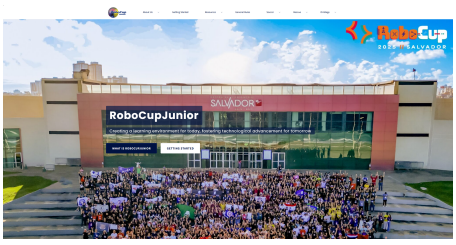
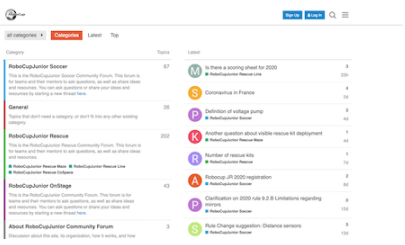
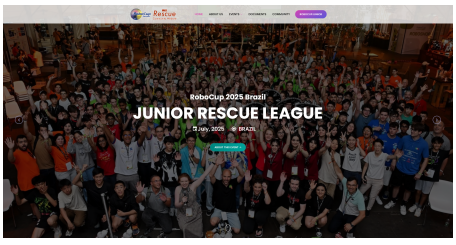
RoboCupJunior Rescue Maze Rules 2027

RoboCupJunior Rescue Committee 2027		
Chair	Alexander Jeddeloh	Germany
Co-Chair	Stefan Zauper	Austria
	Gonzalo Zabala	Argentina
	Rebeca Graff	Brazil
	Kelen Cristiane Teixeira	Brazil
	Tomas Lugo	USA
	Wiktor Liew	Sweden
	Mahmoud Madi	UAE

RoboCupJunior Exec 2027		Trustees representing RoboCupJunior	
Marek Šuppa	Slovakia	Julia Maurer	USA
Christian Häußler	Germany	Roberto Bonilla	USA
Margaux Edwards	Australia		
Tatiana Pazelli	Brazil		
Tom Linnemann	Germany		
William Plummer	Australia		

Official Resources

RoboCupJunior Official Website	RoboCupJunior Official Forum	RCJ Rescue Community Website
		
https://junior.robocup.org	https://junior.forum.robocup.org	https://rescue.rcj.cloud

Corrections and clarifications to the rules may be posted on the forum before updating this rule file. It is the responsibility of the teams to review the forum to have a complete vision of these rules.

Before you read the rules



Please read through the RoboCupJunior General Rules before proceeding with these rules, as they are the premise for all rules. The English rules published by the RoboCupJunior Rescue Committee are the only official rules for RoboCupJunior Rescue Maze 2027. The translated versions each regional committee can publish are only referenced information for non-English speakers to understand the rules better. It is the responsibility of the teams to read and understand the official rules.

Intro

RoboCupJunior is one of the world's biggest robotics competition for youth, and with a rapidly evolving technological landscape, we feel that it is necessary to evolve the rules so that the competition can keep up and continue to be an engaging and rewarding experience for all involved.

Because of this we have decided to rewrite of the rules, this rewrite will not change anything from how the competition will be run but it is intended to make the rules easier to understand. Because almost everything is rewritten we have not marked what has changed in the rules. The only actual rule changes from the previous year are:

- Letter victims have been changed to smiley victims.
- A Tile is now 28cm × 28cm.
- Walls are now 12.5cm.
- Ramps may now be up to 30 degrees inside the Hazard Zone.
- Restrictions on the amount of rescue kits have been removed and the size of the kits have been increased to minimum 1.5cm per dimension and minimum volume of 3.375 cm^3.
- The exit bonus now requires that the identification light stays on for 5 seconds instead of blinking.
- Exit bonus on the wrong tile can now trigger a misidentification and use of the identification light for anything other than victim identification and exit bonus now triggers misidentification.
- Dangerous Zone renamed to Hazard Zone.

Scenario

There has been a catastrophe. With first responders spread too thin, your team has been tasked with building a robot to help the victims of this catastrophe. Your robot must autonomously navigate the treacherous terrain to locate victims, to triage and deliver supplies to them, so that they can sustain themselves until human first responders can get there. Problem solving and technical skills will be essential. We are all relying on your team, good luck!

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1. RoboCupJunior General Rules

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These are the RoboCupJunior General Rules. They apply to every competition that uses this rulebook, including the International RoboCupJunior competition. Under the license above, the organizing committee of a SuperRegional, Regional, or local competition may adapt them as needed for its competition. Check with the organizers of each competition which rules they use.

If you are unsure about any part of the General Rules or the League Rules, you are encouraged to ask on the official RoboCupJunior Forum: https://junior.forum.robocup.org/

You can also ask questions about the rules, or about RoboCupJunior in general, on the official Discord Server (https://robocup-junior.github.io/soccer-rules/discord/).

1.1. Getting Started

If you are new to RoboCupJunior, the Getting Started guides on the Official Website (https://junior.robocup.org/gettingstarted/) explain everything from building your first robot to entering your first competition:

1. **Starting a Team** (https://junior.robocup.org/robocup-beginners-guide/): form a team, build a robot, keep costs down, and find tutorials for your league.
2. **Qualification and Competitions** (https://junior.robocup.org/qualification/): how the season works, how regions qualify teams, and how to enter competitions outside your region.
3. **Your First Competition** (https://junior.robocup.org/your-first-competition/): what to expect at a competition, what to bring, and what to do when something goes wrong.
4. **For Educators** (https://junior.robocup.org/for-educators/): why robotics works in schools, and how to start a program with your students.

1.2. Team Requirements

1.2.1. Team Definition

Team: A team is its robot(s) and the students who build and develop them. The team members are the students who design, build, and program the robot(s) they enter. Membership may change between competition levels as described in Team Changes.

Technical Roles: Every team member must have a defined technical role, for example, mechanical design, electronics and sensors, or software. During technical judging, each member must be able to explain their role and what they contributed to the robot(s). Non-technical tasks, such as documentation, the poster, graphic design, or the presentation, can be shared by the team, but they do not count as a technical role.

Shared Members and Robots: Team members and robots must not be shared between teams.

1.2.2. Age Requirements

Junior Student Members: Must be 14 to 19 years old (inclusive) on July 1st of the competition year.

