RCAP CoSpace Rescue Challenge Rules 2023

(FirstSteps Category)

These are the official rules for the RoboCup Asia Pacific (RCAP) 2023 CoSpace Rescue Challenge. They are released by the RoboCup Asia Pacific CoSpace Rescue Technical Committee. The English rules have priority over any translations. Changes from the 2021 rules are highlighted in red.

PREFACE

In RCAP CoSpace Rescue Challenge, teams have to develop and program appropriate strategies for autonomous robots to navigate through the competition environment to collect objects. In the Virtual RCAP CoSpace Rescue Challenge, students will only program the virtual robot and compete in virtual environment.

The RCAP CoSpace Rescue Simulator is the only official platform for this sub-league. The simulator allows user to program robots using a graphical programming interface, python, or C language. Participation teams can contact support@cospacerobot.org for RCAP CoSpace Rescue Simulator download, help and assistance.

In the CoSpace Rescue FirstSteps category, students will only compete in VIRTUAL_WORLD.

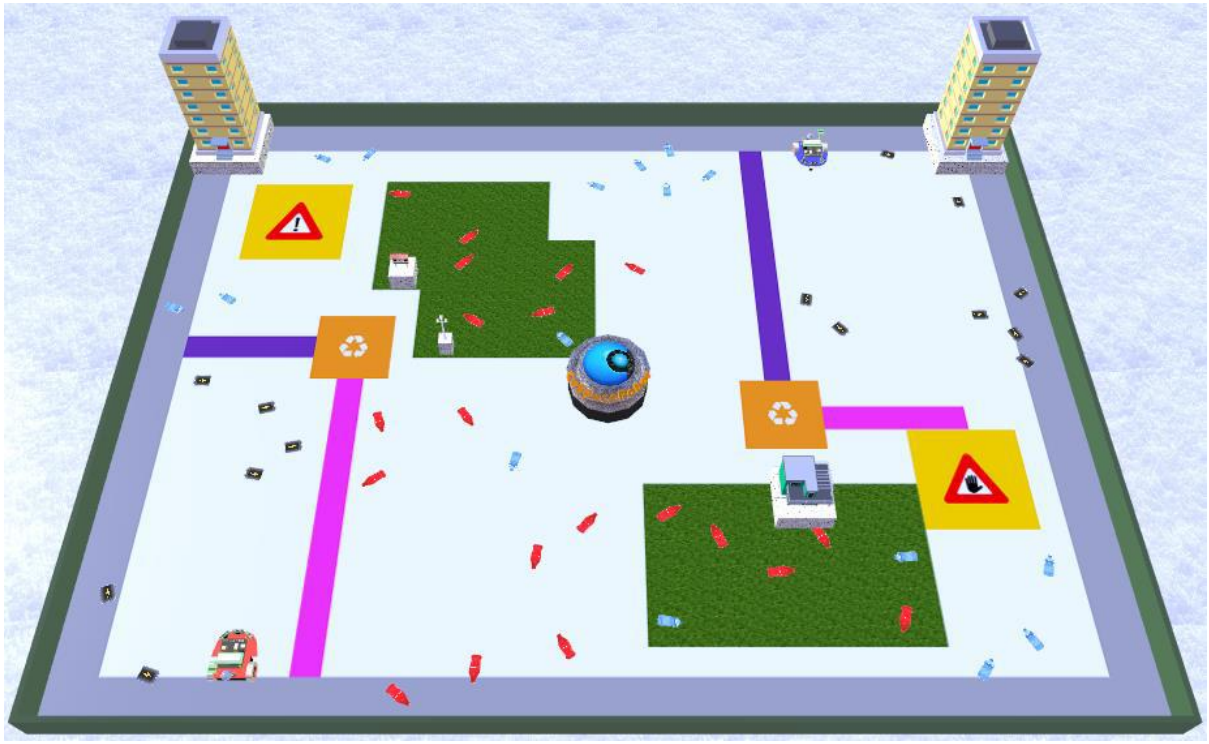


Figure 1: CoSpace Rescue FirstSteps Challenge

Contents

CHAPTER 1: GENERAL RULES

1 Team

1.1. Team Members

1.1.1 A CoSpace Rescue team should consist of 2 to 4 members. Each participant can only register for one team. Each participant can only register for one team.

1.1.2 All team members must be at the right age for the respective age group.

- U12 group: Teams with all students aged 7 to 12 year old can participate in this category.
- U19 group: Teams with all student members aged 13 to 19 year old can participate in this category. If a team has mixed ages (with both U12 and U19 members), they will be allowed to compete in U19 category.

Age is specified as on 1st July in the year of the competition.

1.1.3 Every team member needs to carry out a technical role for the team (strategy planning, programming, etc.), which should be identified at the registration. Each member will need to explain his/her technical role and should be prepared to answer questions on the technical aspects of their involvement in preparing the CoSpace Rescue Challenge.

