1 Organizing Committee

This document describes the rules that will be used at the RoboCup 2015 3D Simulation League. The 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 Competitions and Schedule

2.1 Server and Server Changes

The competition will use Simspark 0.2.4 + Rcsserver3D 0.6.10 and Ubuntu 14.04 64 Bits. Oracle Java 8 Runtime (http://www.webupd8.org/2012/09/install-oracle-java-8-in-ubuntu-via-ppa.html) will be available for clients. Clientes MUST use agentproxy 2.0 available at: http://robocup.hs-offenburg.de/uploads/media/proxy.tar.gz to connect to server.

The main changes in the server include:

- added new rule requiring that the ball must either touch an opponent, or touch a teammate outside the center circle, before a team taking a kickoff can score;
- penalty shootout kickoffs may be direct now, but it is not mandatory;
- added noise to the beam effector with the amount of noise added controlled by the 'BeamNoiseXY' (in meters) and 'BeamNoiseAngle' (in degrees) values in naosoccer4.rb;
- added new training command parser commands for setting the game time and score;
- added penalty shootout mode where a goal is awarded to the left team (penalty kicker) if the right team's player (penalty goalie) leaves the penalty area.

2.2 Competition Format and Challenges

- General Format and Schedule

The competition will include 3 rounds (first, second and third round) and finals. The teams will be classified by the average of sum of score of the three rounds and the top two that ranking will go contest the final. It will
also include 1 challenge: Kick Accuracy Challenge. The tentative format and schedule is the following:

**October 27th**  
Team set-up (9am – 8pm)

**October 28th**  
Team set-up (9am – 8pm)  
Team Leaders Meeting (TLM) (2pm-3pm)

**October 29th**  
First Round – (10am) *(code upload deadline[Cud]: 9.30am)*

**October 30th**  
Second Round – (10am) *(Cud: 9.30am)*  
Kick Accuracy Challenge (4pm-6pm) *(Cud: 3.30pm)*

**October 31st**  
Third Round – (10am) *(Cud: 9.30am)*

**November 01st**  
Finals (10:00am) *(Cud: 09:30am)*

**Qualifying Rounds**

The rounds will be composed by all teams and in each round, placing will be determined in the following order:

- Points gathered. A win gives 3 points, a tie 1 point and a loss 0 point.
- Goal difference (goals scored minus goals conceded) in this round.
- Goals scored in this round.
- Head to head game of this round.
- Two extra halves of 3 minutes each (only in cases where it matters for advancing to the next round or define the ranking in the 9th to 12th places round)
- Penalty shoot-outs (for 2-team ties only)
- Coin toss

**Finals**

If a final ends in a tie, two extra halves are played. If these end in a tie as well, a penalty shootout determines the winner. In the final, the winner will be determined in the following order:

- Number of goals scored in the game
- Two extra halves of 3 minutes each
- Penalty shoot-out
• Coin toss

• Kick Accuracy Challenge

Requirements

• The start player script has to start a player that kicks the ball towards (0, 0) when it receives "KickChallenge" as the challenge name argument.

Evaluation

The score of the team is evaluated as the average of the distances to the target position (0, 0).

The accuracy is measured over ten kicks. Each kick, the player starts from a random position in his own half within 45 degrees seen from (0, 0). The start positions of the player are of ever increasing distance (3-12 meters) to the destination spot. They are the same for all teams.

The time starts when the player gets closer than 0.5m to the ball or 3 seconds after the player was beamed (by the automated referee) to its start position roughly 1m behind the ball (whichever happens first).

An attempt is over, if

• the player leaves a 2m circle around the initial ball position (which also results in a score penalty of 5m),

• the ball leaves that circle and stops,

• or the ball does not leave the circle 5 seconds after start of the run.

The final sum is rounded to 3 digits. Equal scores will result in the same place.

You can get the current version of Kick Accuracy Challenge Tool and see more information at: https://github.com/magmaOffenburg/magmaChallenge

• General Rules

• Match Preparation and Format

1. Set-up: 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.
2. **Start/end:** The matches will be started automatically by a competition managing system. Teams are required to provide scripts named `start.sh` and `kill.sh` 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 scripts named `start_penalty_kicker.sh` and `start_penalty_goalie.sh` to run their penalty kicker and goalie respectively. The IP address that the agents should connect to is given as the first parameter to the start scripts. Examples of start and kill scripts can be found on the SSL wiki.

