REGULATIONOFTHE“ROBOT SHOW” COMPETITION

Level: Level 2. Category: for continuing
Platform: any

Participant age: from 12 to 19
Team: from 2 to 5
Robots: autonomous robots
Used equipment: any platform, any details of the designers, including those made self-dependent.
Programming language: at the discretion of the team.

Introduction
Theatrical robot performances (originally - Dancing) invite teams of students to become the authors of the stage play, which will be attended by autonomous robots designed, built and programmed by the team itself. The objective of these competitions is to create a robotic presentation lasting one or two minutes in which technology will become the subject of art. The format of the performance is not regulated and can be represented by any spectacular art form. This may be a dance, a fairy tale, a theatrical play, artistic installation, etc. The performance may be accompanied by music, but it is not obligatory. The creative and inventive approach of the teams to the project is encouraged - both to the development of the robots themselves and to the performance of the play.

All teams shall follow the rules of the “Theatrical robot performances” competition, while respecting the age limits and established team sizes.
1. Age restrictions: from 12 to 19 years.
2. Participants in a team: each team shall have from 2 to 5 participants.
3. Each team member makes a definite contribution to the common cause. Each participant can be in only one team.

Summary
Evaluation of teams takes place in three stages: an open technical demonstration, a technical interview and a stage performance.

An open technical demonstration is a five-minute presentation of the technical features and capabilities of the robot team. Teams shall to talk about the technical capabilities of their robots, such as interaction with people and with each other, orientation within the stage space by marking or special beacons, special design solutions or sensory systems, algorithmic features, etc. Also, teams need to demonstrate all the described features in action. It will also be necessary to talk about the process of developing and implementing the project, the difficulties encountered and ways to overcome them. The content of the presentation (demonstration and story) and the quality of its performance will be evaluated.

A technical interview is a fifteen-minute survey conducted by the judges, during which team members will be required to answer questions about the technical implementation of their project. The most valuable are the original and innovative solutions in the field of mechanics, electronics and software development - such decisions will receive the highest marks of judges. The judges will also be interested in the degree to which the team members understand the principles of the technologies they use. During the survey, teams will need to demonstrate the originality and authenticity of their developments. All team members should be equally ready to answer the judges' questions. At the same time, each participant should be ready to talk about their role in the project and their contribution to the
development and creation of the robot.

A **stage performance** is a play of one or two minutes in duration, in which artistic and entertainment qualities are estimated, as well as innovative and technical techniques used. Through the presentation, teams need to demonstrate their creative qualities, originality and ingenuity. It is assumed that all participating teams will make every effort to conduct their performances in the best way.

1 **Robots**

1.1 **Use of technology**

1.1.1 Creative use of various technologies is encouraged by teams. Unusual and creative use of technology (including sensors) will be encouraged and rewarded. For example, laptops, mobile phones, Raspberry Pi tablets and similar devices that can be used as controllers for robots can be used on stage as part of a performance. The use of technology in an unusual, innovative way to create a spectacular performance is encouraged.

1.1.2 Teams are encouraged to design robots of their own design. Commercial kits can be used, but with substantial modification. You cannot simply follow the assembly instructions or change only minor details.

1.1.3 Robots shall perform exclusively in autonomous mode.

1.2 **Size and number of robots**

1.2.1 Robots may be of any size. Participants should build a robot of this size that can wear them on their own. The team can create and use any number of robots. Note, however, that the use of a large number of robots does not necessarily lead to a higher score in the end.

1.3 **Design and construction**

1.3.1 Teams shall design their robots taking into account security. For example, all moving parts shall be protected with strong materials in order to protect against human contact. Use of protective covers are recommended by moving batteries. It is necessary to provide in robots protection against short circuits and leaks of chemicals.

1.3.2 Robots shall be reliable and not fall apart.

1.3.3 When creating the appearance of robots using images of popular characters, teams should respect the copyright of the character.

1.3.4 The use of high-voltage electricity on the stage under no circumstances is strictly prohibited.

1.4 **Communications**

1.4.1 Robots can exchange information with each other during a performance. At the same time, any communication of robots with devices that are not on the stage is prohibited.

1.4.2 The following communication sheets are valid:

1. infrared (IR);
2. Bluetooth (LE or classic);
3. ZigBee.