1.2 Responsibility

1.2.1 The team members are responsible for

- verifying the latest version of the rules prior to the competition. If any rule clarification is needed, please contact the CoSpace Technical Committee.
- checking updated information (schedules, meetings, announcements, etc.) during the event.
- coding for the robot in the virtual world.
- uploading the correct code to the robot.
- communication with CoSpace Technical Committee and Organising Committee for all CoSpace Rescue Challenge related matters.

2 Referees

2.1 Official

2.1.1 A referee is an official who manages the CoSpace Rescue games and makes sure that the CoSpace Rescue rules are followed.

2.1.2 The referee receives and uploads the teams' virtual programs, as well as running the game.

3 Interruption of a Game

3.1.1 Human interference during the game is not allowed.

3.1.2 In any case, only the team captain is allowed to communicate with the referee.

3.1.3 In principle, a game will not be stopped during the challenge unless the referee needs to discuss an issue/problem with the OC/TC.

4 Conflict Resolution

4.1 Referee

4.1.1 During a gameplay, the referee's decisions are final.

4.1.2 At conclusion of game play, the referee will ask the captain to sign the score sheet. Captain should be given maximum 1 minute to review the score sheet and sign it. By signing it, the captain accepts the final score on behalf of the entire team; in case of further clarification, the team captain should write their comments in the score sheet and sign it.

4.1.3 In case the team refuses to sign the scoresheet after the game, they should be advised to file a complaint following the procedure in section 4.4. This should not interrupt the following games. The referee should follow the instruction given by the chief judge.

4.2 Rule Clarification

4.2.1 It is team's responsibility to verify at the RoboCup Asia Pacific Official website on the latest version of the rules prior to the competition. If any rule clarification is needed, please contact the RCAP CoSpace Rescue Technical Committee.

4.2.2 If necessary even during a tournament, a rule clarification may be made by members of the RCAP CoSpace Rescue Technical Committee and Organizing Committee.

4.3 Special Circumstances

4.3.1 In special circumstances, such as the occurrence of unforeseen problems or malfunction of a robot, rules may be modified by the RCAP CoSpace Rescue Organizing Committee Chair in conjunction with available Technical Committee and Organizing Committee members, even during a tournament if necessary.

4.3.2 If any of the team captains/members/mentors do not show up to the team meetings to discuss the problems and the resulting rule modifications described at 4.3.1, it will be considered as an endorsement.

4.4 Complaint Procedure

4.4.1 Rule issues are not to be discussed during the run. Referee decisions are binding for the CoSpace Rescue challenge. A team may protest by executing the following complaint procedure. The procedure is automatically invoked if a referee decides to abort the run for any reason (e.g. field damage, lighting failures, burning robots).

4.4.2 To initiate the complaint procedure, the team leader of the challenging team has to contact a member of the Technical Committee within 10 minutes of the end of the run. The member of the Technical Committee will then invoke a team leader conference in consultation with the Organizing Committee. The following parties will participate in this conference: the referees of the run, Organising Committee members, and the Technical Committee (counselling). The situation shall be resolved by unanimous consent or by vote of the Organising Committee members.

4.4.3 All teams are reminded that while this is a competition, the league is also about cooperative research and evaluation, as such, complaints should be handled in a fair and forthcoming way.

5 Documentation

5.1 Learning Journal

5.1.1 Teams are required to submit the document – My first robocup journey prior to the event.. Refer to Appendix E.

5.2 Team Presentation Video

5.2.1 Each team is required to submit a team presentation video 3 weeks before the competition. The highlighted videos will be showcased in RCAP Academy YouTube Official Channel (youtube.com/rcapacademy). Template and guidelines will be given by the Technical Committee.

6 Code of Conduct

6.1 Fair Play

6.1.1 CoSpace Rescue Challenge is built upon the foundation of fairness, respect, and friendship. Team members should be mindful of other people and their robots when moving around the tournament venue.

6.1.2 Mentors (teachers, parents, chaperones, translators, and other adult team members) are not allowed in the student work area. They are not allowed to be involved in the programming of students' robots.

6.2 Behaviour

6.2.1 Prior to the Challenge, team leaders and mentors are required to sign and acknowledge that they fully understand and are aware of the rules as well as Code of Conducts for the Challenge. All participants are responsible for their own actions.

6.2.2 During challenge, participants are to follow the directions of the referee. Failure to do so will result in a WARNING (Yellow Card). Subsequent infractions will result in an automatic DISQUALIFICATION (Red Card) of the round. Disqualification as a result of deliberately distract the competition is FINAL and appeals will not be entertained in any form. The status of Yellow/Red Cards will be recorded.

