

# 2017RoboCup 机器人世界杯中国赛比赛规则

## RoboCup 类人组项目

2017RoboCup 机器人世界杯中国赛  
RoboCup 类人组项目技术委员会

2017 年 1 月 31 日



# RoboCup Soccer Humanoid League Laws of the Game\* 2015/2016

Version 0.2, 07. May 2016 --- Draft for discussion



Louis Vuitton Cup

RoboCup Humanoid League Mailing List (for important announcements, rule discussion and questions): [lists.cc.gatech.edu/mailman/listinfo/robocup-humanoid](mailto:lists.cc.gatech.edu/mailman/listinfo/robocup-humanoid)

RoboCup Humanoid League Home Page: [www.robocuphumanoid.org](http://www.robocuphumanoid.org)

- inspired by the Laws of the Game of Fédération internationale de Football Association (FIFA 2013/2014), [http://resources.fifa.com/mm/document/footballdevelopment/refereeing/02/36/01/11/laws\\_of\\_the\\_game\\_weben\\_neutral.pdf](http://resources.fifa.com/mm/document/footballdevelopment/refereeing/02/36/01/11/laws_of_the_game_weben_neutral.pdf)
- with RoboCup Humanoid League specific amendments

## **Overview**

Section I – Laws of the Game

Section II – RoboCup Humanoid League Competition Rules

Section III – Rules for RoboCup Humanoid League Technical Challenges

# Section I

## Laws of the Game

The Laws of the Game should be updated regularly to refer to the most recent FIFA document.

Deviations from the FIFA rules are marked in the text:

'replaces': A RoboCup-specific rule temporarily replaces a FIFA rule.

'suspended': A specific FIFA rule is not yet applied.

'new': A RoboCup-specific rule is temporarily introduced.

## NOTES ON THE LAWS OF THE GAME

### Modifications

Subject to the agreement of the member association concerned and provided the principles of these Laws are maintained, the Laws may be modified in their application for regional matches.

Any or all of the following modifications are permissible:

- size of the field of play
- size, weight and material of the ball
- width between the goalposts and height of the crossbar from the ground
- duration of the periods of play
- substitutions

### Male and Female

References to the male gender in the Laws of the Game in respect of referees, assistant referees, players and officials are for simplification and apply to both men and women.

### Official languages

RoboCup Humanoid League Technical Committee publishes the Laws of the Game in English.

### Key

A single line in the left-hand margin indicates new Law changes.

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## Law 1 – The Field of Play

### Field surface

Matches may be played on artificial surfaces with a height of approximately 30 mm.

(replaces: Matches may be played on natural or artificial surfaces, according to the rules of the competition.)

The colour of artificial surfaces must be green.

(suspended: Where artificial surfaces are used in either competition matches between representative teams of member associations affiliated to FIFA or international club competition matches, the surface must meet the requirements of the FIFA Quality Concept for Football Turf or the International Artificial Turf Standard, unless special dispensation is given by FIFA.)

### Field markings

The field of play must be rectangular and marked with lines. These lines belong to the areas of which they are boundaries.

The two longer boundary lines are called touch lines. The two shorter lines are called goal lines.

The field of play is divided into two halves by a halfway line, which joins the midpoints of the two touch lines.

The centre mark is indicated at the midpoint of the halfway line. A circle with a radius of 1.5 m is marked around it. (replaces: A circle with a radius of 9.15 m (10 yds) is marked around it.)

(suspended: Marks may be made off the field of play, 9.15 m (10 yds) from the corner arc and at right angles to the goal lines and the touch lines, to ensure that defending players retreat this distance when a corner kick is being taken.)

### Dimensions

The length of the touch line must be greater than the length of the goal line.

Length (touch line): approximately 9 m

Width (goal line) approximately 6 m

(replaces:

Length (touch line): minimum 90 m

maximum 120 m

Width (goal line) minimum 45 m

maximum 90 m)

All lines must be of the same width, which must be approximately 5 cm.

(replaces: All lines must be of the same width, which must be not more than 12 cm (5 ins).)

### International matches

Length (touch line): approximately 9 m

Width (goal line) approximately 6 m

(replaces:

Length (touch line): minimum 100 m

maximum 110 m

Width (goal line) minimum 64 m

maximum 75 m)

### The goal area

Two lines are drawn at right angles to the goal line, 1.6 m for KidSize and 1.2 m for TeenSize and AdultSize from the inside of each goalpost. These lines extend into the field of play for a distance of 1 m and are joined by a line drawn parallel with the goal line. The area bounded by these lines and the goal line is the goal area.

(replaces: Two lines are drawn at right angles to the goal line, 5.5 m (6 yds) from the inside of each goalpost. These lines extend into the field of play for a distance of 5.5 m (6 yds) and are joined by a line drawn parallel with the goal line. The area bounded by these lines and the goal line is the goal area. )

### The penalty area

(suspended: Two lines are drawn at right angles to the goal line, 16.5 m (18 yds) from the inside of each goalpost. These lines extend into the field of play for a distance of 16.5 m (18 yds) and are joined by a line drawn parallel with the goal line. The area bounded by these lines and the goal line is the penalty area.)

A penalty mark is made 2.1 m from the midpoint between the goalposts and equidistant to them. (replaces: Within each penalty area, a penalty mark is made 11 m (12 yds) from the midpoint between the goalposts and equidistant to them.)

(suspended: An arc of a circle with a radius of 9.15 m (10 yds) from the centre of each penalty mark is drawn outside the penalty area.)

### Flagposts

(suspended: A flagpost, not less than 1.5 m (5 ft) high, with a non-pointed top and a flag must be placed at each corner.)

(suspended: Flagposts may also be placed at each end of the halfway line, not less than 1 m (1 yd) outside the touch line.)

### The corner arc

(suspended: A quarter circle with a radius of 1 m (1 yd) from each corner flagpost is drawn inside the field of play.)



## Goals

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A goal must be placed on the centre of each goal line.

A goal consists of two upright posts equidistant from the corner flagposts and joined at the top by a horizontal crossbar. The goalposts and crossbar must be made of wood, metal or other approved material. They must be square, rectangular, round or elliptical in shape and must not be dangerous to players.

The distance between the posts is 1.8 m for KidSize and 2.6 m for TeenSize and AdultSize and the distance from the lower edge of the crossbar to the ground is 1.1 m for KidSize and 1.8 m for TeenSize and AdultSize.

(replaces: The distance between the posts is 7.32 m (8 yds) and the distance from the lower edge of the crossbar to the ground is 2.44 m (8 ft).)

(suspended: figures of different goal post geometries)

(suspended: The position of the goalposts in relation to the goal line must be according to the graphics below.)

If the shape of the goalposts is square (viewed from above), the sides must be parallel or perpendicular to the goal line. The sides of the crossbar must be parallel or perpendicular to the field plane.

If the shape of the goalposts is elliptical (viewed from above), the longest axis must be perpendicular to the goal line. The longest axis of the crossbar must be parallel to the field plane.

If the shape of the goalposts is rectangular (viewed from above), the longest side must be perpendicular to the goal line. The longest side of the crossbar must be parallel to the field plane.

Both goalposts and the crossbar have the same width and depth, of approximately 10 cm. (replaces: Both goalposts and the crossbar have the same width and depth, which do not exceed 12 cm (5 ins).) The goal lines must be approximately 5 cm of width. (replaces: The goal lines must be of the same width as the goalposts and the crossbar.) Nets may be attached to the goals and the ground behind the goal, provided that they are properly supported and do not interfere with the goalkeeper.

The goalposts and crossbars must be white.

## Safety

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Goals must be anchored securely to the ground. Portable goals may only be used if they satisfy this requirement.

## The field of play

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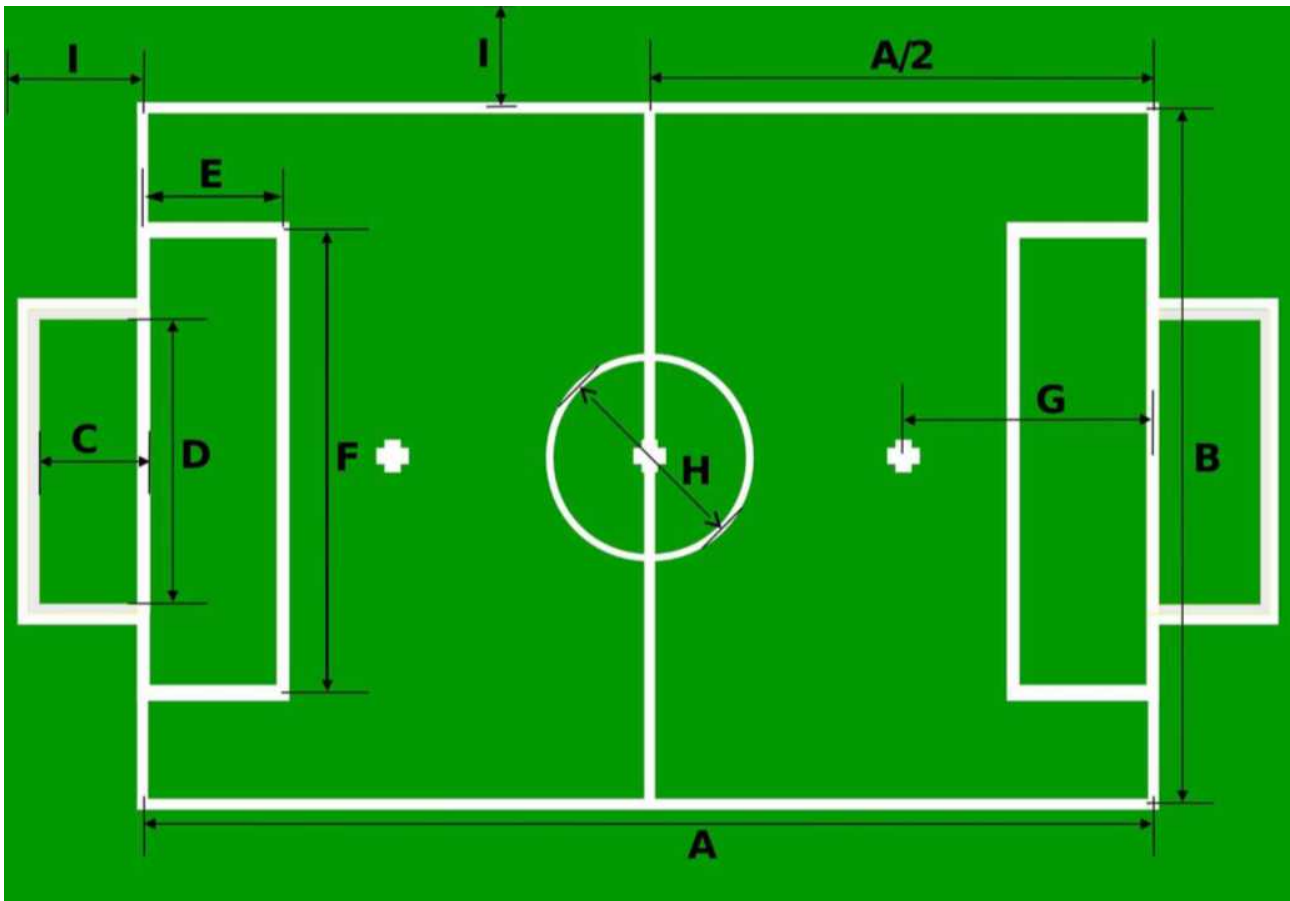


Figure 1: Humanoid robot soccer field (not to scale)

Table 1: Approximate dimensions of the rectangular field of soccer play.

