

Junior Humanoid Soccer Entry league rules 2023

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Introduction

In the Junior Humanoid Soccer Entry competition, teams of young engineers design, build and program humanoid robots to compete against another team in matches. The robots in this league are not autonomous and are controlled wirelessly by the participants.

To succeed, participants must demonstrate programming, robotics, electronics and mechatronics skills. To grow the RoboCup community, teams are required to share their designs with other participants and demonstrate decent sportsmanship regardless of culture, age, or competitive outcome.

Robot design and programming

Robots should be designed and programmed exclusively by student team members. Supervisors, teachers, parents, or companies should not be involved in the design, construction, assembly, programming, or debugging of robots. To avoid possible disqualification, it is extremely important that teams abide by this rule.

Rules of participation in tournaments

Team members may participate in Junior Humanoid Soccer Entry leagues for a maximum of two seasons.

After their second participation, they need to move up to Junior Humanoid Soccer leagues.

Team members who have previously participated in Junior Humanoid Soccer leagues may not participate in Entry leagues.

1 Gaming

1.1 Game rules and duration

Junior Humanoid Soccer Entry games are played between two teams of one robot each playing soccer against each other. The robots are not autonomous and are wirelessly controlled by team members.

The game consists of two halves. The duration of each half is 5 minutes.

There will be a 5 minute break between halves.

Time will be counted down during the half without stopping (unless the referee wishes to consult with another referee).

The countdown is started by the referee or assistant referee.

Teams should be on the field 5 minutes before game time. Being at the inspection table does not count in favor of this time limit. Teams late to the start of the game may be penalized one goal for every 30 seconds late at the discretion of the referee.

The final score of the game will be trimmed so that the difference between the losing and winning team is no more than 10 goals.

1.2 Pre-match procedures

Before the first half of the game begins, the referee flips a coin. The team named first in the drawing calls the coin. The winner of the toss may choose to play on either half of the field or to have the right of first kick. The loser of the toss has the other option. After the first half, the teams switch sides of the field. The team that didn't play the ball in the first half will play the ball in the second half.

Before the match starts, the referee or his assistant can check whether the robots are able to play (i.e. whether they are able to move around the field and perform the required movements). If neither robot is capable of playing, the game will not be played and both teams will be scored zero goals.

1.3 Kick-off

Each half begins with an opening kick-off. All robots should be positioned on their half of the field. All robots should be stopped. The ball is set up by the referee in the center of the field.

The point guard is the first team to put their robot on the field.

The other team places their robot on their half of the field so that it is at least 30 cm away from the ball (outside the center circle).

Robots may not be placed outside the field. Robots may not be moved once they have been placed unless the referee requests an adjustment in placement to ensure that the robots are properly placed within the field positions.

At the referee's command (usually on a whistle), all robots are launched immediately by the team captains. Any robots launched early will be removed from the field by the referee and deemed damaged.

Before the game begins, all damaged robots are allowed to return to the playing field immediately if they are ready and fully functional.

If there are no robots on the field when the ball is played due to damage, the penalties are canceled and the match is restarted with a neutral kick-off.

Neutral kick-off

Neutral kick-off of the ball is similar to the initial ball roll with a small change: all robots must be at least 30 cm away from the ball (outside the center circle).

1.4 Human intervention

With the exception of the opening kick, human intervention by teams (e.g., touching robots) is not allowed during play unless authorized by the referee. The offending team/team member(s) may be disqualified from the game.

The referee or assistant referee can help the robots to unhook, if there is no fight for the ball nearby and if the situation resulted from normal interaction between the robots (i.e. it was not a design or programming error of the robot alone). The referee or assistant referee unhooks the robots just enough to allow them to move freely again.

1.5 Ball movement

The robot should not hold the ball. Holding the ball is defined as gaining full control of the ball by removing all degrees of freedom.

Examples of holding the ball include attaching the ball to the robot's body, surrounding the ball with the robot's body to prevent access by others, encircling the ball, or grasping the ball in any way with any part of the robot's body. If the ball does not roll while the robot is moving, this is a clear sign that the ball is stuck.

