



RCAP CoSpace Humanoid OnStage Rules 2026

These are the official rules of the RoboCup Asia-Pacific CoSpace Humanoid OnStage in 2026.

The English version of these rules shall prevail over any translation.

1. Overview

RCAP CoSpace Humanoid OnStage is a new RCAP STEAM performance league that brings together humanoid robotics, artificial intelligence, virtual worlds, storytelling, and the performing arts. Teams create an original stage performance in which human performers, autonomous physical humanoid robots, supporting robots, and virtual characters interact in a hybrid real-virtual environment. Participants are encouraged to use AI tools as creative partners for ideation, scripting, music, 3D assets, visual effects, and technical development, while demonstrating clear student ownership, technical understanding, and artistic expression. The league aims to help students become interdisciplinary learners who can connect STEM, AI literacy, design, and the arts through hands-on creation and public performance.

The performance environment is uniquely composed of two integrated spaces:

- 1) Virtual World: A 3D digital world featuring 3D objects, music, video lighting, and particle effects. This space includes programmable virtual wheeled robots and virtual humanoid robots, the latter of which allows for technical gait tuning.
- 2) Real World: The real-world stage where autonomous physical robots (custom-built or commercial) and human performers interact with the projected virtual scenery.

A core pillar of this league is the integration of AI tools in a hands-on, frustration-free manner. Teams are encouraged to use AI for ideation, such as using Large Language Models to craft performance scripts, and for asset generation, including the creation of 3D objects, original music, and dynamic lighting effects.

The league is intended to be open-ended and innovative, focusing on how effectively teams use these diverse technologies to engage an audience. Rather than just studying AI in theory, students must demonstrate its practical deployment to support their chosen theme and narrative. The final assessment prioritizes the logic of AI integration, the implementation of robotics features, and the creative problem-solving journey undertaken by the team.



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2. General Rules

2.1 Team Size

2.1.1 Minimum Team Size: Teams must consist of at least 2 members.

2.1.2 Maximum Team Size: 5 members

Note: Regional competitions may define their own team sizes depending on their venue capacity and regional variations.

2.1.3 Shared Members and Robots: No team member(s) or robot(s) may be shared between teams.

2.2 Age Requirements

2.2.1 U12 Age Group: All team members must be aged 12 years and below.

2.2.2 U19 Age Group: All team members must be aged 19 years and below, and at least one member must be aged 13 or above.

2.2.3 Age Determination Date: Age is determined as of July 1st of the competition year.

2.3 Authenticity and Originality

The core mission of the CoSpace Humanoid OnStage **League** is to turn "imagination into impact" through a student-centered journey. To maintain a fair and inspiring environment for all participants, please adhere to the following requirements:

2.3.1 Original Ideas: All team performances must be based on unique and original ideas. Teams should develop their own storytelling or dance themes rather than duplicating performances from other teams or previous years.

2.3.2 Original Mobile Robots & Props: While teams may use various components, the design and construction of mobile robots and props must be the original work of the students. Teams are strongly encouraged to move beyond standard commercial kit instructions to showcase their own engineering and creativity.

2.3.3 Humanoid Robots (Real): The use of commercial humanoid robots is permitted. However, teams will be highly rewarded for their own custom programming and integration of these robots into the show. While the use of standard gaits is allowed, teams must communicate with the judging panel prior to the competition to disclose their use and clarify which aspects of the movement logic were developed by the students.

2.3.4 Proof of Authenticity: Teams are required to maintain a learning journey or documentation (such as a problem-solving journal or photos of development stages) to demonstrate that the programming, construction, and AI-assisted assets are the original work of the team members.

2.3.5 Please Note: Any team found to have knowingly used duplicate robots, costumes, or performance movements—or whose work was significantly completed by a mentor—will be subject to Authenticity Deductions of up to 20 points or potential disqualification.