		KidSize [m]	TeenSize & AdultSize [m]
A	Field length	9	
B	Field width	6	
C	Goal depth	0.6	0.6
D	Goal width	1.8	2.6
	Goal height	1.1	1.8
E	Goal area length	1	
F	Goal area width	5	
G	Penalty mark distance	2.1	
H	Center circle diameter	1.5	
I	Border strip width (min.)	0.7	

(replaces figure of field)

### Corner flagpost

(suspended: figure of flagpost)

### Metric measurements

(suspended: figure with metric dimensions of field)

## **Imperial measurements**

(suspended: figure with imperial dimensions of field)

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## **Decisions of the International F.A. Board**

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### **Decision 1**

(suspended: Where a technical area exists, it must meet the requirements approved by the International F.A. Board, which are contained in the section of this publication entitled The Technical Area.)

### **Decision 2**

(suspended: Where goal-line technology (GLT) is used, modifications to the goal frame may be allowed. They must be in accordance with the specifications stipulated in the FIFA Quality Programme for GLT and according to the above description, "Goals".)

## Law 2 – The Ball

### Qualities and measurements

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The ball is:

- spherical
- made of leather or other suitable material
- FIFA size 1 for KidSize, size 3 for TeenSize and size 5 for AdultSize leagues.  
(replaces: of a circumference of not more than 70 cm (28 ins) and not less than 68 cm (27 ins) and: not more than 450 g (16 oz) and not less than 410 g (14 oz) in weight at the start of the match)
- (suspended: of a pressure equal to 0.6 – 1.1 atmosphere (600 – 1,100 g/cm<sup>2</sup>) at sea level (8.5 lbs/sq in – 15.6 lbs/sq in))

### Replacement of a defective ball

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If the ball bursts or becomes defective during the course of a match:

- the match is stopped
- the match is restarted by dropping the replacement ball at the place where the original ball became defective, unless play was stopped inside the goal area, in which case the referee drops the replacement ball on the goal area line parallel to the goal line at the point nearest to where the original ball was located when play was stopped

If the ball bursts or becomes defective during a penalty kick or during kicks from the penalty mark as it moves forward and before it touches any player or the crossbar or goalposts:

- the penalty kick is retaken

If the ball bursts or becomes defective whilst not in play at a kick-off, goal kick, corner kick, free kick, penalty kick or throw-in:

- the match is restarted accordingly

The ball may not be changed during the match without the authority of the referee.

## Decisions of the International F.A. Board

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### Decision 1

*(suspended: In addition to the requirements of Law 2, acceptance of a ball for use in matches played in an official competition organised under the auspices of FIFA or the confederations is conditional upon the ball bearing one of the following:*

- *the official “FIFA APPROVED” logo*
- *the official “FIFA INSPECTED” logo*
- *the “INTERNATIONAL MATCHBALL STANDARD” logo*

Such a logo on a ball indicates that it has been tested officially and found to be in compliance with specific technical requirements, different for each logo and additional to the minimum specifications stipulated in Law 2. The list of the additional requirements specific to each of the respective logos must be approved by the International F.A. Board. The institutes conducting the tests are subject to the approval of FIFA.

Member association competitions may also require the use of balls bearing any one of these three logos.

(figures...)

### Decision 2

*(suspended: In matches played in an official competition organised under the auspices of FIFA, the confederations or the member associations, no form of commercial advertising on the ball is permitted, except for the emblem of the competition, the competition organiser and the authorised trademark of the manufacturer. The competition regulations may restrict the size and number of such markings.)*

### Decision 3

*(suspended: Where goal-line technology (GLT) is used, balls with integrated technology are allowed, but they must either be “FIFA APPROVED”, “FIFA INSPECTED” or “INTERNATIONAL MATCHBALL STANDARD” (see “Decision 1”).)*

## Law 3 - The Number of Players

### Number of Players

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A match is played by two teams, each consisting of not more than four players in KidSize and not more than three players in TeenSize, one of whom must be designated as goalkeeper. A match may not start if either team consists of less than one player.

(replaces: A match is played by two teams, each consisting of not more than eleven players, one of whom is the goalkeeper. A match may not start if either team consists of fewer than seven players.)

### Number of substitutions

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#### Official competitions

Up to a maximum of three substitutes may be used in any match played in an official competition organised under the auspices of FIFA, the confederations or the member associations.

The rules of the competition must state how many substitutes may be nominated, from three up to a maximum of twelve.

#### Other matches

In national "A" team matches, up to a maximum of six substitutes may be used.

In all other matches, a greater number of substitutes may be used provided that:

- the teams concerned reach agreement on a maximum number
- the referee is informed before the match

If the referee is not informed, or if no agreement is reached before the match, no more than six substitutes are allowed.

### Substitution procedure

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In all matches, the names of the substitutes must be given to the referee prior to the start of the match. Any substitute whose name is not given to the referee at this time may not take part in the match.

To replace a player with a substitute, the following conditions must be observed:

- the referee must be informed before any proposed substitution is made
- the substitute only enters the field of play after the player being replaced has left and after receiving a signal from the referee
- the substitute only enters the field of play at the halfway line and during a stoppage in the match
- the substitution is completed when a substitute enters the field of play
- from that moment, the substitute becomes a player and the player he has replaced becomes a substituted player
- the substituted player takes no further part in the match

- all substitutes are subject to the authority and jurisdiction of the referee, whether called upon to play or not

### **Changing the goalkeeper**

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Any of the other players may change places with the goalkeeper, provided that:

- the referee is informed before the change is made
- the change is made during a stoppage in the match

### **Infringements and sanctions**

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If a substitute or substituted player enters the field of play without the referee's permission:

- the referee stops play (although not immediately if the substitute or substituted player does not interfere with play)
- the referee cautions him for unsporting behaviour and orders him to leave the field of play
- if the referee has stopped play, it is restarted with an indirect free kick for the opposing team from the position of the ball at the time of the stoppage (see Law 13 – Position of free kick)

If a named substitute enters the field of play instead of a named player at the start of the match and the referee is not informed of this change:

- the referee allows the named substitute to continue the match
- no disciplinary sanction is taken against the named substitute
- the number of substitutions allowed by the offending team is not reduced
- the referee reports the incident to the appropriate authorities

If a player changes places with the goalkeeper without the referee's permission before the change is made:

- the referee allows play to continue
- the referee cautions the players concerned when the ball is next out of play

In the event of any other infringements of this Law:

- the players concerned are cautioned
- the match is restarted with an indirect free kick, to be taken by a player of the opposing team from the position of the ball at the time of the stoppage (see Law 13 – Position of free kick)

### **Players and substitutes sent off**

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A player who has been sent off before the kick-off may be replaced only by one of the named substitutes.

A named substitute who has been sent off, either before the kick-off or after play has started, may not be replaced.



## Law 4 – The Players ('Equipment')

### Safety

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

### The Design of the Robots (new)

Robots participating in the Humanoid League competitions must have a human-like body plan, as shown in Fig. 2. They must consist of two legs, two arms, and one head, which are attached to a trunk.

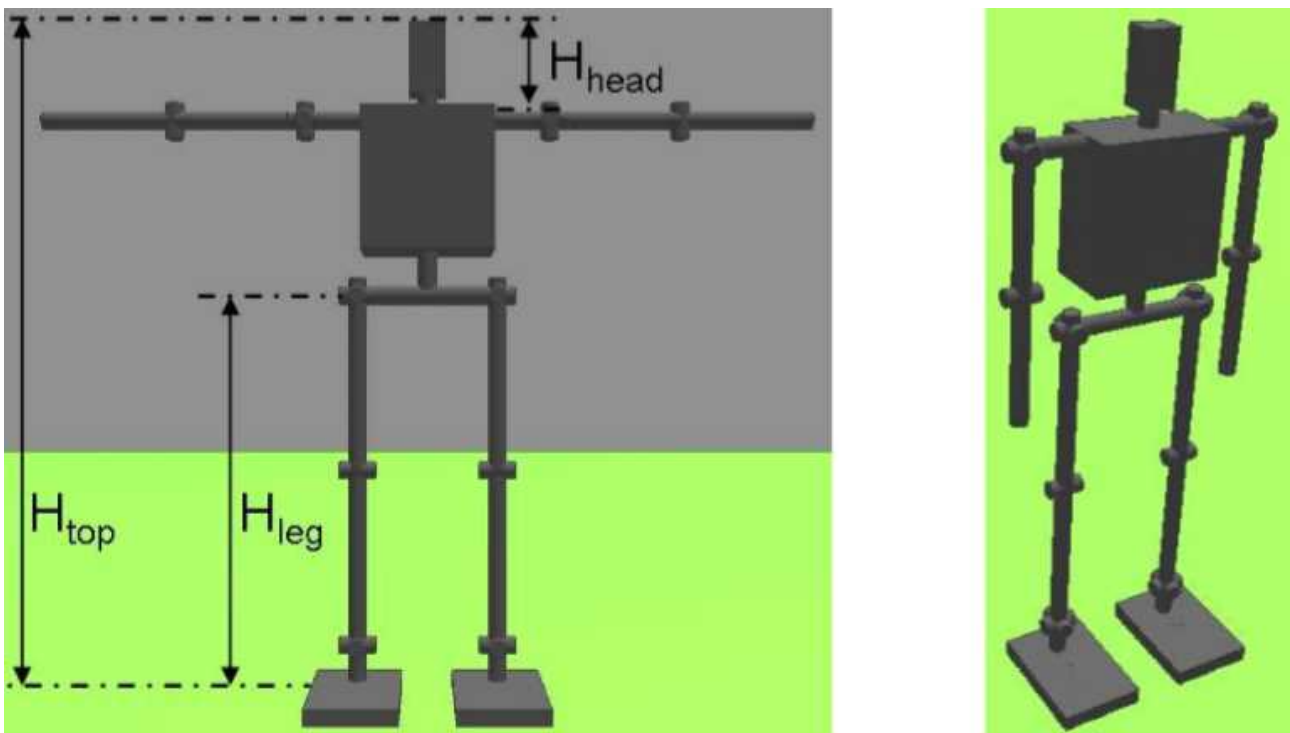


Figure 2: Example of a humanoid robot body plan (left) and standing upright pose (right).