Junior Mentors and Parent/Chaperones: Must be 19 years or older on July 1st of the competition year.

Entry Leagues: Entry leagues and other "Primary" divisions are not part of the International competition, but many Regional and SuperRegional competitions run them. Their organizers set the age limits, which may differ from the range above.

1.2.3. Team Size

Minimum Team Size: A team must have at least 2 members.

Maximum Team Size:

- Soccer and Rescue Leagues: 4 members.
- OnStage League: 5 members.

Regional and SuperRegional competitions may set their own team sizes, for example, because of venue space. At a higher-level competition (a SuperRegional or International competition the team qualified for), a team must follow that competition's maximum team size, even if the team was larger at its qualifying competition.

1.2.4. Team Changes

Team membership may change between competition levels, for example, when a member can no longer take part. At a higher-level competition, at least half of the team (rounded up) must be students who were members when the team qualified for that competition. New members must take part in designing, building, or programming the robot(s) before they compete, and must meet the Technical Roles requirement. A qualification and the robot(s) belong to the team and cannot be given to another team. How a region reassigns a place that a team does not use is part of the qualification process (https://junior.robocup.org/qualification/).

1.2.5. Team Supervision

Junior Mentor: A Junior Mentor is a supervisor who guides the team and meets the Age Requirements. Junior Mentors are not team members. They must not design, build, or program the robot(s) for the team (see Mentoring and Onsite Assistance).

Junior Mentor Requirement: Every Junior team must have at least one Junior Mentor who is registered with the team, attends the competition with the team, and can be reached by the team and the event organizers throughout the competition.

Junior Mentors and Parent/Chaperones are responsible for supervising their team and have a duty of care for their team members' well-being, as required by their home region's rules. Any concern about a team member's well-being should be reported to the event organizers immediately.

Unless the event organizers decide otherwise, Junior Mentors and Parent/Chaperones may not enter the competition areas during rounds and interviews. They must not pressure or intimidate teams, judges, or the judging process, and must not interfere with robots. Event organizers will handle inappropriate behavior, which may lead to disciplinary action.

1.3. Robot Requirements

1.3.1. Robot Communication

Permitted Communication: During competition rounds, robots may communicate with each other only on the 2.4 GHz band. Their transmission power must never exceed 100 mW EIRP (Effective Isotropic Radiated Power).

Responsibility: Teams are responsible for their robots' communication. Their wireless equipment, and how they use it, must follow the laws of the host country. Spectrum availability is not guaranteed.

Component Communication: Parts of the same robot may communicate with each other.

League Adaptability: Each league may change these communication rules to fit its needs.

1.3.2. Safety and Power Requirements

Electrical Power:

- Robots must not be powered from a wall socket (mains electricity).
- Maximum voltage: 48 V DC or 25 V AC RMS (Root Mean Square).
- Voltage must be easy to measure during inspections. Measuring points must be covered or designed to be safe.

Battery Safety:

- Lithium batteries must be stored in safety bags, and charging must be supervised by team members in competition areas.
- Teams must follow the safety procedures, including how to handle a battery fire and how to evacuate.

Robot Safety Design:

- **Power Management**: Batteries must be firmly mounted and wiring must be safe. Every robot must

have an easy-to-reach way to cut its power immediately in an emergency.

- **Mechanical Safety**: Robots must not have sharp edges, places where fingers can get caught, or other hazards. Actuators must suit the robot's size and purpose.
- **Hazardous Behavior**: If a robot could behave dangerously, the team must tell the event organizers at least two weeks before the competition. If the team discovers such a behavior later, it must tell the organizers immediately and must not use that behavior in competition until the organizers approve it.

1.4. Documentation and Sharing Requirements

1.4.1. RoboCupJunior Team Posters

Purpose: Posters help teams share their robot designs and ideas with judges, other teams, and the public. Posters are displayed in the venue's public competition areas, and RoboCupJunior shares digital copies or photos after the competition.

Size: Posters must be no larger than A1 (59.4 x 84.1 cm).

Content: Posters should summarize the team's design documents and present the robot's capabilities attractively.

1.4.2. Technical Description Video (See League Documentation)

Content:

- **Robot Demonstration**: Show the fully working robot systems and highlight their technical features.
- **Design Process**: Explain the team's design choices and how the team solved problems.
- **Presentation**: The video should be clear and of good quality, and should explain any innovative or unusual techniques.
- **Innovation & Sustainability**: Show new technologies and sustainable practices.

Submission: Each league's guidelines will specify the video length and the deadlines.

1.4.3. Bill of Materials (BOM)

Submission: Teams must submit a Bill of Materials (BOM) that lists the main components and materials of their robot(s).

Details: For each component, the BOM must include:

- Name or description (for example, the part number).
- Supplier or source (including PCBs and machined parts).
- Whether it is new or reused.
- Whether it comes from a kit or is custom-built.

- Price.

Template: For the International competition, a standard BOM template will be provided with the league documentation submissions.

1.4.4. Sharing Team Resources

Sharing: Materials that teams submit as part of their documentation will be shared in the leagues' GitHub repositories: https://github.com/robocup-junior

Credit: Teams must give credit to the creators of any outside work they use and follow its license. The focus should stay on the team's own learning.

1.4.5. Plagiarism Guidelines

External Code Use: Teams may use code written by others, but must give credit to the original authors.

Learning Priority: Teams should focus on learning and should not use complete solutions made by others. Always check the license.

1.4.6. Acceptable Uses of AI

Teams must disclose any generative AI tools they used to create content in their code or documentation (for example, text, figures, or images). Teams must name each AI system they used and briefly explain how they used it. Using AI for editing, grammar correction, or translation into English is common practice and does not need to be disclosed.

1.5. Spirit and Behavior

1.5.1. Behavior

All participants are expected to be respectful and polite to everyone, including other participants, volunteers, referees, the organizers of all Junior and Major Leagues, and the host venue.

1.5.2. Code of Conduct

All organizers, volunteers, team members, mentors, supporters, and visitors must follow the RoboCup Code of Ethics and Conduct (https://robocup.org/conduct). Anything that breaks the Code must be reported in the way the Code describes. The Code gives the formal reporting address (conduct@robocup.org) and explains what to do at the competition, including in an emergency.