2.4 Plagiarism Guidelines

- 2.4.1 Teams may use music or video to complement their performance. If a team uses copyrighted music, they should follow the Copyright Law of the region where the event is held.
- 2.4.2 External Code Use: Teams are allowed to use external code but must credit the original creators.
- 2.4.3 Learning Priority: Teams should prioritize learning and not use complete solutions from others. Always pay attention to licensing rules.

2.5 Bill of Materials (BOM)

- 2.5.1 Submission of Hardware components: Teams must submit a BOM (Bill of Materials) listing major components and materials used. The BOM must include:
 - 1) Component name/description (e.g., part number).
 - 2) Supplier/source of the component (including PCBs/machined components).
 - 3) Status (new/reused).
 - 4) Kit or custom-built.

2.6 AI Asset Disclosure Log

- 2.6.1 Submission of AI-generated components: Teams must submit a AI Asset Disclosure Log listing all components created using AI tools. The BOM must include:
 - 1) AI-generated 3D Objects
 - 2) AI-generated music
 - 3) AI-generated video
 - 4) Any other components created by AI

2.7 Documentation and Sharing Requirements

- 2.7.1 Since the beginning, RoboCup and RCAP have prioritised the sharing of knowledge and discoveries gained during our events. This spirit of collaboration advances the RCAP educational mission and strengthens the bonds within our community. We are confident that such sharing benefits all participants. Generally, teams may share their work through team presentations.

2.7.2 PPT Presentation

- 1) Teams must create a PowerPoint presentation with a minimum of 10 slides. The PPT should summarise:
 - a) The core theme of the CoSpace Humanoid OnStage performance.
 - b) How various AI tools were integrated.
 - c) How the robots, including the humanoid robots, were programmed and utilised to enhance the theme.
 - d) The PPT presentation will be uploaded to the RCAP Academy channel for public sharing.

2.7.3 Influencer Videos

- 1) Teams may create a presentation video based on the template provided by the event organizer.



- 2) These team presentation videos will be uploaded to the RCAP Academy channel (<https://www.youtube.com/RCAPAcademy>) for public sharing.

2.8 Spirit and Behavior

2.8.1 Behavior: All participants are expected to behave themselves and be considerate and polite especially but not only towards other participants, volunteers, referees and organisers of all Junior and Major Leagues as well as the host venue.

2.8.2 Code of Conduct: All organisers, volunteers, team members, mentors, supporters and visitors must abide by the RoboCup Federation Code of Conduct. Any instances where, a situation occurs that does not meet the code of conduct must be reported to a RoboCup Federation organisation member and will be investigated.

2.8.3 Mentoring and Onsite Assistance

- 1) Support from other teams, mentors, teachers, parents, sponsors, internet communities etc. is a core part of how teams learn and grow.
- 2) To ensure fair competition and maximize learning it is required that none of the support they receive does the work of competing for the team. A good indication is the team's ability to explain not only what their robots' components do but also how they do it.

3. Real World

3.1 Real Performance Stage (Real Environment)

3.1.1 The size of the performance stage area is a rectangular area of 5 x 4 meters for robots with the 5 meter side facing the judges.

3.1.2 There is a black line marking with a minimum of 19 mm width outside the stage.

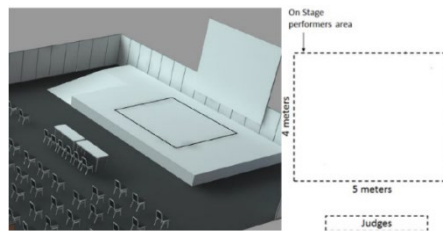


Figure 1: Performance Stage

3.1.3 The floor provided shall be made of a flat (non-glossy) white surface, for example, painted MDF (compressed wood). While floor joints will be made to be as smooth as possible, robots must be prepared for irregularities of up to 5 mm in the floor surface.

3.1.4 Teams should come prepared to calibrate their robots for the venue condition.

3.2 Robot Requirements

3.2.1 Robot Type: Fully autonomous wheeled robots and humanoids can be used. Each team must have at least one real and/or virtual humanoid robot in the performance.