The robots must be able to stand upright on their feet and to walk on their legs. The only allowed modes of locomotion are bipedal walking and running.

All actions of the robots must be kinematically equivalent to humanoid motions.

### Robot Height (new)

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

- $40\text{cm} \leq H_{\text{top}} \leq 90\text{cm}$  to play in the KidSize class,
- $80\text{cm} \leq H_{\text{top}} \leq 140\text{cm}$  to play in the TeenSize class,
- $130\text{cm} \leq H_{\text{top}} \leq 180\text{cm}$  to play in the AdultSize class.

$H_{\text{top}}$  is defined as the height of the robot when standing upright (with fully extended knees, cf. Fig. 2 right) and  $H_{\text{com}}$  denotes the height of the robot's center of mass, measured in upright posture.

## Size Restrictions (new)

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

- Each foot must fit into a rectangle of area  $(2.2 \cdot H_{com})^2/32$ .
- Considering the rectangle enclosing the convex hull of the foot, the ratio between the longest side of the rectangle and the shortest one, shall not exceed 2.5.
- The robot must fit into a cylinder of diameter  $0.55 \cdot H_{top}$ .
- The robot does not possess a configuration where it is extended longer than  $1.5 \cdot H_{top}$ .
- The length of the legs  $H_{leg}$ , including the feet, satisfies  $0.35 \cdot H_{top} \leq H_{leg} \leq 0.7 \cdot H_{top}$ .
- The height of the head  $H_{head}$ , including the neck, satisfies  $0.05 \cdot H_{top} \leq H_{head} \leq 0.25 \cdot H_{top}$ .  $H_{head}$  is defined as the vertical distance from the axis of the first arm joint at the shoulder to the top of the head.
- The leg length is measured while the robot is standing up straight. The length 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.

## Sensors (new)

Teams participating in the Humanoid 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,

- the only active external sensor allowed is sound ("human-like" with respect to volume and frequency) with one loudspeaker on the robot. The loudspeaker must be placed in the head. Any other active sensor (emitting light, sound, or electromagnetic waves into the environment in order to measure reflections) is not allowed.
- external sensors, such as cameras and up to two microphones, may not be placed in the legs or arms or the torso of the robots. They must be placed in the robot's head and above any neck joint.
- The field of view of the robots is limited at any time to 180 degrees. This means that the maximum angle between any two points in the overlap of the field of view of all cameras mounted on the robot must be less than 180 degrees. Also the pan-tilt motion of the head and the cameras mounted on the robot's head is restricted to be more human like not only with respect to the field of view but also to the range of motion of the neck joints. Therefore, the mechanism to pan the camera is limited to 270 degree pan, which means  $\pm 135$  degrees from the position looking straight ahead. The mechanism to tilt the camera is limited to  $\pm 90$  degrees (measured from the horizontal line). Furthermore, if positioned at the center mark the robot may not be able to see both goals in any tilt angle and in any standing or walking posture of the robot.
- The number of cameras is limited to a stereo vision setup (i.e., max. 2 cameras with a large overlap) only. Monocular vision is also allowed.
- Touch sensors, force sensors, and temperature sensors may be placed at any position on the robot.

- Sensors inside the robot may measure all quantities of interest, including (but not limited to) voltages, currents, forces, movements, accelerations, magnetic field and rotational speeds. They can be at any position inside the robot.

## **Communication and Control (new)**

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Robots participating in the Humanoid 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.

Robots may communicate only via the wireless network provided by the organizers, which must support the referee box. The total bandwidth of the robots belonging to one team may not exceed 1 Mbit/s. The robots must not rely on availability or quality of the wireless network. They must be able to play if the network is not available or of low quality. Only robots are allowed to communicate by WLAN. Any other computers of team members are only allowed to communicate by tethered LAN. No other wireless communication is allowed onsite. All other wireless hardware must be deactivated. A team may be disqualified if one of the team members violates this rule.

Robots in play may communicate with each other at any time during a game. Any kind of transmission from an external computer or an out of play robot to the playing robots is prohibited. This implies that any monitoring is only done by receiving UDP communication from the robots using an external computer connected by tethered LAN to the official wireless router. Sending any transmission from an external computer to the robots has to take place during a timeout or using a direct cable between the computer and the robot during maintenance of the robot.

During the game an official game controller/referee box will be used. It uses UDP to broadcast information to the robots like elapsed time, current score, game state (ready, set, playing, finished) and the robot-specific penalized state. The source code is open. To encourage teams to use the referee box, 15 seconds advantage is given to teams using the referee box in any stoppage of the game.

No humans are allowed on the field while the ball is in play. Robot handlers must receive permission from the referee prior to entering the field. Each team may designate only one person as robot handler. The robot handler of a team may not touch a robot of another team in order to avoid any (unintentional or intentional) damage to that robot.

The source code of the game controller/referee box is available from <http://github.com/fumanoids/gamecontroller/tree/HL>, see also <https://www.robocuphumanoid.org>.

## **Basic equipment**

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(suspended: The basic compulsory equipment of a player comprises the following separate items:

- a jersey or shirt with sleeves – if undergarments are worn, the colour of the sleeve must be the same main colour as the sleeve of the jersey or shirt

- shorts – if undershorts or tights are worn, they must be of the same main colour as the shorts
- stockings – if tape or similar material is applied externally it must be the same colour as that part of the stocking it is applied to
- shinguards
- footwear)

## Shinguards

(suspended:

- are covered entirely by the stockings
- are made of rubber, plastic or a similar suitable material
- provide a reasonable degree of protection)

## Colours

- (new) Robots must be mostly black or of dark grey color (i.e. RAL 7011 Iron Grey or darker) and non reflective. Robots may also be colored in aluminum-like silver, grey or white but then their feet must be colored black. Any color used for the field (green, white) or colors similar to the opponent team's team markers must be avoided. Arms, legs and bodies of the robot must be of solid shape appearance.
- (new) The robots must be marked with team markers. These markers are colored magenta (referred to as red) for one team and cyan (referred to as blue) for the other team. Robot legs and arms must be covered by team markers. From each side of the robot, at least one team marker must be visible on both an arm and a leg. The marker must be at least 5 cm in height and as wide as the leg or arm of the robot as seen from that side. If both teams cannot agree, which team color to use, a coin will be flipped 15 minutes prior to the game to assign the team colors.
- (new) The robots of each team must be uniquely identifiable. They must be marked with numbers or names. The goal keeper robot must be marked uniquely that it can be easily distinguished from the other robots of a team by the referees.
- The two teams must wear colours that distinguish them from each other and also the referee and the assistant referees.
- (suspended: Each goalkeeper must wear colours that distinguish him from the other players, the referee and the assistant referees)

## Infringements and sanctions

In the event of any infringement of this Law:

- play need not be stopped
- the player at fault is instructed by the referee to leave the field of play to correct his equipment
- the player leaves the field of play when the ball next ceases to be in play, unless he has already corrected his equipment
- any player required to leave the field of play to correct his equipment must not re-enter without the referee's permission

- the referee checks that the player's equipment is correct before allowing him to re-enter the field of play
- the player is only allowed to re-enter the field of play when the ball is out of play

A player who has been required to leave the field of play because of an infringement of this Law and who re-enters the field of play without the referee's permission must be cautioned.

### **Restart of play**

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If play is stopped by the referee to administer a caution:

- the match is restarted by an indirect free kick taken by a player of the opposing team from the place where the ball was located when the referee stopped the match (see Law 13 – Position of free kick)

## **Decisions of the International F.A. Board**

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### **Decision 1**

Players must not reveal undergarments showing slogans or advertising. The basic compulsory equipment must not have any political, religious or personal statements. A player removing his jersey or shirt to reveal slogans or advertising will be sanctioned by the competition organiser. The team of a player whose basic compulsory equipment has political, religious or personal slogans or statements will be sanctioned by the competition organiser or by RoboCup Federation Humanoid League.

## Law 5 – The Referee

### The authority of the referee

Each match is controlled by a referee who has full authority to enforce the Laws of the Game in connection with the match to which he has been appointed.

### Powers and duties

#### The Referee:

- enforces the Laws of the Game
- controls the match in cooperation with the assistant referees and, where applicable, with the fourth official
- ensures that any ball used meets the requirements of Law 2
- ensures that the players' equipment meets the requirements of Law 4
- acts as timekeeper and keeps a record of the match
- stops, suspends or abandons the match, at his discretion, for any infringements of the Laws
- stops, suspends or abandons the match because of outside interference of any kind
- stops the match if, in his opinion, a player is seriously injured and ensures that he is removed from the field of play. An injured player may only return to the field of play after the match has restarted
- allows play to continue until the ball is out of play if a player is, in his opinion, only slightly injured
- ensures that any player bleeding from a wound leaves the field of play. The player may only return on receiving a signal from the referee, who must be satisfied that the bleeding has stopped
- allows play to continue when the team against which an offence has been committed will benefit from such an advantage and penalises the original offence if the anticipated advantage does not ensue at that time
- punishes the more serious offence when a player commits more than one offence at the same time
- takes disciplinary action against players guilty of cautionable and sending-off offences. He is not obliged to take this action immediately but must do so when the ball next goes out of play
- takes action against team officials who fail to conduct themselves in a responsible manner and may, at his discretion, expel them from the field of play and its immediate surrounds
- acts on the advice of the assistant referees regarding incidents that he has not seen
- ensures that no unauthorised persons enter the field of play
- indicates the restart of the match after it has been stopped
- provides the appropriate authorities with a match report, which includes information on any disciplinary action taken against players and/or team officials and any other incidents that occurred before, during or after the match

## **Decisions of the referee**

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The decisions of the referee regarding facts connected with play, including whether or not a goal is scored and the result of the match, are final.

