RoboCup Robot Soccer League Rule Book

RoboCup Robot Soccer League Technical Committee

(DRAFT 2026 Working Rules Document, as of 2025-10-07)

Questions or comments on these rules should be submitted via
`https://github.com/RoboCup-SPL/Rules/issues`, to the `#rule-book` channel
on the ? Discord server, or by mail to `tba@tba.com`.

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1 Purpose and Scope of the RoboCup Robot Soccer League

This document defines the purpose, scope, and rules of the RoboCup Robot Soccer League for the international RoboCup competition, at the forefront of research, innovation, and education in humanoid soccer across all forms.

1.1 Vision and Mission Statement

The RoboCup Robot Soccer League (RSL) will drive innovative research that advances the software and hardware of autonomous robots with a particular emphasis on robots deployed in real-time, dynamic, partially observable, and multi-agent environments. The RSL is well suited to advance *research*, *development*, and *education* in:

- Multi-robot systems (5+ robots) requiring decentralized coordination with limited communication over noisy channels.
- Robots that approach or approximate Human-like capabilities.
- A league that promotion research,
- Localization and state-estimation.
- Dynamic humanoid motor control.
- Real-time and on-board robot perception.
- Software engineering for autonomous robots.
- Hardware engineering for autonomous robots.
- Across topics, robot learning in all its forms.

In addition, the RSL aim to:

- Grow the community of humanoid soccer within RoboCup.
- Further education in robotics and is designed such that both teams with a primary focus in research and teams with a primary focus in education are able to participate.
- Encourage active sharing of software and hardware designs for league-wide collaboration.
- Measure the capabilities of the league against the 2050 vision of RoboCup.
- Drive the vision and direction of the rules to encourage good quality soccer between between evenly matched teams.

1.2 Core Vision and Requirements for Legal Standard Robot Platforms

The RSL encourages and welcomes the use of standard humanoid robot platforms available within the market to advance the state of humanoid robot soccer and the vision of the RSL.

With the RSL vision in mind, the core requirements for standard humanoid platforms used within the RSL are platforms:

1. Capable of dynamic motions such as fast walking, kicking a ball off the ground, and getting up from the ground;
2. Capable of running state-of-the-art AI neural network models for perception, decision-making, and control;
3. Sufficiently small and affordable that teams can fund multiple robots and travel with them to competitions;
4. Able to be programmed at a low-level of control;
5. Well-Documented.

1.3 Core Vision and Requirements for Constructed Robots

The RSL equally encourages and welcomes the use of fully custom built or modified humanoid robot platforms. To create a welcoming and fair environment for all robot platforms, the RSL ensures the following:

1. Both store-bought and custom-built robots can participate in a fair competition without risking damage to their robots.
2. The tournament is designed such that games are interesting for all participating teams and match-ups are fair.
3. The tournament is designed such that all currently existing teams are able to participate.
4. Details about hardware and software of the robots is made available to teams and organizers to ensure a fair competition and encourage scientific exchange.
5. League resources are distributed such that both store-bought and custom-built robots equally benefit from them.
6. Robots are designed with the goal of RoboCup in mind, thus restricting the allowed sensors where possible to humanoid sensors. Exceptions to this rule can be made if it benefits scientific progress.

2 Teams and Players

2.1 Number of Players

A match is played by two teams, each with ...

Needs to be discussed and defined in TC

At most one player per team on the field may be designated as *goalkeeper*, the others are all *field players*. When playing at full strength, a team must have a *goalkeeper* on the field.

Each of the players has a unique jersey number from the set $\{1, 2, 3, \ldots, 20\}$.

2.2 Number of Substitutes

In addition, each team may prepare *substitute players* outside of the field. A *substitute player* may be substituted in to become a *field player* or *goalkeeper*.

2.3 Substitution procedure

Some more sections of the Humanoid rule book, like substitution procedures for players and goalkeeper, sanctions, etc. should be moved to the chapter Game Process

3 Robot Players

3.1 The Design of the Robots

Robots participating in the RSL League must have a human-like body shape with a torso, head, two arms, and two legs, as well as human-like symmetry and proportions regarding sizes of the body parts and weight distribution.

Definition of humanoid robot from Kajima et al, 2005

The robots must be able to stand upright on their feet, to walk on their legs and to be able to recover from a fall (get back to a standing position).

The only allowed modes of locomotion are bipedal walking, running, and jumping, .

as well as soccer-related movements such as dribbling, kicking, or other forms of ball handling

The design of the robot's arms, including their length and placement, shall permit arm use and behaviors that are reasonably comparable to those of humans. Examples of permitted uses include assisting in getting up after a fall or picking up and throwing the ball (where otherwise allowed by the rules).