3.2.2 Robot Size: Prior to the competition, teams must consult with the Organizing Committee if any robot exceeds 2 meters in height.

3.3 Robot Communication

3.3.1 Permitted Communication: Communication between robots during the performance is allowed as long as it uses the 2.4GHz spectrum and its power output does not exceed 100 mW EIRP (Effective Isotropic Radiated Power) under any circumstances.

3.3.2 Responsibility: Teams are responsible for managing their robot communication. Spectrum availability is not guaranteed.

3.3.3 Communication: Communication between different components of the same robot is permitted.

3.4 Safety and Power Requirements

3.4.1 Electrical Power:

- 1) Robots must not use mains electricity.
- 2) Maximum allowed voltage: 48V DC or 25V AC RMS (Root Mean Square).
- 3) Voltage must be easily measured during inspections, and measuring points must be covered for safety or designed with safety considerations in place.

3.4.2 Battery Safety:

- 1) Lithium batteries must be stored in safety bags, and charging must be supervised by team members in competition areas.
- 2) Teams must follow safety protocols, including battery handling and evacuation procedures.

3.4.3 Robot Safety Design:

- 1) Power Management: Secure batteries, safe wiring, and emergency stop functionality.
- 2) Mechanical Safety: No sharp edges, pinch points, or other hazards. Actuators must be appropriate for the robot's size and function.
- 3) Hazardous Behavior: Teams must report potentially dangerous robot behaviors at least two weeks before a RCAP event.

3.5 Other Props on Stage

3.5.1 Prior to the competition, teams must consult with the Organizing Committee if the stage props involve the use of water or fire.

4. Virtual World

The virtual world in CoSpace Humanoid OnStage is a sophisticated digital extension of the real stage, creating a seamless co-existence between real and digital performers. This environment is typically projected onto a backdrop screen and serves as the canvas where technology meets creativity.



4.1 Environmental Components

4.1.1 The virtual environment is a multi-layered digital space designed to support the team's narrative. It consists of the following components:

- 1) 3D Objects: Custom-designed digital assets, such as buildings, trees, or specialized props, that provide the setting for the performance.
- 2) Atmospheric Effects: Dynamic video lighting and particle effects (e.g., smoke, fire, or sparkles) that can be added to the virtual world to create "extraordinary effects" that might be hazardous in the real world.
- 3) Integrated Multimedia: Original music, speeches, and video displays embedded within the environment to enhance theme delivery.

4.1.2 Each team must include at least one autonomous humanoid robot in the performance. Wheeled robots, virtual robots, and props may be used as supporting performers.

4.2 Virtual Performers

4.2.1 The virtual world is populated by autonomous digital entities that teams must design and program creatively:

- 1) Virtual Humanoid Robots: Digital performers that provide a platform for advanced technical development, specifically gait tuning, where students optimize the walking patterns and physical balance of the humanoid in the digital space.
- 2) Virtual Wheeled Robots: Fully programmable autonomous agents that can interact with humanoids and real-world performers.
- 3) Cinematography: Teams are judged on the creative use of a virtual cameraman, allowing for dynamic camera angles and perspectives within the 3D space to better engage the audience.

4.3 AI Asset Creation

4.3.1 In line with the **league's** focus on AI literacy, students are encouraged to use AI tools in a hands-on, "frustration-free" manner to generate virtual assets:

- 1) Generative AI for 3D Assets: Teams can use AI to create complex 3D objects and environment textures.
- 2) Generative Audio/Visuals: AI tools may be used to craft original music, lighting sequences, and particle effects to ensure the virtual scenery is unique and impactful.

5. Real-Virtual Worlds Interaction

5.1.1 The virtual world is an active participant in the show, not just a static backdrop. One of the key technical requirements is establishing real-virtual and virtual-virtual communication. Virtual robots and environmental items should react accordingly once they receive a signal from the physical world, ensuring the two environments are fully integrated.