1.5.3. Mentoring and Onsite Assistance

Help from other teams, mentors, teachers, parents, sponsors, and online communities is an important part of how teams learn and grow.

For fair competition and the best learning, this help must never do the team's competition work for

them. A good test: the team can explain not only what each part of their robot does, but also how it works.

1.5.4. Teams Onsite

- During the competition, only official team members may represent the team at registration, during setup, and in the competition areas during rounds and interviews.
- At least 2 team members must be present at the competition. If fewer can attend, the team must contact the event organizers as early as possible. The organizers decide whether and how the team may compete. Unless the organizers decide otherwise, a team that competes with fewer than 2 members present is not eligible for awards or for SuperTeam participation.
- Teams are responsible for making sure their members are at the right place at the right time for every scheduled activity.
- During the competition, teams must not receive remote help with their robot, code, or strategy from anyone outside the team, for example, by phone or remote desktop. Help on site is covered by Mentoring and Onsite Assistance.
- Teams that break these rules may face disciplinary action.
- If teams have problems on site, they are encouraged to ask other teams or the organizers for help.

1.5.5. Violations

The event organizers may disqualify teams, team members, Junior Mentors, or Parent/Chaperones from the competition and ask them to leave the venue. This can happen for repeated or serious unacceptable behavior, or for repeated or serious violations of the General Rules or League Rules.

2. Code of Conduct

2.1. Spirit

1. It is expected that all participants (students and mentors alike) respect the aims and ideals of RoboCupJunior as set out in our mission statement.
2. The volunteers, referees, and officials will act within the event's spirit to ensure the competition is competitive, fair, and, most importantly, fun.
3. **It is not whether you win or lose but how much you learn that counts!**

2.2. Fair Play

1. Robots that cause deliberate or repeated damage to the field will be disqualified.
2. Humans who cause deliberate interference with robots or damage the field will be disqualified.
3. It is expected that all teams aim to participate fairly.

2.3. Behavior

1. Each team is responsible for verifying the latest version of the rules on the RoboCupJunior Official website and additional clarifications/corrections on the official forum made by the RoboCupJunior Rescue Committee before the competition.
2. Participants should be mindful of other people and their robots when moving around the tournament venue.
3. Participants are not allowed to enter setup areas of other leagues or teams unless explicitly invited to do so by team members.
4. Teams will be responsible for checking updated information (schedules, meetings, announcements, etc.) during the event. The RoboCupJunior Rescue Committee will provide updated information on notice boards in the venue, the local competition website, or the RoboCupJunior website if possible.
5. Participants and their companions who misbehave may be asked to leave the venue and risk being disqualified from the tournament.
6. Referees, officials, tournament organizers, and local law enforcement authorities will enforce these rules equally to all participants.
7. Teams are expected to be at the venue early on the setup day as important activities will occur. These activities include but are not limited to registration, participation raffle, interviews, captains, and mentor's meetings, among others.

2.4. Mentors

1. Non-team members (mentors, teachers, parents and other family, chaperones, translators, and other adult team members) are not allowed in the student work area.
2. Mentors are not permitted to be involved in building, repairing, or programming their team's robots before and during the competition.
3. In the first instance, mentor interference with robots or referee decisions will result in a warning. If this behavior recurs, the team could face a possible elimination from the tournament.
4. Robots have to be the work of the students. Any robot that appears identical to another robot may be prompted for re-inspection.

2.5. Ethics and Integrity

1. Fraud and misconduct are not condoned. Fraudulent acts may include the following:
    a. Mentors working on the software or hardware of student's robot(s) during the competition.
    b. More experienced/advanced groups of students may provide advice but should not do the work for other groups. Otherwise, the team risks being disqualified.
2. RoboCupJunior reserves the right to revoke an award if fraudulent behavior is proven after the award ceremony occurs.
3. Suppose it is evident that a mentor intentionally violates the code of conduct and modifies and

works on the student's robot(s) during the competition. In that case, the mentor will be banned from future participation in RoboCupJunior competitions.

4. Teams that violate the code of conduct can be disqualified from the tournament. Disqualifying a single team member from further participation in the tournament is also possible.
5. Referees, officials, tournament organizers, and local law enforcement authorities will give a team a warning in less severe cases of violations of the code of conduct. A team can be disqualified immediately without warning for severe or repeated violations of the code of conduct.

2.6. Sharing

1. The spirit of world RoboCup competitions is that teams should share technological and curricular developments with other participants after the tournament. Sharing furthers the mission of RoboCupJunior as an educational initiative.
2. The RoboCupJunior Rescue Committee may publish developments on the RoboCupJunior website after the event.
3. Participants are strongly encouraged to ask questions to their fellow competitors to foster a culture of curiosity and exploration in the fields of science and technology.

3. Glossary

Assistant Field Judge

Judge who helps the field judge with rules decisions and keeps track of the scoring.

Black Tile

A tile that is of a singular black color that the robot is not allowed to visit.

Blue Tile

A tile that is of a singular blue color that the robot has to stop on for 5 seconds before visiting another tile.

Calibration

The part of the game where the designated team members are allowed to get values from their robots and change settings on the robot to adapt it to the fields unique conditions.

Checkpoint

The tile that the robot is returned to when a lack of progress occurs.

Cognitive Victim

The Victim is identified by 5 concentric circles.

Color Tile

Any tile with an associated color i.e. black tile, blue tile, red tile, silver tile.

Competition Area

The field and the area around the field where only functionaries and the designated team members are allowed to be.

Debris

Small objects not fixed to the floor, examples of debris are toothpicks, rice, ...

Designated Team Members

Team members who are allowed inside the competition area and are responsible for the robot during the game.

Extra Scoring

Additional score given to the team after a game is concluded.

Field

The area consisting of a horizontal floor with floating and linear tiles, a perimeter wall, internal walls and field elements.

Field Judge

Judge who ensures that the rules are followed during the game.

Field Elements

Things that are placed in the field that are not walls, i.e. obstacles, speed bumps, ...

Floating Tile

Tiles that cannot be reached by only following the right or left wall.