Arm configurations that enable behaviors significantly different from those of humans are not permitted. In particular, robots must not use their arms to provide continuous support for locomotion, such as walking on arms or using arms as additional legs.

Derived from Heinrichs suggestion

3.1.1 Size Restrictions

All robots participating in the Humanoid League must comply with the following restrictions:

to be discussed - including height restrictions

The length of the legs H_{leg}, including the feet, satisfies $0.35 \cdot H_{top} \leq H_{leg} \leq 0.7 \cdot H_{top}$, where H_{top} is the height of the top of the robot. The length of the leg is measured from the first rotating joint where its axis lies in the plane parallel to the standing ground to the tip of the foot.

A classic piece of human anatomy and art history, Leonardo da Vinci's "Vitruvian Man" famously depicts a man whose arm span is equal to his height, creating a 1:1 ratio. Therefore, the arm span, A_{span}, including the hands, should satisfy $0.8 \cdot H_{top} \leq A_{span} \leq 1.2 \cdot H_{top}$.

Based on H_{top}, the following size restrictions apply:

- xx cm $\leq H_{top} \leq$ xxx cm to play in the xy class,
- xxx cm $\leq H_{top} \leq$ xxx cm to play in the z class.

to be discussed - define divisions

H_{top} is defined as the height of the robot when standing upright (with fully extended knees). H_{top} is measured with the head of the robot oriented in such a way that it is tilted to either its maximum upwards tilt angle or the horizon line, whichever is lower.

The height of the head H_{head}, including the neck, satisfies $0.1 \cdot H_{top} \leq H_{head} \leq 0.3 \cdot H_{top}$. H_{head} is defined as the vertical distance from the axis of the first arm joint at the shoulder to the top of the head.

3.1.2 Weight Restrictions

The robot's Body-Mass Index (BMI) is defined as follows: $\mathrm{BMI} = \frac{M}{{H_{top}}^2}$, where M is the mass of the robot in kg and H_{top} its height in meters.

The Body Mass Index (BMI) of the robot should be: $5 \leq \mathrm{BMI} \leq 30$.

3.1.3 Safety

From the humanoid league rules, to be discussed

A player must not use equipment or wear anything that is dangerous to himself or another player (including any kind of jewellery).

do we need to mention jewellery?

Robots competing in the physical competition must be equipped with an emergency stop button that makes the robot immediately desist with all motions, or ideally go limp and/or cut power to the actuators. In addition to the emergency stop button, robots may only have up to two additional

physical or virtual buttons: One to start the robot behaviour and one to stop the behaviour. The buttons must be clearly labeled. If the robot has more buttons that cannot be detached, they must be visibly masked during the games.

In ...tbd... size, robot handlers are allowed to carry an additional remote emergency stop button. This button must be worn either around the neck or on the belt of the robot handler and must be clearly marked. Each emergency stop button can only be connected to the robot of the robot handler that holds the button. The remote emergency button cannot perform any additional functions and does not replace the regular emergency button. Robot handlers must keep their hands clearly away from the button unless the button is being pressed. Robot handlers must not use the remote emergency button to intentionally incapacitate their robots.

to be discussed, will there still be robot handlers?

to be discussed, add other safety measures from our discussion?

3.2 Hardware

Modifications or additions to the robot hardware are allowed.

No additional hardware is permitted including off-board sensing or processing systems. Additional sensors besides those originally installed on the robots are likewise not allowed.

to be discussed, divisions, list of permitted robots, self-built robots, etc.

to be discussed

3.3 Sensors

Teams participating in the RSL League competitions are encouraged to equip their robots with sensors that have an equivalent in human senses. These sensors must be placed at a position roughly equivalent to the location of the human's biological sensors. In particular, ...

to be discussed

3.4 Team Markers

to be discussed

3.5 Goalkeeper

The *goalkeeper* may use any of the allowed jersey numbers. The *goalkeeper* must wear a jersey with a primary color different from the primary colors used by the *field players* of both teams.

3.6 Communication and Control

Robots participating in the RSL league competitions must act autonomously while a competition is running. No external power supply, teleoperation, remote control, or remote brain of any kind is allowed. Communication is only allowed among robots on the field, and between the robots and the GameController.

between the robots and the referees,

3.6.1 Non-wireless Communications

In general there are no restrictions on communication between robots in play on the field using visual signaling (e. g. gestures) or the robot's built-in microphones, speakers, and infrared transceivers. However, communication that causes excessive discomfort to an audience, affects the safety of an audience, or violates normal playing rules is not permitted.

3.6.2 Wireless Communications

...

The use of remote processing/sensing is prohibited.

To be discussed. Take this section from the SPL rules?