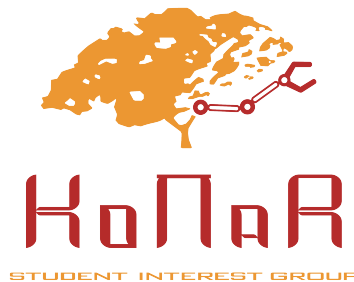


RULES OF ROBOTIC TOURNAMENT

„ XV Robotic Arena ”

MiniSumo Strong

“KoNaR” Student Interest Group
Faculty of Electronics, Photonics and Microsystems
Wrocław University of Science and Technology



Section I

General

§ 1

1. This document regulates rules of the tournament in category “MiniSumo Strong”.
2. In case of 3 or less robots, the category is played as a demonstration and no prizes will be awarded for it.

Section II

Robot Specification

§ 2

1. Robots can't be pre-built, commercial construction.
2. It is necessary to provide a place for the judge to attach a line with a carabiner to the rear part of the robot's structure.
3. Robots must fit in a 10 cm square extended by precision of a measuring equipment.
4. The attached fastening element for the line with a carabiner may extend beyond the area from a point above.
5. Robots will be connected by a 60 cm line or chain with carabiners at both ends.
6. Height of robots is not limited.
7. Weight of robots must not exceed 500 grammes extended by precision of measuring equipment.
8. After placing the robot on a sheet of 80gsm paper and then lifting it, the sheet must stay on the ground.

9. All robots must be equipped with a start module which allows to remotely start the robot, either provided by the organizer or self-built.
10. Communication with robots during matches is forbidden.
11. Disabling robots remotely is an exception from the point above.
12. Structural changes during the competition are prohibited.
13. The robot can be programmed in any programming environment.
14. Modifications to the program are allowed during the competition.

§ 3

1. Robots must be fully autonomous.
2. Robots can't contain any devices which intentionally disrupt opponents control system.
3. Any parts that could damage the arena are not allowed.
4. The robot cannot contain any projectile devices.
5. The robot cannot include devices emitting significant amounts of heat, such as flamethrowers.
6. The robot cannot have elements that attach it to the stage or prevent its movement (e.g., suction cups, glue).
7. The robot cannot include devices emitting gases, liquids, or loose materials.
8. Robots functionality cannot be dependent on varying environment during tournament, such as lighting (from dusk to bright reflectors), smoke, loud music or laser effects. The show may be lit by regular lightbulbs, halogens, energy saving lightbulbs, fluorescent lamps, LEDs and other lightsources common in households. Organizers have no control over street lighting near windows of the building. During the show it will be forbidden to use camera flashes and other intense light.

Section III

Arena Specifications

§ 4

1. The sumo-strong arena where the matches take place has a rectangular shape with dimensions of 170 cm by 50 cm, with a tolerance of ± 5 cm.
2. The upper surface of the arena is made of a black wooden board.
3. The outer edge of the arena, the 2 cm-wide sideline, is marked with white tape around the rectangle with dimensions of 170 cm by 50 cm, with a tolerance of ± 5 cm.
4. The interior of the arena is defined as the inner area along with the sideline.
5. Within the arena, there are the following zones separated by 2 cm-wide white tape:
 - Starting zone: an area 60 cm wide marked at the ends of the arena.
 - Battle zone: an area 25 cm wide delineated between the centerline and the starting zone.
 - Centerline: a line running through the center of the arena, perpendicular to the longer sides.
6. The judge determines the suitability of the arena for the match, deciding whether it is still suitable for competition or needs replacement.
7. The outer area of the arena extends at least 70 cm from the sideline.
8. The color of the outer area of the arena can be of any choice.
9. The material used for the outer area can be of any type.
10. During matches, the outer area remains free of obstacles.

11. An exception to the above rule is the protective barrier preventing robots from falling out of the fighting area, whose upper edge is lower than the plane of the ring.

Section IV

Competition

§ 5

1. Competition will be conducted in two stages:
 - (a) elimination phase
 - (b) finals
2. In the elimination phase robots will play matches in groups one versus one in all of the combinations.
3. Size and number of groups, as well as number of places in group granted with promotion will be stated by the organisers after closing the registration and will depend on the number of registered robots.
4. Robots promoted to finals phase will play matches as a single-elimination tournament.
5. Each phase results announcement will occur after finishing the phase.

§ 6

1. Matches will be held based on the schedule given by the referee.
2. If a robot does not show up for the match on scheduled time the contestant will be rushed by the referee.
3. If the robot will not show up for the match within 5 minutes after being rushed, it will lose by default.

Section V

Winner Selection Rules

§ 7

1. Two robots take part in a match.
2. The match consists of maximum 3 encounters.

§ 8

1. Yusei points (effective) are awarded in following situations:
 - (a) The opponent's robot crosses any part of the centerline. The opponent's robot will be in the battle zone when the match time expires.
 - (b) The opponent's robot exits the arena on its own.
 - (c) The opponent's robot is disqualified or receives one penalty or more than one warning.
 - (d) Two Yusei points have been awarded.
 - (e) One Yusei point has been awarded, and the opponent receives a warning.
2. A robot is considered to have left the arena, if any of its parts touches the exterior area.
3. Yusei points (advantage) are granted in a situation that opponent is stuck at the sideline and is not able to move away on its own.