Functionary

People helping with the running of the competition, i.e. judge, organizing committee, security guards, ...

Game

The calibration and scoring run.

Game Time

The time the team has to do calibration and the scoring run.

Hazard Zone

An area of the field enclosed by walls that has a red tile at the entrances, field elements within the hazard zone may be harder to traverse than outside it.

Identification Light

The light used by the robot to show to the field judge and assistant field judge that it has identified a victim or that it is scoring the exit bonus.

Lack of Progress (LoP)

When the robot either does something disallowed or is stuck and is moved back to the last visited checkpoint.

Linear Tile

Tiles that led back the starting tile by either following the left or right wall.

Red Tile

A tile that is of a singular red color that marks a entrance to the hazard zone.

Scored

Something is considered scored when the **Scoring Condition:** is fulfilled.

Scoring Run

The part of the game where the robot is not allowed to be modified and it runs autonomously to gain score.

Silver Tile

A tile that is of a singular silver color that marks a checkpoint.

Smiley Victim

The victim is identified by a smiley face.

Speed Bump

Small objects fixed to the floor, examples of speed bumps are wooden dowels, aluminium profiles, ...

Starting Tile

The tile the robot starts and ends the run on, is designated by the field judge.

Successfully Visits

A robot has successfully visited a tile if after visiting the tile it can continue visiting other tiles, i.e if a robots flips over onto another tile and can't continue it has **not** successfully visited that tile.

Tile

A square part of the field floor. The tile's area is the navigable space by the robot.

Victim

Represents a person in different needs of help.

Victim Identification Area

The area within which the robot can help the victim.

Visited Tile

A tile is considered visited when looking from above more than half of the robots area is within that tile.

Wall

The wall inside and enclosing the field, that creates the maze that the robot navigates during the scoring run. The walls also include the structure supporting it, e.g. pillars, aluminium profiles, …

4. Field

4.1. Layout

1. All measurements in the field section has a tolerance of ± 10%.
2. The tiles shall be squares and have sides that are between 26 and 32 cm (inclusive). This rule has a measurement tolerance of 0%.
3. Walls shall be at least 12.5cm high measured from the field floor and shall be the length of the tile and be mounted on the edges of the tile.
4. The minimum height between the floor and any ceiling shall be 25 cm.
5. The field floor shall be made up of a whole multiple of tiles, the tiles may have deviations of up to 3mm in height and gaps of up to 3mm. There may be holes in the floor for fastening walls.
6. The placement of walls, field elements and tiles may be modified during the round by the field judge before the start of a scoring run as long as the scoring and difficulty is the same during the round.
7. Environmental conditions may vary across fields, the field and rounds. The conditions includes but is not limited to lighting, magnetic field, …
8. The competition area is the field and 150 cm around the field where only functionaries and designated team members are allowed within. The field judge may include other people access to the competition area.

4.2. Hazard Zone

1. There may be a hazard zone on the field, it shall be enclosed and any entrance shall be marked with a red tile.
2. The hazard zone may not prevent the robot from exploring the field outside the hazard zone, and the start point may not be inside the hazard zone.
3. Inside the hazard zone the hazard variant of the rules may be used, i.e the modification marked with **Hazard Variant:** .

4.3. Colored Tiles

1. A colored tile shall be the same size as any other tile, and shall be fixed to the floor.

4.3.1. Blue Tile

1. After visiting a blue tile a robot needs to stop and stay still for 5 consecutive seconds before it is allowed to visit another tile. If this is not done it shall be considered a lack of progress.
2. **Scoring Condition:** Shall be considered scored when the robot makes a successful visit of another tile after visiting the blue tile.

4.3.2. Black Tile

1. A visit of a black tile shall be considered a lack of progress.
2. For consideration of linear/floating tiles black tiles shall be considered a wall.

4.3.3. Silver Tile

1. The last visited silver tile shall be considered the current checkpoint.

4.4. Field Elements

4.4.1. Speed Bump:

1. Speed bumps shall be fixed to the floor.
2. Speed bumps shall have a maximum height of 1 cm, measured from the floor.
3. Speed bumps shall not be placed on any ramp or stair.
4. **Hazard Variant:** Maximum height of 2cm and allowed to be placed on ramps.
5. **Scoring Condition:** Shall be considered scored when the robot after visiting a tile containing a speed bump successfully visits a tile without the speed bump on it.

4.4.2. Obstacles

1. Obstacles shall have a minimum height of 15 cm.
2. Obstacles may be fixed to the floor.
3. Obstacles shall be at least 20 cm from any wall or touching any wall and at least 20 cm from the opposite edge of the tile and any other obstacle.

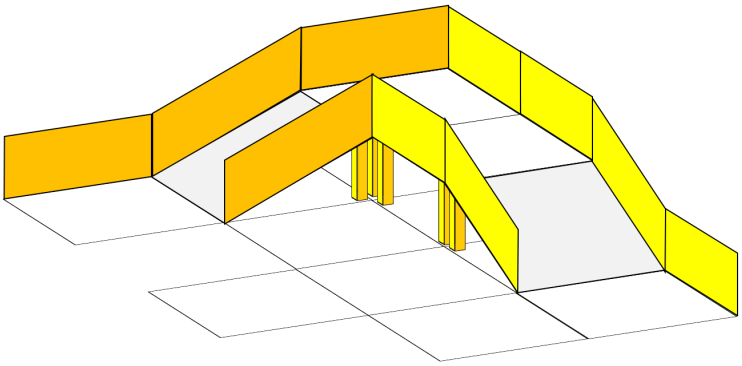
4.4.3. Debris

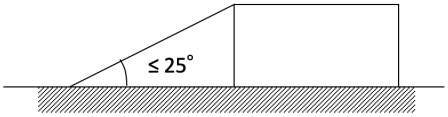
1. Debris may only be placed inside the hazard zone.
2. Debris shall not be fixed to the floor.
3. Debris shall have a maximum height of 1 cm, measured from the floor.