3. **Team format:** A match is played by two teams of 11 players. A match may not start if either team consists of less players. Each match consists of two halves of five minutes each. After the first half the teams switch sides. Each player can select any available agent models, possibly forming a heterogeneous team. The details of the available models were previously announced. The possible team composition is described in the heterogeneous player section of this document.

4. **Representation:** 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, otherwise it is assumed that the team has none for this match. During the match, only the team's representative can approach the referee.

5. **Forfeiting rule:** We define forfeiting as refusing to make a good faith effort to participate in a scheduled game. A team that forfeits is disqualified from the competition. In round-robin tournaments, when a team forfeits all the scores will be 3x0 against this team. In a knock-out round the teams who forfeits will be replaced by the next team in the rank from previous round.

5. **Faulty agents:** When a match has started and an agent shows clearly unnatural 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 unnatural behavior, the team’s representative is responsible of notifying the referee, who will make the binding decision whether to restart the game on his own discretion.

   - If the problem persists after restarts, the team’s representative can ask the referee for a 2 minute time-out to fix the problem. A fix may include the use of a binary from a previous round.

   - If the problem still persists after the time-out, or if it occurs after the first 30 seconds of the match the game will continue. If due to the problem the team ends up with less than the minimum amount of players, the match will result in a win by the average score against this team but at least 1:0.
• **Heterogeneous Players**

Each team has to use a minimum of 3 different player types and no more than 7 players from one player type. If only 3 different player types are used then a minimum of 2 players for each type must be used. The standard player type is counted identically to heterogeneous player types. Possible configurations for the different player types are: (7-2-2), (7-1-1-1-1), (4-4-3), (3-3-3-2), (3-2-2-2-2), etc. If teams do not comply with this rule, the server will not allow the faulty player to connect (that is either the 8th player of a given player type or the first player that does not allow the '3 player types' rule to be fulfilled). The heterogeneous types that were used last year will also be used during the 2015 competition.

• **Game Play**

1. **Kickoff:** Goals scored directly from the kickoff are not accepted. Also, the agent performing the kick-off may not touch the ball again until it was touched by another player. In case of infringement, a kick-off is awarded to the opposing team. A goal can be scored after a kickoff only if a second player from the team performing kickoff touches the ball outside the main circle or if an opponent touches the ball.

2. **Goalkeeper:** The player with uniform number 1, 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 cannot be guilty of a handling offense when his hands are within his own penalty area.

4. **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.

5. **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.

6. **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 repositioned. If three players of one team are within a circle with radius 1 m. of the ball, the furthest of these three is repositioned.
7. Immobility: Players that have been immobile or fail to stand up for too long will be repositioned. The goalkeeper will be repositioned after 30 seconds of immobility, or after failing to stand up for 60 seconds; other players will be repositioned after 15 seconds of immobility, or after failing to stand up for 30 seconds.

8. Penalty shoot-outs: During a penalty shoot-out, 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, sudden death rounds of one kick each are used until one side scores and the other does not. If after ten penalty shots no winner is determined, a coin-toss is used to decide.

9. 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 in case of an equal amount, will be re-positioned outside the field. The following collision events are considered fouls and can be rewarded with a free kick to the opposing team, if they result in tripping, obstructing, blocking, slowing down or forcing a change of direction by an opponent: running into an opponent from behind, and moving in the path of a faster moving opponent (illegal interception).

10. 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 a log/subdirectory. Except these files, the home directory is read-only during the games, so agents should not try to open any other file for writing.

11. Fair play: Games should be played according to a 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 is strictly forbidden during the tournament. Violation of the fair-play commitment 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 communication means other than those provided by the simulator, 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 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.

- **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 complaint 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, preferably the same as the team’s representative.

- **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. Note that teams that have used third party source code must follow that code's license regarding conveying the work. For instance, under GPL you are required to accompany your binary with the corresponding source, a written offer to supply the corresponding source, or information about where the source is offered to the general public. Failing to comply with any licensing will result in disqualification of the team from the current and/or future competitions.