RoboCup Junior Soccer 2024 Award Criteria (Rubrics)



This is the final draft of the 2024 Award Criteria - any changes made between publishing and the Eindhoven event will be noted above the award guidelines.

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4/10/2024 - final draft published.



General Award Guidelines

These are the official Soccer League award guidelines for RoboCupJunior 2024 released by the RoboCupJunior Soccer League Committee. This English version has priority over any translations. Use the forum (<u>https://junior.forum.robocup.org/c/robocupjunior-soccer</u>) to ask questions or help us to improve these guidelines!

Congratulations goes out to all the teams that put robots on the field this season anywhere in the world and the teams that will be attending the international championship; your efforts are what keep RCJ going! Starting this season, we will begin recognizing the outstanding achievement of teams through a digital hall of fame. By definition, not every team can be considered outstanding hence this document explains how official awards are limited and categorized. With this new tradition, teams that are given special recognition may also serve to help all other competitors learn from their example.

There are five criteria that will be used to evaluate overall team rating in order to qualify for these awards: design documentation, poster presentation, group interview, sportsmanship, and leadership. Using the expectations described for each criteria below, a team will be given an overall rating of proficient, satisfactory, or developing which will then be used to qualify teams for award trophies. A team that exceeds expectations in any criteria may be considered for a certificated award. Trophies are relevant to performances at the event, a team's ranking in the tournament, and all trophies will be awarded. Certificates are considered a higher honor as they are only awarded when a team qualifies.

RoboCup Junior prides itself from standing out from other competitions by focusing on the educational objectives rather than the competition alone. Therefore, the following expectations are designed so teams that demonstrate growth and are willing to share their more sophisticated solutions with others are prioritized.

Unlike the rules, these guidelines are not mandatory to follow. They are designed to be a useful resource for teams wanting to better understand the expectations of the RoboCupJunior soccer organizing committee.



Award Explanation Table

	Trophies Recognition for the top performers at the event.	Certificates Special recognition given only if teams qualify.	Explanations
Tournament rankings & Criteria ratings.	Individual Team 1st Place Individual Team 2nd Place Individual Team 3rd Place	Exemplary Team Outstanding Design Outstanding Innovation	These trophies combine rank in the tournament and criteria ratings to identify the overall top performers at the event. A team earning one of these trophies may receive any other trophy or certificate other than Individual Team High Rank. Certificates serve to identify the best teams to learn from for future seasons. They are only awarded if teams meet the qualifying standards set across seasons.
Tournament rankings	Individual Team High Rank		The Individual team High Rank award is for the highest ranked team in the tournament that has not already earned an Individual Team trophy.
only	SuperTeam 1st Place		SuperTeam 1st Place trophies go to the set of teams that win the SuperTeam challenge.
Criteria ratings only		Outstanding Achievement Top Poster & Presentation	Poster & Presentation certificate goes to the team that does the best job sharing information with others at the event.
			The Outstanding Achievement certificate may go to any team exceeding expectations in any criteria.



Determining Overall Team Ratings

Proficient teams: meets or exceeds all expectations in at least four out of the five criteria Satisfactory teams: rated satisfactory or above in at least four criteria. Developing teams: rated developing in two or more criteria.

The organizing committee will evaluate evidence for any teams being considered for a rating below proficient and make the final determination. The overall ratings with brief feedback may be presented to every team before the end of the summer of the event.

Determining Trophy Winners

Trophies are awarded at every event and are relative to the level of competition that season.

The individual team trophies are determined by calculating overall rankings using the following: a judged score of five (5) is given for a proficient rating, no score (0) for satisfactory rating, and a team with a rating of developing will not qualify. The team's rank score is then calculated by taking the number of teams minus the team's rank with three (3) point top rank bonus added for rank one, two (2) points for rank two, and one (1) point for rank three. The team's overall score is then their rank score added to their judged score to generate the overall team rankings. Any ties in the individual team rankings will be broken by the team with the highest rating followed by the highest rank.