4.4.4. Ramps

1. Ramps shall have a maximum incline of 25 degrees from the horizon.
2. Ramps may not be placed next to each other so that it creates a peak like structure.
3. Ramps shall end with a horizontal tile.
4. **Hazard Variant:** Maximum incline of 30 degrees.
5. **Scoring Condition:** Shall be considered scored when the robot after visiting a ramp tile successfully visits a horizontal tile, the horizontal tile must be a tile that the robot did not begin its navigation

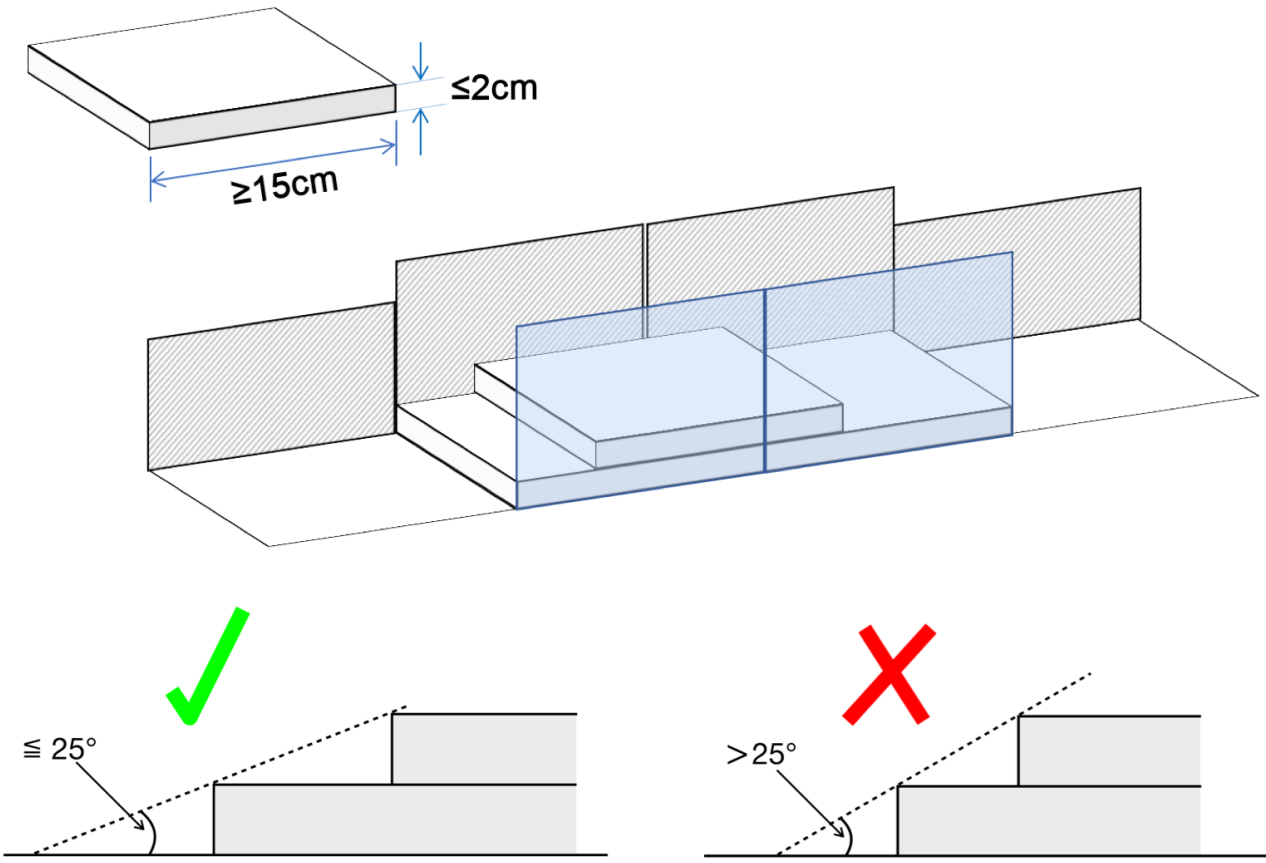
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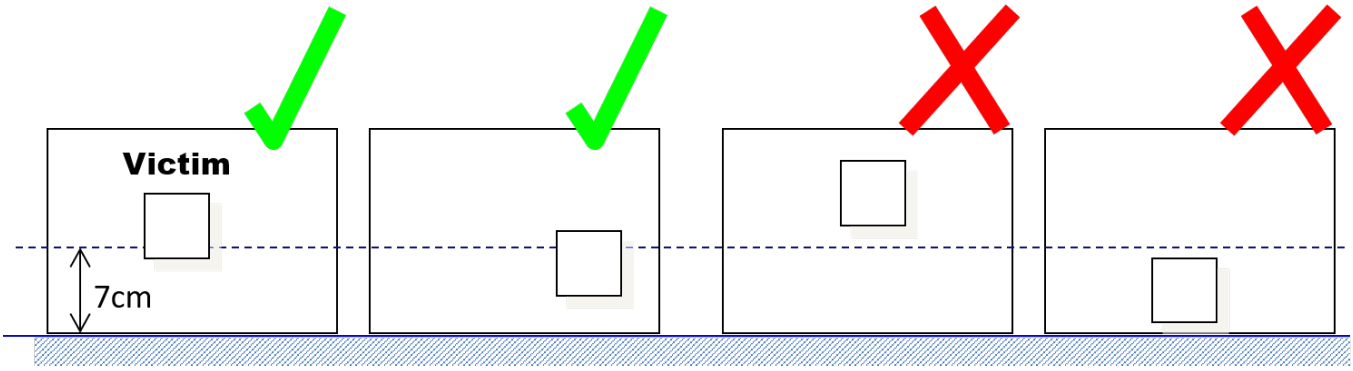
4.4.5. Stairs

1. The width of the stairs shall be the same as the tiles.
2. Each step of the stair shall have a maximum height of 2 cm.
3. If a stair has a peak like structure the top step shall have a length of at least 15 cm but less than the length of a tile.
4. Stairs shall end with a horizontal tile.
5. Stairs shall have a maximum incline of 25 degrees between each step.
6. **Hazard Variant:** Maximum incline of 30 degrees.
7. **Scoring Condition:** Shall be considered scored when the robot after visiting a stair tile successfully visits a horizontal tile, the horizontal tile must be a tile that the robot did not begin its navigation from.