The team is obliged to prevent interference from their devices to the robots of other teams during training and performances. Teams may not use other frequencies (such as Wi-Fi or Z-waves) to transmit these signals, because such signals may interfere with participants competing in other leagues.

1.5 **Marking on the Stage**

1.5.1 Teams may place markings on the stage floor for navigating robots. However, following the line is not awarded by high points.

1.5.2 Teams can place up to eight cylindrical color markers on the stage to navigate robots. Four markers are painted in orange, four - in green. Markers have a length of 210 mm and a diameter of 40 mm. How to create markers is written in the Annex. Teams can bring their own markers corresponding to these rules.

1.6 **Additional recommendations for the development and creation of robots**

1.6.1 Robots must be prepared for the fact that on the surface of the scene there may be irregularities
of up to 5 mm in size at the joints of the plates from which it is composed. The organizers will try to do everything possible to minimize the size of these irregularities, but somewhere it may be technically impossible, and the teams should be ready for this.

1.6.2 The competition organizers will do their best to provide teams with various types of lighting equipment, including spotlights. However, teams should be prepared for the fact that in the competition they will not be provided with lighting equipment. Teams should be ready to calibrate their robots in the light conditions that will be at the event. Commands using electronic compasses as sensors should consider that the metal parts of the scene can affect the readings of such sensors. Teams should be ready to calibrate such sensors.

2 Stage performance (40% of the final result)

2.1 Review
2.1.1 The performance of robots on the stage is an opportunity to demonstrate their technical and design features in the format of a stage performance. This may be, for example, a magic show, a theatrical or comedy play, history, dance or installation. The creative and inventive approach of the teams to the performance, their willingness to experiment and take risks with the use of technologies and materials in their presentation is welcomed. See details in the Annex.

2.2 Stage performance judging
2.2.1 Each team will be given two attempts to appear before the judges. When summing up, the maximum result of the team will be used.
2.2.2 The team performance on the stage will be evaluated by a panel of at least three judges. At least one of these judges should participate in a technical interview.

2.3 Performance
2.3.1 The duration of the performance itself shall be at least one minute and no more than two minutes.
2.3.2 Each team will have a total of five minutes for the entire performance. The judges start counting the time when one of the team members enters the scene. The time to speak includes the time the team needs to prepare the stage and the robots, the introduction and the performance itself, including all restarts that will occur due to the circumstances controlled by the team. The team will not receive penalties if this time limit is exceeded due to circumstances that the team could not control (for example, if the technical staff had problems with playing music). In any case, the question of fines is decided by the judges.
2.3.3 The time for the performance does not include the time it takes for the team to assemble their equipment and robots and to remove the stage after the performance ends. This team is given an extra minute. Thus, in aggregate, the team can spend no more than six minutes on the scene.
2.3.4 The playback of music and other audiovisual content will be performed by a technician specially appointed by the organizing committee.
2.3.5 Teams are urged to use time efficiently and, in particular, during the stage preparation and the robots, to present their project to the audience.

2.4 Restart
2.4.1 Teams may, at the discretion of the judges, begin their performance from the beginning, if it becomes necessary. Within the five minutes set aside for a performance, the number of allowed restarts is unlimited. For the execution of restarts teams are awarded penalty points. After five minutes from the beginning of the performance, the team will have to leave the stage.

2.5 Music and video
2.5.1 Teams may use music as a supplement to their performance. It will be convenient if the teams mark the beginning of the performance with a sound signal.
2.5.2 If teams use music in their performance, they will need to provide the organizers with their own audio files. The preferred method of transferring files to the organizers is on a removable drive as an
MP3 file. On the drive must be clearly indicated the name of the team. The drive should contain only MP3 music file. Teams need to transfer their files to the organizers before the trial runs. It is desirable that teams have several copies of their audio files.

2.5.3 At the beginning of an audio file there should be a pause of several seconds.

2.5.4 Visual support is welcomed by the teams of their performance. Visual accompaniment can be made in the form of a video, animation, presentation, etc. For this, teams will be provided with a projector and a screen on the stage. It should be noted that for technical reasons the organizers of the competition cannot guarantee in advance a certain height of the screen with a projection above the stage level.