Overall ranking score for teams either satisfactory or proficient = (# of teams - rank + any top rank bonus) + judged score

The individual tournament high rank trophy recognizes a team that did well in the tournament matches but may not have been ranked as highly or rated in the judged criteria as highly as the top three overall ranked teams.

The SuperTeam challenge trophy goes to the winning teams of the SuperTeam challenge.



Determining Certificate Winners

There are no physical or organizational limits to the number of certificates that may be awarded. All teams meeting the qualifications below may be awarded a certificate.

Qualifying for Certificates

Expectations should change very little across seasons. These expectations and standards below are written so that only the most outstanding teams may qualify.

Exemplary Team Certificate

Exemplary teams are the best examples of the effective application of soft and hard engineering skills. These teams are amongst the top performers, have outstanding designs or innovations, and serve as community leaders for their league. To qualify, all of the follow must be met:

- Exceeded expectations in leadership criteria and in one other criteria.
- Earned an overall rating of proficient.
- Team performs well in the tournament, superTeam challenge, AND technical challenges.

Outstanding Design Certificate

Teams recognized for outstanding design have fielded robots that are great examples of what can be done through the application of the engineering design process. To qualify, all of the follow must be met:

- Elements of the design document, group interview, and poster exceeded expectations
- Earned an overall rating of satisfactory or better.
- □ Team performs well in either the tournament, superTeam challenge, OR technical challenges.



Outstanding Innovation Certificate

Teams recognized for an outstanding innovation created a design that is both novel and effective for others to learn from. To qualify, all of the follow must be met:

- The design document, group interview, and poster clearly describe an innovation that is potentially effective and instructive.
- Earned an overall rating of satisfactory or better
- The innovation's effectiveness is apparent during either the tournament, technical challenges, OR SuperTeam matches.
- □ The same innovation has not been recognized in previous seasons or the team has made significant improvements.

Outstanding Achievement Certificate

Teams recognized as outstanding achievement serve as an example of what it means to exceed expectations in any aspect of the judging criteria. To qualify:

- Exceed expectations in any aspect of the judging criteria.
- □ Earned an overall rating of satisfactory or better.
- □ Team has not been recognized for the same achievement in previous seasons or has made significant improvements.



Criteria

Design Document

A team's design document should tell the story of how their robots and strategies were developed through succinct explanations and plenty of visual artifacts. Development of this document should begin as soon as the design work begins. A proper design document provides evidence of student centered work in electrical, mechanical, software, and strategy development and is a resource for everyone, including the publishing team.

The design document is NOT an exhaustive collection of notes such as an individual's engineering notebook nor a detailed log of every meeting. It should also not be published solely for the purpose of impressing judges; as long as the document is well organized, function will outweigh form (i.e. the content matters more than how it is presented). For more details on what a good design document could look like, see <u>appendix B</u>.

Design documentation must be published and accessible online but may be kept unlisted or private prior to the event. Access to judges must be made at least two weeks prior to the event. After the event, all links will be made public but may still be maintained by the teams.

Rating	Expectations
Developing	A team did not submit documentation on time. OR There are little or no original pictures, videos, CAD renderings, schematics, sketches or other visual artifacts that demonstrate the development of mechanical, electrical, software, or strategy design skills. OR An attempt was made to gain credit for another's work; design elements are clearly beyond the experience level of team members.
Satisfactory	Documentation provides details on how a team developed their designs and strategies such that a technical person could repeat the process. AND Documentation includes an appropriate amount of original visual artifacts that make evident designs were likely developed by students.
Proficient	Document is satisfactory AND includes an evaluation of resources used (e.g. time, budget, materials) AND gives insight on how the team approached design failures AND includes experimental data that informed design choices AND demonstrates growth in electrical, mechanical, and software design skills.



Poster Presentation

A team's poster is a way of sharing their robot's design and discoveries to everyone during and after the event. Teams should think of their posters as a well designed summary of their design documents.

