

RoboCup Soccer
Simulation League
3D Competition
Rules and Setup
for the 2012 competition
in Mexico City

V. 1.0
May 2012

Table of Contents

1. Introduction.....	2
2. Tournament Format.....	3
3. Schedule.....	4
4. Hardware and Software Specifications.....	4
4.1 Servers.....	4
4.2 Monitors.....	4
4.3 Clients.....	4
4.4 Software.....	5
5. Determining the Winner.....	5
5.1 Round Robins.....	5
5.2 Elimination Rounds.....	5
6. Match Format.....	6
7. Game Play.....	7
8. Referee.....	9
9. Publication of Logs and Binaries.....	10

1. Introduction

This document describes the rules that will be used at the 2012 RoboCup Soccer 3D Simulation League. Their goal is to provide for fair games and smooth execution of the competitions. The Organizing Committee (OC) has the right to append or change these rules at any time within reasonable bounds. All teams will be notified of these changes as soon as possible. Teams can appeal to these changes or to the rules in general, however the final binding decision will be made by the OC.

2. Tournament Format

To Be Announced

3. Schedule

Mon. June 18	Team Setup
Tue. June 19	Team Setup
Wed. June 20	Seeding Round + Round 1
Thu. June 21	Round 1 + Round 2
Fri. June 22	Round 3 + Round 4
Sat. June 23	Semi Finals + Finals

4. Hardware and Software Specifications

4.1 Servers

- Intel(R) Core(TM) i7-975 @ 3.33GHz
- 4 GB RAM DDR3
- Intel Gigabit Ethernet NIC

4.2 Monitors

- Intel Core(TM) 2 Quad CPU Q8200 @ 2.33 GHz
- 4 GB RAM DDR3
- 1024MB Nvidia GTX 285 Graphic Card
- Intel Gigabit Ethernet NIC

4.3 Clients

- Intel Core(TM) 2 Quad CPU Q8200 @ 2.33 GHz
- 4 GB RAM DDR3
- Intel Gigabit Ethernet NIC

4.4 Software

- Simulator: simspark 0.2.3, rcssserver3d 0.6.6 with kickoff rule patch¹
- Operating system: Fedora 16 x86_64 (64 bit)
- Dependencies: ODE 0.11.1 + tbb patch (double precision), Ruby 1.8.7 (patch level 358)

5. Determining the Winner

5.1 Round Robins

For the round robins, each team plays each other team in the same group once. For the seeding round the groups will be determined by drawing lots. Placing will be determined in the following order:

1. Points gathered. A win gives 3 points, a tie 1 point, a loss 0 points.
2. Head to head games of this round.
3. Goal difference (goals scored minus goals conceded) in this round.
4. The number of goals scored in this round
5. Two extra halves of 3 minutes each (for two teams only)
6. Penalty shots (for two teams only)
7. Coin toss

5.2 Elimination Rounds

In the elimination rounds, the winner will be determined in the following order:

1. Goals scored in this round
2. Two extra halves of 3 minutes each
3. Penalty shots
4. Coin toss

¹ A patch will be available soon

6. Match Format

The matches will be started automatically by a competition managing system. Teams are required to provide start.sh and kill.sh scripts for running and terminating their team. All players of a team must be running in less than 15 seconds when start.sh is executed. Additionally, each team must provide start_penalty_kicker.sh and start_penalty_goalie.sh scripts to run their penalty kicker and goalie respectively. The IP address of simulation server is given as the first parameter to the start scripts. Examples of start and kill scripts are given below. The OC will supply upload instructions at the first day, which teams must use and follow to be able to run their agents. Teams will be given the opportunity to upload and test their agents on the competition system before the start of each round. When a round is started, it will no longer be possible to upload or make changes to the agents, until all matches of that round have been played.

A match is played by two teams of 11 players each in a 20x30 meters field. Only in case of severe server problems, OC might decide to switch back to 9 vs 9 games. Each match consists of two halves of five minutes each. After the first half the teams switch sides.

For a match, each team has the chance to appoint a single team member as the team's representative. This representative should announce himself to the referee before the start of the match. During the match, only the team's representative can approach the referee.

When a match has started and an agent shows clearly unexpected behavior or gets disconnected, the following rules apply:

- If this occurs in the first 30 seconds of the match, the match will be restarted up to 2 times. In the case of unexpected behavior, the team's representative is responsible for notifying the referee, who will make the binding decision whether to restart the game on his own discretion.

```
#!/bin/bash
#
# RoboCup 2012 sample start script for 3D soccer simulation
#
AGENT_BINARY="my_agent_binary"
BINARY_DIR="."
NUM_PLAYERS=11

killall -9 "$AGENT_BINARY" &> /dev/null

for ((i=1;i<=NUM_PLAYERS;i++)); do
    echo "Running agent No. $i"
    "$BINARY_DIR/$AGENT_BINARY" -h $1 > log/stdout$i 2> log/stderr$i &
    sleep 1
done
```

```
#!/bin/bash
#
# RoboCup 2012 sample kill script for 3D soccer simulation
#
killall -9 "my_agent_binary" &> /dev/null
```

- If the problem persists, the team's representative can ask the other team's representative for a 2 minute time-out to fix the problem.
- If the problem still persists, or if it occurs after the first 30 seconds of the match the game will continue.

