



Robot Championship 2024



RULES & REGULATIONS

Draft Version 2024

**This is not the final version of rules and regulations
for the IEEE Region 8 Robot Championship 2024.**



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1. GENERAL REMARKS

- 1.1. Only valid applications will be considered to be selected for participation. The deadline for applications is by the end of the day of the 1st March 2024 12:00 (CET timezone). All the applications must be made using the Google form publicly available. No later submissions nor submissions done through any other channel(s) will be considered.
- 1.2. There is a limit of twenty-five (25) teams for this championship. If the total number of eligible applications exceeds that limit, a selection process will be made. This selection will consider the diversity of sections participating, the team's motivation, and the funding.
- 1.3. The hosting country can have up to four participants competing in the championship.
- 1.4. After being accepted, each team must apply for at least two STEM activities. This application must be made using the online form, and no other means of application will be accepted. The application must be submitted between 1 of February and 1 of April, end of the day at UTC. Activities must be submitted individually per team.
- 1.5. STEM activities are also encouraged to be placed by external members, such as Student Branches supporting any team.
- 1.6. The best three STEM activities will be awarded: 1st place with 400 USD, 2nd with 300 USD, and 3rd place with 200 USD. Only original receipts will be accounted for reimbursement. No money in advance will take place.
- 1.7. IEEE Region 8 may fund applications on a limited type of expenses, such as accommodation expenses. A motivation for this funding must be written in the application form's proposal file. This fund is limited and will be assigned to teams depending on several factors (non-exhaustive list, in a non-relevant order): (1) the income level of the team's country of origin, (2) the resources available at the team's local section level. Clear criteria will be established and defined by the organisation committee.
- 1.8. In case of acceptance to participate in the championship, all team members must be physically at the event during its entire duration — no partial participation of any member will be accepted. Furthermore, each team is fully responsible for all the funding (except specific funding obtained from Region 8). No charging can be done to IEEE Region 8 or any other event organisers in the future. This is mandatory, and non-complying teams will be penalised.
- 1.9. An arena of 6m by 6m will be available on site. The arena floor will be made of plywood and have a sticker/design of about 4m by 4m. Robots need to be designed to give an Allowance of 4mm floor difference between panels.



2. TEAMS & ROBOT CLASSES

- 2.1. Every team will participate in the Featherweight category where each robot is allowed to weigh up to 20 kg.
- 2.2. Each team must consist of up to three (3) members (plus one mentor who is not to be funded through Region 8), each bound to that one team and robot. No participant can be part of more than one team.
- 2.3. Competitors must be current student members of a student branch within Region 8, or past students having finished their studies in the previous scholastic year and still members of the student branch.
- 2.4. Every game is governed by a distinct set of rules. It is important to note that rules and judgments made in previous games do not necessarily apply to subsequent games. The decisions made by the judges in each game are definitive and binding.
- 2.5. Additionally, there will be specific criteria describing the type of robot eligible to participate in the competition. This will include detailed regulations pertaining to the abilities and competencies required for a robot to be deemed fit for competition
- 2.6. **Description of type robot that can participate.**

3. GENERAL CONSTRUCTION

- 3.1. A maximum voltage of **24V DC** is allowed for powering the robot's drive and add-on systems.
- 3.2. The fitting of interchangeable body panels or alternative add-ons is allowed between games.
- 3.3. Any onboard equipment that could require maintenance between games, such as the recharging of compressed gas cylinders or batteries, should be easily and quickly accessible. The robot should be fully serviceable within a reasonable amount of time to participate in the planned competitions.
- 3.4. All compressed gas cylinders must be controlled. Such cylinders, provided by the competitors, will be stored at room temperature, then tested and vented if necessary to **1000 psi**.



3.5. Each robot must have a number of **active** and **effective** add-ons within the rules of the competition.

3.5.1. An active add-on is defined as an actuated device intended to enhance the robot, in addition to or independent of the robot train drive such as Flipper, Spinner, Lifters etc.

3.5.2. An effective add-on is one which effectively enhances the capabilities of the robot. Such as fixed ramps, tow bars, fork bars etc.

3.5.3. The use of automated tools to enhance a robot's performance is allowed, provided that safety measures including emergency stops are implemented. Additionally, a manual control system should be incorporated to enable human intervention when necessary.

3.6. Essential spare parts must be made available on the day of the competition.

3.7. GENERAL BUILD AND FUNCTION

3.7.1. Robots can be built using wheels, tracks or legs ("walkers"). No flying robots (or parts of them) will be accepted in the championship (e.g., drones are not allowed).

3.7.2. Other styles and methods may be considered, but participants are required to contact the organisers before commencing construction.

3.7.3. "Cluster Bots", i.e., robots consisting of two or more components, are allowed. They must enter the arena as a single object, and if 50% or more of the robot is immobilised, the robot will be deemed to have lost that particular game.

3.7.4. In the event a participating robot ceases to function during the game, a predetermined time frame will be allocated for rectification. Should the robot fail to resume functionality within this allotted time, the game will be declared null. Consequently, the runner-up in the competition will be given the opportunity to replace the non-functioning robot.