The poster session is an opportunity for all teams to discuss their designs and discoveries with everyone at the event. Unlike design documents, Robocup Junior will archive all posters after the event for future teams to study.

There may be an opportunity for teams to submit their posters early for peer feedback. Please see information sent out in the event newsletters for information on how to participate.

A poster is scored using the poster rubric to recognize the best poster in each sub-league. For a team's summary evaluation, the following is expected:

Rating	Expectations
Developing	A team did not submit the poster on time or does not meet the following expectations completely. OR Poster is not presented in the proper format
Satisfactory	Team presented a poster but did not participate in the poster session.
Proficient	Team presented a poster and participated in the poster session by having at least one team member available at the poster while other members studied the other posters (you're encouraged to alternate members so everyone has a chance to engage).



Group Interview

The group interview is an opportunity to provide information that may not be apparent in the design document or poster and to give judges time to study the team's robots. It is also an opportunity for teams to give feedback and learn from one another . Groups of three teams will meet together for about 45 minutes with a panel of at least two judges. Each team will begin with a five (5) minute presentation. Judges will then ask up to three (3) questions selected from the list available in <u>appendix A</u> that are designed to test understanding. Remaining time will be for the other two teams to ask questions and provide any feedback.

Presentation should focus on the unique experiences of your team whether it is something the team is proud of or struggled with. It should not include general facts such as how omnidirectional drives work. The focus also does not have to be solely on technical designs that were already shared via the design document and poster. A team may present how they found effective ways of team management for example.

Care must also be taken to not include information that is beyond the experience of the student members; for example, do not include a schematic of a circuit that is not well understood by student members. Presentations should be informative even if it is just affirming common challenges/issues. Extra consideration will be given to teams who have students that have difficulty speaking in English if judges are made aware.

Rating	Expectations
Developing	Team did not participate in the group interview. OR Team did not satisfactorily answer two out of the three questions from judges. OR Team was not paying attention to or disrupting another team's presentation after being warned by the judges.
Satisfactory	Not all team members participated or discussed their contributions OR Team did not provide feedback or ask questions from other presentations OR Team provided little information of benefit to other teams.
Proficient	Team presented information that was mostly of benefit to other teams AND all members contributed AND the team participated in all discussions AND presentation revealed the team's proficiency in any design or teamwork skills.



Sportsmanship

Sportsmanship expectations include the behavior of students, mentors, parents, and anyone else associated with the team attending the event. Although everyone is competing, we're all involved to learn and have fun; participants should not hinder the experience for others.

Attendance at each general match, technical challenge, and superTeam match will be taken. Teams should come prepared to keep their robots functional for the entire event and should have a member in charge of keeping a schedule. If a team cannot participate in a match or activity, the head referee should be notified to avoid delays and being marked as a "no show". If a team is struggling, other teams may offer help but should NOT force their "help" onto a team for the sake of looking good. Teams or volunteers may notify the organizing committee of any team that may have exceeded these expectations at any point during the season.

We expect spirits to be high and misunderstandings between teams and volunteers will occur. It is critical these misunderstandings are handled in a respectful manner. Unless in extreme cases, participants should be given a warning before teams are penalized.

Rating	Expectations		
Developing	A participant continued being disrespectful or inappropriate after being warned. OR		
	A team did not participate in or was late to over half of their matches. OR		
	A team did not participate in the SuperTeam challenge. OR		
	A team did not participate in over half of the technical challenges.		
Satisfactory	More than one participant from the same team was warned and behavior still continued OR		
	Team participated in and was on time for less than 90% of their matches. OR		
	Team was a "no show" at any point. OR		
	A team missed some technical challenges.		
Proficient	Team participated in 90% of their matches AND participated in all technical challenges AND made all superTeam matches AND		
	was never a "no show".		



Leadership & Outreach

This criteria is included only for certificate qualifications. Teams that have earned a spot at the international competition are considered leaders of their regions even if only by example. Therefore, all teams attending the event meet the expectations rated as proficient.

