

# RoboCup MSL - 2018 Rule Changes

**Disclaimer:** This document contains an overview of the Rulebook changes introduced for 2018 RoboCup competitions. It was created to facilitate the integration with new rules, but it does not replace the reading of the official rulebook in any way.

The Executive and Technical Committees would like to thank all the contributions of the teams with proposals for rule changes. Rules are adapted with the league roadmap in mind, making sure that the evolution goes towards the RoboCup 2050 goal, along with a steady scientific progress.

Here is a summary of the changes, and a description of each one on the following pages:

- Increase Field and Goal Sizes
- Optional 802.11b (2.4GHz) Access Point
- Promoting Faster Game Flow
- Goalkeeper Ball Catch Hardware
- Revised “Lobbing from own half” Offence
- Kick & Touch Allowed On Setplays
- Other minor changes
- Technical Challenge

Any questions or issues regarding the rules should be addressed to the MSL Technical Committee mailing list: [rc-msl-tc@lists.robocup.org](mailto:rc-msl-tc@lists.robocup.org).

The 2018 Middle-Size League Exec/Technical Committees members,

Ricardo Dias, DETI/IEETA, University of Aveiro, Portugal

Junhao Xiao, National University of Defense Technology, China

Seyed Ehsan Marjani Bajestani, Qazvin Islamic Azad University, Iran

Wouter Houtman, Eindhoven University of Technology, Netherlands

Yifei Han, Beijing Information Science & Technology University, China

Junchong Ma, National University of Defense Technology, China

## Increase Field and Goal Sizes

Going towards the 2050 RoboCup objective means going towards the official FIFA rules. Following is a table that compares several dimensions between outdoor soccer (FIFA), indoor soccer (Futsal) and the Middle-Size League.

	FIFA	Futsal	MSL 2017	MSL 2018
Goal Width (m)	7.32	3	2	2.4
Goal Height (m)	2.44	2	1	1
Field Length (m)	105 (avg.)	40 (avg.)	18	22
Field Width (m)	69 (avg.)	22 (avg.)	12	14
Keeper Width (m) (arms along body)	0.60	0.60	0.73	0.73
Keeper Height (m)	1.90	1.90	0.80	0.80
Keeper Area (m <sup>2</sup> )	1.14	1.14	0.58	0.58
Goal Area (m <sup>2</sup> ) - on front	17.86	6.00	2.00	2.40
Ratio Goal Width/Field Width	10.6%	13.6%	16.7%	17.1%
Ratio Field Width/Field Length	65.7%	55.0%	66.7%	63.6%
Ratio Keeper Area/Goal Area	6.4%	19.0%	29.2%	24.3%

Furthermore, the field is already cluttered, so we propose a bigger field for 2018 to provide more space for the robots to move at fast speeds, aiming also at more collision avoidance. On the other hand, the ratio between keeper size and goal size is significantly higher when compared to the other 2 real sports. This can lead to strategies where teams invest a lot on the goalkeeper and less on the cooperative behaviour. Because one of the main MSL focuses is on multi-agent cooperative strategy, we decided to increase the goal width in order to decrease the keeper/goal ratio, coming closer to the Futsal ratio. It is expected that the field size will continue to slowly increase on the next years.

### Changes On:

- RC-1.1: Dimensions
- RC-1.7: Goals

## Optional 802.11b (2.4 GHz) Access Point

It is known that the 2.4 GHz band is already too overwhelmed. In practice, this means that most teams only make use of the 5 GHz band (802.11a), so the 802.11b network will only be provided by the LOC if at least one team requests it along with the qualification materials. Otherwise, only the 802.11a Access Point will be provided.

### Changes on:

- RC-4.2.5 - Communications
- CR 1.1 - Team Qualification for RoboCup-2018
- A 1 - Table of Network-Addresses

## Promoting Faster Game Flow

Over the last years, the Middle-Size League has been committed in speeding up the flow of the game (last change in this direction was made for RoboCup 2016, in which the time for repositionings was reduced from 10 seconds to 7 seconds). We want to continue in that direction and increase the playing time in MSL matches even more!

Some of the time wasted is on ball repositionings. We included on the rules a statement that says the referee should only reposition the ball if it's too far away from the desired position (or if it requires the ball to be repositioned to a restart point). In other words, whenever possible, the referee should be able to re-start the game without moving the ball.