The referee may only change a decision on realising that it is incorrect or, at his discretion, on the advice of an assistant referee or the fourth official, provided that he has not restarted play or terminated the match.



## Decisions of the International F.A. Board

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### Decision 1

A referee (or where applicable, an assistant referee or fourth official) is not held liable for: any kind of injury suffered by a player, official or spectator any damage to property of any kind

any other loss suffered by any individual, club, company, association or other body, which is due or which may be due to any decision that he may take under the terms of the Laws of the Game or in respect of the normal procedures required to hold, play and control a match.

Such decisions may include:

- a decision that the condition of the field of play or its surrounds or that the weather conditions are such as to allow or not to allow a match to take place
- a decision to abandon a match for whatever reason
- a decision as to the suitability of the field equipment and ball used during a match
- a decision to stop or not to stop a match due to spectator interference or any problem in spectator areas
- a decision to stop or not to stop play to allow an injured player to be removed from the field of play for treatment
- a decision to require an injured player to be removed from the field of play for treatment
- a decision to allow or not to allow a player to wear certain apparel or equipment
- a decision (where he has the authority) to allow or not to allow any persons (including team or stadium officials, security officers, photographers or other media representatives) to be present in the vicinity of the field of play
- any other decision that he may take in accordance with the Laws of the Game or in conformity with his duties under the terms of FIFA, confederation, member association or league rules or regulations under which the match is played

### Decision 2

In tournaments or competitions where a fourth official is appointed, his role and duties must be in accordance with the guidelines approved by the International F.A. Board, which are contained in this publication.

### Decision 3

Where goal-line technology (GLT) is used (subject to the respective competition rules), the referee has the duty to test the technology's functionality before the match. The tests to be performed are set out in the FIFA Quality Programme for GLT Testing Manual. If the technology does not function in accordance with the Testing Manual, the referee must not use the GLT system and must report this incident to the respective authority.

## Law 6 – The Assistant Referees

### Duties

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Two assistant referees may be appointed whose duties, subject to the decision of the referee, are to indicate:

- when the whole of the ball leaves the field of play
- which team is entitled to a corner kick, goal kick or throw-in
- when a player may be penalised for being in an offside position
- when a substitution is requested
- when misconduct or any other incident occurs out of the view of the referee
- when offences have been committed whenever the assistant referees have a better view than the referee (this includes, in certain circumstances, offences committed in the penalty area)
- whether, at penalty kicks, the goalkeeper moves off the goal line before the ball is kicked and if the ball crosses the line
- (new) operate the game controller

### Assistance

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The assistant referees also assist the referee in controlling the match in accordance with the Laws of the Game. In particular, they may enter the field of play to help control the distances as defined by the laws of the game (replaces: 9.15 m (10 yds) distance).

In the event of undue interference or improper conduct, the referee will relieve an assistant referee of his duties and make a report to the appropriate authorities.

## LAW 7 – THE DURATION OF THE MATCH

### Periods of play

The match lasts two equal periods of 10 minutes, unless otherwise mutually agreed between the referee and the two teams. Any agreement to alter the duration of the periods of play (e.g. to reduce each half to 8 minutes because of insufficient light) must be made before the start of play and must comply with competition rules. (replaces: The match lasts two equal periods of 45 minutes, unless otherwise mutually agreed between the referee and the two teams. Any agreement to alter the duration of the periods of play (e.g. to reduce each half to 40 minutes because of insufficient light) must be made before the start of play and must comply with competition rules.)

### Half-time interval

Players are entitled to an interval at half-time.

The half-time interval must not exceed 5 minutes. (replaces: The half-time interval must not exceed 15 minutes.)

Competition rules must state the duration of the half-time interval.

The duration of the half-time interval may be altered only with the consent of the referee.

### Allowance for time lost

Allowance is made in either period for all time lost through:

- substitutions
- assessment of injury to players
- removal of injured players from the field of play for treatment
- wasting time
- any other cause

The allowance for time lost is at the discretion of the referee.

### Penalty kick

If a penalty kick has to be taken or retaken, the duration of either half is extended until the penalty kick is completed.

### Abandoned match

An abandoned match is replayed unless the competition rules provide otherwise.

## LAW 8 – THE START AND RESTART OF PLAY

### Definition of kick-off

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A kick-off is a way of starting or restarting play:

- at the start of the match
- after a goal has been scored
- at the start of the second half of the match
- at the start of each period of extra time, where applicable

A goal may be scored directly from the kick-off.

### Procedure

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Before a kick-off at the start of the match or extra time

- a coin is tossed and the team that wins the toss decides which goal it will attack in the first half of the match.
- the other team takes the kick-off to start the match.
- the team that wins the toss takes the kick-off to start the second half of the match.
- in the second half of the match, the teams change ends and attack the opposite goals.

### Kick-off

- after a team scores a goal, the kick-off is taken by the other team.
- all players must be in their own half of the field of play
- the opponents of the team taking the kick-off are at least 1.5 m from the ball until it is in play (replaced: the opponents of the team taking the kick-off are at least 9.15 m (10 yds) from the ball until it is in play)
- the ball must be stationary on the centre mark
- the referee gives a signal
- the ball is in play when it is kicked and moves forward (new: or 10 seconds after the referee gave the signal)
- (suspended) the kicker must not touch the ball again until it has touched another player

### Infringements and sanctions

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(suspended: If the player taking the kick-off touches the ball again before it has touched another player:

- an indirect free kick is awarded to the opposing team to be taken from the position of the ball when the infringement occurred (see Law 13 – Position of free kick)

In the event of any other infringement of the kick-off procedure:

- the kick-off is retaken

## **Definition of dropped ball**

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A dropped ball is a method of restarting play when, while the ball is still in play, the referee is required to stop play temporarily for any reason not mentioned elsewhere in the Laws of the Game.

## **Procedure**

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The referee drops the ball at the place where it was located when play was stopped, unless play was stopped inside the goal area, in which case the referee drops the ball on the goal area line parallel to the goal line at the point nearest to where the ball was located when play was stopped.

Play restarts when the ball touches the ground.

## **Infringements and sanctions**

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The ball is dropped again:

- if it is touched by a player before it makes contact with the ground
- if the ball leaves the field of play after it makes contact with the ground, without a player touching it

If the ball enters the goal:

- if a dropped ball is kicked directly into the opponents' goal, a goal kick is awarded
- if a dropped ball is kicked directly into the team's own goal, a corner kick is awarded to the opposing team

## LAW 9 – THE BALL IN AND OUT OF PLAY

### **Ball out of play**

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The ball is out of play when:

- it has wholly crossed the goal line or touch line whether on the ground or in the air
- play has been stopped by the referee

### **Ball in play**

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The ball is in play at all other times, including when:

- it rebounds off a goalpost, crossbar or corner flagpost and remains in the field of play
- it rebounds off either the referee or an assistant referee when they are on the field of play

## LAW 10 – THE METHOD OF SCORING

### Goal scored

A goal is scored when the whole of the ball passes over the goal line, between the goalposts and under the crossbar, provided that no infringement of the Laws of the Game has been committed previously by the team scoring the goal.

### Winning team

The team scoring the greater number of goals during a match is the winner. If both teams score an equal number of goals, or if no goals are scored, the match is drawn.

### Competition rules

When competition rules require there to be a winning team after a match or home-and-away tie, the only permitted procedures for determining the winning team are those approved by the International F.A. Board, namely:

- away goals rule
- extratime
- kicks from the penalty mark

### Goal-line technology (GLT)

GLT systems may be used for the purpose of verifying whether a goal has been scored to support the referee's decision. The use of GLT must be stipulated in the respective competition rules.

## (suspended: LAW 11 – OFFSIDE)

### Offside position

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It is not an offence in itself to be in an offside position. A player is in an offside position if:

- he is nearer to his opponents' goal line than both the ball and the second-last opponent

A player is not in an offside position if:

- he is in his own half of the field of play or
- he is level with the second-last opponent or
- he is level with the last two opponents

### Offence

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A player in an offside position is only penalised if, at the moment the ball touches or is played by one of his team, he is, in the opinion of the referee, involved in active play by:

- interfering with play or
- interfering with an opponent or
- gaining an advantage by being in that position

### No offence

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There is no offside offence if a player receives the ball directly from:

- a goal kick
- a throw-in
- a corner kick

Infringements and sanctions

In the event of an offside offence, the referee awards an indirect free kick to the opposing team to be taken from the place where the infringement occurred (see Law 13 – Position of free kick.)



## LAW 12 – FOULS AND MISCONDUCT

Fouls and misconduct are penalised as follows:

### Direct free kick

A direct free kick is awarded to the opposing team if a player commits any of the following seven offences in a manner considered by the referee to be careless, reckless or using excessive force:

- kicks or attempts to kick an opponent
- trips or attempts to trip an opponent
- jumps at an opponent
- charges an opponent
- strikes or attempts to strike an opponent
- pushes an opponent
- tackles an opponent

A direct free kick is also awarded to the opposing team if a player commits any of the following three offences:

- holds an opponent
- spits at an opponent
- handles the ball deliberately (except for the goalkeeper within his own penalty area)

A direct free kick is taken from the place where the offence occurred (see Law 13 – Position of free kick).

### Penalty kick

A penalty kick is awarded if any of the above ten offences is committed by a player inside his own penalty area, irrespective of the position of the ball, provided it is in play.

### Indirect free kick

An indirect free kick is awarded to the opposing team if a goalkeeper, inside his own penalty area, commits any of the following four offences:

- controls the ball with his hands for more than six seconds before releasing it from his possession
- touches the ball again with his hands after he has released it from his possession and before it has touched another player
- touches the ball with his hands after it has been deliberately kicked to him by a team-mate
- touches the ball with his hands after he has received it directly from a throw-in taken by a team-mate

An indirect free kick is also awarded to the opposing team if, in the opinion of the referee, a player:

- plays in a dangerous manner
- impedes the progress of an opponent
- prevents the goalkeeper from releasing the ball from his hands
- commits any other offence, not previously mentioned in Law 12, for which play is stopped to caution or send off a player

The indirect free kick is taken from the place where the offence occurred (see Law 13 – Position of free kick).

