RoboCup Singapore Open 2026 RCJ OnStage Rules (U12) Summary

(Based on RCJ OnStage Entry Rules 2026)

This summary is made based on RCJ OnStahe Entry Rules 2026 (https://robocup-junior.github.io/onstage-rules/main/onstage_entry_rules.pdf)

Teams should make sure to review *ALL* the pages of these rules. Each team has a responsibility to verify the latest version of these documents prior to the competition, as changes may be made at any moment. Teams are encouraged to study all documents in detail.

Preface

RoboCupJunior OnStage invites teams to design, build, and program creative and autonomous physical robots. The objective is to create a live robotic performance that uses technology to engage an audience. This includes a range of possible performances, such as dance, storytelling, theater, or art installations. While music may be used, it is optional. The league is intended to be open-ended, encouraging teams to be creative, innovative, and entertaining in both their robot design and their overall performance.

Innovation is a core pillar of OnStage, and teams are highly rewarded for robots that dynamically interact with their environment, humans, or other robots. The competition prioritizes personal growth and learning, requiring teams to construct their own robots rather than strictly following commercial kit instructions.

Teams are evaluated in the following three areas:

1. **OnStage Performance (50%):** A live stage show lasting no less than one minute.
2. **Technical Interview (30%):** A 15-minute live meeting to assess students' understanding of their robots and code.
3. **Poster (20%):** A digital PDF summarizing the design process and features.

Teams must choose exactly two technical robotic features—such as specific software solutions, electromechanical designs, or intelligent interactions—to be the focus of their judging. Teams should be prepared to demonstrate how these features are integrated into their robots and how they contribute to the progression of the live performance.

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1. What is OnStage

RoboCupJunior OnStage invites teams to design, build, and program creative and autonomous physical robots with the goal of creating a live robotic performance. The league is open-ended, allowing for a variety of creative routines such as dance, storytelling, theatre, or art installations.

Core Objectives and Innovation

The primary objective is to showcase the implementation and integration of two specific technical robotic features that visually enhance the performance's theme or story. Innovation is a central pillar, and teams are highly rewarded for robots that dynamically interact with their environment, humans, or other robots to alter their behaviour. Furthermore, teams must demonstrate personal growth and technical mastery by constructing their own robots—rather than following commercial kit instructions—and must be able to clearly explain their research, development, and individual technical roles to the judges

Judging and Scoring Components

A team's total score is a weighted combination of four main areas:

- **OnStage Performance (50%)**: A live stage show (minimum 1:30 minutes) on a 5 x 4 meter stage where robots must perform autonomously.
- **Technical Interview (30%):** A live meeting where judges evaluate the team's understanding of their robotics, code, and design authenticity.
- **Technical Poster (20%):** It describes two technical features being judged, and annotated pictures of the development process

2. Team Requirements

1. **Team Size:** Teams must have between 2 and 5 members.
2. **Age requirement:** All members are 12 or below.
3. **Roles:** Every member must have a defined technical role (e.g., software, mechanical, or electrical) and be able to explain it to judges.

3. Stage

1. **Dimensions:** The performance area is a 5 x 4 meter rectangle, with the 5-meter side facing the judges.
2. **Markings:** A black line (about 2cm width) marks the outside edge of the stage.
3. **Surface:** The floor is a flat, non-glossy white surface (typically painted MDF); teams should prepare for joints or irregularities of up to 5 mm.

4. Robot Requirements

4.1. Autonomy and Control:

4.1.1. Robots must perform autonomously during the performance routine.

4.1.2. Robots may be started manually at the beginning of the performance.

4.1.3. Remote control of any robot is strictly prohibited once the performance begins.

4.1.4. Interaction between robots, humans, or the environment is highly rewarded if it is used to dynamically alter the robot's behavior.

4.2. Construction and Originality:

4.2.1. Teams should construct their own robots rather than using the instructions that come with a commercial kit.

4.2.2. Teams are encouraged to design costumes for their robots, though they must respect copyright laws if using famous characters.

4.2.3. No robot or team member may be shared between different teams.

4.2.4. Every team member must have a defined technical role (e.g., mechanical, electrical, or software) and be able to explain it to the judges.

4.3. Physical Requirements and Setup:

4.3.1. Robots must be of a size and weight that team members can easily carry and lift onto the stage without assistance.