Exemplary teams enhance their community or RoboCup Junior community in general by providing resources or encouragement for others. The organizing committee may be made aware of these efforts through their own observations, what is presented in any other criteria (e.g. team documentation), or by nomination from another team or volunteer.

This is not an opportunity for teams to boast or exaggerate their outreach efforts simply for recognition. It is also not the intention for outreach to be a requirement for teams especially when they are inexperienced and may need to focus on developing essential skills. The intention is to recognize teams that through the natural progression of their season, realize an opportunity to help and decide to pursue it.

Teams given consideration for exemplary status must have evidence of their efforts and a likelihood of impact that has yet to be recognized through an award. An example would be a team developing and testing a resource for themselves and then deciding to offer it publicly in such a way that others may learn from it (e.g. it includes explanations behind how the resource works and was developed). A counter example would be a team simply offering a design solution that others may directly copy and utilize without any needed experience nor understanding (e.g. a CAD model published in an online repository).

This is also an opportunity for others to learn from the stories of other teams and be encouraged how their communities were impacted by participating in RCJ. Again, it is not the expectation that teams make community outreach a priority or even consider it. An example would be an RCJ team using their skills to respond to a need in their community. A counter example would be a team reporting they offered a one day workshop in an attempt to gain recognition.



Poster & Presentation Rubric

Category	1	2	3	4
Abstract	Abstract is missing, unclear or wholy incomplete (i.e omits many critical elements of the poster).	Abstract is somewhat incomplete (i.e. omits some critical aspects of the poster) OR repeats detailed information already in the poster.	Abstract clearly summarizes each critical component AND uses appropriate scientific language.	Rubric 3 is satisfied AND there is a clear intent to share actionable knowledge.
Method / Production / Design	Very little to no information about production (i.e. design, construction, programming, component selection, and overall process).	Some information about production (i.e. those listed in rubric 1) OR complete information is supplied but descriptions are not clear and concise.	Complete information about production . (i.e.those listed in rubric 1). AND the information is clear and concise	Rubric 3 is satisfied AND there is a clear intent to share all actionable knowledge.
Data / Results / Discussion	No data is displayed OR data analysis is not relevant to project development.	Minor data resulting from testing is displayed OR significant data resulting from testing is displayed but no major modifications based upon the testing are mentioned.	Significant data resulting from testing is displayed AND major modifications were made on the robot as a result of testing AND data and results are displayed clearly (e.g. using graphs or tables).	Rubric 3 is satisfied AND the poster demonstrates a clear understanding of the link between testing, evaluation and modification based upon the testing AND method of testing is described so it may be repeated by others.
Photos / Graphics	Several photos and graphics of a poor quality OR are not relevant to the related section of the poster	Photos and graphics are relevant to the related section of the poster but some are not labeled or cited.	Photos and graphics are relevant AND excellent quality AND appropriately labeled and cited.	Rubric 3 is satisfied AND the amount of images are appropriate to the content being presented.
Layout / Design	The poster does not follow a logical layout OR contains many spelling or grammatical errors	The poster follows a somewhat, but not wholly, logical layout OR the poster contains a few spelling or grammatical errors.	The poster has a clear and logical layout (i.e.Information is easy to access for the viewer, with graphics, images and text appropriately positioned and font size consistent). Spelling and grammar are error free.	Rubric 3 under "Layout/ Design" AND has an original design t hat effectively highlights the team's creativity and professionalism.
Presentation	Team not present during poster presentation session	Team was absent for significant portion of poster session OR is not able to answer any questions adequately	Team was present during poster session but was regularly absent OR did not actively engage OR did not adequately answer questions	Team present during the entire poster session AND actively engaged with judges, participants, and guests AND did their best to answer any/all questions.



