



Challenge

ROBO
~motion


Onion House

Last modified: 01.02.2024

1. General Information:

- 1.1. The purpose of the competition is to promote robotics, fun and fair-play competition.

2. Definitions:

2.1. General Definitions:

- 2.1.1. Team - a group of people consisting of Participants and Competitors who independently created at least one Robot or its algorithm, participating in the Competition. Due to the multiplicity of the Competition and its categories, the representation of the Team is limited to a maximum of 10 people (not including any guardian).
- 2.1.2. Constructor - the person or people participating in the competition who created the Robot in question.
- 2.1.3. Organizer - a person who supervises and influences the course of the Competition, wearing a name badge with the inscription Organizer.
- 2.1.4. Robot - a mechatronic device powered by electricity that moves autonomously and responds to its environment to a certain, noticeable degree.
- 2.1.5. Identical robots - robots, having a similar design and using similar algorithms. The final determination of the identity of robots is decided by the Chief Judge.
- 2.1.6. Judge - the person who supervises the competition on the day of the Competition.
- 2.1.7. Category Judge - a person who supervises the proper course of the categories entrusted to him, having a decisive vote on issues / disputes that are described in the regulations of the category.
- 2.1.8. Chief Judge - a person who supervises the proper course of the Competition taking place within the XChallenge, having a decisive and final say in issues/disputes both those described in the regulations of a given category and general regulations and those that are not included in the regulations of a given category or general regulations.
- 2.1.9. Participant - a person who takes an active, or passive part in the competition. It can be a competitor, judge, organizer or spectator.
- 2.1.10. For the competitor, see Constructor.

2.2. Category Definitions:

- 2.2.1. Board - the place where the entire category takes place.
- 2.2.2. Onion - red onion (whose color is at least close to dark red/dark purple), up to 8cm in diameter.
- 2.2.3. Obstacles - other items on the board, which differ significantly in color from the onion. They can be, for example, orange, white onion or lemon. The dimensions of the obstacles are a maximum of 8cm by 8cm by 8cm.
- 2.2.4. Robot's Ride - lasting a maximum of 90s robot's ride on the board.

3. Category Specification:

- 3.1. The goal of the robot in the "Onion" House category is to obtain as many points as possible during one robot run lasting a maximum of 90 seconds. During the run, the robot's task is to collect as many onions as possible and transport them to the BASE.
- 3.2. For each onion that the robot transports to the Base, the player receives 1 point.
- 3.3. For each obstacle that the robot transports to the Base, the player loses 1 point.
- 3.4. At any time, a competitor can end his robot's ride.
- 3.5. There is no limit to the number of competing robots of a given Team, however, one robot can participate in a maximum of 4 categories, with the proviso that in one category it can compete in a maximum of 2 competitions (for example, one robot can participate in Drag Race, LF Standard, LF Turbo Enhanced and Micro Sumo, however, it cannot simultaneously compete in Drag Race, LF Standard, LF Turbo and LF Turbo Enhanced).
- 3.6. No two Identical robots are allowed to compete in the competition.
- 3.7. The Organizer provides a table, chair and access to an electrical outlet to the Team. Other needs must be communicated to the Organizer via email by writing to xchallenge@dolinawiedzy.pl. The Organizer is not obligated to meet these needs, but is obligated to notify if they will be met.
- 3.8. The robots can be viewed by participants throughout the competition, and Team members undertake to politely answer Participants' questions.