Other robots must have access to the ball.

1.6 Scoring

A goal is scored when the ball crosses the goal line. Goals scored by both the attacking and defending robots have the same result: they score a goal for the opposing team. After a goal has been scored, play will be restarted by the introduction of the ball by the team to whom the goal was scored.

1.7 Lack of progress

Lack of progress occurs when there is no progress in gameplay for a reasonable period of time and the situation is unlikely to change.

Typical situations of lack of progress are when the ball gets stuck between robots, when the position of the ball and the robot does not change, or when the ball is beyond the detection or reach of all robots on the field.

After a distinct and loud "one-two-three" countdown, the referee declares "no progress" and moves the ball to the nearest available neutral spot. If this does not remedy the lack of progress, the referee may move the ball to another neutral location.

1.8 Damaged robots

If a robot is damaged, it must be removed from the field and repaired before it can play again. Even if the robot is repaired, it must remain off the field for at least one minute or until the next kick-off.

Here are some examples of a damaged robot:

- it cannot move (loss of robot parts, power, etc.).

Computers and repair equipment are not allowed in the game area during play. Usually a team member must take the damaged robot to an "approved repair table" near the playground. The referee may only authorize the calibration of robot sensors, computers and other instruments in the playing area 5

minutes before the start of each half. Robots can only be reprogrammed during gameplay when they are out of play (i.e. damaged or off the field) or when explicitly authorized by the referee.

Once the robot is repaired, it will be placed in an unoccupied neutral location, furthest away from the ball, directed towards their goal. The robot may be returned to the field only after the damage has been repaired. If the referee notices that the robot has been returned to the field with the same original problem, the referee may ask that the robot be removed and play continue as if the robot had not been returned.

Only the referee decides if the robot is damaged. The robot may be removed or returned only with the permission of the referee.

1.9 Game stop

Basically, the game shouldn't stop.

The referee may stop play if there is a situation on or around the field that the referee wishes to discuss with a tournament official, or if the ball is defective and a replacement is not available.

When the referee has stopped play, all robots must be stopped and remain on the field untouched. The referee may decide whether play will be continued/resumed from the situation in which play was stopped or by a neutral kick-off.

2 Team

2.1 General provisions

A team should consist of one or more participants. Team participant(s) and/or robot(s) cannot be split between teams. The maximum number of team members is determined by each local Competition Organizer.

Each team member should fulfill a technical role.

Each team should have a captain. The captain is the person responsible for communicating with the referees. A team may replace its captain during the competition with another team member. No more than two members of a team may be near the field during a match: usually the captain and his assistant.

2.2 Violations

Teams that do not follow the rules will not be allowed to participate.

3 Robots

3.1 Number of robots / replacements

The number of robots in a team is 1 (one). Each team is allowed to have no more than one robot for the entire tournament. Swapping robots during competition within a team or with other teams is prohibited.

3.2 Interference

Robots must not interfere in the radio frequency spectrum with other robots in the field.

A team claiming that their robot has been affected in any way by another team's robot must provide evidence of the interference. Any interference should be confirmed by the tournament organizers if the claim is made by another team.

3.3 Control

During a match, all robot control is performed by team members through wireless interfaces operating in the radio frequency spectrum. WiFi, Bluetooth, ZigBee and other modules can be used. A special remote control can be used as a control tool as well as a PC or smartphone/tablet.

Teams are independently responsible for ensuring communication. Availability of frequencies cannot be guaranteed.

3.5 Mobility

Robots should be designed and programmed so that their movement is not limited to one dimension (defined as a single axis, such as moving only in a straight line). They must move in all directions across the field, such as turning.

3.6 Design

Any robotics kit or modules can be used to build the robot.

The robots must be programmed exclusively by the students who are members of the team.

Mentors, teachers, parents, or companies should not be involved in programming and debugging robots.

Any programming language, interfaces, and integrated development environments (IDEs) can be used to program the robots.

Robots competing in the competition should have a humanoid body. They should consist of two legs, two arms and one head attached to the torso. Robots should be able to stand on their feet and walk. The only acceptable modes of locomotion are walking on two legs and running. All robot actions should be kinematically equivalent to humanoid movements.