6. AI-Generated Component Requirements

6.1 Scope of AI Integration

6.1.1 CoSpace Humanoid OnStage encourages the exploration of AI. Teams are permitted and encouraged to use generative AI tools to assist in the creation of various performance components to lower the barrier for beginners and focus on high-level creativity and storytelling.

6.2 Permitted AI-Generated components

Teams are encouraged to use AI tools for the following components of their performance:

6.2.1 Ideation and Scripting: Using Large Language Models (LLMs) to brainstorm performance themes, develop character backstories, and craft the final narrative script.

6.2.2 Virtual Scenery and 3D Assets: Generating 3D objects, textures, or environmental designs for use within the CoSpace virtual environment.

6.2.3 Audio and Soundscapes: Creating original music, soundtracks, or synthesized voices for the humanoid performers that complement the theme.

6.2.4 Visual Effects: Developing video content, dynamic lighting sequences, and particle effects (such as smoke or sparkles) that interact with the live and virtual performers.

6.2.5 Technical Assistance: Using AI for coding logic, gait tuning suggestions for humanoids, or debugging robot-to-virtual communication protocols.

6.3 Documentation and Disclosure

Transparency regarding the use of AI is a mandatory requirement for technical assessment.

6.3.1 AI Tool List: Teams must provide a comprehensive list of all AI tools and third-party libraries used during the project.

6.3.2 Implementation Methodology: For every AI-generated component, teams must explain the "How" and "Why"—detailing the prompts used, the iterative process of refining the AI's output, and how the final result was integrated into the performance.

6.3.3 Credit: Teams must credit the specific AI tools used within their Technical Poster or Technical Description Poster and during the interview.

6.4 Assessment of AI Components

During the Technical Interview, judges will assess the AI components based on:

6.4.1 Deployment Logic: Why did the team choose a specific AI tool for a particular task?

6.4.2 Human-AI Collaboration: How did the team "learn by doing" through the AI's output? The team must demonstrate a clear understanding of the assets the AI helped create.

6.4.3 Problem Solving: What challenges were encountered when using AI tools (e.g., assets not scaling correctly or scripts needing tonal shifts), and how did the team resolve them?



7. Judging Overview

All teams are judged in the following areas:

- 1) Technical Documentation (20%)
 - a) Technical Poster (U12 age group)
 - b) Technical Video (U19 age group)
- 2) Technical Interview (30%)
- 3) OnStage Performance (50%)

8. Judging – Technical Documentation (20%)

8.1 General Requirements for All Documentation

- 8.1.1 The technical documentation is a critical component of the CoSpace Humanoid OnStage League, allowing teams to share their design journey, the intersection of STEM and the arts, and their practical application of AI tools. The requirements are tailored to the development levels of each age group.
- 8.1.2 Language: All documentation must be presented in English.
- 8.1.3 Authenticity: Teams must clearly establish that the work is their own and disclose if any components were reused from previous years with substantial improvements.
- 8.1.4 AI Transparency: Teams must clearly distinguish between student-written code/assets and those generated by AI tools.

8.2 Technical Poster (U12 Age Group)

- 8.2.1 The Technical Poster serves as a visual record of the team's "imagination to impact" journey. Its primary aim is to explain the technology and creative process used to build their hybrid performance in a format that is interesting and entertaining for judges, other teams, and the public.
- 8.2.2 The poster must be A1 size (60 x 84 cm) and submitted as a PDF. It includes the following:
 - 1) Team Identity: Clearly display the team name, country, and a photo of the team members.
 - 2) Performance Narrative: A brief summary of the story or theme being presented on stage, explaining how the team used robots to bring a performance to life.
 - 3) AI Creative Partners: A simple disclosure of the AI tools used (e.g., using AI to help write the script, generate background music, or design 3D objects for the virtual world).
 - 4) Visual Highlights: Use annotated pictures to showcase the physical humanoid robots and the virtual environment (such as 3D buildings, particle effects, and video lighting).
 - 5) Development Stages: Include photos of the team at work to show the different stages of robot development and virtual world design, helping to establish the authenticity of the performance.