### **Disciplinary sanctions**

The yellow card is used to communicate that a player, substitute or substituted player has been cautioned.

The red card is used to communicate that a player, substitute or substituted player has been sent off.

Only a player, substitute or substituted player may be shown the red or yellow card.

The referee has the authority to take disciplinary sanctions from the moment he enters the field of play until he leaves the field of play after the final whistle.

A player who commits a cautionable or sending-off offence, either on or off the field of play, whether directed towards an opponent, a team-mate, the referee, an assistant referee or any other person, is disciplined according to the nature of the offence committed.

### **Cautionable offences**

A player is cautioned and shown the yellow card if he commits any of the following seven offences:

- unsporting behaviour
- dissent by word or action
- persistent infringement of the Laws of the Game
- delaying the restart of play
- failure to respect the required distance when play is restarted with a corner kick, free kick or throw-in
- entering or re-entering the field of play without the referee's permission
- deliberately leaving the field of play without the referee's permission

A substitute or substituted player is cautioned if he commits any of the following three offences:

- unsporting behaviour
- dissent by word or action
- delaying the restart of play

## **Sending-off offences**

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A player, substitute or substituted player is sent off if he commits any of the following seven offences:

- serious foul play
- violent conduct
- spitting at an opponent or any other person
- denying the opposing team a goal or an obvious goalscoring opportunity by deliberately handling the ball (this does not apply to a goalkeeper within his own penalty area)
- denying an obvious goalscoring opportunity to an opponent moving towards the player's goal by an offence punishable by a free kick or a penalty kick
- using offensive, insulting or abusive language and/or gestures
- receiving a second caution in the same match

A player, substitute or substituted player who has been sent off must leave the vicinity of the field of play and the technical area.

## LAW 13 – FREE KICKS

### Types of free kick

Free kicks are either direct or indirect.

#### The direct free kick

Ball enters the goal

- if a direct free kick is kicked directly into the opponents' goal, a goal is awarded
- if a direct free kick is kicked directly into the team's own goal, a corner kick is awarded to the opposing team

#### The indirect free kick

Signal

The referee indicates an indirect free kick by raising his arm above his head. He maintains his arm in that position until the kick has been taken and the ball has touched another player or goes out of play.

Ball enters the goal

A goal can be scored only if the ball subsequently touches another player before it enters the goal:

- if an indirect free kick is kicked directly into the opponents' goal, a goal kick is awarded
- if an indirect free kick is kicked directly into the team's own goal, a corner kick is awarded to the opposing team

#### Procedure

For both direct and indirect free kicks, the ball must be stationary when the kick is taken (suspended: and the kicker must not touch the ball again until it has touched another player).

#### Position of free kick

Free kick inside the penalty area

Direct or indirect free kick to the defending team:

- all opponents must be at least 0.5 m from the ball (replaces: all opponents must be at least 9.15 m (10 yds) from the ball )
- all opponents must remain outside the penalty area until the ball is in play
- the ball is in play when it is kicked directly out of the penalty area
- a free kick awarded in the goal area may be taken from any point inside that area

Indirect free kick to the attacking team:

- all opponents must be at least 0.5 m from the ball until it is in play, unless they are on their own goal line between the goalposts (replaces: all opponents must be at

least 9.15 m (10 yds) from the ball until it is in play, unless they are on their own goal line between the goalposts)

- the ball is in play when it is kicked and moves (new): or 10 seconds after the referee gave the signal
- an indirect free kick awarded inside the goal area must be taken on the goal area line parallel to the goal line at the point nearest to where the infringement occurred

Free kick outside the penalty area

- all opponents must be at least 0.5 m from the ball until it is in play (replaces: all opponents must be at least 9.15 m (10 yds) from the ball until it is in play )
- the ball is in play when it is kicked and moves
- the free kick is taken from the place where the infringement occurred or from the position of the ball when the infringement occurred (according to the infringement)

### **Infringements and sanctions**

If, when a free kick is taken, an opponent is closer to the ball than the required distance:

- the kick is retaken

If, when a free kick is taken by the defending team from inside its own penalty area, the ball is not kicked directly out of the penalty area:

- the kick is retaken

Free kick taken by a player other than the goalkeeper

If, after the ball is in play, the kicker touches the ball again (except with his hands) before it has touched another player:

- an indirect free kick is awarded to the opposing team, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

If, after the ball is in play, the kicker deliberately handles the ball before it has touched another player:

- a direct free kick is awarded to the opposing team, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)
- a penalty kick is awarded if the infringement occurred inside the kicker's penalty area

Free kick taken by the goalkeeper

If, after the ball is in play, the goalkeeper touches the ball again (except with his hands), before it has touched another player:

- an indirect free kick is awarded to the opposing team, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

If, after the ball is in play, the goalkeeper deliberately handles the ball before it has touched another player:

- a direct free kick is awarded to the opposing team if the infringement occurred outside the goalkeeper's penalty area, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)
- an indirect free kick is awarded to the opposing team if the infringement occurred inside the goalkeeper's penalty area, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

## LAW 14 – THE PENALTY KICK

A penalty kick is awarded against a team that commits one of the ten offences for which a direct free kick is awarded, inside its own penalty area and while the ball is in play.

A goal may be scored directly from a penalty kick.

Additional time is allowed for a penalty kick to be taken at the end of each half or at the end of periods of extra time.

### Position of the ball and the players

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The ball:

- must be placed on the penalty mark

The player taking the penalty kick:

- must be properly identified

The defending goalkeeper:

- must remain on his goal line, facing the kicker, between the goalposts until the ball has been kicked

The players other than the kicker must be located:

- inside the field of play
- outside the penalty area
- behind the penalty mark
- at least 1 m from the penalty mark (replaces: at least 9.15 m (10 yds) from the penalty mark)

### Procedure

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- After the players have taken positions in accordance with this Law, the referee signals for the penalty kick to be taken
- The player taking the penalty kick must kick the ball forward
- He must not play the ball again until it has touched another player
- The ball is in play when it is kicked and moves forward

When a penalty kick is taken during the normal course of play, or time has been extended at half-time or full time to allow a penalty kick to be taken or retaken, a goal is awarded if, before passing between the goalposts and under the crossbar:

- the ball touches either or both of the goalposts and/or the crossbar and/or the goalkeeper

The referee decides when a penalty kick has been completed.

## **Infringements and sanctions**

***If the referee gives the signal for a penalty kick to be taken and, before the ball is in play, one of the following occurs:***

the player taking the penalty kick infringes the Laws of the Game:

- the referee allows the kick to be taken
- if the ball enters the goal, the kick is retaken
- if the ball does not enter the goal, the referee stops play and the match is restarted with an indirect free kick to the defending team from the place where the infringement occurred

the goalkeeper infringes the Laws of the Game:

- the referee allows the kick to be taken
- if the ball enters the goal, a goal is awarded
- if the ball does not enter the goal, the kick is retaken

a team-mate of the player taking the kick infringes the Laws of the Game:

- the referee allows the kick to be taken
- if the ball enters the goal, the kick is retaken
- if the ball does not enter the goal, the referee stops play and the match is restarted with an indirect free kick to the defending team from the place where the infringement occurred

a team-mate of the goalkeeper infringes the Laws of the Game:

- the referee allows the kick to be taken
- if the ball enters the goal, a goal is awarded
- if the ball does not enter the goal, the kick is retaken

a player of both the defending team and the attacking team infringe the Laws of the Game:

- the kick is retaken

If, after the penalty kick has been taken:

the kicker touches the ball again (except with his hands) before it has touched another player:

- an indirect free kick is awarded to the opposing team, the kick to be taken from the place where the infringement occurred (see Law 13 – Position of Free Kick)

the kicker deliberately handles the ball before it has touched another player:

- a direct free kick is awarded to the opposing team, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

the ball is touched by an outside agent as it moves forward:

- the kick is retaken

the ball rebounds into the field of play from the goalkeeper, the crossbar or the goalposts



and is then touched by an outside agent:

- the referee stops play
- play is restarted with a dropped ball at the place where it touched the outside agent, unless it touched the outside agent inside the goal area, in which case the referee drops the ball on the goal area line parallel to the goal line at the point nearest to where the ball was located when play was stopped

## LAW 15 – THE THROW-IN

A throw-in is a method of restarting play.

A throw-in is awarded to the opponents of the player who last touched the ball when the whole of the ball crosses the touch line, either on the ground or in the air.

A goal cannot be scored directly from a throw-in.

### Procedure

If the ball leaves the field it will be replaced on the field by the referee or an assistant referee. There is no stoppage in play.

The positions for replacement of the ball are described in the following with respect to the touch lines and always meant to be in a distance of about 40cm orthogonal to the position on the touch line and inwards to the playing field.

If the whole of the ball passes over a touch line then the assistant referee will replace the ball back on the field on the same side of the field as the ball went out of play. The ball will be replaced in one of three positions:

- If the referee cannot determine which robot was the last to touch the ball before it left the field, then the ball is replaced directly in from the point at which the ball left the field.
- Otherwise, the ball is placed one meter back from the point it went out, where “back” is defined as being towards the goal of the team that last touched the ball.

In any case, the ball cannot be placed closer than the length of the goal area to either end of the field.

Balls are deemed to be out based on the team that last touched the ball, irrespective of who actually kicked the ball.

After placing the ball, the ball is in play immediately.

(replaces: At the moment of delivering the ball, the thrower:

- faces the field of play
- has part of each foot either on the touch line or on the ground outside the touch line)
- holds the ball with both hands)
- delivers the ball from behind and over his head)
- delivers the ball from the point where it left the field of play

All opponents must stand no less than 2 m (2 yds) from the point at which the throw-in is taken.

The ball is in play when it enters the field of play.

After delivering the ball, the thrower must not touch the ball again until it has touched

another player.)

## **Infringements and sanctions**

(suspended: Throw-in taken by a player other than the goalkeeper

If, after the ball is in play, the thrower touches the ball again (except with his hands) before it has touched another player:

- an indirect free kick is awarded to the opposing team, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

If, after the ball is in play, the thrower deliberately handles the ball before it has touched another player:

- a direct free kick is awarded to the opposing team, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)
- a penalty kick is awarded if the infringement occurred inside the thrower's penalty area

Throw-in taken by the goalkeeper

If, after the ball is in play, the goalkeeper touches the ball again (except with his hands), before it has touched another player:

- an indirect free kick is awarded to the opposing team, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

If, after the ball is in play, the goalkeeper deliberately handles the ball before it has touched another player:

- a direct free kick is awarded to the opposing team if the infringement occurred outside the goalkeeper's penalty area, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)
- an indirect free kick is awarded to the opposing team if the infringement occurred inside the goalkeeper's penalty area, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

If an opponent unfairly distracts or impedes the thrower:

- he is cautioned for unsporting behaviour

For any other infringement of this Law:

- the throw-in is taken by a player of the opposing team)

## LAW 16 – THE GOAL KICK

A goal kick is a method of restarting play.