The height of the robot is determined for an upright position with knees, body and head fully extended. The height of the robot should be between 25 cm and 50 cm. The maximum weight of the robots is no more than 5kg.

3.9 Violations

Robots that do not adhere to these specifications/rules will not be allowed to play.

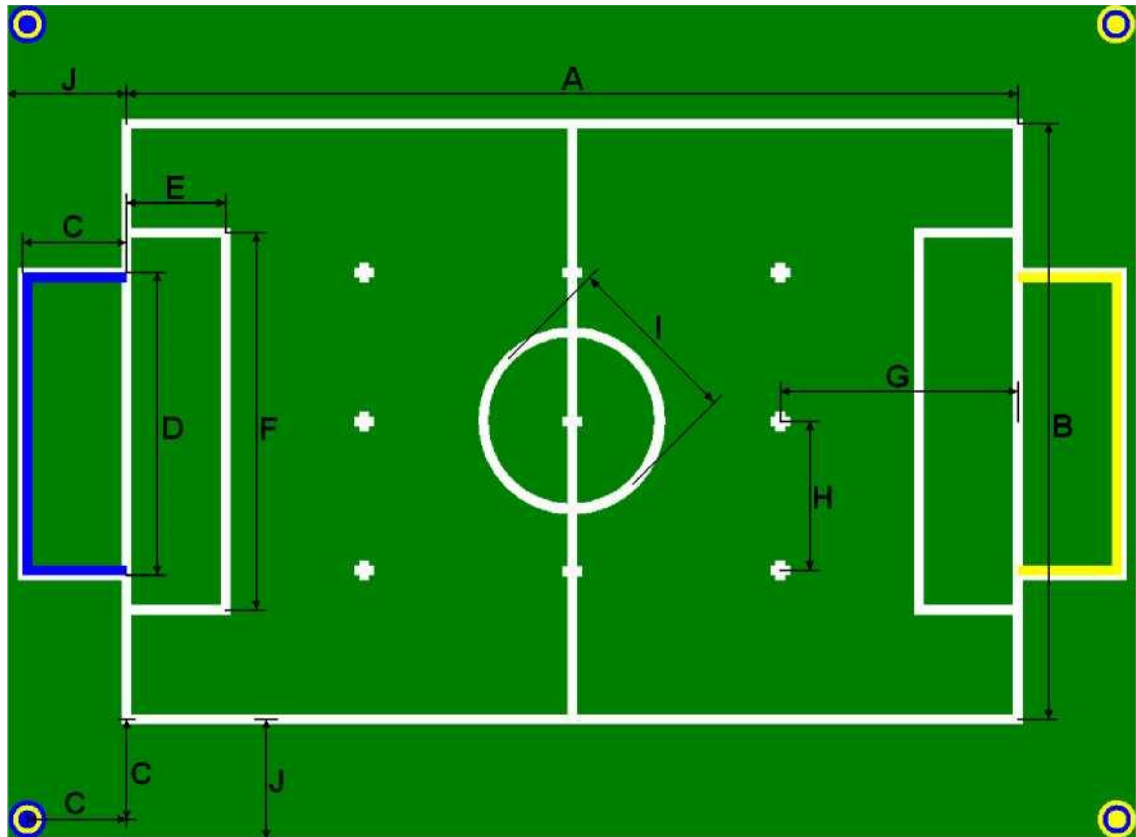
If an infraction is found during the current game, the team is disqualified for that game.

If such violations are repeated, the team may be disqualified from the tournament.

4 Playing Field

4.1 Field dimensions

The full size of the playing field is 300*400 cm.



Field dimensions

A	Field length	340
B	Field width	240
C	Gate depth	15
D	Gate width	100
E	Depth of the penalty area	30
F	Width of the penalty area	120
G	Distance to the penalty spot	90
H	Neutral points	65
I	Diameter of the center circle	90
J	Out Zone	30

A 5 cm wide marking on the field can be made with white paint.