§ 9

1. Before beginning of the match contestants standing near the arena should bow before each other according to referee's instructions
2. Every module installed inside robots taking part in fights at the arena must be programmed in the way that it only reacts to the commands sent from the appropriate transmitter
3. After the programming procedure follows test start of the robots. It is necessary only at the beginning of the match or in a situation that a robot fought at a arena with a different identifier. The test start may also be conducted after contestant's request.
4. The part of arena in which the start of the round will take place is stated by throwing the pointer.
5. Before the start of each round the robots should be placed on the stated part of arena according to directions set by the pointer's arrows.
6. Based on a random draw the robots may be positioned facing each other with rear left or rear right corners.
7. Contestants have 120 seconds to place robot in the aforesaid part of arena.
8. The robots are started by the referee with IR remote controller. The beginning of the round occurs immediately after receiving:
 - (a) Start signal in case of using external modules
 - (b) Start command in case the start module functionality was implemented internally.
9. Before the start of round robots cannot move or take any action resulting in taking advantage over their opponent (e.g. spreading ploughs, scanning surroundings etc.). During this time contestants are committed to leaving the outer area of the arena. The referee decides if this rule was violated.
10. In case of no reaction for the "start" command the round is repeated. If after three consecutive rounds the start will not occur, referee decides of further course of the match.

§ 10

1. The robot that acquires two Yuko points first wins the match.
2. If neither of match participants acquires Yuko points or both have the same number, the winner is announced by the referee. However, if neither of the contestants had clear advantage and the winner can not be declared, additional three-minute round may be decreed.
3. A match ends when:
 - (a) One of participating robots acquires 2 Yuko points.
 - (b) The third round has already ended.
4. A round lasts for up to three minutes but ends when one of the contestants gets Yuko point.
5. After the end of a round, referee sends "Stop" signal to the robots. It is recommended to cut the power supply of motors either with program or hardware.
6. After the end of a match, contestants should remove their robots from arena and bow before each other.

§ 11

1. A round should be interrupted and restarted from the beginning if one of the situations occurs:
 - (a) Both robots are clogged in the way that there is no possibility for them to take any action.
 - (b) Both robots touch the outer area of arena at the exact same moment.

- (c) In any circumstance based on which the referee decides that the winner of the round can not be decided.
- 2. In case of restarting a round, making changes or fixing the robot is forbidden and the contestants must immediately place their robots in the position stated in paragraph 9, point 4. The exception from this situation is acceptance of the suspension request - paragraph 12, point 1.
- 3. If neither of the competing robots has won the restart, the referee may decree placing robots in the specific position at the arena and restart the round in within the time limit.

§ 12

- 1. If a robot had an accident and is not able to continue the fight, the contestant may ask for round suspension.
- 2. The referee must take immediate actions to explain the situation and decide on the further course of the match.

§ 13

- 1. In the elimination phase the victor is awarded with one point.
- 2. The classification in every group is stated based on (in case of the same number of points, next item is considered):
 - (a) Points in decreasing order.
 - (b) The difference between won and lost matches in decreasing order.
 - (c) Victories in decreasing order.
 - (d) Result of a direct 1 vs 1 match.
 - (e) Coin toss.
- 3. The referee may decree additional match between interested contestants instead of coin toss.
- 4. In the finals, match victory grants promotion to the next round.
- 5. The winner of the grand final becomes the winner of the competition.

Section VI

Violations and Penalties

§ 14

- 1. The contestant that takes any of following actions gets a warning:
 - (a) Enters the outer or inner area of arena before the referee announces the end of a round or a pause.
 - (b) Preparations for the match restart take more than 30 seconds.
 - (c) Takes any other action that is at odds with fair-play rules.
- 2. If a contestant gets two warnings, his opponent is awarded with one Yuko point.
- 3. Each of the following actions is considered a violation and in these situations the opponent or both robots get one Yuko point:
 - (a) Any part of a robot that weighs more than 60 grammes is separated from the robot.
 - (b) A robot stops at the arena for more than 15 seconds.
 - (c) A robot emits smoke.

§ 15

1. The consequence of fulfilling any of these conditions by a contestant results in disqualification:
 - (a) The contestant behaves in unsportsmanlike manner or does not comply with fair-play rules (i.e. uses vulgar or offensive language or insults the opponent or the referee).
 - (b) The contestant damages opponent's robot on purpose.
 - (c) The contestant induces others to play the match by intentionally damaging or defiling the arena.
 - (d) The contestant's robot due to malfunction is not able to fight in all the elimination phase matches.
 - (e) The contestant due to late arrival for elimination phase is not able to fight in all the elimination phase matches.
 - (f) The contestant's robot during a match is not compatible with the specification stated in paragraph 2.
2. If there is suspicion of incompatibility with the specification during a match, the referee is committed to interrupting the match and immediately take the measurement of the robot.
3. A new measurement of a robot may also be taken at the request of opponent.
4. The new measurement is taken with tolerance extended by precision of measuring equipment.
5. The result of disqualification in the final phase is match loss.
6. The result of disqualification in the elimination phase is cancellation of the results of all the matches the contestant participated in and awarding all opponents with victory by default.