Abstract
This document contains the rules for the RoboCup2007 Atlanta Soccer Simulation League 2D competition. More information about this competition can be found at http://wiki.cc.gatech.edu/robocup/index.php/Soccer_Simulation

1 Soccer Simulator
RCSSBase version 11.1.x and RCSSServer version 11.1.x will be used. In the 11.1.x version, some defects of the automatic referee about goal kick, back pass and penalty shootouts in the 10.x version have been fixed. The default server configuration files (server.conf and player.conf) generated by RCSSServer 11.1.x will be used. Note that the number of halves and the switch of penalty shootouts will be changed according to the round.

2 Machines Configurations
Every team will be allowed to use four machines for their game. Teams can only use Linux operating system. Teams cannot use the competition machines to hack their program, but two machines will be available for the test.

2.1 Operating System
CentOS 5.0 will be used.

2.2 Hardware Specification
DELL Optiplex GX270D
- CPU: Pentium4 2.8GHz
- Memory: 1GB
- HDD: 40GB
- CDRW/DVD
3 Schedule

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<th>July</th>
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<th>Venue is opened at noon.</th>
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<td>2nd</td>
<td>Team setup, test and team leader meeting</td>
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<td>Group A and B</td>
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<td>4th</td>
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<td>8th</td>
<td>Place Matches and Final Match</td>
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</table>

The detailed schedule will be announced at the competition site.

4 Tournament Modus

4.1 Automatic matches

All matches will be started automatically by the league manager script (or by human referee). Please note these important points:

- Teams are only allowed to update their binaries by 15 minutes before the first game starts in a day.

- You need to provide 9 small scripts starting and killing your team. The scripts you need have to be called `start`, `start1`, `start2`, `start3`, `start4`, `kill1`, `kill2`, `kill3` and `kill4`; place them in top of your home directory (e.g. `/home/robolog/start`). The sample scripts will be put on the website\(^1\). Please have a look at them. It should be fairly easy to adopt them for your team.

- In order to test the automatic running games script (the league manager), teams have to finish testing their binaries and scripts on a competition machine by 17:00 on July 2nd.

- Scripts will be executed by a different user in your user group. Your scripts and your team have to be at least group read- and executable.

- The scripts should use absolute paths or change to the respective directories.

- Double check that your kill scripts kill all of your programs (goalie, players, coach) – even if your programs terminate automatically.

- In the elimination rounds or place matches, the penalty shootouts will be started automatically after the extra halves if the game ends with a draw. Make sure your team can handle this.

- If it doesn’t work, we don’t fix it.

- Do NOT output many data to stdout, stderr and files in your home directory because it might cause a serious network delay.

\(^1\)http://wiki.cc.gatech.edu/robocup/index.php/Soccer_Simulation
4.2 After Competition

Teams will be published automatically after the competition. To help us with publishing your team, create a tar.gz file before the final round and rename it to /home/[teamdir]/[teamdir].tar.gz. In case a team fails to provide this file, we will publish the complete home directory of that team. Also, it may cause disqualification in RoboCup2008 competition.

5 General Tournament Rules

The 2D competition will consist of 16 teams. The setup of the tournament is as follows:

- There will be three points allocated for a win and one point for a draw. A forfeit will record a score of either 3:0 or the score of the forfeiting team’s other game in that round with the largest goal differential, if it is larger than 3.
- The Simulation League Team Competition will consist of three rounds.
- The first round will consist of 4 groups of 4. Four teams are seeded and directly assigned to the different groups. The decision which teams are seeded, is made by the committee according to rankings of last years tournaments, i.e. Robocup2006, and SSIL. In this year, this will be the first three teams of RoboCup2006 and the winner of SSIL. The other teams are randomly assigned to the groups.
- In the second round teams will be distributed to 2 groups of 8, where each team plays against all other teams of the same group. The assignments of a team to a group is based on the ranking of the first round as follows:
  - Group E: A1,B1,C2,D2,A3,B3,C4,D4
  - Group F: A2,B2,C1,D1,A4,B4,C3,D3
- The first four teams of each group(E1, E2, E3, E4, F1, F2, F3,F4) will advance to the quarter-finals (with double-elimination) in the final round (See Figure.1). The other teams (E5, E6, E7, E8, F5, F6, F7, F8) will play for their final places(9th–16th) in the final round.
- In case of double elimination, you can play in the tournament until you lose twice. The tournament consists of the quarter-finals, the WinnersBracket and the LosersBracket. If you lose in the quarter-finals or in the WinnersBracket, you go to the LosersBracket. When you lose in the LosersBracket (When you lose twice), you drop out from the tournament.
- The quarter-finals with double-elimination are as follows.(See Figure.1)
  - Game QF1: E1 vs F4
  - Game QF2: E3 vs F2
  - Game QF3: E2 vs F3
  - Game QF4: E4 vs F1
• The WinnersSemiFinals are as follows. (See Figure.1)
  – Game WSF1: Winner of QF1 vs Winner of QF2
  – Game WSF2: Winner of QF3 vs Winner of QF4

• The WinnersFinal is as follows. (See Figure.1)
  – Game WF: Winner of WSF1 vs Winner of WSF2

• The LosersRound1 are as follows. (See Figure.1)
  – Game LR1A: Loser of QF1 vs Loser of QF2
  – Game LR1B: Loser of QF3 vs Loser of QF4

• The LosersRound2 are as follows. (See Figure.1)
  – Game LR2A: Loser of WSF2 vs Winner of LR1A
  – Game LR2B: Loser of WSF1 vs Winner of LR1B

• The LosersSemifinal is as follows .(See Figure.1)
  – Game LSF: Winner of LR2A vs Winner of LR2B

• The LosersFinal is as follows. (See Figure.1)
  – Game LF: Loser of WF vs Winner of LSF

• The Final match is as follows. (See Figure.1)
  – Final: Winner of WF vs Winner of LF

If Winner of WF loses, we have the Final again.

• The final placing matches will be held as follows.
  – Game for 15th and 16th : E8 vs F8
  – Game for 13th and 14th : E7 vs F7
  – Game for 11th and 12th : E6 vs F6
  – Game for 9th and 10th : E5 vs F5
  – Game for 7th and 8th : Loser of LR1A vs Loser of LR1B
  – Game for 5th and 6th : Loser of LR2A vs Loser of LR2B

Each game must have a winner. 3000+3000 cycles of extra time will be played with the golden goal rule. If there is still no result, the game is decided by penalty shootouts (see below).
Quarter finals with double elimination

Figure 1: Quater-finals with double elimination
6 Tiebreakers

Tiebreakers between \( n \geq 2 \) teams in the first two rounds will apply in the following priorities:

1. points
2. head-to-head results
   for \( n = 2 \), this breaks the tie if and only if the head to head match was not a draw
   for \( n > 2 \), this breaks the tie if and only if one team won against all other teams who are tied.
3. Overall goal difference for this round
4. if \( (n > 2) \), overall goal difference including only games with the tied teams
5. Overall number of goals scored
6. if \( (n > 2) \), overall number of goals scored including only games with the tied teams
7. Penalty shootouts between the tied teams. Details of the structure will be explained further below.

If \( n > 2 \) teams are tied, then the above list of tiebreakers is used until 1 team can be put first. That one team is ranked first and the remaining teams are grouped into another tiebreaker, and the criteria are applied from the beginning of the list.

The exception to the above list: If teams are tied and it is the case that some team(s) in the tie will advance to the next round and some team(s) will not, then game statistic values will NOT be used to break the tie. Instead penalty shootouts will be performed between the tied teams. If more than two teams are involved in the tie, the teams are first ranked using the game statistic values (numbers 3 through 6) above. Any remaining ties are broken uniformly randomly. This ranking is used to group the teams in a standard single elimination bracket (highest ranked team plays against lowest ranked team in the first round, etc.). With an uneven number of team, the highest ranked team is free in the first round. Each match follows the 2 team penalty shootouts described below.