4.4.6. Victims

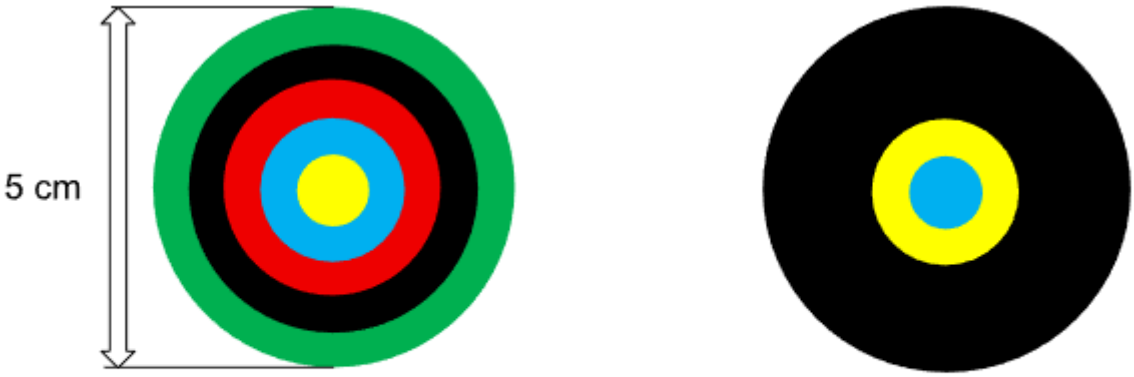
1. The victim shall be placed on a wall not facing a color tile/obstacle/speed bump/stair and/or ramp. Any part of the victim must be 7 cm from the floor.



2. The victim shall be represented in one of two way, either by a smiley victim and/or a cognitive victim. They shall be printed on or attached to the wall, the victim may not protrude more than 3mm from the wall. The victim can be in 1 of 3 states, harmed/stable/unharmed.
3. Smiley victims shall be represented by a smiley face emoji, the victim shall be of a contrasting color to the wall. The victim may be rotated and their diameter shall be 4 cm.
    a. The Harmed state is represented by a sad face.
    b. The Stable state is represented by a neutral face.
    c. The Unharmed state is represented by a happy face.



4. Cognitive victims shall be represented by a circle of 5 concentric rings where the innermost circle has a diameter of 1 cm and where each subsequent ring having a diameter of 1 more cm. Each circle may have a different color of the one before it where each color represents a different numerical value, black=-2, red=-1, yellow=0, green=1, blue=2. A value is then calculated by the sum of the 5 rings.
    a. The Harmed state is represented by the value 2.
    b. The Stable state is represented by the value 1.
    c. The Unharmed state is represented by the value 0.



5. The victims identification area is a half circle with a radius of 15cm in front of the victim.
6. There may be objects and/or symbols on/in the field that resemble victims in appearance but that are not victims.
7. **Scoring Condition:** Shall be considered scored when the robot while within the victims identification area uses its identification light to blink for 5 seconds, with a interval of 500ms on 500ms off, while remaining stationary.

5. Robot

5.1. Control

1. After start by a designated team member the robot must run autonomously.
2. The robot may not use any kind of pre-mapping, including but not limited to placement of walls, features, ...

5.2. Construction

1. The robots design and construction shall be primarily and substantially the teams original work.
2. The robot may not hover or fly.
3. Robot kits and/or components specifically designed and/or marketed to complete any single primary task of RoboCupJunior Rescue may not be used.
4. Only lasers of class 1 and 2 are allowed, teams using lasers must have the data-sheet for the laser available and provide them to the competition if/when asked to.
5. The robot must be equipped with a handle that is to be used to pick it up during the scoring run.
6. Robots may not have any sensors or devices that enable them to "see" over walls.
7. The robot must be equipped with an identification light that is easily visible to the field judge.
8. Robots may not intentionally mark or damage the field.

5.3. Rescue Kits

1. Rescue kits may be carried and deployed by the robot.
2. A rescue kit shall have a minimum size of 1.5 cm in each dimension and a minimum volume of 3.375 cm^3 after deployment, and shall be provided by the competing team.
3. **Scoring Condition:** Shall be considered scored when after the robot has entirely left the victims identification area, the rescue kit has stopped moving the kit is entirely within the victims identification area and the victim is identified.

5.4. Team

1. Each team may only have one robot on the field.
2. Each team member must be able to explain their work and have a specific technical role.

5.5. Inspection

1. The robot shall be inspected by at least 2 judges before the first game, to make sure that the rules are followed.

2. Use of a robot similar to another team's robot is not allowed.
3. The team is responsible that the robot is re-inspected if they have done any substantial changes from the last inspection.
4. All teams must submit their source code to the competition organizers before the competition, as well as any substantial changes to their source code. The source code shall not be shared by the organizers unless permission is given by the team.
5. A team that has not passed inspection may not compete, if the robot has not passed inspection when it is their turn that round is forfeited.

6. The Game

6.1. Before the Game

1. Before each game the team shall designate 1 or 2 members to be designated team members.
2. Before each game the designated team members shall explain their lack of progress procedure to the field judge, show their identification light and inform the field judge if they want to calibrate their robot.
3. When the designated team members are ready, or the allotted start time for the round has passed, the field judge shall countdown and start the timer thereby starting the game, after this the robot and/or designated team members are not allowed to leave the competition area before the end of game.
4. Before the start of the scoring run calibration of the robot may be done, calibration may be skipped by the team. After a scoring run has started no more calibration is allowed, this includes any changes to code or code selection.

6.2. Calibration

1. The robot may not move on its own during calibration.
2. Designated team members may place and move the robot anywhere within the competition area.
3. During calibration designated team members may take sensor readings and modify the corresponding values in the robot's program.

6.3. Scoring Run

1. To start the scoring run a designated team member shall inform the field judge, then start the robot on the starting tile as indicated by the field judge.
2. The robot may start in any direction on the start tile.
3. If the team does not calibrate the robot, it may start on the start tile with the field judge countdown.
4. Any moved field element or part lost by the robot may not be reset until after the scoring run.