2.5.5 Interaction of robots and the screen on the stage is allowed and welcome. For this, VGA and HDMI cables will be provided on the stage with access to the projector. It should be noted that the organizers cannot guarantee in advance one or another length of cables.

2.6 Stage

2.6.1 The size of the scene will be at least 5 m wide and at least 4 m deep. Inside the scene will be marked with a space of 4 m × 3 m for the robot performance.

2.6.2 The boundary of the space for the performance will be marked by a line made with black electrical tape 50 mm wide. Robots can use this line to define the boundaries of the performance area. The floor shall be smooth, anti-glare white.

2.7 Decorations

2.7.1 It is not recommended to use static non-interactive decorations (props) that are not included directly in the performance, since the focus should be on robots. Props are considered as interactive:

- interacting with robots using sensors
- interacting with robots through communication (see sect. 1.4).

2.7.2 Non-interactive decorations should be placed on the periphery of the stage space reserved for the performance. Robots, if installed on the periphery of the area to perform, can use these decorations to perform certain tasks or to start a performance.

2.8 Interaction with robot and with each other

2.8.1 Robots can be started at the beginning of a performance manually by humans, using sensors or remotely (see Section 1.4). This limits the permissible direct physical interaction of people with robots. All questions concerning the admissibility of a particular interaction of people with robots must be resolved with the judges before the start of the speech.

2.8.2 People are welcome to take part in performance. People cannot interact with robots physically (touch robots, move them, etc.), but can interact with sensors installed on robots. It should be borne in mind that a more direct interaction with robots (for example, consisting in keeping the robot inside the performance zone) will be rated lower than a more intelligent interaction (for example, following the robot after a person with a camera).

2.8.3 Any interaction between robots is extremely welcome. Robots are allowed to interact with each other, both physically and with the help of sensors and/or wireless communications (see Section 1.4).

2.9 People on a stage

2.9.1 During the whole time of performing on stage with the robots there can be no more than two team members. The number of people performing on stage with the robots does not affect the final result of the team. People during the performance can be both inside and outside the restricted area for the performance, but should not leave the scene itself (5 x 4 m).

2.10 Penalty point scoring

2.10.1 The team is awarded penalty points for exceeding the time limit allocated for the performance (see section 2.3).
2.10.2 The team is awarded penalty points every time when all contact points (for example, wheels) of at least one of the robots are outside the area allocated for the performance. In case of doubt as to which parts of the robot should be considered contact points, teams should contact the organizers of the competition for clarifications before the start of the performance.

2.10.3 The team is charged three penalty points for each restart made due to circumstances controlled by the team.

2.10.4 Penalty points may be awarded at the discretion of the judges to teams that consciously copied robots, costumes, script, scenery or any other elements of the performance (except music) from another team or used (with or without modifications) robots, costumes, script, scenery or any other elements of the performances of past years.

2.10.5 A non punctual team may be penalized. If the team is not ready to speak at the appointed time, the organizer can change the schedule of performances, allowing the team to perform after all the performances and award penalty points. For another non-punctuality a team may be disqualified.

2.11 Preparing to performance

2.11.1 It is in the responsibility of the teams to verify by contacting the organizers of the competition before the start of the performance that the audio and video files provided to the organizers (see Section 2.5) are reproduced correctly.

2.11.2 Depending on the configuration of the scene, it may be that the person who runs the robot on the stage and the event organizer responsible for playing the multimedia material (audio and video) will not see each other. Teams should be prepared for such conditions.

2.12 Training start on the main stage

2.12.1 The main stage for performances will be available for teams to perform training and test launches. In order to fairly distribute the time of using the stage between the teams, a written record will be organized on using the stage for training and test launches. Teams should follow the established timetable for using the stage.

2.12.2 Each team after training on the stage must clean it, the scene must be completely clean before training of the next team. The last team performing training and test launches on the stage before the start of the performances should clear the stage no later than three minutes before the start of the first performance.

2.13 Content

2.13.1 By the performance, the exploitation of the themes of violence, war, criminality or crime is not allowed. Do not use inappropriate words and images.

2.13.2 Participants should carefully and thoughtfully select all verbal formulations and think over the content and subtext of their presentation. What seems acceptable and admissible to you may be offensive to your friends from other countries.