8.3 Technical Video (U19 Age Group)

8.3.1 The Technical Video Presentation is a recorded demonstration designed to provide a "behind-the-scenes" look at the team's project. It focuses on the technical depth and the integration of AI literacy and humanoid robotics that may not be fully visible during the live performance

8.3.2 Purpose: The aim is to showcase how the team moved from "imagination to impact" by integrating mechanisms, sensor systems, and algorithms into their performance.

8.3.3 Requirements:

- 1) Duration: The video must be a maximum of 6 minutes.
- 2) Visibility: During technical demonstrations, robots must be presented without costumes so that their construction and movement mechanisms (e.g., DOF, wiring) are visible.
- 3) Language: The video must be in English, including voice-overs and on-screen text. Subtitles are highly recommended.

8.3.4 Content Guidelines:

- 1) AI Workflow: Teams must explain their deployment of AI tools (such as Gemini or other generative AI) to create performance scripts, 3D assets, or original music.
- 2) Humanoid Implementation: A technical demonstration of humanoid robot integration, specifically highlighting gait tuning and autonomous control
- 3) Hybrid Interaction: Evidence of wireless communication (Bluetooth, Wi-Fi, Zigbee, or other approved communication) and interaction between the physical robots and the virtual AI environment.
- 4) Problem-Solving: Teams should provide clear examples of technical challenges encountered and the original solutions developed

9. Judging – Technical Interview (30%)

9.1 General Requirements for Interview

9.1.1 The Technical Interview is the primary tool for verifying the authenticity and originality of the students' work. During the Technical Interview, teams demonstrate their project's technical depth and prove the authenticity and originality of their work to a panel of judges.

9.1.2 Format:

- 1) Duration: Up to 20 minutes.
- 2) Attendance: All team members must be present and prepared to explain their specific technical roles (e.g., software, hardware, use of AI tools.)
- 3) Materials: Teams must bring all physical robots, program code, and virtual environment.

9.1.3 In the modern AI era, every student is expected to grow as an interdisciplinary learner. Regardless of age group, teams must be transparent about the AI tools they used. They must clarify which parts of their performance were assisted by AI and explain their own role in guiding and refining those



outputs to ensure the project remains their original work.

9.1.4 **League** Evolution Proposal (Bonus): Teams are invited to act as "Consultants" and propose one innovative enhancement for the CoSpace Humanoid OnStage League. Bonus points are awarded for technically feasible and constructive ideas; no points are deducted if no proposal is offered.

9.1.5 Authenticity & Deductions: To ensure a student-centered "learning by doing" environment, judges may apply a deduction of up to 20 points if they believe mentors or adults were involved in building, programming, or directing the choreography.

9.2 Technical Interview (U12 Age Group)

9.2.1 Focus: Exploration, Interdisciplinary Learning, and "Frustration-Free" AI Literacy.

9.2.2 Objective: The interview for the U12 group is designed to be an encouraging and hands-on experience. Judges focus on the students' ability to explain their creative process and their basic understanding of how their robots and virtual worlds function together.

9.2.3 AI Tool Integration: Teams are encouraged to explain how they used AI tools (such as Gemini) as a "creative partner" to brainstorm story themes, generate simple performance scripts, or create basic 3D assets for their virtual environment.

9.2.4 Technical Expectations: Students should be able to operate the physical robots and understand the code.

9.2.5 Humanoid & Robot Logic: The focus is on learning by doing. Teams should explain the autonomous movement of their wheeled robots, mobile props, and humanoid robots, prioritizing simple logic over complex engineering.

9.3 Technical Interview (U19 Age Group)

9.3.1 Focus: Technical Integration, Applied AI Workflow, and Hybrid Interaction.

9.3.2 Objective: This session is a technical exchange where teams demonstrate the logical integration of their robotic features and virtual environments.

9.3.3 Emphasis on AI Tools: Teams must showcase their AI Workflow. This includes explaining the prompt engineering used to generate performance scripts, original music, or 3D assets. Students should describe how they refined and audited AI-generated content to ensure it fits their specific story.