6.4. Lack of Progress

1. When a lack of progress is called the lack of progress procedure shall be performed by a designated team member and the robot shall then be restarted from the last visited checkpoint. The robot may restart in any direction.
2. If the robot has not visited any checkpoints, the start tile shall be the tile the robot restarts from.
3. The lack of progress procedure shall be consistent, simple and easy to follow by the field judge.
4. During a lack of progress only the demonstrated LoP procedure is allowed to be used without any modification, including but not limited to changing settings, removing specific debris, ...
5. A lack of progress is when:
    a. A designated team member declares a lack of progress.
    b. A designated team member touches the field or their robot without permission from a field judge.
    c. A field judge declares a lack of progress.

6.5. Misidentification

1. A misidentification is when a robot uses its identification light but does not score a victim identification or the exit bonus.
2. Identifying the same victim multiple times shall not be considered a misidentification.

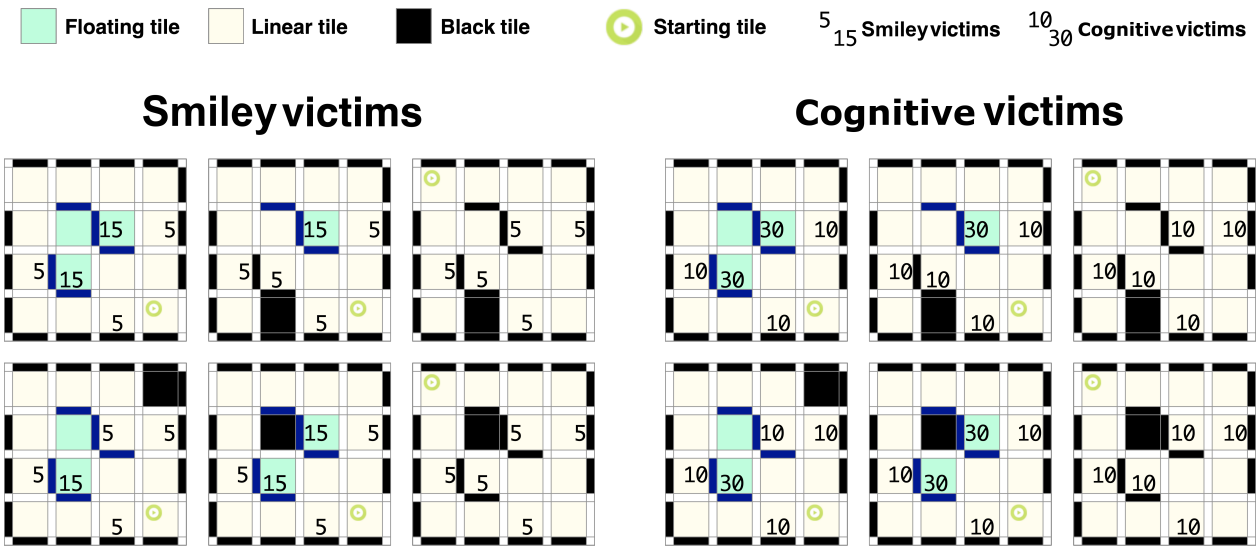
6.6. End of Game

1. When end of game is called the timer shall be stopped and the run time shall be recorded.
2. End of game is called when:
    a. 8 minutes of game time has elapsed.
    b. A designated team member declares end of game.
    c. The robot successfully scores the exit bonus.
    d. A field judge declares end of game.

6.7. Scoring during the Scoring Run

1. For each victim identification:
    a. Victim on linear tile:
        i. Smiley victim: 5 points.
        ii. Cognitive victim: 10 points.
    b. Victim on floating tile:
        i. Smiley victim: 15 points.

ii. Cognitive victim: 30 points



2. For each scored rescue kit:
   a. Victim is harmed: 10 points for 1 scored rescue kit, 30 points for 2 scored rescue kits, max 30 points.
   b. Victim is stable: 10 points for 1 scored rescue kit, max 10 points.
3. For each scored blue tile: 30 points, successive visit of a scored blue tile shall decrease the score by 10 points down to a minimum of 0 points.
4. For each scored speed bump tile: 5 points.
5. For each scored ramp: 10 points.
6. For each scored stair: 10 points.
7. For each scored checkpoint: 10 points.
8. For each misidentification: -5 points.
9. Each individual element on the field may only be scored once, the score may never be less than 0.

6.8. Extra Scoring

1. A reliability bonus is given, this is calculated from (but never less than 0):
   a. For each successful victim identification, 10 points.
   b. For each scored rescue kit, 10 points.
   c. For each scored blue tile, 10 points.
   d. For each lack of progress, -15 points.
2. The exit bonus is scored when the robot stays stationary on the start tile for 5 seconds with its identification light turned on. The exit bonus is calculated from:
   a. For each successful victim identification: 10 points.
   b. For each scored blue tile: 10 points.

c. For each scored stair: 5 points.

d. For each scored ramp: 5 points.

7. Competition

This chapter outlines the structure of an international RoboCupJunior Rescue competition. The competition format and the inclusion of elements like rubrics based scoring, Technical Challenges and the SuperTeam Challenge may vary in local, regional and super-regional competitions. Please refer to the respective organizer for details.

7.1. Rounds & Scoring

1. The competition will consist of multiple rounds of which the worst one or more will be omitted from the final score. The worst round is defined by the lowest normalized field score of the team.
2. The field score for every round will be normalized with the score of the best team of that round:

```
(NORMALIZED FIELD SCORE) = (FIELD SCORE) / (BEST FIELD SCORE)
```

3. The normalized field scores will be used to calculate the mean. The worst round(s) will not be considered here:

```
(MEAN OF NORMALIZED FIELD SCORES) = (SUM OF NORMALIZED FIELD SCORES EXCLUDING OMITTED
ROUNDS) / (NUMBER OF ROUNDS - NUMBER OF OMITTED ROUNDS)
```

4. The normalized rubrics score is made up of a sum of normalized scores for the individual rubrics as follows:

```
(NORMALIZED RUBRICS SCORE) =
   0.6 x (TDP SCORE) / (BEST TDP SCORE)
 + 0.2 x (VIDEO SCORE) / (BEST VIDEO SCORE)
 + 0.2 x (POSTER SCORE) / (BEST POSTER SCORE)
```