4. WEIGHT & DIMENSIONS

4.1. WEIGHT

4.1.1. The maximum weight is as defined in Section 2.1.

4.1.2. If interchangeable add-ons are used, the final weight is measured with the heaviest setup.

4.2. DIMENSIONS



- 4.2.1. The base/floor dimensions (length x breadth) of the robot must not exceed **80cm x 80cm**.
- 4.2.2. After every game the robot is expected to be able to retract itself to its initial status/position/setup (including dimensions), if these have been altered during the game. Failure to do so will result in the robot losing the match.
- 4.2.3. There is a vertical maximum height restriction of 50 centimetres.

5. MOTIVE POWER

5.1. GENERAL

- 5.1.1. Motive power for the drive and/or add-ons may be **electric, hydraulic or pneumatic**.
- 5.1.2. A combination of engines, such as electric drives, pneumatic and/or hydraulic pumps is allowed.
- 5.1.3. Other types of engines may be considered, but participants are required to contact the organisers prior to construction.

5.2. SAFETY

- 5.2.1. Proper activation and deactivation of robots is critical. Robots must only be activated in the arena, testing areas, or with the express consent of the event organisers or the safety officials.
- 5.2.2. All robots must be fitted with a **cut-off/kill switch** which fully deactivates all of the robot's subsystems, including drive, add-ons and communications, in less than sixty (60) seconds by a manual disconnect. If there is more than one isolating switch, these must be positioned adjacent to one another.
- 5.2.3. The kill switch must be positioned in a visible part of the robot's bodywork and away from any operating add-ons or drive. This position must be clearly marked and accessible at all times.
- 5.2.4. The switch/link may be fitted under a cover, provided that the cover can be quickly opened without the use of tools and is clearly marked.
- 5.2.5. If the proposed robot design might fail to conform to any safety regulations, contact the organisers before commencing any work.

5.3. ELECTRIC

- 5.3.1. The maximum voltage is as defined in Section 3. The utilised voltage must be declared on the **technical check sheet** before the tournament commences.



- 5.3.2. All power connections, i.e. connections carrying a heavy current, must be of an adequate grade and be properly insulated. Cables must be routed to minimise the chances of being cut.
- 5.3.3. Batteries must be completely sealed and not contain free-flowing liquid, whether electrolyte or otherwise.
- 5.3.4. Battery connections must be adequately insulated.

5.4. HYDRAULIC

- 5.4.1. Hydraulic pressure is limited to **3000 psi**. The competitor must be able to demonstrate the pressure used and carry with them a portable pressure gauge that can be fitted to the system if required to do so by the organising team.
- 5.4.2. The use of accumulators on the hydraulic circuits is strictly prohibited.
- 5.4.3. Hydraulic fluid storage tanks must be of a suitable material.
- 5.4.4. Hydraulic fluid lines and fittings must conform to **British Standards (BS)** specifications. The lines must be routed to minimise the chances of being cut.

5.5. PNEUMATIC

- 5.5.1. Pneumatic pressure is limited to **1000 psi**. The competitor must be able to demonstrate the pressure used and carry with them a portable pressure gauge that can be fitted to the system if required to do so by the organising team.
- 5.5.2. Compressed gas cylinders must conform to current **HSE** specifications only. Only the following cylinders, or multiples thereof, are allowed.

| Capacity (kg) | Material |
|---------------|-----------|
| 1.1 | Steel |
| 1.1 | Aluminium |
| 2.0 | Aluminium |

- 5.5.2.1. These compressed gas cylinders must have been examined by a competent person in the past five years and have a **valid test certificate**, stamped with the date of the test and the brand of the person who carried out the inspection.
- 5.5.2.2. If, upon inspection, we deem that the construction or valve has been altered or tampered with in any way, the robot will be disqualified. Valves must be fitted using the torque values specified in **BS 5430**.



- 5.5.3. Pneumatic lines and fittings must conform to **BS EN983** or **ISO4414**. The lines must be routed to minimise the chances of being cut.
- 5.5.4. All gases in pneumatic systems must be **inert**. Examples include carbon dioxide (CO₂), argon (Ar) and nitrogen (N₂).
 - 5.5.4.1. CO₂ can only be considered inert when dry, hence under no circumstances must moisture be allowed to enter a CO₂ cylinder except under the supervision of a competent person with knowledge of the correct drying procedures.
- 5.5.5. **SAFETY**
 - 5.5.5.1. All compressed gas cylinders and valves/regulators must be contained within the body of the robot to shield them from punctures.
 - 5.5.5.2. The compressed gas cylinder must be securely fastened down. Unless adequately protected by the bodywork, the valve/regulator must have an adequate **strap** or **cage** over it.
 - 5.5.5.3. A **pressure relief/safety valve** must be fitted on the high pressure side of the circuit and set to lift at **1000 psi**. CO₂ cylinders must also be protected by a **burst disc**, set to rupture if the pressure within the cylinder reaches **2700 psi/190 bars**.