2.14 Safety

2.14.1 For the safety of competitors, organizers and spectators, as well as to meet local safety standards in the region in which competitions are held, pyrotechnic effects, explosions, smoke, open flames, water and other potentially traumatic substances are not allowed.

2.14.2 Teams in whose performance potentially situations may arise that are dangerous to the health of others or lead to scene damage should provide a written script for the approval of the organizers of the competition no later than 25 days before the start of the competition. The organizers of the competition may request before the performance additional explanations concerning the scenario, as well as a demonstration of the performance or any part of it, and then give their explanations and recommendations regarding the potentially dangerous elements of the performance. Teams may be refused the opportunity to present certain elements during a performance if the organizers of the competition consider them unsafe, or if the team does not complete an early coordination of these elements with the organizers of the competition.
2.15 Authenticity and originality
2.15.1 The performance shall be original and shall not have analogues among those previously presented by “Roboland Dances”. It is desirable that the teams independently verify the compliance of their robots and performances according to this rule.

3 Open technical demonstration (40% of the final result)

3.1 Review
3.1.1 Description of the technical capabilities of the robot is intended to demonstrate to the audience of competitions how exactly these opportunities were achieved. Teams for which participants English is not native will be provided by an interpreter. Teams can use prepared multimedia (video and other) materials for demonstration.

3.2 Demonstration procedure
3.2.1 The teams will be given five minutes for the demonstration itself, as well as one additional minute for preparing the scene before the demonstration and clearing the scene after the demonstration.
3.2.2 During the demonstration, the technical capabilities of the robot (s) of the team shall be demonstrated and it will be explained what the team did to achieve these capabilities. The technical capabilities of the robot can include both individual elements made during the performance, and specific technical aspects, such as the implementation of the interaction of the robot with people or other robots, the use of certain sensors, etc.
3.2.3 Teams are advised to remove clothing from robots for a detailed design demonstration. If this is difficult, then the teams should prepare a photo or video about the internal mechanisms for the electronic presentation.
3.2.4 A technical demonstration will be judged by at least two judges.
3.2.5 The assessment will take into account the information provided by the team in the technical questionnaire (see annex). Teams are strongly advised to familiarize themselves with the technical demonstration evaluation table (see annex). Teams should be taken into account that both the content of the technical demonstration and the form of its performance are evaluated.

3.3 Stage
3.3.1 The technical demonstration is held on the same stage as the performance itself, with all of the restrictions set out in section 2.6.

3.4 Presentation
3.4.1 Teams will be provided with two microphones for the presentation. The use by teams of previously prepared multimedia material (presentations in the form of slides, video, music, etc.) as an accompaniment to the demonstration is welcomed. The number of team members participating in a presentation on the stage is unlimited.

4 Technical interview (20% of the final result)

4.1 Interview procedure
4.1.1 For technical interviews, teams are given 15 minutes.
4.1.2 Interviews are evaluated by at least two judges.
4.1.3 Evaluation of a technical interview is conducted in accordance with the table of evaluation of a technical survey (see annex). Teams are strongly encouraged to review it before the survey.
4.1.4 Teams should ensure that during the interview all their robots are available, as well as copies of control programs in a form that is convenient for quick viewing.
4.1.5 The judges' questions about the technical aspects of any part of the project should be ready for each team member to answer. Also, participants should be ready to talk about their contribution to the project and the role they played during the implementation phase.
4.2 Repeated technical interview
4.2.1 If the judges deem it necessary, the team may be asked to undergo a second technical interview. When calculating the final result, then the result of the re-interview will be taken into account.

5 Materials required for competitions

5.1 Documentation
5.1.1 Before the international stage of the competition, technical information forms will be sent to the teams. Teams will need to complete these forms so that the judges who will conduct the technical interview can get acquainted in advance with the main details and features of the project.
5.1.2 The teams will also need to fill out another general technical form (see the sample in the annex) for the judges before the start of the competition.