5. The Rubrics for TDP, Video and Poster will be available on the RoboCupJunior website and the RCJ Rescue Community website.
6. The score from the Technical Challenge will be normalized with the score of the best team:

```
(NORMALIZED TECHNICAL CHALLENGE SCORE) = (TECHNICAL CHALLENGE SCORE) / (BEST TECHNICAL
CHALLENGE SCORE)
```

7. The final score is made up of a weighted sum of normalized scores from the field score, the rubrics and the Technical Challenge as such:

```
(TOTAL SCORE) =
   0.6 x (MEAN OF NORMALIZED FIELD SCORES)
 + 0.2 x (NORMALIZED RUBRICS SCORE)
 + 0.2 x (NORMALIZED TECHNICAL CHALLENGE SCORE)
```

8. Ties in scoring will be resolved based on the mean of normalized field scores.

7.2. Technical Challenge

The Technical Challenge is an additional part of the competition where each team's ability to quickly modify the behavior of their robot will be tested. It consists of one or more mini-tasks with only a limited timespan to solve.

1. The Technical Challenge will take place after the scoring runs have ended.
2. The rules of the individual parts of the Technical Challenge will not be announced before the competition. The teams will only have limited time to prepare for the Challenge.
3. The timeframe for the completion of these tasks will be announced alongside the rules and scoring at a team meeting after the scoring runs.
4. The rules will require the teams to reprogram their robot to change its behavior. There will be no hardware changes required compared to the main scoring runs.
5. The time given will correspond to the difficulty level of the tasks.
6. Any external contact during the Technical Challenge is prohibited; non-team members are not allowed to take place on the competition area or to help the competitors remotely.

7.3. SuperTeam Challenge

The SuperTeam Challenge takes place independently of the main competition and won't influence the team's individual score. It has its own award and is focused on the cooperation between the teams.

1. Each SuperTeam will consist of at least two teams. Teams coming from regions that share a native language will not be part of the same SuperTeam.
2. The rules of the SuperTeam Challenge will be announced at the competition and require the teams of each SuperTeam to work together.
3. The SuperTeam Challenge will require substantial software changes and may require minor hardware adjustments.



It is highly recommended that teams bring some kind of communication hardware or think about a communication mechanism for this challenge.

4. The robot brought to the competition must remain substantially the same robot for the Super Team Competition.
5. Modifications should maintain the robot's original functional concept, mechanical layout, and

overall design approach. Changes that effectively create a second, entirely different robot are not allowed.

8. Open Technical Evaluation

8.1. Description

1. The organizers will evaluate your technical innovation during a dedicated time frame. All teams need to prepare for an open display during this time frame.
2. Judges will circulate and interact with the teams. The Open Technical Evaluation is intended to be a casual conversation with a question-and-answer atmosphere.
3. The Open Technical Evaluation's main objective is to emphasize the innovation's ingenuity. Innovative may mean technical advances compared to existing knowledge or an out-of-the-ordinary, simple but clever solution to existing tasks.

8.2. Evaluation Aspects

1. A standardized rubric system will be used, focusing on:
    - creativity
    - cleverness
    - simplicity
    - functionality
2. Your 'work' can include (but is not limited to) one of the following aspects:
    - creation of your own sensor instead of a pre-built sensor
    - creation of a 'sensor module' which is comprised of various electronics resulting in a self-contained module to provide a specific functionality
    - creation of a mechanical invention that is functional but out of the ordinary
    - creation of a new software algorithm for a solution

8.3. Documents

1. Teams must provide documents that explain their work. Each invention must be supported by concise but clear documentation. The documents must show precise steps towards the creation of the invention.
2. The deadline for delivering the documents is scheduled for 3 weeks before the first day of the competition through an online form.
3. Documents must include one Technical Description Paper (TDP), one Poster and one Video. Teams should be prepared to explain their work.
4. All teams must submit their TDP before the competition. The TDP is a public document that will be

shared with the community. The competition organizer will ask the team to fill out the web form or ask to submit a PDF file. All teams must strictly follow the guidance on the web form or, in the case of PDF submissions, strictly follow the template provided. If a team does not follow this guidance / template (including but not limited to the different sections, fonts, sizes and lengths) the score for the document will be 0 and is not going to be evaluated. A template for the TDP and rubrics are available on the RoboCupJunior Rescue Community Website.

5. All teams must submit a Poster file before the competition and bring a physical Poster to the competition venue. The Poster is a public document that will be shared with the community during the Poster Presentation session at the competition venue. The poster should include but is not limited to: the name of the team, country, league, robot description, robot capabilities, controller, the programming language used, sensors included, method of construction, time used for development, cost of materials, and awards won by the team in its country, etc. A guide for the poster format and rubrics are available on the RoboCupJunior Rescue Community Website.
6. All teams must create and submit a Video before the competition. The Video should be short and showcasing the work of the team. These videos will be presented during the competition and should summarize the key aspects of the team's project, design process, and innovations. A guide for the video format and rubrics are available on the RoboCupJunior Rescue Community Website.

8.4. Sharing

1. Teams are encouraged to review others' posters, TDPs and presentations.
2. Teams awarded certificates must post their documents and presentation online when the RoboCupJunior Rescue Committee asks.

9. Judging

1. During each game there shall be two judges in the competition area who are responsible for the field, persons and objects surrounding it.
2. During the game, decisions made by the field judge or assistant field judge are final.
3. If a rule is broken the field judge may call a lack of progress or end of game, depending on the severity.
4. After the game a designated team member shall review the games score-sheet and if they agree sign it. If the designated team member does not agree with the scoring they shall not sign and write a comment on why not. In the case of a disagreement with the score-sheet the competitions organizing committee shall investigate and decide on a resolution.
5. The competitions organizing committee shall only overrule a field judges decision if it is a clear and obvious mistake.
6. The competitions organizing committee may at any time release rules updates and/or rules clarifications. In this event they shall make this clear to competing teams.
7. Any rule violations may be penalized by disqualification from the tournament or the game or result in a loss of points at the discretion of the judges, officials, or competitions organizing committee.