9.3.4 Technical Features: Judges look for implementation of robotic functions, such as humanoid gait tuning and the established bidirectional communication (Hybrid Interaction) between the real and virtual worlds.

9.3.5 Problem Solving: Teams should clearly describe a technical hurdle they faced and the logical steps they took to resolve it using their chosen technologies

10. Judging - Performance (U12 & U19 Age Groups, 50%)

10.1 About the CoSpace Humanoid Stage Performance



- 10.1.1 The CoSpace Humanoid Stage Performance is a live, interdisciplinary showcase representing the pinnacle of the "imagination to impact" journey. It is defined as a creative theatrical or dance routine where physical humanoid and wheeled robots, virtual robotic entities, and human performers unite within a "real-virtual coexisting world". This hybrid environment allows teams to explore the intersection of STEM, the arts, and AI literacy by bringing digital storytelling to life through autonomous robotics.
- 10.1.2 Teams create original stage presentations where humans, autonomous real humanoid robots, and virtual robots interact through speech, gestures, music, dance, and storytelling, assisted by AI tools. A key requirement is the meaningful interaction and wireless communication between real and virtual components.
- 10.1.3 The 3D Virtual Environment: The virtual world acts as a digital extension of the real stage. Teams are required to design 3D scenery—including buildings, trees, and animations—that suits the performance theme. This environment should incorporate Digital Interactive Media, cinematography, and creative virtual camera work to enhance the storytelling.
- 10.1.4 Humanoid and Robotic Entities: Physical humanoid robots must move and act autonomously to bring coding and design to life. They are expected to demonstrate smooth, controlled movements and effective use of sensor technology to interact with their environment or other robots.

10.2 Before the Performance Routine Starts

- 10.2.1 Teams shall wait on the side of the stage until they are welcomed by the officials.
- 10.2.2 Teams must submit their music and audiovisual/multimedia files to a designated A/V technician who will assist in controlling the system during the routine.
- 10.2.3 Each team must appoint one member to be responsible for starting and controlling the 3D virtual environment.
- 10.2.4 Teams will be formally invited onto the stage by a RoboCupJunior official to begin their time slot.

10.3 Timing

10.3.1 OnStage Timing

- 1) Each team is allotted a total of 7 minutes on stage. This time includes setup, the stage presentation, the performance routine, any restarts, and the clearing of the stage.
- 2) The timer begins when the first team member steps onto the stage. The timer only stops once the entire stage is clear and free of any remnants from the performance.
- 3) Teams must exit the stage immediately once their allotted 7 minutes have expired.
- 4) There will be no penalty if the time limit is exceeded due to circumstances outside the team's control (e.g., technical issues with venue equipment). The judges have the final authority on all time penalties.



10.3.2 Performance Routine Timing

- 1) For the U12 age group: The duration of the performance routine must be more than 1 minute.
- 2) For the U19 age group: The duration of the performance routine must be more than 1 minute 30 seconds.
- 3) Teams must indicate the start of their performance clearly with a “3-2-1” countdown to the judges.
- 4) Teams must indicate the end of their performance clearly (e.g., by thanking the audience or taking a final bow).

10.4 Stage Presentation

10.4.1 Teams are strongly encouraged to utilize their setup time to deliver a stage presentation. This presentation should introduce the team members, performance to be delivered and highlight the technical features, AI-driven logic, and humanoid integrated into their show

10.5 Restarts

- 10.5.1 Teams may restart their performance routine if necessary, at the discretion of the judges. There is no limit on the number of restarts allowed within the allocated stage time.
- 10.5.2 Teams can restart without re-entering the stage, provided they give a clear "3-2-1" countdown to the judges.
- 10.5.3 Scores and deductions are reset to zero after a team requests a restart. However, fixed penalties for every restart will be applied at the end of the performance according to the scoresheet.
- 10.5.4 A restart must be clearly signaled verbally by a team member on stage.
- 10.5.5 Penalty marks will be deducted if the restart is caused by the team’s own fault.
- 10.5.6 No penalty will be applied if the restart is due to circumstances outside the team’s control, such as problems with the venue’s music system or projectors.