Furthermore, the robots should be able to avoid the ball in restart situations. After the referee positions the ball and sends the signal to the teams, robots should put effort in not touching the ball while repositioning (otherwise the game stops again to reposition the ball and re-send the signal). Particularly on drop-ball situations, the robots must be able to move away from the ball without grabbing it. A team that touches the ball on repositionings (having the possibility to avoid it), causing the game to stop to reposition the ball, should be awarded a yellow card on the second occurrence.

### Changes on:

CR 2.3 - Referees during Match

RC-13.1.4 - Moving the ball in re-positionings

## Goalkeeper Ball Catch Hardware

With the previous MSL rules, the goalkeeper robots were not able to catch the ball and hold it. Going towards a real soccer match, we would like to allow the goalkeeper robots to have special hardware to catch the ball in the air to defend an opponent kick.

Such system must be designed to be able to grab the ball, hold it for a short period and put it back in play (release the ball from this system) within 2 seconds. This system can only be used inside the penalty area, after an opponent kick and cannot be used to intentionally hide the ball from the opponent.

When with the ball possession, the goalkeeper should not be prevented from releasing the ball (if the keeper is blocked from releasing the ball, the 2 seconds limit do not apply). Opponent players should show effort in driving away from the keeper.

This system may enclose the ball more than 1 third of its diameter, as long as the ball stays visible to the opponent.

In cases where this ball catch hardware is an active system, it cannot be used at the same time as the "extending arms". If it is a passive system, it can be used at the same time as the extending arms, as there might be no way to turn this system off.

### Changes on:

RC-12.0.2 - Goalkeeper Ball Manipulation

RC-4.2.0 - Robot Size

## Revised “Lobbing from own half” Offence

According to the 2017 MSL rules, if a robot makes a lob-shot from its own half towards the opponent side of the field without the intention to make a pass, a free-kick at the mid-line is awarded to the opponent team.

This rule has two main problems: on one hand, teams are prevented from using a strategy that is used in real soccer in dangerous situations; on the other hand, it is very unnatural for the audience to see the repositioning of the ball on the mid-line after such situations.

It has been included to avoid teams kicking the ball to the opponent side against the keeper and grabbing it nearer the opponent goal and kick, in a time when the MSL had less strategic play. Today we have RC-12.0.1 regarding the 3-meter radius circle for dribbling and the need for pass between two robots.

For 2018 we revised this rule, while keeping the concerns that led to the creation of this rule. If a ball is lobbed from the own half and no teammate is there to receive the ball, even if the ball touches and opponent and leaves the field on the opponent side, the next set-play situation would still be awarded to the defending team - if the ball crosses the goal line, award a goalkick for the defending team, if it crosses the side line on the defending team side, award a throw-in for that team.

This is only valid until any team gets control of the ball again.

### Changes on:

RC-10.1.2 - Lobbing from own half

## Kick & Touch Allowed On Setplays

The 2017 rules required a pass between two players of the same team to score a valid goal. Although it promoted enthusiastic matches last year in Nagoya, with a lot more passes between robots, it somewhat limits some strategies.

We would like to relax this rule on some setplays - namely, free-kicks taken on the opponent side, corner kicks and throw-ins on the opponent side - and allow a touch of a second robot from the same team to count as a “ball received and kicked” for scoring purposes. This will allow, for example, “heading” the ball with the robot body from a corner kick, which was not possible due to the mandatory pass rule.

### Changes on:

RC-10.1.1 - Valid methods of scoring

## Other minor changes

- References to RoboCup 2017 were changed to RoboCup 2018
- Added Technical Inspection Failure Consequences to the rules
- Added to CR 3.7 same considerations for CR 3.6 regarding games effectively played
- On RC-12.6.1, fixed typo in last sentence: should be “90 seconds” instead of “90 minutes”
- On RC-12.6.2 changed “2 minutes off penalty” to “90 seconds off penalty”
- On list of qualification materials add declaration of need for 802.11b
- Fix VDL IP addresses (using old Phillips team IP addresses)

# Technical Challenge

The technical challenge for RoboCup 2018 will be held in the normal field and it was designed to allow teams to show their skills, with emphasis on skills that are used during the tournament.

The challenge is divided into 2 runs: Run 1 - "Skills on static field and colored obstacles recognition" and Run 2 - "Dribbling static colored obstacles". By reducing the number of runs with respect to last year, we are opening up new skill demonstrations, with special focus on dribbling.

## **Changes on:**

F-2000 Challenges - Challenge 1