RCAP CoSpace Grand Prix Rules 2020

Exclusive for International CoSpace Online (iCooL) Challenge

(U12)

These are the official rules for RoboCup Asia-Pacific (RCAP) CoSpace Grand Prix 2020 exclusive for the International CoSpace Online (iCooL) Challenge. This rule book is released by the RoboCup Asia-Pacific CoSpace Grand Prix Technical Committee. English rules have priority over any translations.

PREFACE

The RCAP CoSpace Grand Prix Challenge is a new educational initiative to interest, excite and engage participants regarding STEM and Computational Thinking through tinkering, making and coding in both virtual and real environments (CoSpace). In the RCAP CoSpace Grand Prix Challenge (iCooL), students will only compete in virtual environment.

The CoSpace Grand Prix Simulator is the only official platform for the CoSpace Grand Prix Challenge. This simulator allows programs to be developed using a graphical programming interface (GUI) or C language. The same program for the virtual robot in the virtual environment can be downloaded on to a real robot in the real environment. Participating teams can contact support@cospacerobot.org for CoSpace Grand Prix Simulator download, help and assistance.

Figure 1: CoSpace Grand Prix Challenge

Content

CHAPTER 1: GENERAL RULES

1 CoSpace Grand Prix Challenge (iCooL) Description

In the CoSpace Grand Prix Challenge (iCooL), students are only required code a virtual robot, and finally take part in the Grand Prix Challenge (iCooL). The maximum stay in virtual world is 8 minutes.

Figure 2: CoSpace Grand Prix Challenge (iCooL), U12

2 Participants

The iCooL Challenge will only accept individual participant.

2.1. Age Regulation

2.1.1 Participant aged 7 to 12 year old can take part in CoSpace Grand Prix U12 Category. Age is as specified on 1st July in the year of the competition.

2.2. Responsibility

2.2.1 The participant is solely responsible for

- verifying the latest version of the rules prior to the competition. If any rule clarification is needed, please contact the RCAP CoSpace Technical Committee.
- coding for iCooL Challenge
- uploading the correct code to the iCooL Challenge server.
- communication with RCAP CoSpace Technical Committee and Organising Committee for all iCooL Challenge related matters.

3 Referees

3.1. Digital Referee

3.1.1 The virtual race will be judged by the CoSpace Grand Prix built-in referee system automatically.

3.2. Official

3.2.1 Official from RCAP CoSpace Organising Committee will download the code submitted and run the race. The official will make sure that the CoSpace Grand Prix Challenge (iCooL) rules are followed.

3.2.2 In any case, official will not stop the game unless any unforeseen situation appears. Official will communicate with the participants to explain the action taken in case any interruption is carried out.

4 Conflict Resolution

4.1. Official

4.1.1 During the CoSpace Grand Prix, the officials' decisions are final.

4.2. Rule Clarification

4.2.1 If necessary, a rule clarification may be made by an official from the CoSpace Technical Committee and Organizing Committee, even during a tournament.

5 Code of Conduct

5.1. Fair Play

5.1.1 CoSpace Grand Prix Challenge is built upon the foundation of fairness, respect and friendship.

5.1.2 Mentors (teachers, parents, chaperones, translators, and other adult members) are not allowed to be involved in the programming of students' robots or perform other assistance work.

5.2. Sharing

5.2.1 Teams are encouraged to share their programming and strategies with members after the competition.

5.2.2 Any developments may be published on the CoSpace Robot website after the event.

5.2.3 RCAP CoSpace Grand Prix sharing furthers the mission of RoboCup Asia Pacific as an educational initiative.

5.3. Spirit

5.3.1 It is expected that all participants (students and mentors alike) will respect the RoboCup Asia Pacific mission.

5.3.2 It is not whether you win or lose, but how much you learn that counts!

CHAPTER 2: FIELDS AND ROBOTS

6 Virtual Field

6.1. VIRTUAL_WORLD Dimension

6.1.1 The dimensions of VIRTUAL_WORLD will be less than 300cm x 400cm.

6.1.2 Any surface colour that does not distract the robot's detection or movement is allowed.

6.2. VIRTUAL_WORLD Layout

6.2.1 The VIRTUAL_WORLD may consists any of black/white guidelines, obstacles, gantries, pit stops, detour markers, and mysterious tasks.