6. ADD-ONS

- 6.1. All pyrotechnics, explosives, flames, firearms, liquids, corrosives and electronic devices such as radio jammers and heat guns are strictly prohibited.
- 6.2. Devices using inflammable or combustion-supporting gases are prohibited.
- 6.3. Untethered projectiles are not allowed.
 - 6.3.1. If tethered projectiles are used, the tether may not exceed **1.5 m** in length. This is measured from the centre of the robot to the tip of the projectile.
- 6.4. Rotating hardened steel blades that may shatter are not allowed. Discuss the blade grade with the organising committee prior to installation.
- 6.5. Any blades, such as bayonets, must not exceed **15 cm** in length.
- 6.6. Adequate protection must be fitted at all times on any add-ons with sharp edges and other hazardous parts of the robot(s) except when the robot is in the arena. This protection would not be considered as part of the final overall weight of the robot.
- 6.7. Any moving or swinging arms, regardless of whether they hold sharp and/or rotating



add-ons, must be fitted with a visible **locking pin** to show that the arm(s) is/are securely locked in place.

- 6.7.1. Locking pins must be painted **red** or have a **red tag** attached and must be in place at all times, except in the arena. These locking pins do not contribute to the overall weight of the robot.

6.8. Self-contained add-ons must have a secondary restraint fitted in the event of the primary fitting breaking away.

6.9. Autonomous add-ons are allowed, although strict safety procedures must be incorporated. Discussing such designs with the organisers is strongly recommended.

7. RADIO CONTROL

7.1. All robots must be controlled wirelessly from outside the arena.

7.2. **All the RC circuits, which can either be purchased or built, must have its frequency declared.** In order to do this, all registered competitors will be invited to join a Google/Facebook group named “IEEE R8 Robot Championship 2024” after the final registration deadline to communicate this information to all participants. It is up to each team to ensure that there are no duplicate frequencies. Teams are encouraged to use **2.4 or 5.0 GHz** technology rather than FM in order to avoid interference with other teams’ radios and external sources.

7.3. Frequencies are allocated on a first come first served basis.

8. GENERAL SAFETY

8.1. Robots will be inspected for safety, reliability and conformity to these rules and regulations before being allowed to compete.

8.2. It is always advisable to consult with the organisers before developing potentially controversial systems. Failing to do so, may result in disqualification and banning from the championship as per organisers decision

THIS SECTION WILL BE UPDATE ONCE ALL APPLICATIONS HAVE BEEN ACCEPTED AND CONFIRMED FOR THE CHAMPIONSHIP.

9. CHAMPIONSHIP STRUCTURE

This section is subject to change as the date of the event approaches. The general layout of the competition will be maintained.



- 9.1. The championship structure will be defined once the number of competitors is finalised. This ensures that an adequate competition structure is chosen for the number of teams. The following structure is a sample and the organisers can change how the games are played depending on the robots that manage to come to Malta to compete.
- 9.2. The championship is first divided into two major parts: (1) Qualifying phase (2) Knockout phase.
- 9.3. For the first Game, the matchups are randomly pre determined by the organising committee with the sole condition that no team from the same country is matched up against the other. The matchups will be revealed on the day.
- 9.4. The Qualifying phase will involve:
 - Round1: "Time to Fall"
 - Round2: **"Weight in line"**
 - Round3: **"Weight in line"**
- 9.5. Qualifier Round1 "Time To Fall" will determine the ranking for the next round (details of "Time to Fall" in section 14). The Winner with the shortest game time ranks first, followed by the second shortest winner time. After all winners are ranked, losers are ranked with longest game time followed by the second longest game time. Disqualified players do not earn any qualifying points.
- 9.6. Qualifier Round2 **"Weight in line"** is the second qualifying game. The matchups will be determined based on the performance in the 1st qualifier round. The robots will be paired with 1st Place Rnd1 Qualifier Vs Last Place Rnd1 Qualifier. 2nd Place Rnd1 Qualifier Vs 2nd Last Rnd1 Qualifier and so on.
- 9.7. Qualifier Round3 "Weight Game" is the third qualifying game. The matchups will be determined according to the points scored during the previous round.
- 9.8. Tie breaker. In the case of a tie/s where teams score equal points to each other, the ranking from Round1 is to be used as a tiebreaker.
- 9.9. Knockout Phase. The First 8 Qualifiers pass through to the knockout phase.
- 9.10. The matchups for the knockout phase will be determined based on the total points gained in both weight games. The robots will be ordered from best to worst and matched as such. *E.g., 1st Place qualifier Vs Last place Qualifier. 2nd Place Qualifier Vs 2nd Last Qualifier and so on.* Any robots that have previously competed against each other will not be paired for subsequent matches. Instead, they will be matched against the competitor with the least favourable performance among the remaining participants, commonly referred to as the 'worst runner-up'
- 9.11. The Knockout phase starts with the "Death Clock." For every match, one winner will be drawn and moves on to the next game. Details for this game are stated in Section 14.
- 9.12. The semi final game is a 2nd game of "Death Clock," described in Section 14. Its winners will move on to the final match. The losers will be matched to compete for the 3rd place.