5.2 Poster
5.2.1 Teams will be provided by the open space to show their poster. Poster size should not exceed the standard size of A1 paper (60 cm × 84 cm). The poster shall be placed at the location indicated by the organizers prior to the start of the technical interview of the team. Teams may use a poster during an interview (if the poster contains useful information), but it should be noted that the presence of the poster, as well as its quality and content, are not evaluated in a technical interview. Posters made in electronic form are not accepted.
5.2.2 The task of the poster is to present the team to the competition audience, briefing other participants about the technologies and techniques used by the team during project preparation. The poster should be interesting, well-designed and informative. Teams should take into account that the poster will be watched not only by the judges, but also by other participants of the competition and the audience.
5.2.3 It is desirable to display the following information on the poster: the name of the team and its country, the category in which the team performs (initial or main), region / country, photos of robots from different stages of development, brief information about technological innovations applied in the robot.

6 Evaluation and rewarding

6.1 Evaluation Criteria
6.1.1 Criteria for the evaluation and distribution of points awarded to teams are given in the appropriate evaluation forms (Annexes A to C).

6.2 Scoring
6.2.1 The final score of each team is calculated as the sum of the points scored by the team as a result of technical interviews and technical demonstration and stage performance. The competitions are conducted without final stage.

6.3 Prizes and awards
6.3.1 The following prizes are awarded:
1. “Team of the year” - the team with the highest total score;
2. “The Roboland-2019 International OnStageSuperTeam of the Year” - the team with the highest score in the SuperTeam category (in the case of conducting of SuperTeam).

6.3.2 Teams also receive awards in the following categories:
1. “The best design and construction”;
2. “The best use of electronics”;
3. “The best technical demonstration”;
4. “Best programming”;
5. “The best stage performance”;
6. “The best innovative presentation”
7. “The best creative idea”
8. “The best costumes”
10. “The best teamwork”

Awards are awarded on the basis of a technical interview and a technical demonstration, as well as taking into account performances on the stage (at the discretion of the judges). One team can be awarded by only one award.

6.3.3 Also, teams may be awarded certificates in the following nominations:

1. “The best engineering poster” - awarded to the team that prepared the best poster in the opinion of the judges, describing the team and technology of its robot;

2. “The best support team” - awarded to the team that, by voting of the other teams, provided the best support to other teams; support can be expressed in various ways, such as helping with components and tools, developing friendships, encouraging other teams, etc.

3. “Best Innovative Presentation” is awarded to teams that have prepared the best multimedia accompaniments in the opinion of judges for their presentations; This may be a video, slide show, computer graphics, etc., shown during the presentation.

6.3.4 No team should receive more than three prizes and / or certificates.
6.3.5 The number of awards depends on the number of teams registered in the competition. Some of the above awards may not be presented.

6.4 Feedback
6.4.1 “Theatrical robot performances” is an educational project. It is important that teams learn from their experience of participating in competitions. The organizers of the competition will provide feedback on the performance of each team on the results of the competition. The feedback will reflect the strengths of the team and indicate points on which the team should still work. It should be borne in mind that these reviews should not be used by participants to challenge the final results.
6.4.2 Each team will be able to familiarize themselves with their points for the first attempt at performing on the stage in order to be able to better prepare for the second attempt.

7 Code of honor
7.1 The Spirit of Competition
7.1.1 It is expected that all competitors, including mentors, share the goals and ideals of the international festival Roboland-2019.
7.1.2 What matters is not whether you win or not, but how much you will learn! Take advantage of the opportunity to collaborate with students and mentors from around the world so as not to miss the important experience of lifelong learning. Remember, this is a unique moment!

7.2 Fair play
7.2.1 It is assumed that the goal of all participants is fair play.
7.2.2 People who intend to interfere with the work of robots or damage the scene will be disqualified, and if they are not participants, they will be removed from the competition.
7.2.3 Remember that helping those who need and friendship is the spirit of Roboland-2019. It makes the world a better place.
7.2.4 Participants are encouraged to help each other. However, too hard participation can lead to disqualification for interacting teams. For example, if a member of one team makes a significant contribution in designing, repairing or programming the robots of the second team before and / or during a competition, both teams may be disqualified.

7.3 Publication of results
7.3.1 The spirit of the competition RoboLand assumes that all new and original results obtained by the teams in preparation for and during the competitions must be published after the end of the competition.
7.3.2 After the end of the competition, the development results will be published on the Roboland-2019 website.
7.3.3 The exchange of information between the participants consists of the mission of Roboland-2019 as an educational initiative.