A goal kick is awarded when the whole of the ball passes over the goal line, either on the ground or in the air, having last touched a player of the attacking team, and a goal is not scored in accordance with Law 10.

A goal may be scored directly from a goal kick, but only against the opposing team.

### Procedure

If the ball leaves the field it will be replaced on the field by the referee or an assistant referee. There is no stoppage in play.

If the whole of the ball passes over a goal line then the ball will be replaced back on the field according to the following rules:

- If the referee cannot determine which robot was the last to touch the ball before it left the field, then the ball is replaced in about 1 meter distance from the corner of the field.
- If the ball was last touched by the offensive team then the ball is placed on the halfway line on the side of the field the ball went out.

Balls are deemed to be out based on the team that last touched the ball, irrespective of who actually kicked the ball.

(replaces:

- The ball is kicked from any point within the goal area by a player of the defending team
- Opponents remain outside the penalty area until the ball is in play
- The kicker must not play the ball again until it has touched another player
- The ball is in play when it is kicked directly out of the penalty area)

### Infringements and sanctions

(suspended: If the ball is not kicked directly out of the penalty area from a goal kick:

- the kick is retaken

Goal kick taken by a player other than the goalkeeper

If, after the ball is in play, the kicker touches the ball again (except with his hands) before it has touched another player:

- an indirect free kick is awarded to the opposing team, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

If, after the ball is in play, the kicker deliberately handles the ball before it has touched another player:

- a direct free kick is awarded to the opposing team, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

- a penalty kick is awarded if the infringement occurred inside the kicker's penalty area

#### Goal kick taken by the goalkeeper

If, after the ball is in play, the goalkeeper touches the ball again (except with his hands) before it has touched another player:

- an indirect free kick is awarded to the opposing team, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

If, after the ball is in play, the goalkeeper deliberately handles the ball before it has touched another player:

- a direct free kick is awarded to the opposing team if the infringement occurred outside the goalkeeper's penalty area, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)
- an indirect free kick is awarded to the opposing team if the infringement occurred inside the goalkeeper's penalty area, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

In the event of any other infringement of this Law:

- the kick is retaken)

## LAW 17 – THE CORNER KICK

A corner kick is a method of restarting play.

A corner kick is awarded when the whole of the ball passes over the goal line, either on the ground or in the air, having last touched a player of the defending team, and a goal is not scored in accordance with Law 10.

(suspended: A goal may be scored directly from a corner kick, but only against the opposing team.)

### **Procedure**

If the ball leaves the field it will be replaced on the field by the referee or an assistant referee. There is no stoppage in play.

If the whole of the ball passes over a goal line then the ball will be replaced back on the field according to the following rules:

- If the referee cannot determine which robot was the last to touch the ball before it left the field, then the ball is replaced in about 1 meter distance from the corner of the field.
- If the ball was last touched by the defensive team then the ball is replaced in a distance of about the goal area length from the closest corner of the field.

Balls are deemed to be out based on the team that last touched the ball, irrespective of who actually kicked the ball.

(replaces:

- The ball must be placed inside the corner arc nearest to the point where the ball crossed the goal line
- The corner flagpost must not be moved
- Opponents must remain at least 1 m from the corner arc until the ball is in play (replaces: Opponents must remain at least 9.15 m (10 yds) from the corner arc until the ball is in play )
- The ball must be kicked by a player of the attacking team
- The ball is in play when it is kicked and moves
- The kicker must not play the ball again until it has touched another player)

### **Infringements and sanctions**

(suspended: Corner kick taken by a player other than the goalkeeper

If, after the ball is in play, the kicker touches the ball again (except with his hands) before it has touched another player:

- an indirect free kick is awarded to the opposing team, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

If, after the ball is in play, the kicker deliberately handles the ball before it has touched

another player:

- a direct free kick is awarded to the opposing team, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)
- a penalty kick is awarded if the infringement occurred inside the kicker's penalty area

Corner kick taken by the goalkeeper

If, after the ball is in play, the goalkeeper touches the ball again (except with his hands) before it has touched another player:

- an indirect free kick is awarded to the opposing team, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

If, after the ball is in play, the goalkeeper deliberately handles the ball before it has touched another player:

- a direct free kick is awarded to the opposing team if the infringement occurred outside the goalkeeper's penalty area, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)
- an indirect free kick is awarded to the opposing team if the infringement occurred inside the goalkeeper's penalty area, to be taken from the place where the infringement occurred (see Law 13 – Position of free kick)

In the event of any other infringement:

- the kick is retaken)

## PROCEDURES TO DETERMINE THE WINNER OF A MATCH OR HOME-AND-AWAY

Away goals, extra time and kicks from the penalty mark are the three methods approved for determining the winning team where competition rules require there to be a winning team after a match has been drawn.

### **Away goals**

Competition rules may provide that where teams play each other home and away, if the aggregate score is equal after the second match, any goals scored at the ground of the opposing team will count double.

### **Extra time**

Competition rules may provide for two further equal periods, not exceeding 5 minutes each, to be played. The conditions of Law 8 will apply. (replaces: Competition rules may provide for two further equal periods, not exceeding 15 minutes each, to be played. The conditions of Law 8 will apply. )

### **Kicks from the penalty mark**

#### Procedure

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- The referee chooses the goal at which the kicks will be taken
- The referee tosses a coin and the team whose captain wins the toss decides whether to take the first or the second kick
- The referee keeps a record of the kicks being taken
- Subject to the conditions explained below, both teams take five kicks
- The kicks are taken alternately by the teams
- If, before both teams have taken five kicks, one has scored more goals than the other could score, even if it were to complete its five kicks, no more kicks are taken
- If, after both teams have taken five kicks, both have scored the same number of goals, or have not scored any goals, kicks continue to be taken in the same order until one team has scored a goal more than the other from the same number of kicks
- A goalkeeper who is injured while kicks are being taken from the penalty mark and is unable to continue as goalkeeper may be replaced by a named substitute provided his team has not used the maximum number of substitutes permitted under the competition rules
- With the exception of the foregoing case, only players who are on the field of play at the end of the match, which includes extra time where appropriate, are eligible to take kicks from the penalty mark
- Each kick is taken by a different player and all eligible players must take a kick before any player can take a second kick
- An eligible player may change places with the goalkeeper at any time when kicks from the penalty mark are being taken
- Only the eligible players and match officials are permitted to remain on the field of play when kicks from the penalty mark are being taken
- All players, except the player taking the kick and the two goalkeepers, must remain within the centre circle



- The goalkeeper who is the team-mate of the kicker must remain on the field of play, outside the penalty area in which the kicks are being taken, on the goal line where it meets the penalty area boundary line
- Unless otherwise stated, the relevant Laws of the Game and International F.A. Board Decisions apply when kicks from the penalty mark are being taken
- If at the end of the match and before the kicks start to be taken from the penalty mark, one team has a greater number of players than its opponents, it must reduce its numbers to equate with that of its opponents and the team captain must inform the referee of the name and number of each player excluded. Any player thus excluded may not participate in kicks from the penalty mark.
- Before the start of kicks from the penalty mark, the referee must ensure that an equal number of players from each team remains within the centre circle and they shall take the kicks

## THE TECHNICAL AREA

The technical area relates to matches played in stadiums with a designated seated area for technical staff and substitutes as described below.

While the size and position of technical areas may differ between stadiums, the following notes are issued for general guidance:

- the technical area extends 1 m (1 yd) on either side of the designated seated area and extends forward up to a distance of 1 m (1 yd) from the touch line
- it is recommended that markings are used to define this area
- the number of persons permitted to occupy the technical area is defined by the competition rules
- the occupants of the technical area are identified before the beginning of the match in accordance with the competition rules
- only one person at a time is authorised to convey tactical instructions from the technical area
- the coach and other officials must remain within its confines except in special circumstances, e.g. a physiotherapist or doctor entering the field of play, with the referee's permission, to assess an injured player
- the coach and other occupants of the technical area must behave in a responsible manner

## THE FOURTH OFFICIAL AND THE RESERVE ASSISTANT REFEREE

- A fourth official may be appointed under the competition rules and officiates if any of the three match officials is unable to continue, unless a reserve assistant referee is appointed. He assists the referee at all times
- Prior to the start of the competition, the organiser states clearly whether, if the referee is unable to continue, the fourth official takes over as the referee or whether the senior assistant referee takes over as referee with the fourth official becoming an assistant referee
- The fourth official assists with any administrative duties before, during and after the match, as required by the referee
- He is responsible for assisting with substitution procedures during the match
- He has the authority to check the equipment of substitutes before they enter the field of play. If their equipment does not comply with the Laws of the Game, he informs the referee
- He supervises the replacement balls, where required. If the match ball has to be replaced during a match, he provides another ball, on the instruction of the referee, thus keeping the delay to a minimum
- He assists the referee to control the match in accordance with the Laws of the Game. The referee, however, retains the authority to decide on all points connected with play.
- After the match, the fourth official must submit a report to the appropriate authorities on any misconduct or other incident that occurred out of the view of the referee and the assistant referees. The fourth official must advise the referee and his assistants of any report being made
- He has the authority to inform the referee of irresponsible behaviour by any occupant of the technical area
- A reserve assistant referee may also be appointed under competition rules. His only duty shall be to replace an assistant referee who is unable to continue or to replace the fourth official, as required

## THE ADDITIONAL ASSISTANT REFEREE

Additional assistant referees may be appointed under the competition rules. They must be active referees of the highest category available. The competition rules must state the procedure to be followed when a referee

is unable to continue, and whether:

1. the fourth official takes over as the referee, or
2. the senior additional assistant referee takes over as the referee, with the fourth official becoming an additional assistant referee

### **Duties**

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Where appointed, the additional assistant referees, subject to the decision of the referee, are to indicate:

- when the whole of the ball leaves the field of play over the goal line
- which team is entitled to a corner kick or goal kick
- when misconduct or any other incident occurs out of the view of the referee
- when offences have been committed whenever the additional assistant referees have a better view than the referee, particularly inside the penalty area
- whether, at penalty kicks, the goalkeeper moves off the goal line before the ball is kicked and if the ball crosses the line

### **Assistance**

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The additional assistant referees also help the referee to control the match in accordance with the Laws of the Game but the final decision will always be taken by the referee. In the event of undue interference or improper conduct, the referee will relieve an additional assistant referee of his duties and make a report to the appropriate authorities.