- 9.13. The runner up game is “Hanging Hazard” and is described in Section 14. Its winner will be awarded 3rd place, and the loser the 4th.
- 9.14. The final game is “Hanging Hazard” and is described in Section 14. Its winner will be awarded 1st place, and the loser the 2nd.
- 9.15. An illustration for the Championship Structure is presented in Figure 1. (Note as pointed out in 9.1, the Championship Structure can be subject to change to **adjust to the number of** participants available to participate on the day).
- 9.16. The timings and end conditions of each game are described in Section 14.
- 9.17. For every game, no competitor is allowed to touch/modify the respective robot until the end of that game.

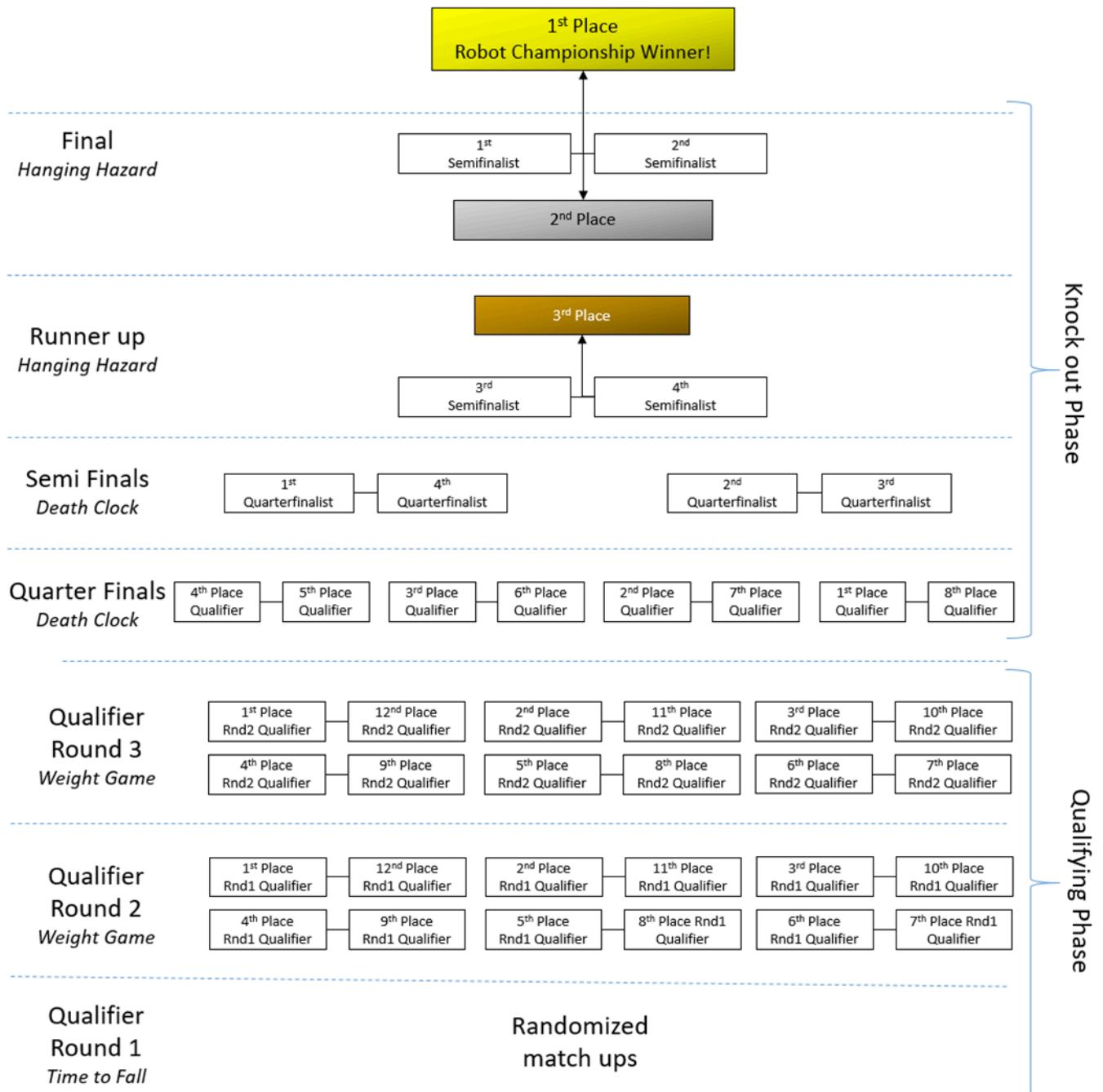


Figure 1 - Illustration for the Championship Structure ONLY for guidance depending on the robots that can participate in the championship.

10. MAINTENANCE WORKSHOP (PIT AREA)

- 10.1. Power tools are permitted on the day(s) of the event. Care must be taken not to damage any property. Any damage done to the premises will have to be paid for by the offending team.



- 10.2. No welding equipment is allowed on the premises.
- 10.3. Only repairs may be carried out in the workshop. Modifications to the robot are prohibited after the final technical checkup.
- 10.4. A staff member will notify teams ten (10) minutes prior to their game so that any repairs and adjustment can be safely finalised. If a team does not approach the arena in time, the jury is empowered to disqualify the team for that game.
- 10.5. A maximum of three (3) persons per team is allowed in the maintenance workshop.