Poster Requirements:

- Poster Size at most B1 / A1 Size 70.7cm (28") high x 100.0cm (40") wide (landscape).
- **Title / Identification** team name, region, sub-league.
- Abstract A concise summary of the entire project. The abstract should summarize the critical elements of the poster, but should avoid repeating what is stated elsewhere in the poster.
- Method / Robot Production / Design A description of the choices made during the robots' production, including the rationale underlying those choices. Production includes the design, construction, programming, component selection, and overall process. Teams should indicate the programming language, sensors used, time and cost of development. Also to include a bill of materials for the major components.
- Data / Results / Discussion The poster has details of the team's development and testing of the robot including any relevant data and modifications made as part of the robot's creation. Teams should include data with testing methods when possible especially for novel designs that others can use to compare and improve upon.
- Photos / Images The poster should have plenty of photographs and images detailing their robots' designs, schematics, algorithms, etc. All images, including graphics for styling, should either be original or available for non-commercial reuse with modification as per the creative commons license (<u>http://creativecommons.org/</u>). Any photo or image should be labeled and cited especially if not original.
- All information in the poster should be in English.



Appendix A: Group Interview Questions

Judges may ask questions from the following list and may ask followup questions based upon responses. Judges should focus questions on items that may need clarification or were missing from a team's presentation or design document. No more than one question from each category should be asked.

General:

- Which of your design decisions are influenced by which testing/experience?
- What other work (other RCJ or Major teams, other robotics things) did you draw inspiration from? OR How did you learn how to do <this>?

Electrical:

- Why/how did you pick <this component/circuit>?
- What did you blow up? OR Can you give an example of how you troubleshooted your circuit?
- What was a challenge you had building or designing <this part> of your circuit? OR what benefits do you see from making the circuit <this> way?

Mechanical:

- Why did you or did you not include <Kicker/Dribbler/Camera/360°View/other particular feature>?
- Why did you opt for <material> to construct <mechanical system>?
- How did you manufacture <this custom part>?

Strategy:

- If your robots are <here> on the field and the ball is <here>, what will your robots do?
- How do your robots deal with <occluded goal/ball not in FoV/other challenging gameplay situations>?

Software:

- How does your robot make sense of sensor inputs?
- How do your robots <communicate/perform this function> in software?
- How do you debug/calibrate your robots?



Appendix B: Design Document Guidelines

Developing documentation may seem like a daunting or even annoying task especially with such a small team of students working on complex robots. However, proper documentation is essential to confirm and communicate a team's accomplishments. If done correctly, it can also be a valuable tool for everyone, including the students creating the documentation, to reflect, learn, and build from.

Collecting content

Selecting content

Organizing content

Final Edits

Works cited



Collecting content

Basic: It takes little effort to help remind everyone to take a picture or video any time there are significant developments. A good design document will not only be a valuable resource for other teams but also give the judges confidence that the team did the engineering for their robot on their own. Do not put this responsibility on just one member; everyone should practice methods of gathering content.

Intermediate: To be more organized, individuals may try out using apps like Google Keep (see below) or Microsoft OneNote. Applications like this allow content to be quickly organized and annotated to make it easier to compile later. Consider using a central (preferably version controlled) repository so you do not risk losing content only saved to a particular device.

Advanced: Since every team member must serve in a technical role, consider having each member maintain a personal engineering notebook detailing and reflecting upon their accomplishments. This aids in solidifying understanding and can save time later in life as a personal reminder when working on similar projects. Learning how to develop a personal engineering notebook will also serve a student well when graduating from RCJ.







Fig. 4. Design of the spiral-root-function

Collect screenshots of software tools you use while developing your designs. Source: The Rockys 2021

Example of how Google Keep organizes images along with written notes. Source: author's phone! Remember to take pictures while constructing the robot. Source: Mind Benders 2021



Selecting content

With every member gathering content, there will be too much to include in the document; use the table below to help select the best content to include.