6.2.2 Black/White Guidelines

- The black/white guideline (1.8-2 cm wide) may be made with standard electrical insulating tape, or printed onto other materials.
- The black/white guideline forms a path to guide REAL_ROBOT during the race in REAL_WORLD.
- Straight sections of the black/white guideline may have gaps with at least 5 cm of straight line before each gap. The length of a gap will be no more than 20 cm.

Figure 3: Black / white guideline

6.2.3 Obstacles

The size of obstacles should not be less than 10 cm x 5 cm x 15 cm (Length x width x height); there is no upper bound to the size.

6.2.4 Gantries

Gantry is an overhead assembly on which certain signs or signals are posted. Gantry will not block the road. The design and colour of gantries can be varied.

Figure 4: Example of a gantry

6.2.5 Pit Stops

In motorsports, a pit stop is where a racing vehicle stops in the pits during a race for refuelling, new tyres, repairs, mechanical adjustments, a driver change, or as a penalty, or any combination of the above.

The size of pit stop is not fixed. It is orange in colour.

Figure 5： Pit stop

6.2.6 Detour Markers

There are some colour markers in virtual VIRTUAL_WORLD to help teams to make decision. The marker can be of any colour.

Figure 6: Detour markers

6.2.7 End Markers

The end marker is as shown in figure 8. This is the terminal point of the Black/White guideline.

Figure 7: End marker

6.2.8 Finish Lines

The mission is completed when VIRTUAL_ROBOT passes the finish line.

7 Virtual Robot

7.1. VIRTUAL_ROBOT Configuration

7.1.1 The VIRTUAL_ROBOT configuration is as follows:

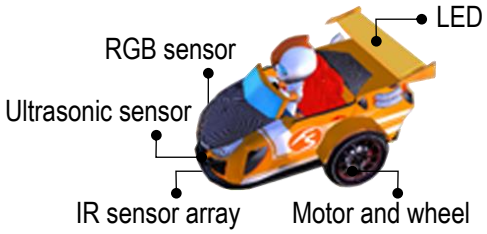

Figure 8: Virtual robot

7.2. Robot Coding

7.2.1 Teams are encouraged to use the CoSpace Grand Prix Simulator to develop appropriate strategies for the VIRTUAL_ROBOT.

CHAPTER 3: GAMEPLAY AND JUDGING

8 CoSpace Grand Prix Procedure

8.1. Release of Task

8.1.1 The tasks for both real and virtual challenges will be released to teams prior to the race.

8.2. Submission of AI

8.2.1 The participant must submit code to iCooL server at the end of coding session. Only one code is allowed for each virtual arena. The iCooL server will be closed 10 min after the end of coding session.

8.3. Virtual Race

8.3.1 It is the participant's responsibility to ensure that the correct program is uploaded.

8.3.2 The official will download the program submitted, upload the programs onto the VIRTUAL_ROBOT, and place it in the initial station in the VIRTUAL_WORLD.

8.3.3 VIRTUAL_ROBOT is required to pass all Pit Stops or gantries successfully in any order. VIRTUAL_ROBOT does not need to stop at the Pit Stop.

8.3.4 The VIRTUAL_ROBOT should avoid all obstacles.

8.3.5 Teams are encouraged to make use of Detour Markers to plan the best race route.

8.3.6 When VIRTUAL_ROBOT reaches the "Finish" line, the race ends.

8.3.7 The maximum time for VIRTUAL_ROBOT to stay in VIRTUAL_WORLD is 8 minutes.

8.4. Ranking

The teams are ranked as follows:

	Situation	Rank
Tier 1	• VIRTUAL_ROBOT passes all Pit Stops and reaches the Finish Line	• The team rank is determined by the race time at the Finish Line in the VIRTUAL_WORLD.
Tier 2	• VIRTUAL_ROBOT is not able to passes all Pit Stops (regardless whether it reaches the Finish Line or not)	• The race time for VIRTUAL_ROBOT to reach the last Pit Stop will be recorded. • The team rank will be determined based on the number of Pit Stops passed followed by the race time.

Rule clarification: iCooL@robocupap.org

Technical support: support@CoSpaceRobot.org