11. 'MAKING OF' MATERIAL

- 11.1. Each team must submit a **'making of' video** of the robot two weeks prior to the actual competition. These videos will be used to promote the competing robots in between games. **Submission of the video is COMPULSORY.** Failure to produce such material will result in a subtraction of points for the team in the Qualifying phase.
- 11.2. The video must include a background of the team members as well as the specifications of the robot to be submitted.
- 11.3. The video must be at least three (3) minutes and not longer than ten (10) minutes long.
- 11.4. Each individual video will have points allocated to it as deliberated by the organising committee.

12. SUBMISSION DETAILS

- 12.1. The competitors will be asked to hand in their robots at a specified date before the competition, generally one day prior to the competition itself. No robot will be allowed to participate if not delivered by this date irrespective of the reason produced.
- 12.2. When handing the robot to the organisation (cf. point 12.1 above), robots will be measured and weighed to make sure they abide by the rules. An inventory sheet will be prepared by the organisation and delivered for completion to each team in order to list any additional items the robot will use during the event. Examples for these items are extra body panels, add-ons and batteries. Participants will only be allowed to use the items declared on this day during the competition. This inventory sheet must be filled and submitted to the organisation at least one day prior to the competition start.
- 12.3. Competitors will also be requested to display the robot in operation to the organisers, subsequent to which competitors will only be allowed to remove batteries for charging. The batteries will be marked by an IEEE official in order to ensure that no other batteries are used during the event. Following this, the robot shall be held in the possession of the organisation until the day of the tournament, preferably in a locked up sports bag or any other contraption.



13. DISCLAIMER

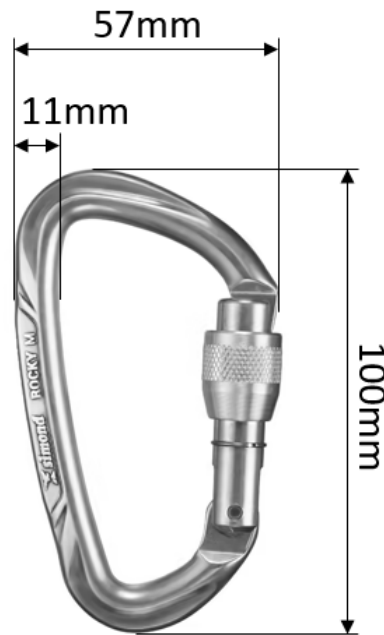
- 13.1. The IEEE Region 8 (henceforth referred to as “we”) reserves the right at any time and at our sole discretion, to make any changes to the rules and regulations without prior notice.
- 13.2. We reserve the right to disqualify any robot that, in our sole opinion, is likely to damage the premises or compromise the safety of any personnel, contestants and members of the general public.
- 13.3. In order for the Robot Championship to be held, at least ten (10) teams must register. Should one or more teams drop out after the registration period, the championship will still take place provided that at least six teams (6) submit a functioning robot for that particular category on the submission date.

14. GAME TYPES

14.1. TIME OF FALL

- 14.1.1. This game will be used to qualify robots for the Knockout phase of the championship.
- 14.1.2. The robots winning one match stand a higher chance to be qualified.
- 14.1.3. OBJECTIVE: To pull the opponent off the edge at the shortest time possible.
- 14.1.4. RULES:
 - 14.1.4.1. Players start the game connected to each other via a chain with connectors at each end for each player and equidistant from a pit/fall.
 - 14.1.4.2.

14.1.4.2.1. Image of connector to be used during this game:



Diameter of connector material is 11mm with the gate opening up to 17mm.

Imp. In case a player's tow point does not fit the connector, that player is disqualified for this game.

14.1.4.3. When the game starts, a timer begins. Both players need to try to pull their opponents off over the edge. The player that succeeds wins the match.

14.1.4.4. As soon as a player falls, the timer stops.

14.1.4.5. No add-ons (cf. Section 3.5.1) are allowed to be used in this game.

14.1.4.6. The game ends whenever one of these criteria is met:

14.1.4.6.1. *1st priority:* Whenever a player manages to pull the opponent off the edge, or

14.1.4.6.2. *2nd priority:* after 60 seconds of game time.

14.1.4.7. In the case where the game ends after the game time is over (*2nd priority*) and none of the players falls off the edge, the distance from the edge of the pit to the tow point is measured. The player with the longest distance counts as the winner of the match. (Imp. a winner of this type ranks **lower** than any winner which pulls their opponent off the edge. Vice versa, a loser of this type ranks higher than players who fall off the edge).

- 14.1.4.8. In case of multiple winners via 2nd priority, such winners are ranked between themselves starting from the winner with the longest distance followed by losers with the longest distance.
- 14.1.4.9. In cases where a player's tow point breaks (the part intrinsic to the robot required to fix the chain connector) that player is disqualified and automatically loses the game. The opponent will count as having a 1st priority win using the time when the tow point broke for ranking purposes.
- 14.1.4.10. In case the chain or connectors break (although highly unlikely) a rematch will take place using a spare chain and connectors.

14.2. Weight in line

- 14.2.1. OBJECTIVE: A red/blue player scores red/blue weights, respectively, by dragging and dropping them in their respective corner pits.



