to spectators, or damage to the contest site. Moreover, the referee or any judge may stop a trial at any time if it appears to her/him that a danger to spectators or site is impending.
4. All devices using inflammable or corrosive chemicals, rockets, explosives, high voltage, or open flame will not be permitted. Only Painter Class robots may emit liquids. Non-electrically powered devices will be admitted only insofar as they pose no danger to spectators and site (see rule #3), and are not likely to set off smoke detectors, etc. (Any robot emitting smoke will automatically be barred from further competition.)
5. Any number of human operators may control the various functions of a given competing machine.
6. Each participant will be required to present his/her robot at the start of the Tournament. At that time, the judges will inspect the competing machine for infringements of any of the rules. (At this time, the contestant must describe all aggressive features used by her/his entry, but such information will be kept confidential by the judges.)
7. Judges will be selected by the Tournament organizers. The referee will be Duane Mulder, an electronics engineer with many years of experience refereeing Sumo Robot competitions.

8. Prizes will be awarded based upon performance and audience popularity. All decisions of the judges will be final and absolute.
9. All pressurized systems (gas or liquid) shall not exceed 150 psi. A regulator or gauge must be included, on the robot, to illustrate this.
10. Competitors will be barred from competition if they have open toed footwear. Steel toed boots are the recommended footwear for all competitors.
11. In situations where wireless control is being used there will be no intentional jamming of an opponents signal.
12. In all classes (except Class "D") power sources shall not exceed 48 volts.
13. Non-competitive (display) robots are welcome.
14. Persons entering more than one robot will only be charges 1 entrance fee.
15. Control cables carrying voltages in excess of 48 volts are strictly forbidden.
16. Any robot, entered in any class, that weighs over 50 lbs. must have a kill switch/pull tab loop that is electrically connected in-line with the machine's power source.

Rules pertaining to ALL Sumo Classes except Autonomous Class and Clever Class:

- A1. The competition will simulate, using robotic machines, a SUMO WRESTLING TOURNAMENT, with machines competing in separate matches on a one-on-one basis.
- A2. A match will consist of three rounds. The winner of two out of three rounds will be awarded the match. When a contestant loses either one or two matches (depending upon the number of entries for that Class), s/he will be disqualified from further competition; otherwise, contestants will be paired off again by the judges, and the process will then repeat until a single overall winner emerges.
- A3. Each trial will take place on a playing field consisting of a circular platform, varying in size and appearance according to the Robot Class, raised approximately two to five inches above the floor.
- A4. The object for a competing machine during the course of a round will be to remain within the boundary of the playing field longer than one's opponent. (A machine will be judged to be "off" the playing field when any substantial part of it touches the floor.) Once a starting command is given, no-one other than the referee may touch a competing machine until a win or time-out is declared.
- A5. If both machines leave the field, it will be up to the referee to decide which one left first. If neither machine crosses the boundary within three minutes, then the judges will chose a winner on the basis of aggressiveness.
- A6. If both robots become immobilized simultaneously, the referree with initiate a 10-second countdown, ending as soon as either robot regains mobility. If, at the end of this countdown, both machines are still immobile, the judges will decide whether to award the round to one side, or to call a draw and start the round over again.
- A7. No devices which permanently modify the surface of the playing field or damage the centre pole (where applicable) will be allowed.

Rules Pertaining to All Sumo Classes EXCEPT the Autonomous Classes:

- S1. The playing field will consist of a 6-foot diameter unfinished particle-board circle, elevated approximatedly 5 inches above the floor.
- S2. Each round will start at a verbal command from the referee, with both machines "facing off" in the center of the circle, at approximately one foot apart.

S3. Competing machines may be either self-controlled or remotely-controlled. Control cables between machine and human operator(s) are permitted, providing they are not used to deliberately entangle the opponent. CONTROL CABLES CARRYING VOLTAGES IN EXCESS OF 25 VOLTS ARE STRICTLY FORBIDDEN!

S4. Devices which cut the opponent's control cable WILL be permitted. Therefore, control cables carrying currents greater than 1/2 amp should be fuse-protected. Also permitted will be various forms of damaging and over-turning the opponent's machine, providing General Rule #3 is strictly adhered to.