4.3.2. The performance stage is a rectangular area measuring 5 x 4 meters.

4.3.3. Robots must be started within the performance area to be considered for judging.

4.3.4. Teams have a total of 7 minutes on stage for setup, introduction, performance, and clearing the area.

4.3.5. The actual performance routine must last no less than 1:00 minute.

4.4. Power and Electrical Safety:

4.4.1. Robots are prohibited from using mains electricity.

4.4.2. The maximum allowed voltage is 48V DC or 25V AC RMS, and measuring points must be accessible or safely designed for inspection.

4.4.3. Lithium batteries must be stored in safety bags, and all charging in competition areas must be supervised by team members.

4.4.4. Robot designs must feature secure batteries, safe wiring, and emergency stop functionality.

4.5. Mechanical Safety:

4.5.1. Robots must have no sharp edges, pinch points, or other mechanical hazards.

4.5.2. The use of projectiles, explosions, smoke, flames, water, or any other hazardous substances is strictly forbidden.

4.6. Communication:

4.6.1. Robot-to-robot communication is encouraged but must use the 2.4GHz spectrum with a power output not exceeding 100 mW EIRP.

4.6.2. There must be no communication between off-stage devices and on-stage devices.

4.7. Interaction and Features:

4.7.1. Teams must choose and highlight exactly two technical robotic features that they are most proud of to be judged on.

4.7.2. These two features must be described on the team poster and demonstrated during the Technical Interview and Open Technical Demonstration.

4.7.3. Humans performing on stage must ensure they do not hide important components of the robot performance from the judges.

5. Technical Features to be Presented

5.1. Selection and Interaction

5.1.1. **Feature Count:** Teams must choose exactly two specific technical features of their robot(s) to be judged. These should be the aspects of the project the team is "most proud of".

5.1.2. **Technical Nature:** Both selected features must be of a technical nature (e.g., specific sensors, complex movements, or programming logic).

5.1.3. **Rewarded Interaction:** Teams are highly rewarded for features that allow intelligent interaction with the environment, humans (responding to sound or gestures), or other robots to dynamically alter behavior.

5.1.4. **Visual Integration:** While not explicitly listed as a "criteria," the performance is an opportunity to demonstrate these features through a creative stage show.

5.2. Presentation and Documentation Requirements

5.2.1. **Poster Documentation:** Teams must include a description of these two technical features on their Technical Poster.

5.2.2. **Technical Interview:** During the 15-minute Technical Interview, teams must demonstrate their understanding of these features and be prepared to show their programming code to the judges.

5.3. Judging Focus

5.3.1. Judges evaluate the features based on the students' technical understanding, the authenticity of the work, and the team's ability to explain not just what the components do, but how they do it.

6. Judging Components & Weighting

6.1. Judging Components

6.1.1. **OnStage Performance (50%):** A live performance of no less than one minute where teams demonstrate their robots through a creative stage show.

6.1.2. **Technical Interview (30%):** A live meeting of up to 15 minutes where judges evaluate the students' technical understanding of their robots and programming code.

6.1.3. **Technical Poster (20%):** A digital PDF summarizing the team's design process, performance description, and chosen technical features.

6.2. The "Two Robot Features" Requirement

6.2.1. Teams must choose exactly two technical robotic features they are most proud of to be the core focus of their judging.

6.2.2. These features must be described in the Poster and demonstrated during the Technical Interview and Open Technical Demonstration.

6.2.3. Features must be of a technical nature; for example, how a robot uses a particular sensor or interacts with another robot.

6.3. Evaluation Criteria

6.3.1. **Authenticity and Understanding:** Judges focus on determining the students' actual understanding of the robots they have developed. Teams are expected to build their own robots rather than follow commercial kit instructions.

6.3.2. **Dynamic Interaction:** Robots that interact with their environment, other robots, or humans to dynamically alter their behavior will be highly rewarded.

6.3.3. **Deductions:** Penalty marks are deducted for restarts during the performance. Robots started from outside the performance area will not be considered for judging.

7. Technical Poster (20%)

7.1. About the Technical Poster

The poster is a tool for sharing robot designs and insights with judges, other teams, and the public. It aims to summarize design documents and present the robot's capabilities in an engaging and visual format.

7.1.1. **Digital Submission:** Teams must submit a digital copy of their poster in PDF format by the deadline set by the organizers.

7.1.2. **Public Display:** Teams will be provided with public space in the competition area to display their physical Technical Poster for others to see.