Image of weights

- 14.2.2. POINTS and WEIGHT Details:



| Weight (kg) | Weight dimensions | | Points value |
|------------------------------------------------|-------------------|----------------|--------------|
| | Diameter (mm) | Height (mm) | |
| 0.5 | 100 | 13 | 5 |
| 1.0 | 140 | 13 | 10 |
| 2.0 | 176 | 18 | 15 |
| 5.0 | 235 | 25 | 20 |
| 5.0 | 235 | 25 | 20 |
| 10.0 | 300 | 30 | 30 |
| If player's opponent falls into opponent's pit | | | 50 |
| If player's opponent falls into player's pit | | | 100 |

14.2.3. RULES:

- 14.2.3.1. Both players start the game in their respective colour corners.
- 14.2.3.2. Pushing/minor physical contact with the opponent is allowed.
- 14.2.3.3. The usage of active add-ons are ONLY allowed to be used on the weights.
- 14.2.3.4. If a player scores the opposing player's weights in their corner, those points will be considered negative points.
E.g., the blue player has already earned 20 points but then dragged the 5 points red weight in their blue corner — now the blue player has 15 points (20 - 5).
- 14.2.3.5. If a player manages to score ALL the available weights in time (refer to point 14.2.3.8 below), they can move on to attempt to drop their opponent in their pit for 100 points or in the opposing pit for 50 points, and the game ends. At this stage, the use of active add-ons on the opponent is now allowed.
E.g., the blue player scores all the blue weights. If there is still available time, the blue player can attempt to push the red player into the blue pit for 100 points or into the red pit for 50 points.

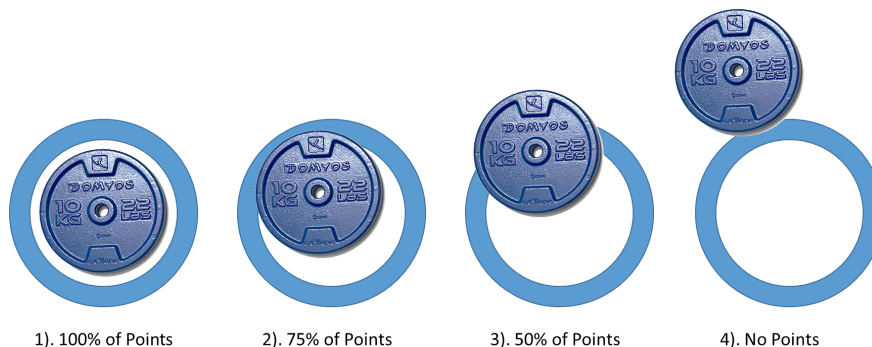
According to rule 14.2.3.8, should a contestant successfully arrange all designated weights within the stipulated time frame, they are then eligible to progress to the next phase of this game. In this phase, the contestant may endeavour to manoeuvre their opponent into a specific location for additional points: depositing the opponent into their own pit will yield 100 points, whereas



placing them in the opponent's pit will result in 50 points. This marks the conclusion of the game. Furthermore, for this game, the employment of active add-ons against the opponent is not permitted.

For instance, if the blue player successfully organises all blue weights and time remains, they may then attempt to push the red player into the blue pit to gain 100 points, or into the red pit for 50 points.

- 14.2.3.6. If a player drops their opponent in any pit before scoring **all** their available points first, that player loses the game scoring 0 additional points, and the dropped opponent scores 100 points. Then the game ends.
- 14.2.3.7. If a robot falls in any pit on their own, the opponent scores the number of points depending on which pit that robot fell into. If it falls in the player's own pit, the opponent scores 50 points. If it falls in the opponent's pit, the opponent scores 100 points. In both cases the game ends.
- 14.2.3.8. The game ends either after one of the players falls into the pit, or after 5 minutes since the start. The player with the most points scored wins the match (Note: this also applies even if a player is illegally pushed into a pit as stated in point 14.2.3.6).
- 14.2.3.9. Add rules related to the points according to the position of weight in the circle.
Score value;
 - 1) If weight is located fully within its designated location - 100% of points awarded.
 - 2) If weight is located within its designated location but touches the locating circle - 75% of points are awarded.
 - 3) If weight touches both the outside and Inside of the designated location - 50% of points are awarded.
 - 4) If weight does not touch the inside of the designated location - No points are awarded.



14.2.4. ROUGH PLAY PENALTIES:



- 14.2.4.1. In case of a foul a horn blows to pause the game. Players pause and pay attention to the judges. The judges will point to the fouling corner and show a YELLOW or a RED card.
- 14.2.4.1.1. With a YELLOW card, 10 points are deducted from the fouling player's score.
 - 14.2.4.1.2. With a RED card, the fouling player stops playing scoring 0 additional points and the fouled opponent receives 100 points to their score.
- 14.2.4.2. If a player already had 2 YELLOW cards in the same match, the next foul will result in a RED card.
- 14.2.4.3. If a foul is considered too severe by the judges, a RED card can be given even if the player has no YELLOW cards.
- 14.2.4.4. In case of a RED card, the fouled player can continue scoring their weights as the game is resumed.
- 14.2.4.5. Note: In this scenario, the player with the RED card is not to be pushed or scored as the 100 pts are already awarded to the fouled player.