7. Game Play

- 1. Kickoff:** Goals scored directly from the kick off are not accepted. Also, the kicker must not touch the ball again until it has touched another player. In case of infringement, a kickoff is awarded to the opposing team.
- 2. Goalkeeper:** The player with uniform number 1, if available and only this player, will be designated as the goalkeeper.
- 3. Handling the ball:** Handling the ball involves a deliberate act of a player making contact with the ball with his hand or arm, as decided by the referee on his own discretion. Handling the ball is penalized with a free kick to the opposing team. The goalkeeper can not be guilty of a handling offense when his hands are within his own penalty area.
- 4. Holding or impeding the progress of an opponent:** Holding an opponent includes the act of deliberately preventing him from moving past or around using the hands or the arms. Impeding the progress of an opponent means deliberately moving into the path of the opponent to obstruct, block, slow down or force a change of direction by an opponent. Holding or impeding the progress of an opponent is penalized with a free kick to the opposing team.
- 5. Obstructing the ball:** Obstructing the ball involves use of a player's body, arms or legs to prevent progress of the game, which includes covering the ball, carrying the ball, holding the ball between arms or legs and lying in front of the goal in an attacking situation. Deliberately obstructing the ball, as judged by the referee, for longer than 10 seconds is penalized with a free kick to the opposing team. Unintentional obstruction of the ball for longer than 10 seconds is ended by a drop ball by the referee.

- 6. Illegal defense:** At any time during the match, no more than 3 players of a team may be inside of their own penalty area. If a 4th player enters the penalty area, it will be placed outside of the field. When the last to enter is the goalkeeper, the player furthest away from the own goal of the three that were already in the penalty area will be placed outside of the field instead.
- 7. Crowding the ball:** Crowding of the ball when an opponent is near (within 0.8m of the ball) is illegal. If two players of one team are within a circle with radius 0.4 m. of the ball, the furthest of these two is re-positioned. If three players of one team are within a circle with radius 1 m. of the ball, the furthest of these three is re-positioned.
- 8. Immobility:** Players that have been immobile or fail to stand up for too long will be re-positioned. The goalkeeper will be re-positioned after 30 seconds of immobility, or after failing to stand up for 60 seconds; other players will be re-positioned after 15 seconds of immobility, or after failing to stand up for 30 seconds.
- 9. Penalty shots:** During penalty shots, each team only has a single player in the field: the goalkeeper for the defending team and a striker for the attacking team. Each penalty shot starts with a kickoff. The attacking team gets 60 seconds to attempt to score. The goalkeeper of the defending team has to stay within his penalty area the whole of this time. If neglected, it will be considered as a goal for the attacking team. When penalty shots are used to decide a tied game, each team gets five penalty shots. If after five penalty shots the score is still equal, single penalty shots by each team will determine the winner. If after seven penalty shots no winner could be determined a coin is tossed.
- 10. Colliding with other players:** Players must avoid touching other players. If three or more players get in touch with each other, a player from the team with the most players in this situation or a random player will be re-positioned outside the field.
- 11. Output:** Each player is permitted to generate output in files named stdout and stderr with the player number appended (e.g. stdout3 and stderr3 for player number 3). These write-only files will be located in their home directory under log/ subdirectory. Except these files, the home directory of teams is read-only during the games, so agents should not try to open any other files for writing. If you need this possibility for a good reason, you should contact OC about it before the games.

12. Fair play: Games should be played according to fair and common sense understanding of soccer and to restrictions imposed by the virtual simulated world of the 3D soccer simulator. Circumvention of these is considered violating the fair play commitment and its use during the tournament games is strictly taboo. Violation of the fair play commitment play includes, but is not limited to, for example:

- Using another team's binary in your team
- Jamming the simulator by sending excessive commands per client
- Direct communication between players by using other communication means, such as inter-process communication
- Manipulating competition machines or restarting them intentionally

Any of these is strictly forbidden. Other strategies might be found violating the fair play commitment, after consultation with the OC. However, we expect it to be pretty clear what a fair team should be like. In particular, the destructive disruption of opponent agent operation or the gain of advantage by other means than explicitly offered by the simulator counts as not fair play. If you are in doubt of using a certain method, please ask the OC before the tournament starts. If a team is found to use unfair programming methods during the tournament, it will be immediately disqualified.

8. Referee

During each game a referee is appointed to enforce the rules laid out in this document. In situations that are not handled by the rules, the referee should decide based on his/her common sense. The referee can be a member of the OC or a volunteer, from a team other than the teams of the match, who has full knowledge of the rules as deemed by the OC. During a match only one representative of each playing team is allowed to approach the referee. Decisions of the referee are binding and cannot be appealed during a match. If there is any complain about a game or a decision this should be brought to the OC's attention as soon as possible, who will decide how to handle it after all games of the current round are finished. If the referee cannot decide in a situation, he can consult the OC who will give the final decision.

Each team must supply a volunteer to be a referee. Best would be if that referee is the same as the team's representative.

9. Publication of Logs and Binaries

The OC will make the logfiles of the matches available to the participating teams during the competition. After the competition, the OC will also publish these logfiles on the internet at their earliest convenience.

The OC will also publish the binary, and additional files needed to run this binary, of each team after the competition. To do this, at the start of each round the home directory of the teams participating in that round will be archived. The team's last archive will be used for publication. If the home directory contains material that a team wishes not to be published and that is not needed to run the binary, it is the responsibility of the team to notify the OC of this.

Notice that if a team has used the source code of other teams as a basis, it have to follow the license applied and release their source code as well (if required by the license, like all versions of GPL). Failing to do so will result in disqualification of the team from 2012 and/or next year's competitions.