7.2. Poster Content:

7.2.1. **Feature Identification:** Teams must clearly describe the two specific technical features they have chosen to be judged on during the performance.

7.2.2. **Development Documentation:** The poster must include annotated pictures of the development process, showing how the robot was designed and constructed.

7.2.3. **Performance Summary:** It should include the team name, region, and a brief description of the performance or stage show.

7.2.4. **Design Insights:** The content should highlight the technical choices made by the team, proving they constructed their own robots rather than strictly following commercial kit instructions.

7.3. Format and Duration:

7.3.1. **Physical Size:** The physical poster must be no larger than A1 size (60 x 84 cm).

7.3.2. **Visual Clarity:** Teams are encouraged to use an engaging format that makes their technical systems, such as sensors and mechanisms, easy for judges and the public to understand.

8. Technical Interview (30%)

8.1. About the Technical Interview

The Technical Interview is a live, in-person evaluation where judges determine the students' understanding of the robots they have developed and the authenticity of their work.

8.1.1. **Scoring and Weighting:** The interview accounts for 30% of the total score.

8.1.2. **Duration and Setting:** The meeting lasts up to 15 minutes and takes place in a separate room at the venue.

8.1.3. **Judging Panel:** It is conducted by a panel of at least three officials. At least one of these judges must be an official who also judges the Technical Interview and documentation.

8.1.4. **Language:** The interview is conducted in the main language of the event. Teams requiring a translator should inform officials prior to the event; however, no extra time will be provided for translated interviews.

8.1.5. **Follow-up:** If judges consider it necessary, teams may be asked to complete a second interview.

8.2. Core Requirements:

8.2.1. **Feature Demonstration:** Teams must demonstrate their understanding of exactly two chosen technical features. These should be the aspects the team is most proud of.

8.2.2. **Technical Explanations:** Every team member must have a defined technical role (e.g., software, mechanical, or electrical) and be able to explain their specific contribution to the robot's development.

8.2.3. **Software and Code:** Teams must bring their programming code to the interview.

8.2.4. **Authenticity and Credit:** Teams must be able to explain not just what their components do, but how they do it. Any use of external code or libraries must be clearly credited to the original creators.

9. Stage Performance (50%)

The OnStage Performance is a live show (50% of the total score) where teams demonstrate their robots through a creative routine such as dance, storytelling, theater, or art installations.

Core Objectives

1. **Creative Technology:** Teams must design, build, and program robots for an entertaining live routine.
2. **The Two Features:** Teams must highlight exactly two technical robotic features they are most proud of; these must be technical in nature.
3. **Dynamic Interaction:** High marks are awarded for robots that interact with their environment, humans, or other robots to dynamically alter their behavior.

9.1. Routine

9.1.1. **Opportunities:** A standard competition typically consists of two performances.

9.1.2. **Routine Duration:** The performance must last at least 1:00 minute.

9.1.3. **Total Stage Time:** Teams have seven minutes total for setup, introduction, performance, and clearing the stage.

9.1.4. **Timing:** The timer includes setup and clearing; however, no penalty is given if delays are caused by circumstances outside the team’s control (e.g., music start issues).

9.1.5. **Signals:** Teams must start with a “3-2-1” countdown and clearly signal the end of the performance.

9.2. Restarts

9.2.1. **Allowance:** Restarts are allowed at judges' discretion with no limit on the number within the seven-minute stage time.

9.2.2. **Procedure:** A restart must be verbally signaled and begins with a new "3-2-1" countdown.

9.2.3. **Scoring:** Scores and deductions are reset to 0 upon a restart request, but penalty marks are applied to the final score.

9.3. Music and Multimedia Presentations

9.3.1. **Optional Media:** Music and video/slideshows are encouraged to complement the performance.

9.3.2. **Copyright:** Teams must follow the Copyright Law of the region where the event is held.

9.3.3. **Prohibited Content:** Routines must not include violent, military, threatening, or offensive elements.

9.3.4. **Hazardous Substances:** Projectiles, explosions, smoke, flame, water, or other hazardous substances are strictly forbidden.

9.4. Stage

9.4.1. **Calibration:** Teams must be ready to calibrate robots for specific venue conditions, such as lighting, metal staging affecting compasses, and floor stability.