14.3 Game Title: Climate CHAOS.

Motivation:

The Climate Change Maze aims to draw attention to the consequences of climate change. This maze represents a collapsed building in the aftermath of a climate disaster, highlighting the urgent need for environmental action. Teams will navigate their ground-based robots through the intricate maze, symbolising the challenges humanity faces in a world affected by climate change.

Description:

The Climate Change Maze is a thought-provoking competition designed to raise awareness about the impact of climate change. Teams will guide their remote-controlled ground robots through a challenging maze that simulates the environment of a city with sinkholes, flooding and a forest fire growing closer.

Rules:

1. The Maze:
 - The maze represents a small part of a city surrounded with different environmental catastrophes.
 - Teams must navigate their robots from a designated safe zone to three towers and rescue survivors.
2. Environmental Challenges:
 - Challenges within the maze mimic the effects of climate change, such as flooding, sinkholes and forest fires..

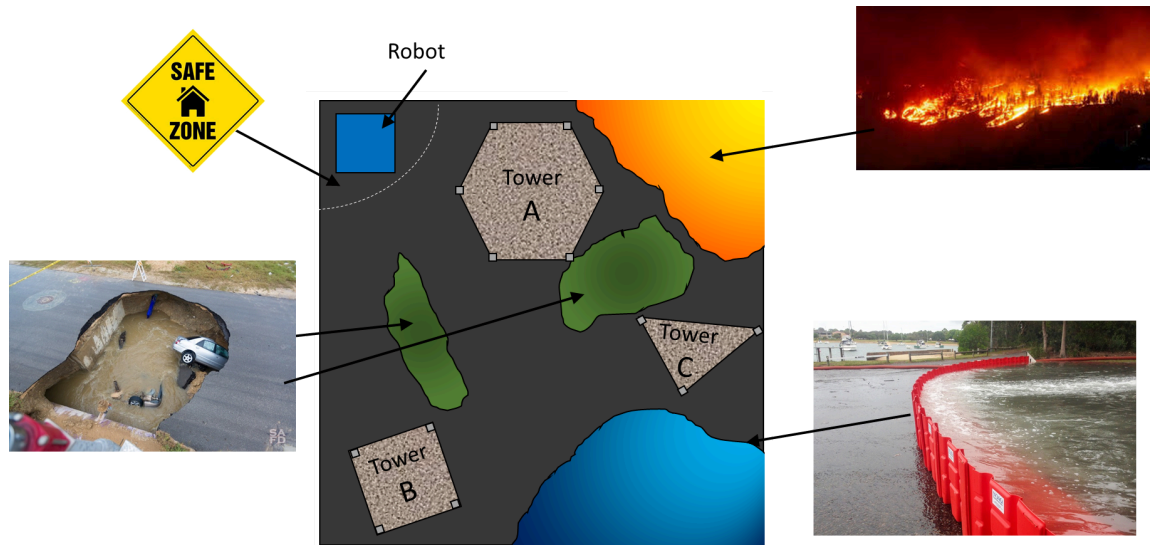
Scoring System:

- Teams are scored based on the time taken to successfully complete the maze and the number of simulated "survivors" (represented by objects) rescued along the route.
- Completion time and the number of survivors saved contribute to the final score.
- The team with the highest score, achieved by saving survivors in the shortest time, wins.

Infrastructure Needed:

1. Maze Structure:

- Refer to image below:



2. Ground Vehicles:

- Teams must provide their own ground-based remote-controlled vehicles capable of navigating through the challenging terrain of the maze.

3. Control Stations:

- Each team requires a control station equipped with remote control systems and a display screen for the robot operator to navigate the robot.

4. Event Organisers:

- Trained event personnel responsible for overseeing the competition, ensuring adherence to rules, and tracking completion times and survivor rescues.

5. Scoring System:

- A scoring system to accurately calculate and display the final scores, factoring in completion time and the number of simulated survivors rescued.

6. Trials:

- They can have no more than three tries if they hit specific objects.

7. Safety Measures:

- Safety barriers and precautions to protect participants, spectators, and ensure the robots remain within the designated maze area.

8. Game length

- The game must be completed within 10 minutes.

Table

The championship will feature three towers, each varying in complexity and characterized by differing numbers of supports, specifically 3, 4, or 6. Atop each tower, metal cutouts representing individuals and pets will be placed, with one cutout per tower.

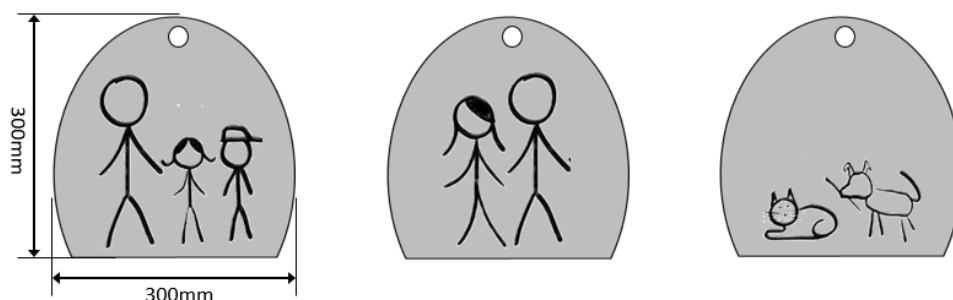
The competition scenario includes three simulated climate disasters: sinkholes, forest fires, and flooding. The forest fire challenge incorporates a visual timer, which escalates in intensity as the competition progresses towards the final tower.