4. Specifications of the robot and the board:

- 4.1. The maximum starting dimensions of the robot are 30cm by 30cm (length and width) and 100cm high.
- 4.2. The weight of the robot must not exceed 10kg.
- 4.3. The dimensions and weight of the Robot will be verified by the Judge at the Arena.
- 4.4. There are no restrictions on modifications to the Robot's design and software. This means that both the design and software of the Robot can be modified during the Competition, however, it should be noted that the Robot after modifications must also meet all requirements for design limitations (e.g., size limitations, weight limitations).
- 4.5. The floor of the board will be white, while all the lines will be 19mm thick and black in color (black insulating tape).
- 4.6. The board will be flat, it will not be surrounded by walls.
- 4.7. The game board is divided into two main parts: the grid, on which there will be onions and obstacles, and the base, from which the robot will take off and to which the onions must be transported.
- 4.8. The lattice measures 210cm by 210cm, line intersections occur every 42cm.
- 4.9. The base measures 210cm by 75cm and is about 77cm away from the lattice.
- 4.10. The tolerance of all dimensions of the board is $\pm 5\%$.
- 4.11. The lines marked in red in the diagram were measured and their dimensions are given in cm in the diagram.

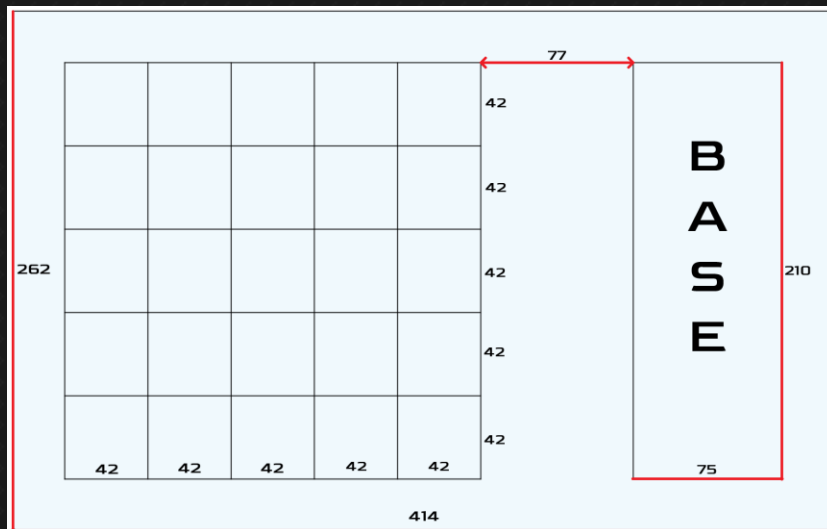


Diagram 1 - a preview diagram of the board for the "Onion" House category.

5. Rules of the games:

- 5.1. During the launch, the robot can be positioned anywhere within the base, the entire robot structure must fit within the base.
- 5.2. The maximum time for one run is 90s.
- 5.3. For each onion found at the base after the run, the contestant receives 1 point, while for each obstacle found at the base after the run, the contestant loses 1 point.
- 5.4. While there is not a single obstacle in the base at the end of the run, the total points for the onions in the base are doubled.
- 5.5. An Onion that is on the Robot at the end of the run is also scored and considered to be in the Base, provided that the entire Robot is within the Base. Otherwise, when the entire Robot is not within the Base the Onion located on the Robot is not scored.
- 5.6. The final ranking includes the arithmetic average of all runs.
- 5.7. The number of trips is not subject to any quantitative limitation.
- 5.8. Onions and obstacles are located on the inner intersections of the lattice (there are 16 of them).
- 5.9. During the trip, there are 6 onions and 6 obstacles on the lattice, which means that 4 intersections on the lattice will remain empty.
- 5.10. Once the ride is over, the robot can be anywhere on the board.
- 5.11. Onions and obstacles will be laid out randomly before each run, however, only after the competitor sets up and prepares the robot (once the onions and obstacles are set up, it is not possible to change the position of the robot or the program).
- 5.12. In the case of identical point scores during the final ranking, the time in which the robot achieved this score (the sum of the duration of all runs) will be decisive - the robot that completed the task faster wins. In the event that the times of the robots were also identical, the deciding factor will be the additional run of each robot whose position in the final ranking is disputed.
- 5.13. All Teams competing in the category will have the opportunity to take test runs before the start of the category. The duration of the test stage and the times at which it takes place will be published with the XChallenge schedule.