Rules Specific to the "Sumo Classic" Class:

B1. At the start of each round, each competing machine must fit into a box with internal dimensions of 1.5 foot by 1.5 foot by 1.5 foot. Once the round has begun, however, the machine may expand its dimensions as required.

B2. There is a maximum weight restriction of 200 lbs.

B3. Each machine must be SELF-POWERED, with its batteries or equivalent power source on-board.

Rules Specific to the "Sumo Clever" Class:

C1. There is NO SIZE RESTRICTION, providing that the robot fits initially within its side of the playing field (seemap.), and is capable of moving itself across the surface of the playing field during the full duration of each trial. Once the round has begun, the machine may expand its dimensions as required.

C2. There IS a weight restriction of 68.2 Kg. (150 pounds).

C3. Each machine must be SELF-POWERED, with its batteries or equivalent power source on-board.

C4. Competition will take place on an octagonal piece of plywood that is 1.5 inches thick. There will be a steel flagpole, five feet high, and 7/8 inch in diameter mounted vertically in the centre of the field. Opponents face each other as in the Classic competition, but must navigate around the flagpole to get at one another.

Rules Specific to the "Lightweight" Class:

L1. At the start of each round, each competing machine must be able to fit into a box with internal dimensions of one foot by one foot by one foot. Once the round has begun, however, the machine may expand its dimensions as required.

L2. The weight of the robot itself may not exceed 4.5 Kg. (10 lb.)

L3. The total fair market value of all materials used in the construction of the robot may not exceed CAN\$75 (value to be assessed by the judges and referee.)

L4. Competitors must use either off-board power supplies, provided by the tournament organizers, or on-board batteries. Each off-board power supply will provide 24 volts dc that is current limited to 3 amps (4 amp surge) by connecting an appropriate incandescent light bulb in series with the positive output terminal. On-board batteries must supply no more than 24 volts and have a 4 amp fuse or breaker in series with one of the terminals. Competitors using off-board supplies should clearly mark the polarity requirements of their power cables, and preferably terminate same at the power supply end with alligator clips. The power cable that connects the robot to the power source must be 8 feet long.

L5. No welding is allowed in the construction of the robot. However, pop riveting and the use of mechanical fasteners is encouraged.

Rules Specific to the "Robot Dancer or Robot Painter" Class:

D1. This event focus upon aesthetic movement. There are no size or weight restrictions, providing the performing robot conforms to the General Rules outlined above. Virtually any form of control (including human, animal, or

machine intelligence) is allowed. The judges will consider BOTH the artistic merit of the final product and the elegance of the generating mechanism.

D2. Competing machines may be either self-controlled or remotely-controlled. Control cables between machine and human operator(s) are permitted.

D3. Each Robot Painter will be given three minutes to paint, or otherwise mark, a blank floor-mounted piece of paper measuring 4 ft. by 5 ft.

D4. Each Robot Dancer will be given three minutes to demonstrate imaginative free-style movement.

Rules Specific to ALL "Autonomous" Classes:

EF1. The power supply and all control devices must be on-board.

EF2. There will be a 2-minute calibration period at the start of each match when drivers will be allowed to calibrate their robot's sensors to the ambient light conditions and to the physical characteristics of their competitors.

EF3. At the start of each round, the robots will be placed on opposite sides of the platform facing in a clockwise direction (i.e., not at each other).

EF4. The intentional dropping of objects, whether tethered or not, is forbidden.

Rules Specific to the standard "Autonomous" Class:

E1. The playing field will consist of a 4-foot diameter circle, finished in white Arborite and elevated approximately 2 inches above the floor.

E2. At the start of each round, each competing machine must be able to fit into a box with internal dimensions of 13.5 inches by 13.5 inches by 13.5 inches. Once the round has begun, however, the machine may expand its dimensions as required.

E3. The weight of the robot itself may not exceed 10 Kg. (22 lb.)

E4. As in all sumo classes except "Lightweight Autonomous" allowed weapons may be used.

Rules Specific to the "Light-Weight Autonomous" Class:

F1. The playing field will consist of a 30-inch diameter circle, finished in white Arborite and elevated 2 inches above the floor.

F2. At the start of each round, each competing machine must be able to fit into a box with internal dimensions with a width and depth of 20 cm. There is no restriction on height.

F3. The weight of the robot itself may not exceed 3 Kg.

F4. No destructive weapons allowed.