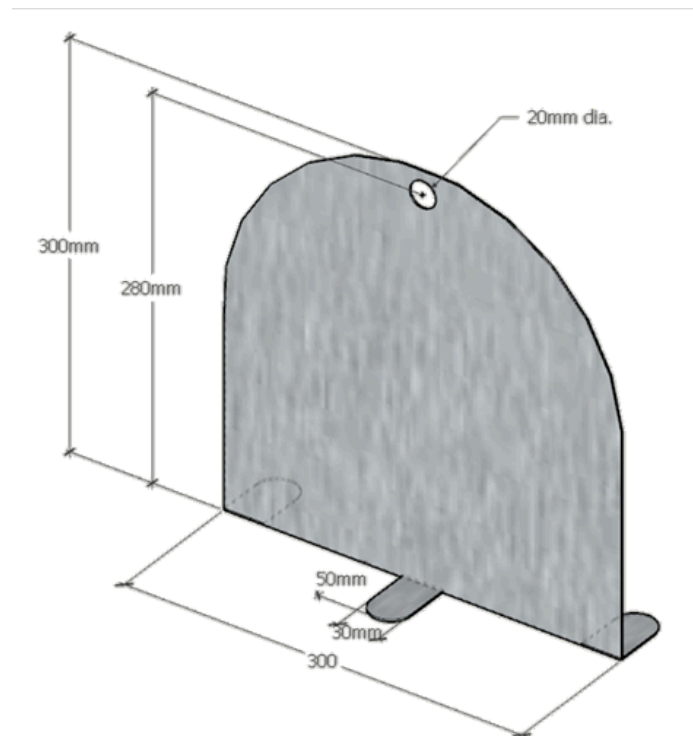
Tower Configuration:

- Three towers present, each with a distinct level of difficulty.
- Towers will have either 3, 4, or 6 supports.

Metal Cutouts:

- Each tower will feature metal cutouts representing people and pets:
-





- Placement: One cutout per tower.

Simulated Climate Disasters:

- The championship includes three types: sinkholes, forest fires, and flooding.

Forest Fire Challenge:

- Incorporates a visual timer.
- Intensity of fire, that is the timer of fire moving increases as the competition advances towards the final tower.

Flooding Scenario:

- Pathways obstructed by various objects, including vehicles.
- Robots are required to navigate without colliding with these objects.

Towers:

Tower A Ground clearance of 60cm with 6 Columns

Tower B Ground clearance of 60cm with 4 Columns

Tower C Ground clearance of 60cm with 3 Columns



| Tower | Ground Clearance (cm) | Number of Columns | Points | Width |
|---------|-----------------------|-------------------|--------|-------|
| Tower A | 60 | 6 | | |
| Tower B | 60 | 4 | | |
| Tower C | 60 | 3 | | |

Map:

14.3. Battle - HANGING HAZARD

14.3.1. OBJECTIVE: to score Rugby Footballs and/or render the opponent immobile

14.3.2. RULES:

14.3.2.1. Both players start the game in their respective colour corners (Blue or Red)

14.3.2.2. The game starts with three Rugby Footballs placed in the arena.

14.3.2.3. Image and details of Rugby Football to be used:



Details: KIPSTA, AF500, Official size, Rugby ball.

Approximate dimensions:

Length: 280mm

Width: 155mm

- 14.3.2.4. There will be four hanging weights above the arena which will be lowered close to the floor before the game starts. These act as an arena hazard for both robots.
- 14.3.2.5. All effective and active add-ons (cf. Section 3.5) are allowed in this game.
- 14.3.2.6. The corner pits are both replaced with pockets for this game.
- 14.3.2.7. The game ends whenever one of these criteria is met:
 - 14.3.2.7.1. 8 minutes of game time. Player with the most scores wins the game.
 - 14.3.2.7.2. If a player is rendered immobile or knocked out. That player loses rendering their opponent as the winner of the game.
 - 14.3.2.7.3. In case of a tie, i.e. even number of scores and both players still active and mobile, a judges decision will be put into play.
- 14.3.2.8. A player scores by dropping a rugby ball in the OPPONENT's pocket colour. i.e The blue player scores by dropping a rugby ball in the red pocket.
- 14.3.2.9. A robot is rendered immobile/knocked out when its driver is no longer able to control it. Examples inc but not limited to: having the driving mechanisms



damaged resulting in loss in mobility. Batteries running out. being flipped upside down or on the side losing contact between the driving system and the ground etc.

Note: In the course of the championship, a contestant is permitted to immobilise their opponent in a locked position for a duration not exceeding 10 seconds. Subsequent to this period, the contestant is obliged to release their opponent from the locked state. Repeated instances of a robot consistently locking its opponent may be considered as a significant factor in the event of a judge's decision being necessary to ascertain the winner.