4.4 Gates

There are two gates on the field, centered on each of the shorter sides of the playing field. The gate can be constructed from 10 cm diameter sanitary pipes.

The width of the gate is 100 cm and the height is 60 cm. The color of the gate can be either white or have different coloring to identify the opponents' gate: yellow and blue.

4.5 Field coverage

The floor consists of a green carpet, ideally a darker shade, over a hard flat surface.

All lines on the field should be colored, marked with tape and have some resistance to breaking or tearing.

Lines should be 5 cm wide ($\pm 10\%$).

4.6 Neutral zones

Six neutral zones (points) are defined on the field. These points are used to continue the game after it has been interrupted.

4.7 The center of the field and the center circle

A center circle will be drawn on the field. It has a diameter of 90 cm. It is designed for referees and captains as a guide during the introduction of the ball into play.

4.8 Penalty areas

In front of each goal there is a penalty area 120 cm wide and 30 cm deep. The penalty areas are marked with a white line 5 cm wide ($\pm 10\%$).

5 Ball

5.1 Ball specifications

A red or orange ball, 8 cm in diameter, is used for the game.

5.2 Balls for the tournament

Balls for the tournament should be provided by the organizers. The organizers are not responsible for providing practice balls.

6 Behavioral Norms

6.1 Playing by the rules

It is expected that the goal of all teams is to play robotic soccer in a fair and clean manner. All robots are expected to be built with other participants in mind.

Robots are not allowed to intentionally interfere with or damage other robots during normal play.

Robots are not allowed to cause damage to the field or ball during normal play.

A robot causing damage may be disqualified from a particular match at the discretion of the referee. The organizing committee will also be informed.

People are not allowed to intentionally interfere with the robots or damage the field or ball.

6.2 Behavior

All participants are expected to behave themselves. All actions and behavior at the tournament venue should be restrained.

6.3 Help

Mentors (teachers, parents, chaperones and other adult team members, including interpreters) are not allowed in the teams' work area unless explicitly but temporarily authorized by a member of the Organizing Committee. Only participating students may be in the work area.

Mentors should not touch, build, repair, or program robots.

6.4 Knowledge sharing

Tournament participants should share the understanding that any technological and educational developments should be shared with RoboCup and RoboCupJunior participants.

6.5 The Spirit of RoboCap

All participants, students, mentors and parents are expected to honor the mission of RoboCupJunior.

What matters is not whether you win or lose, but how much you learn!

6.8 Violations / Disqualification

Teams violating the rules of conduct may be disqualified from the tournament.

It is also possible to suspend only one person or robot from further participation in the tournament.

In less serious cases of misbehavior, the team will be given a warning by showing a yellow card.

In serious or repeated cases of misbehavior, a team may be immediately disqualified without warning by the presentation of a red card.

7 Conflict Resolution

7.1 Referee and assistant referee

The referee is the person responsible for making decisions about the game under these rules and may be assisted by an assistant referee.

During the game, decisions made by the referee and/or assistant referee are final.

Any dispute with a referee or assistant referee may result in a warning. If a dispute continues or another dispute arises, it may result in immediate disqualification from the game.

Only the captain has the right to speak freely with the referee and/or his assistant. Yelling at the referee and/or assistant referee, as well as requesting a change of decision, may be directly penalized with a warning at the discretion of the referee.

At the end of the game, the result recorded in the score sheet is final. The referee will ask the captains to add written comments to the score sheet if they feel it is necessary. These comments will be reviewed by members of the Organizing Committee.

7.2 Clarification of rules

Clarification of rules can be done by members of the Technical Committee and the RoboCupJunior Soccer Organizing Committee, if necessary, even during the tournament.

7.3 Changing the rules

In case of special circumstances, such as unforeseen problems or robot capabilities, the rules may be changed by the RoboCupJunior Soccer Organizing Committee Chairman together with the available members of the Technical Committee and the Organizing Committee, if necessary, even during the tournament.

7.4 Regulations

Each RoboCupJunior competition may have its own rules for the tournament (e.g. SuperTeam system, game modes, robot testing, interviews, schedules, etc.). Regulations become part of this rule.