9.5. Robots

9.5.1. **Originality and Copyright:** Teams are expected to construct their own robots rather than strictly following instructions from a commercial kit. If a team uses a famous character for their robot's appearance, they must adhere to the Copyright Law of the region where the event is held.

9.5.2. **Portability and Size:** While there is no explicit limit on the number of robots, they must be of a size and weight that team members can easily carry and lift onto the stage without assistance.

9.5.3. **Judging Eligibility:** Robots must be started from within the performance area to be considered for scoring; any robot started from outside this area will not be judged for the duration of the performance.

9.6. Communication and Localization

9.6.1. **Technical Specifications:** Robot-to-robot communication is encouraged but must use the 2.4GHz spectrum with a power output not exceeding 100 mW EIRP.

9.6.2. **Communication Boundaries:** There must be no communication between off-stage devices and on-stage devices.

9.6.3. **Interaction and Localization:** Robots are encouraged to sense their environment, including the use of static props to trigger actions or navigate. (Note: While your text mentions "beacons," the rules specifically highlight the use of sensors to interact with props and the environment to dynamically alter behavior).

9.7. Scenery (Props)

9.7.1. **Encouraged Use:** Props are encouraged to add value to the performance.

9.7.2. **Interaction:** Robots can sense static props to perform a certain task or trigger an action.

9.7.3. **Scoring Area:** Interactions or movements must have a point of contact within the performance area to be considered for scoring.

9.8. Robot Autonomy and Interaction

9.8.1. **Manual Start:** Robots may be started manually at the beginning of the performance.

9.8.2. **No Remote Control:** Remote control of any robot is prohibited during the performance routine.

9.8.3. **Dynamic Interaction:** Interaction between robots and/or humans that dynamically alters the robot's behavior is highly rewarded.

9.9. Humans on Stage

9.9.1. **Performing:** Human team members may perform on stage and use acting to illustrate the robots' movements.

9.9.2. **Obstruction:** Humans must ensure they do not hide important components of the robot performance from the judges or audience.

9.10. Deductions

9.10.1. **Restarts:** Penalty marks will be deducted for every restart requested by the team.

9.10.2. **Starting Location:** Robots started from outside the 5 x 4 meter performance area will not be judged during the entire performance.

9.10.3. **Reusing Robots:** Teams reusing robots without informing the judges will be subject to deductions.

10. Code of Conduct

10.1. Spirit

10.1.1. It is expected that all participants, students, and mentors, will respect the RoboCupJunior mission. In addition, participants should keep in mind the values and goals of RoboCupJunior.

10.1.2. It is not whether you win or lose, but how much you learn that counts. Choosing not to take this opportunity to collaborate with students and mentors from all over the world means missing out on a lifelong learning experience. Remember this is a unique moment!

10.2. Fair play

10.2.1. It is expected that the aim of all teams is to participate in a fair and clean competition.

10.2.2. Humans that may cause deliberate interference with robots, robots' performance and/or damage to the stage will be subject to disciplinary action. This will be decided by the OnStage Committee and RoboCupJunior Officials.

10.2.3. Remember, helping those in need and demonstrating friendship and cooperation is the spirit of RoboCupJunior, as well as helping make the world a better place.

10.2.4. Participants are encouraged to help each other.

10.3. Behavior

10.3.1. All behavior is to be of a subdued nature while at the competition. It is expected that every participant behaves in a respectful manner towards each other.

10.3.2. Participants are not to enter set-up areas of other leagues or other teams unless expressly invited to do so by other team members. Participants who misbehave may have disciplinary action taken against them.

10.4. RoboCupJunior Officials

10.4.1. The officials will act within the spirit of the event. The RoboCupJunior officials shall not have a close relationship with any of the teams in the league they judge.

10.5. Mentors

10.5.1. Each team is required to have a mentor to assist with the communication between the team and facilitate learning. The mentor receives communication from the committee leading up to and during the competition via their specified E-Mail-Address.

10.5.2. Mentors (defined as teachers, parents, chaperones, translators, or any other non-team member) are not allowed in the student work area except to assist in carrying equipment in or out of the area on the arrival and departure days.

10.5.3. If a problem is encountered that is beyond the team's capabilities and is clearly beyond the reasonable ability level of a student to repair, mentors may request assistance from the OnStage Committee, including supervised support to conduct repairs.

10.5.4. Mentors are not allowed to set up equipment on stage, as this should be the responsibility of team members. Teams should design all robots and any additional equipment to be carried by team members only.