6.1 Automatic Penalty Shootouts Procedure

To resolve tie-breaks in the first two rounds and the tie-game in the third round, automatic penalty shootouts will be used. In the round robin games, automatic penalty shootouts is not used. For penalty shootouts, we are going to use these parameters:

\[
\begin{align*}
\text{pen\_dist\_x} & : 42.5 \ // 42.5 \text{ m from the goal is position 10.0} \\
\text{pen\_allow\_mult\_kicks} & : \text{true} \ // \text{allow multiple kicks so normal play} \\
\text{pen\_taken\_wait} & : 200 \ // \text{nr of cycles waited after start pen.}
\end{align*}
\]
(This means that the scorer starts 42.5 meters from the goal and can use dashes, turns and kicks. After at most 200 cycles, the penalty is stopped).

And, only in tie-breaks, we are going to use these parameters:

nr_normal_halfs: 0 // no halves
nr_extra_halfs: 0 // no extra halves

(This means that teams cannot use heterogeneous players.)

PLEASE SEE THE SPECIFICATION IN THE NEWS FILE FOR MORE INFORMATION ABOUT PENALTY SHOOTOUTS.

7 Drop Ball

In certain situations, like free-kicks and kick-ins, the game is stopped. If a team fails to put the ball back into play after a free kick, a drop-ball is given after 200 cycles automatically. If repeatedly no player of the team that has to perform the free kick displays efforts to move towards the ball, the waiting time can be suitably shortened by the referee dropping the ball manually.

If in a play_on situation the ball is within 3m for 200 cycles, a drop-ball is given automatically.

The goal is always to keep the game running as smoothly as possible while giving the teams a fair chance to exert their rights. Ball drops should be as near as possible to the current position of the ball or on the corner of the penalty box.

8 Code of Honor

8.1 Coach Messages

The coach can issue arbitrary "freeform" messages during non-play-on mode. The coach can send one advice, one info, and one define, every 30 seconds – the rest will be ignored by the server. Therefore, the Coach shall not send more than 4 of those standard-language directives per 30 seconds, so as to not flood the network.

8.2 Fouls

Free kicks and kick-ins are detected automatically by the soccer server in many relevant cases. Sometimes, however, fouls occur which can only be detected by the human referee who has to award a free kick to the disadvantaged team.

Reasons to call a foul are:

• if one team surrounds the ball so that the other team cannot kick

• if the goal is blocked by so many players so that the ball could not go in (rough guideline: a wall of players blocking the goal);

• if a team intentionally blocks the movement of opponent players;
• the number of goalie moves is limited to 2. It is possible to get around this by doing a small kick and catching again. This is allowed once then the referee is required to drop the ball on the closest corner of the penalty box (notice this practice is not encouraged we are just acknowledging the potential for mis-kicks - continual use may be considered violating the fair play commitment);

• anything else that appears to violate the fair play commitment may also be called as a foul after consultation with the rule committee.

9 Fair Play

The goal of the game is to play soccer according to fair and common sense understanding of soccer and to the restrictions imposed by the virtual simulated world of the soccer server. Circumvention of these restrictions 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 for example:

• using another teams binaries in your team

• if a team is jumming the simulator by sending more than 3 or 4 commands per client per cycle;

• if a team communicates by other means than via the server using the ‘say’ command, for example by using direct inter-process communication;

• if a team attempts to disturb other teams communication by recording and sending strings of former communication or by attempting to fake communication of the opponent team.

Any of these is strictly forbidden.

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

If a team is under suspicion of violating the fair-play agreement, the committee has the right to ask for source code inspection.

10 Remote Participation

General Remark: Remote Participation is only possible in extreme cases.

We will not have the resources to search for problems in remote participants’ startup procedure, so, in their own interest, remote participants are asked to make sure that a 3rd party (i.e. we) can start up your code easily and smoothly on a platform that might be different from their development platform.