7.4 Behaviour
7.4.1 Participants should not forget about other people and robots when moving around the competition venue.
7.4.2 Participants are not allowed to enter the training area of other teams without inviting one of the members.
7.4.3 Participants who violate the norms of conduct may be removed from the competition area and / or disqualified from participation at the discretion of the judges, organizers or representatives of law enforcement agencies.
7.4.4 Each participant is expected to behave respectfully to others.

7.5 Officials
7.5.1 Officials (the organizing committee, the main judge, the judges of the competitions) will act according to the spirit of the competitions.
7.5.2 Officials of Roboland-2019 should not have close associates of any of the teams that they judge.

7.6 Mentors
7.6.1 Adults (mentors, teachers, parents, translators and other adult team members) are not allowed to the training zone, except to assist in the transportation of equipment on the day of arrival and departure.
7.6.2 If a problem arises related to a computer or other device whose repair requires a level clearly higher than the student’s abilities, the mentor may request permission from the organizers to enter the work area for the sole purpose of repair. He must leave the work area immediately after the completion of the repair.
7.6.3 Mentors are not allowed to mount equipment on the stage, as team members must do this. If necessary, the organizers will send volunteers for teams that need help with stage editing. Teams should request this assistance from officials.
7.6.4 The instructor who will be in the students’ working area, is removed from the competition venue, and the team will be fined.
7.6.5 Mentor found to be repairing, creating or programming the robot (s) and / or directing the production is removed from the competition venue, and the team will be fined. This applies to both “individual” and “super-team” competitions.

8 Additional information

8.1 Rules clarification
8.1.1 If clarification of the rules is required, contact the Organizing Committee Roboland-2019. If necessary, during the competition, an explanation of the rules may be made by the chief judge of the competition or by the members of the Organizing Committee.
8.2 Event information
8.2.1 The responsibility of the teams includes checking the update of the current information in a timely manner during the competition. Up-to-date information will be available at information desks and on the official competition website.
8.2.2 Informational letters with relevant information will also be sent to the team mentors.

8.3 Exceptional circumstances

8.3.1 If exceptional circumstances arise, such as unforeseen problems with the robot, the rules may be changed by the Chief Judge of the competition in conjunction with the panel of judges and members of the organizing committee, if necessary even during the competition.
8.3.2 If the captain or mentor of any team did not attend the meeting to discuss the problems and changes to the rules described in 8.3.1, then this will be considered as consent.
9  Annex A
9.1  Scene scheme

Scene location (top view)

Robot performance area with surrounding black lines

Audio and visual equipment:
- VGA cable
- HDMI cable
- Microphones 2 pct.

9.2  Cylinder design scheme

Markers have a length of 210 mm and a diameter of 40 mm. It is proposed to make paper cylinders.

Step 1. A4 sheet or orange/green sheet

Step 2. Make a cylinder of 40 mm, add a mass to the inside bottom (for example blue pebbles) to take it at upright.
**Performance evaluation blank**

**Team:**

**Judge:**

**Signature of the judge:**

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<tr>
<th>Criterion</th>
<th>Parameters</th>
<th>Evaluation</th>
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<tr>
<td><strong>Performance meaningfulness</strong></td>
<td>● Non-recurring robots movements, diverse and intense performance.</td>
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<td>● The integrity of the performance, single theme and plot</td>
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<td>● The performance is organically complemented by a visual demonstration.</td>
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<td>● The performance is fascinating throughout its duration.</td>
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<td>● Harmony and reasonable use of stage space</td>
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<td>● High-quality choreography of the movements of robots, matching</td>
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<td>their movements to the melody.</td>
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<td></td>
<td>Only robots and two actors on a stage. No props and decorations on the</td>
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<td>stage.</td>
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<td><strong>Ingenuity and originality</strong></td>
<td>● The robots were created by the participants themselves, without the</td>
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<td>use of robotic designers and sets</td>
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<td>● Existing technologies are applied in a new and original way, not</td>
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<td>previously presented.</td>
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<td>● Original and innovative technologies were used (unusual mechanical</td>
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<td>or electronic components, power supply systems, etc.)</td>
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<td><strong>Performance quality</strong></td>
<td>● Reliable and robust robots that maintain their integrity throughout the</td>
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<td>entire performance and work as expected.</td>
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<td>● Costumes created by participants independently and organically</td>
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<td>supplementing the performance.</td>
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<td>● Perfectly honed, high quality and well prepared performance</td>
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<td><strong>Technical complexity</strong></td>
<td>● The robots move throughout the entire stage.</td>
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<td>● High-quality synchronization and interaction of robots</td>
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<td>● Robots perform technically challenging and risky maneuvers.</td>
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<td>● Robots interact with the screen on the stage</td>
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<td><strong>Sensors and interaction</strong></td>
<td>● Sensors are used for their intended purpose or otherwise.</td>
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<td>● Communication between robots is used.</td>
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<td>● Robots interact with humans.</td>
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<td>● Robots interact with each other.</td>
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<td>● Robots use color markers for orientation and do not use lines and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>markings on the stage.</td>
<td></td>
</tr>
<tr>
<td><strong>Penalty points</strong></td>
<td>Three penalty points are awarded for:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● every unintended interaction with people;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● every 10 seconds the time limit is exceeded;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● each restart;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● each exit of the robot outside the performance zone.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teams that break the rules should be warned about the inadmissibility of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>violations in the second attempt and will be fined points at the discretion of the judge.</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>40</td>
</tr>
</tbody>
</table>
## Technical interview evaluation blank