Considerations for Selecting Content		
Avoid including	Consider including	
Detailed meeting notes or agendas	A good example of how the team interacts, distributes tasks and makes decisions (e.g. a decision matrix, pictures of multiple sketches on a whiteboard, pictures of students using tools). Evidence of how the design originated.	
General information on function of common parts/designs. (e.g. the ultrasonic sensor uses high frequency sound waves)	Data that was used to determine your design was more effective or how you learned how to use these parts, especially any failures! (e.g. at this angle the ultrasonic sensor was not accurate because; our solution was)	
Hundreds of lines of code	A publicly accessible link to download the code, schematics and other files you want to share (consider using a version controlled repository). Highlight of a specific function or feature of code developed by the team.	
Only the final renderings or CAD images	The series of iterations leading to the final design. Consider including the reasons for your changes.	
Images, schematics, or content that is not original to the team this season especially if not properly cited	Only material that is original to the team this season or used as a comparison to past season's designs to emphasize improvements.	
Schematics that are copies of common circuits.	A link to the resources used. Link to a repository of the team's schematic and PCB files. Images of schematics/pcb's significantly modified or customized. Demonstration/explanation of how a team learned how to make their own schematics/PCBs with images of the team using the tools during development.	
Only designs that worked!	Examples of failed design attempts and how you improved on them.	



Organizing content

The document tells the story of how your robots were developed this season so it should be organized as such. Below is a suggested layout along with examples of how to best organize content.

- Title page Ι.
- Table of contents 11.
- Introduction to team 111.
- Overview of design, IV. capabilities, & strategies
- Design specifics V.
 - A. Mechanical
 - B. Electrical
 - C. Software
- Reflection VI.
- List of links & references VII.



BOM table identifying new parts. Source: socks 2021

Simple yet descriptive circuit diagram. Source: Shinobi 2021

IR sensor

Sub board

Teensy4.0

battery

Motor driver Metoly-62

-

communicatio

MBee3

Ê

solenoid

25V

NUMBER OF TAXABLE

T55P58038-

CAMERA

OpenMy HI

Main board

Sub board

Line sensor

Teensy3.5



Exploded views do a great job of showing a lot of information in little space. Source: Epsilon 6 2023



Final Edits

Remember this is an engineering document so it should consist mostly of images and data rather than text. Double check that the document is concise yet complete enough that one may use it to recreate your design. Your submission should be no more than 10 pages (sized A4 or 8.5"x11") with no smaller than 11 point font.

If you'd like to include a video or data that does not fit well, include thumbnail images linked to the appropriate files in a public repository; do not leave your document as all text like in the example on the left below! Also, make sure that all content fits onto the pages correctly especially if converting file types for submission.

Keep in mind the audience will mainly be other teams who would like to learn from your example and technical judges reviewing your work. Go over the award guidelines again to make sure you've covered all the expectations. Remove any content that may be obvious to RCJ participants and ensure what isn't obvious is explained thoroughly; it may be easy to leave out details that are familiar to you but not to others.





Works cited

All examples above taken from the <u>Awesome RoboCupJunior Soccer repository</u> on Github or from the author.

Take pictures while working - <u>Mind Benders 2021</u> Screenshots of software tools while developing - <u>The Rockys 2021</u> An organized BOM table - <u>Socks 2021</u> Effective circuit diagram - <u>Shinobi 2021</u> Exploded view - <u>Epsilon 6 2023</u> All text - <u>Storming FC 2021</u> A good ratio of image to text - <u>SG-Re_X 2021</u>



Glossary

Certificate - a digital award given only when a team exceeds expectations.

Criteria - a set of expectations a team is rated on by the judges and the OC.

Judged score - the score assigned to a team's overall rating.

Overall rank - the teams ordered by overall score with ties being broken first by overall rating and then by rank.

Overall rating - the combination of a team's ratings from all criteria which depicts how well a team has done in the entire competition.

Overall score - the combination of rank score and judged score used to determine overall rankings.

Rank - how a team placed using the scoring system in either the regular team matches or superTeam matches.

Rank score - the number of teams minus a team's tournament ranking plus any top rank bonus points.

Top rank bonus - points added to the highest ranking teams rank score

Trophy - a physical award given at the competition based on relative performance.