# Interpretation of the Laws of the Game and Guidelines for Referees

Please see respective FIFA documents.

(e.g. pp. 60 of [http://resources.fifa.com/mm/document/footballdevelopment/refereeing/02/36/01/11/lawsofthegameweben\\_neutral.pdf](http://resources.fifa.com/mm/document/footballdevelopment/refereeing/02/36/01/11/lawsofthegameweben_neutral.pdf).)

## Section II

# RoboCup Humanoid League Competition Rules

## The Competitions and Trophies

### Setup and Inspections

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The competitions in the Humanoid League are preceded by a setup and inspection period of at least 24 h. During this time, every robot will be inspected by the league organizing committee for compliance with the design rules detailed in law 4. All robots will be photographed during the inspection. A reinspection becomes necessary after any change that could affect the compliance to the design rules. A reinspection might be requested by any team leader up to 1 hour prior to a game.

### Referee Duty

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Each team must name at least one person who is familiar with the rules and who might be assigned for referee duties by the league organizing committee.

### Competitions

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The competitions consist of:

1. Soccer games for KidSize (4 vs. 4),
2. Soccer games for TeenSize (3 vs. 3),
3. Dribble and Kick for AdultSize,
4. Technical challenges.

In the event of less than 3 teams participating in TeenSize the TeenSize teams will join the AdultSize for a joint Dribble and Kick competition.

The technical challenges consist of:

1. Push Recovery (KidSize, TeenSize and AdultSize)
2. Goal Kick from Moving Ball (KidSize, TeenSize and AdultSize)
3. High Jump (KidSize and TeenSize and AdultSize)
4. High-Kick (KidSize, TeenSize and AdultSize)

Both, Soccer Games (KidSize and TeenSize) and Dribble and Kick (AdultSize) are organized in one or more round robins and playoffs. For the first round robin, the teams are assigned to groups at random. All teams of a group play once against each other. The round robin games may end in a draw. In this case, both teams receive one point. Otherwise, the winning team receives three points and the not winning team receives zero points.

After games of a round robin have been played, the teams of a group are ranked based on (in decreasing priority):

1. the number of earned points,
2. the goal-difference,
3. the absolute number of goals,
4. the result of a direct match,
5. the time needed to score a penalty kick into an empty goal (up to five alternating attempts to score, until at least one team scored),

6. the drawing of a lot.

For each game that a team has won with a difference of 10 goals only 10 goals are counted.

At least two teams of every group will enter the next round robin or the playoffs.

The game plan needs to be announced prior to the random assignment of teams to groups.

## Gameplay

### Kick-off procedure

- The referee gives the signal "READY" that all robots have to reach their own half of the field. Robots not being able to position autonomously in their own half may be placed by their respective robot handler.
- The opponents of the team taking the kick-off are outside the center circle until the ball is in play.
- The referee gives the signal "SET". The referee calls robots illegally positioned to be set back manually by the respective robot handler to the outer line of their goal area. One field player of a manually or illegally positioned team suffers a removal penalty (cf. Section 12).
- The ball is stationary on the center mark. 2015 RoboCup Soccer Humanoid League Rules and Setup
- The referee gives the signal "PLAY" or whistles.
- The ball is in play when it is touched or 10 seconds elapsed after the signal.

Robots being able to autonomously reposition themselves can take any position on the field that is consistent with above requirements. Robots not able to autonomously reposition themselves, e.g. robots being carried or joysticked around by human team members, have to start from a position not closer to the field halfway line than the outer line of the goal area. If all robots of the team executing the kick-off cannot autonomously reposition themselves, then one robot may be placed into the center circle.

If one or both of the teams in a match have permission to use a manual startup procedure, the referee gives the two signals "SET" and "PLAY" with an interval of exactly 10 seconds. Robot players without remote start capability may be started on the field after the "SET" signal. They may not move before the "PLAY" signal was given by the referee. Robots with autonomous positioning ability are given between 15 and 30 seconds for re-positioning after a goal has been scored by one of the teams before the "SET" signal for kick-off is given by the referee. All human team members must leave the field of play immediately after the "SET" signal and before the "PLAY" signal.

A team which uses manual kick-off and not kick-off with the referee box is punished by a penalty of having to wait for 15 seconds after the signal "PLAY" before they are allowed to locomote. If such a team has kick-off then at the signal "PLAY" the referee immediately moves the ball from the kick-off position to a position somewhere on the center line and outside of the center circle and the ball is in play. This rule does not apply if the referee box is out of commission.



## **Free-kick procedure**

1. Referee - blows whistle, announces call (e.g., illegal defense), maybe places the ball depending on the call, and then announces Free Kick Blue/Red.
2. Game controller clicks on Free Kick Blue/Red Ready mode. Now opponent robots must move to a position at least 50cm away from the ball. They have a maximum of 15 secs. to do this or sooner if the referee thinks the kicking team is ready and all opponent robots are at least 50cm away.
3. Any opponent robot still closer than 50cm must be considered as an incapable player.
4. Referee blows whistle, then Game controller clicks on Free Kick Blue/Red mode. team can kick, and ball is in play after 10 secs.

## **Incapable Players**

Players not capable of play (e.g. players not able to walk on two legs, players not able to stand, or players with obvious malfunctions) are not permitted to participate in the game. They must be removed from the field. It is up to the referee to judge whether a player is capable of play. The referee may ask the team leader of a player suspected to be incapable of play to demonstrate playing ability at any time. A field player that is not able to get back into a stable standing or walking posture from a fall within 20 seconds will be removed from the field for 30 seconds removal penalty and has to reenter the field from the center of the touch line as indicated by the referee.

## **Substitutions**

Up to two players per game can be substituted by other players of the same team. The referee must be informed prior to the substitution. A substitute only enters the field after the player being replaced left the field and after receiving a signal from the referee. Any of the other players may change places with the goalkeeper, provided that the referee is informed before the change is made and that the change is made during a stoppage of the match. Exchanging a field player with a goalie does not count as substitution. Changing places/roles between a field player and a goalie does not count as substitution.

## **Temporal Absence**

Servicing robots on the playing field is not permitted. A robot may be taken out of the field for service, after receiving permission from the referee. Taking out a robot for service does not count as a substitution. A serviced robot may not come into play again before 30 s elapsed after it was taken out. It has to enter the field from the center point of the touch line as indicated by the referee.

## **Best Humanoid Award (Louis Vuitton Cup)**

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The teams of all three size classes are ranked in separate lists to determine the overall best humanoid.

The ranking is based on the aggregated number of points earned in the individual competitions.

The points earned in the technical challenge are used directly.

For the Dribble and Kick competitions (AdultSize) and the Soccer Games (Kid- Size and TeenSize) the winner receives 60 points. The second best team receives 42 points. The third best team receives 30 points.

As KidSize, TeenSize and AdultSize robots do not compete directly, a jury decides the overall best humanoid robot, 2nd best humanoid robot, 3rd best humanoid robot. The jury consists of the team leaders of all teams, except for the teams ranked first in the KidSize, TeenSize and AdultSize lists. The jury decides by majority vote. In case of a draw, the president of the RoboCup federation decides the vote.

- The teams ranked first in the KidSize, TeenSize and AdultSize lists are candidates for the best humanoid. The jury decides from the general picture of the performance according to the criteria:
  1. Robustness
  2. Walking ability
  3. Ball handling
  4. Soccer skillsfor the robot that is the best humanoid.
- Of each, KidSize, TeenSize and AdultSize, the best robot that was not chosen to be the best humanoid robot is candidate for the 2nd best humanoid robot. Criteria are the same as for the best humanoid.
- The robot ranked first in the KidSize, TeenSize or AdultSize lists that was not chosen for 1st or 2nd best humanoid is the 3rd best humanoid robot.

## Trophies

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A trophy is awarded to the winner of each of the individual competitions and technical challenges. In case of less than 3 teams participating in a size class no trophies will be given in this class.

A trophy is awarded to the teams second and third in the KidSize 3-3 soccer game, the TeenSize 2-2 soccer games and the AdultSize Dribble and Kick competition. In case of less than 5 teams participating in a size class the team ranked third will be awarded a certificate instead of a trophy. In case of less than 4 teams participating in a size class the team ranked second will also be awarded a certificate instead of a trophy. The final number of trophies awarded will be decided by the RoboCup Federation based on the number of actually participating teams.

Certificates are awarded to the teams second and third in the technical challenges and to the teams ranked second and third in the Best Humanoid list.

The Louis Vuitton Humanoid Cup is awarded to the team ranked first in the Best Humanoid list.

## **The Trend in Rule Evolution for the Next Years**

In this section the Technical Committee (TC) wants to make explicit the trends to be followed in the rules in the next years in order to improve the scientific level of the robots developed by the RoboCup teams. The evolution of rules in the humanoid league has been following a biennial schedule where major changes (like the number of players per team) have been introduced every two years and only incremental changes every other year.

### **The Layout of the Field**

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Size of the playing field may increase with the number of players.

### **The Design of the Robots**

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The height of the robots In the future, the minimum size of KidSize robots and the overlap between size classes may be increased.

### **Handling of the robots.**

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In the future, robot players will be removed from the field by assistant referees in order to limit the number of humans on the field.

Robots must feature a handle in the neck area (with a to be specified size) and must be designed in a way that they tolerate to be lifted vertically by this handle without taking harm or causing harm to the handler.

### **Laws of the Game**

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The number of players in soccer games will be increased. This is to encourage team play and cooperation among humanoid robots.

### **Acknowledgements**

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These rules evolved from previous versions of the RoboCup Humanoid League rules. We would like to thank Henry Yen for the conversion of the rules into a basic LaTeX version in 2010. The 2008 version of the rules was compiled by Pasan Kulvanit and Oskar von Stryk, the 2007 version of the rules by Emanuele Menegatti and the 2006 version by Sven Behnke, who did a remarkable job improving the rule document and gearing it towards the FIFA Laws of the Game. The improvements of the 2005 version were compiled by Norbert Michael Mayer. Other input came earlier from the rules of the RoboCup MiddleSize and Four-Legged Leagues.