6. Litigation, Liability and Disqualification:

- 6.1. Any disputes related to the category described in these rules shall be decided by the Judge of the category.
- 6.2. Any disputes and situations not described in these Regulations shall be decided by the Chief Judge.
- 6.3. The competitor has the right to appeal the Judge's decision.
- 6.4. Responsibility for all actions of each member of the Team shall be borne by the Team.
- 6.5. In case of non-compliance with the rules of fair-play by one of the members of the Team, the Chief Judge has the right to impose a penalty on the Team in the form of disqualification.
- 6.6. In case of behavior of a member of the Team that violates: moral norms, good manners, human dignity, religious feelings or safety of the Participants, the Chief Judge has the right to impose a penalty on the Team in the form of disqualification.
- 6.7. Disqualification of a Team shall invalidate all results obtained by the Team on the day of the Competition.
- 6.8. The disqualified Team is required to return all prizes won on the day of the Competition.
- 6.9. The decision of the Chief Judge is final.
- 6.10. Preparation of all arenas (and their condition) is the responsibility of the Organizer, who appoints technical staff to maintain the condition of the arenas. The Competitor has no right to interfere with the condition of the arenas or to "clean" the arena on his own. However, the Competitor may request the Judge to clean the arena before his/her approach, then if the Judge finds, in such a situation, the need to clean the arena he/she shall summon the technical service responsible for the maintenance of the arenas. Otherwise, if the Judge determines that there is no such need the Competitor may begin his approach or abandon it altogether.
- 6.11. If a team wishes, it can bring its own onions to the competition, however, they must meet the definition given above, i.e. they must be red onions (whose color is at least close to dark red), up to 8cm in diameter.
- 6.12. The organizer reserves the right to amend these regulations.

7. Registration for the Competition:

- 7.1. In order to participate in the XChallenge Competitions, it is necessary to create and activate an account on the xchallenge.pl platform by the date to be announced on [XChallenge social media](#). This will be estimated to be September - October 2024. The next step, after creating an account, is to add to your account all the Robots with which the Participant wants to take part in the Competition. Once the Robots have been added to the account, the other constructors of the Robot can be added to each Robot. The registration process described in this section is necessary for each Constructor, Guardian and each Robot. Any Constructor or Robot that is not registered by this date in the registration process will not be allowed to participate in the XChallenge Competition as a Competitor.
- 7.2. In order to enter a given Competition and its category, it is necessary to confirm one's arrival on the day of the Competition at a specially designated point located

near the main entrance. During the confirmation of arrival, the staff will verify the Participant in the system and issue the Participant with an entry package containing, among other things, a special named RFID tag, and verify which of the entered Robots have arrived ready for the Competition by confirming the arrival of each Robot. All Robots that are not confirmed in the system will not have the opportunity to be included in the final ranking, which is equivalent to not being able to win any place in the Competition.

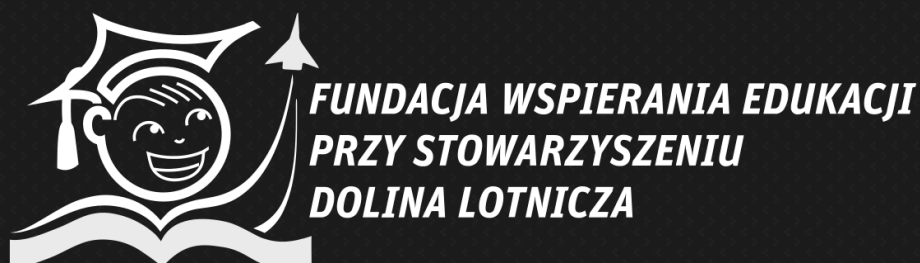
8.Consents:

- 8.1. Registration of a Robot in the competition implies consent to the publication of basic information about it, i.e. the name of the Robot, the name of the Team, the name of the University or Institution, photos, videos and the place taken by the Organizers and Partners of the Competition without informing the Constructor or the Team.

9. Organizers:

ROBOLAB
Local STEM Incubator

RZIT
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