**Team:**

**Judge:**

Signature of the judge: ____________

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Parameters</th>
<th>Evaluation</th>
</tr>
</thead>
</table>
| **Software**                      | ● Using a programming language appropriate for the age of participants  
   ● Participants are able to explain how their control programs work and how they interact with the robot hardware.  
   ● Participants applied original and innovative solutions.  
   ● Adequate choice of libraries used for development  
   ● Expanded explanations on the selected solutions and on the limitations of the program code are given.                                                  | /8         |
| **Mechanical equipment**          | ● The project implemented high-quality and reliable mechanical solutions  
   ● Created complex or innovative mechanical elements  
   ● Participants are able to explain the operation of all mechanical elements of the robot.  
   ● The robot uses design techniques to give mechanical elements very high precision or strength.  
   Adequate and conscious choice of certain drives                                                                 | /8         |
| **Electrical equipment**          | ● Electronic devices were created by the participants themselves.  
   ● Understanding of the device and the principles of the electronic elements of the robot were demonstrated  
   ● Sensors are used or integrated with each other in an original and innovative way.  
   ● Original and innovative use of various technologies for performance (cameras, controllers, drives, GPS navigators, microcontrollers, etc.)  
   ● Expanded explanations are given regarding the selected solutions and regarding the limitations of the electronic equipment of the robot | /8         |
| **Communication and interaction of robots** | ● Effective communication tools are used.  
   ● Participants understand the communication device between robots  
   ● An integral architecture for robot communication is created  
   ● To implement the interaction of robots with each other, sensors and other electronic means are used.  
   ● To implement the interaction of robots with humans, sensors and other electronic means are used.                                                   | /6         |
| **Penalty points**                | The number of penalty points is determined by each judge independently.  
   ● Judges need to make sure that this work is done by students.  
   ● Original software and hardware (without re-use from previous competitions)  
   ● All team members can answer questions and tell about their personal contribution to the creation of robots.                                      | /30        |

TOTAL /30
## Open technical demonstration blank form

**Team:**

**Judge:**

Signature of the judge: __________

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successful demonstration of the technical capabilities of the robot</td>
<td>/15</td>
</tr>
<tr>
<td>Explanation of the technical capabilities of the robot</td>
<td>/10</td>
</tr>
<tr>
<td>Quality and clarity of demonstration</td>
<td>/5</td>
</tr>
<tr>
<td>Penalty points</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>/30</strong></td>
</tr>
</tbody>
</table>
Judgeadvisory

The key objectives of the technical demonstration are:
1. demonstration of the robot (robots) capabilities;
2. an explanation of the key systems work of the robot and a story about its main features and capabilities;
3. demonstration of the correct operation of the robot systems corresponding to the description;
4. drawing the attention of the audience to the key original and innovative solutions implemented in the robot;
5. high-quality presentation and presentation of the project by the team.
REFERENCES

1. Competition on the “Robotshow” category are to be held according to the RoboCupJuniorOnStage Regulation. The above regulation contains a translation of the international stage regulation RoboCupJuniorOnStage http://junior.robocup.org/onstage-preliminary/Translation made by S.V. Kosachenko