The rules were continuously discussed within the technical committee of the humanoid league and also on the humanoid league mailing list. The following members of the technical committee for 2015 were responsible for the rule evolution: Jacky Baltes, Reinhard Gerndt, Sean Luke, Luis F. Lupian, Marcell Missura, Maike Paetzl, Soroush Sadeghnejad and Daniel Seifert. Special thanks go to Martin Friedmann and Sebastian Mielke for the contribution of several figures.

## Section III

# Rules for RoboCup Humanoid League Technical Challenges

## General Rules for Technical Challenges

The technical challenges consist of the following individual challenges:

- Part A: Push Recovery
- Part B: Goal Kick from Moving Ball
- Part C: High Jump
- Part D: High Kick

Only the robots used for the soccer games are allowed to participate in the technical challenges. No hardware modifications of the robots are allowed for the Technical Challenge (i.e., a robot cannot be modified from the configuration it had in the soccer games).

The team scheduled for the Technical Challenge must have access to the field five minutes prior to the scheduled starting time. The referee will give the start signal at the scheduled time.

### Method of scoring

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The Technical Challenge consists of four parts A, B, C and D. Each of the parts can be attempted multiple times, in any order. The team might terminate a trial at any time, in order to reattempt the same part or switch to another part of the challenge. A trial terminates automatically when 25 minutes elapsed after the referee gave the start signal. This concludes the Technical Challenge for the team. The time is taken for each of the trials, if completed successfully. Ranking in the individual challenges is determined according to the rules defined for each individual challenge. For each part, the highest ranked team receives 10 points. The second team receives 7 points. The third team receives 5 points. All other teams who successfully managed this part of the challenge receive 3 points.

### Robot Handlers During the Technical Challenge

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During an ongoing trial of a technical challenge the robot handler is not allowed to interact with the robot's sensors in any way. In the moment the handler either touches the robot or interacts with the robot in any way, the trial is finished and counted as unsuccessful.

- In KidSize and TeenSize robot handlers are not allowed to enter the field vicinity of the robot during a trial, unless the referee asks them to remove a robot.
- In AdultSize one robot handler is permitted to stay on the field near the robot during a trial.

## Part A: Push Recovery

The goal of the push recovery challenge is to withstand a strong push. PET bottles, partially filled with sand or water to determine the weight, cushioned with a layer of foam material (max. 1 cm thick), and suspended by a rope, will be used as a pendulum to apply the push. A 1 kg weight will be used for KidSize, 2 kg for TeenSize, and 3 kg for AdultSize. The length of the rope (between 1 and 2 meters) will remain fixed for all trials in a size class. The rope is attached to a frame with variable height, which is used to adjust the bottom of the bottle to be at the height of the center of mass of the robot. To swing the bottle against the robot's body, the pendulum is released from an angle which is measured by the ground projected distance between the robot and the bottle. At each attempt, the team announces the ground projection distance for the pendulum. The robot may stand still or it may be walking in place. A push is successfully absorbed when after receiving the push, the robot returns to a stable standing or walking posture. A trial consists of a push from the back and a push from the front. For a fully successful trial, the robot needs to accomplish the push recovery from the front AND from the back. For a partially successful trial, the robot needs to accomplish the push recovery from the front OR from the back. The robots are first ranked by the ground projected distance between the robot and the bottle for fully successful trials and then for partially successful trials.

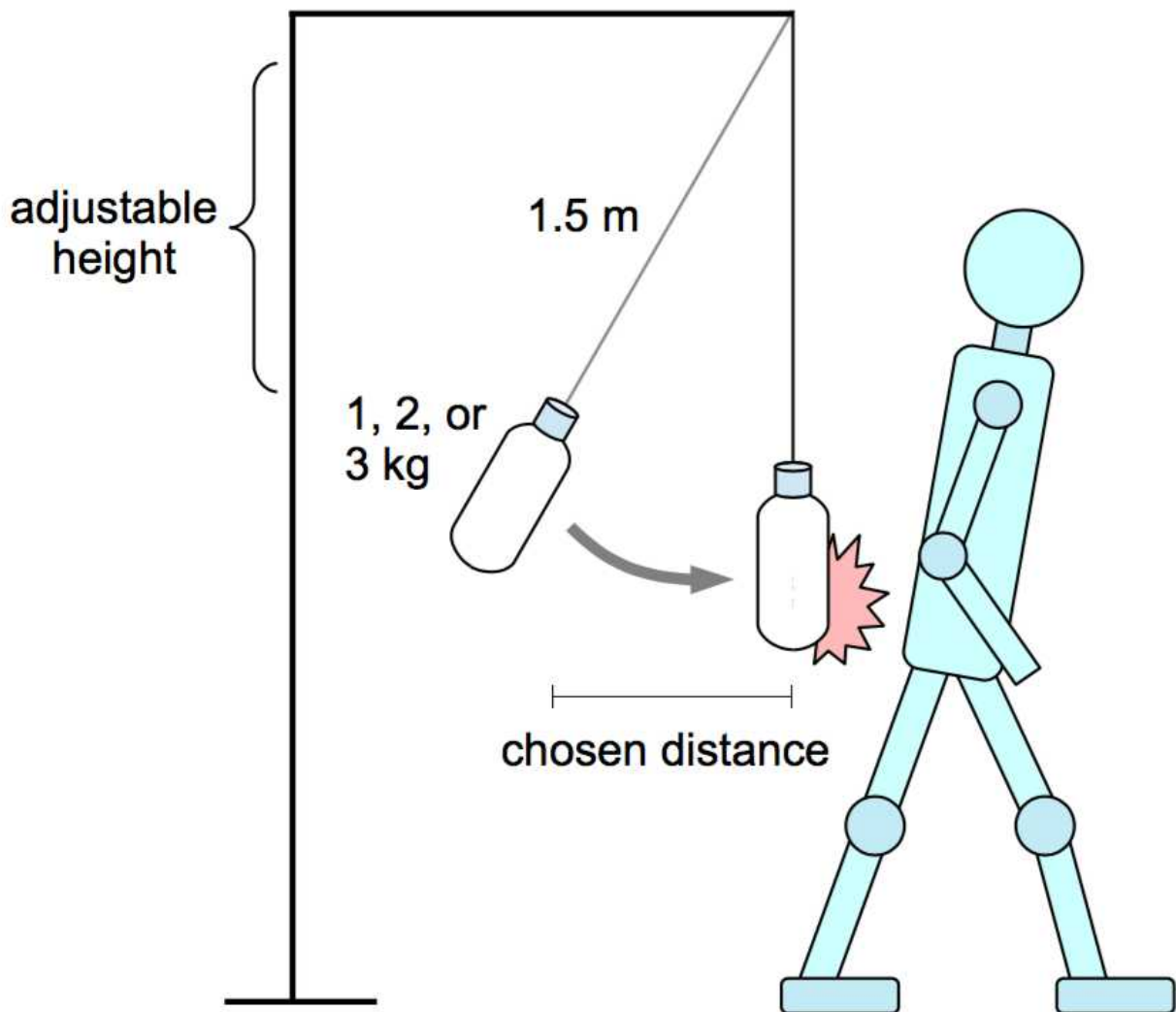


Figure 6: Setup for the push recovery challenge.

## Part B: Goal-Kick from Moving Ball

The goal of the goal-kick from a moving ball challenge is to kick a moving ball into the goal. A ramp will be placed in a fixed position on the extension of the goal area line, such that a ball released from the ramp will travel parallel to the goal line towards the center of the field. The height of the ramp is adjustable and determines the initial velocity of the ball. Teams may place one robot anywhere on the field. After the ball has been released, the robot must make contact with it before the ball comes to a stop, otherwise the trial is unsuccessful. If after the ball contact the ball enters the goal, the trial is successful. Otherwise the trial is partially successful. Teams are first ranked by the release height of the ball from the ramp for successful trials and then by the shortest distance between the ball and the goal for partially successful trials.

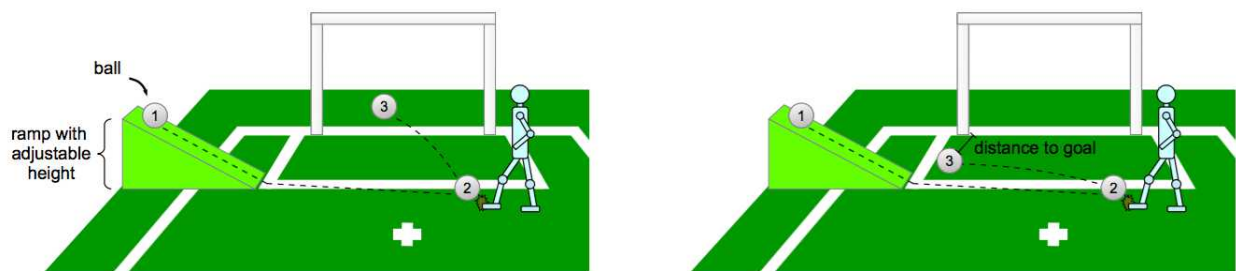


Figure 7: Successful (left) and partially successful (right) goal-kick from a moving ball challenges.

## **Part C: High Jump**

The goal of the high jump challenge is to terminate ground contact and to stay in the air as long as possible. Robots are placed on a contact device of approximately 40 × 40 cm that records the time of flight of a jump. A fully successful jump requires the robot to remain upright for a minimum of 3 seconds after landing without leaving the measuring device. All other attempts are considered partially successful. The robots are ranked first according to the time of flight of fully successful attempts and then according to the time of flight of partially successful attempts.



## **Part D: High-Kick Challenge**

The goal of the high-kick challenge is to kick the ball in the goal at maximum height. At each attempt, the team announces the minimum height their robot tries to achieve. The minimum height must be at least  $\frac{1}{3}$ rd of the ball's diameter and must be a multiple of 1cm.

The ball is then placed on the penalty mark and the team may position the robot freely but at least 30cm away from the ball. After the start signal, the robot may move the ball to any position before attempting a kick from the ground. Only kicks count that score a goal of at least the minimum height. The trial ends unsuccessfully when the ball leaves the field, or when the robot touches the goal obstacle.

The robots are ranked by the maximum height they successfully managed to kick the ball into the goal.