10.6 Penalties

- 10.6.1 Penalties will be applied to the team’s score in the following instances:
- 1) Unplanned Human Intervention: Including unauthorized physical contact or any remote/human-controlled actions during the routine.
 - 2) Team-Caused Restart: Restarts triggered by team errors or technical failures of their own equipment.
 - 3) Time Limit Violation: The total stage time exceeds 7 minutes.
 - 4) Minimum Routine Duration: The performance routine is shorter than the required minimum time for the age group.



- 5) Fault Exception: If a technical problem is determined not to be the fault of the team, no deductions will be applied.

10.7 Scoring Restrictions

- 10.7.1 All robot movements or interactions occurring outside the marked performance area will not be considered for scoring, though they will not lead to deductions.
- 10.7.2 Robots started from outside the performance area will not be considered for judging for the duration of the performance.
- 10.7.3 The use of touch-based sensors (passive sensors with a single logic function dependent on human action) during the performance is considered remote-controlled interaction and will be penalized as an unplanned human interaction.
- 10.7.4 Performances that significantly violate the competition rules may not be scored, at the judges' discretion.

10.8 Props and the Virtual Co-existence World

- 10.8.1 Props may exist within the 3D virtual environment or physically on the stage. Teams are encouraged to use props to enhance their narrative and add value to the performance.
- 10.8.2 Virtual Scenery Design: The virtual environment acts as an extension of the real world. Teams are required to design 3D objects (such as buildings, trees, or animations) and use Digital Interactive Media to create a cohesive, immersive theme.
- 10.8.3 Interactive Props: Higher rewards are given for "interactive" props, defined as:
- 1) Props that interact with robots via sensors (mounted on either the robot or the prop).
 - 2) Props that interact with robots via wireless communication (Bluetooth, Wi-Fi, Zigbee, or other approved communication).
- 10.8.4 All physical props must remain within the designated performance area.

10.9 Robot Autonomy and Technical Interaction

- 10.9.1 Robots may be started manually via human contact, sensor interaction, or remote control at the very beginning of the performance.
- 10.9.2 Humanoid Mastery: Physical humanoid robots are expected to perform with autonomous movement and stability. Teams should demonstrate smooth, controlled logic and are highly rewarded for custom gait tuning and creative use of humanoid degrees of freedom.
- 10.9.3 Autonomous Interaction: Once the routine begins, all remote control is strictly prohibited. Robots should use intelligent interaction to dynamically alter their behavior based on their environment, humans, or other robots.
- 10.9.4 Hybrid World Communication: Teams must establish wireless communication so that the virtual world reacts to real robots and physical robots react to virtual triggers.
- 10.9.5 Visibility: All robot interactions and the initial manual start must be clearly visible to the judges.



10.9.6 Any specific technical clarifications regarding robot interactions should be directed to the committee before the competition

10.10 Humans on Stage

10.10.1 Human team members are encouraged to perform alongside their robots to enhance the narrative and entertainment value of the show. When performing, they must ensure they do not obscure the judges' or audience's view of the robot(s) or any critical technical components.

10.10.2 To maintain the primary focus on the robotic technology, humans on stage should follow basic acting guidelines. This includes avoiding standing with their backs to the audience, remaining professional at all times, and ensuring their positioning does not block the performance area.

10.10.3 Hybrid World Interaction: Humans are encouraged to act as part of the "real-virtual coexisting world." This involves performing in a way that suggests a meaningful interaction with both the physical humanoid robots and the virtual entities or 3D scenery projected on the backdrop.

10.10.4 Intelligent Interaction: Humans should utilize natural human-robot interaction—such as gestures, sound, or proximity—to trigger autonomous robot responses. However, except for the initial manual start-up, human performers must avoid physical contact with robots during the routine unless it is a pre-approved part of the choreography.

RCAP CoSpace OnStage Technical Committee