6.2.3 WARNING (Yellow Card) procedure

- A WARNING can be issued at the sole discretion of the lead referee; however, assistant referee will be consulted. If no objection is raised, WARNING will be issued.
- A WARNING will be issued for the following disruptive behaviours and activities including but not limited to:
  - (a) Not following referee's instructions
  - (b) Disturbing other participants and/or competition staffs (including referees).
  - (c) Speaking loudly, shouting, using any kind of profanities, or making sound that resembles profanity.
  - (d) Sabotaging other teams' belongings or equipment
  - (e) Entering competition area when other teams are competing.
  - (f) Entering other teams' area without explicit permission.
  - (g) Engaging in disorderly conducts such as fighting, physical scuffles, running around competition and/or team area.
  - (h) Harassing referee
  - (i) Mentor interference with robots or referee decisions.

6.2.4 DISQUALIFICATION (Red Card) procedure

- A DISQUALIFICATION can be issued at the sole discretion of the lead referee; however, assistant referee will be consulted. If no objection is raised, DISQUALIFICATION will be issued.
- An immediate DISQUALIFICATION can only be issued jointly by the lead and assistant referee. A DISQUALIFICATION will be issued for the following cases:

  (a) Teams have collected two consecutive WARNINGS during competition period. A competition period is defined as the start to end of duration of competition.

  (b) If one team copies a program from another team, both teams will be disqualified.

6.2.5 Once the RED CARD is issued, the team will be disqualified from the current run. If team receives 2 RED CARDS, it will be disqualified from the whole entire competition.

6.2.6 All immediate DISQUALIFICATION will be reviewed by the Chief Judge and the Organising Committee. Infractions that resulted in immediate DISQUALIFICATION will be reviewed and additional sanctions such as bans from future competitions will be considered.

6.3 Penalty

6.3.1 The following are strictly prohibited.

(a) During the game, using third-party software, self-written code, or any other tools to retrieve additional system information is strictly prohibited.

(b) Any other behaviours that affect the normal operation of the RCAP CoSpace Rescue Simulator, and direct or indirect control of the behaviours of the RCAP CoSpace Rescue Simulator, such as the scaling of the simulation window is strictly prohibited.

6.3.2 A DISQUALIFICATION from the current match can be issued at the sole discretion of the CoSpace Chief Judge and CoSpace Technical Committee if teams offend the rules 6.3.1 for the first time.

6.3.3 A DISQUALIFICATION from the entire competition can be issued at the sole discretion of the CoSpace Chief Judge and CoSpace Technical Committee for repeat offenders.

6.4 Sharing

6.4.1 Teams are encouraged to share their codes and strategies with members after the competition.

6.4.2 Any developments may be published on the RCAP Academy Channel or CoSpaceRobot.org after the event.

6.4.3 RCAP CoSpace Rescue sharing furthers the mission of RoboCup Asia Pacific as an educational initiative.

6.5 Spirit

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

6.5.2 The referees and officials will act within the spirit of the event.

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

CHAPTER 2: FIELDS

7 Arena

7.1 Dimensions

7.1.1 The dimensions of the VIRTUAL_WORLD are 270cm x 360cm.

7.2 Floor

7.2.1 VIRTUAL_WORLD

- The VIRTUAL_WORLD is a 3D simulated environment. The floor is not restricted to white or light colour. However, the colour objects, collection box, special zones, etc., can still be distinguished.

7.3 Boundary

7.3.1 VIRTUAL_WORLD

- VIRTUAL_WORLD will be enclosed by a wall of height 20 cm.

Appendix A shows the sample layout of the VIRTUAL_WORLD.

8 VIRTUAL_WORLD Layout

8.1 Markers

8.1.1 There may be some markers in the virtual worlds. The makers can be used to help the virtual robot for its localization, guidance, etc. The minimum size of the marker is 2cm x 2cm. The colour and shape of the marker is not fixed.

8.2 Special Zones

8.2.1 Certain areas in the virtual world are designated as special zones. RED, CYAN and BLACK objects collected in these areas are worth double points. The special zone is blue in colour as shown in figure 2. The special zones have a minimum size of 30cm x 30cm. The shape of the special zone is not fixed.

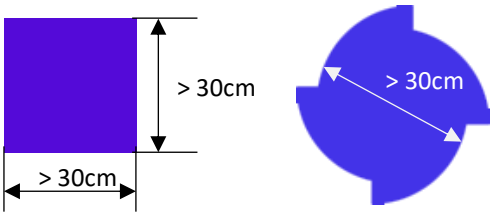


Figure 2: Sample of Special Zones

8.3 Obstacles

8.3.1 Obstacles found in the virtual world can be of any size, any shape with the minimum dimensions of 10cm x 5cm.

8.4 Traps

8.4.1 Traps are surrounded by a yellow boundary as shown in figure 3. The minimum size of the trap is 8cm x 8cm. The traps can be any colour. The shape of traps is not fixed. If a robot goes over a trap it will lose any objects it is currently carrying.

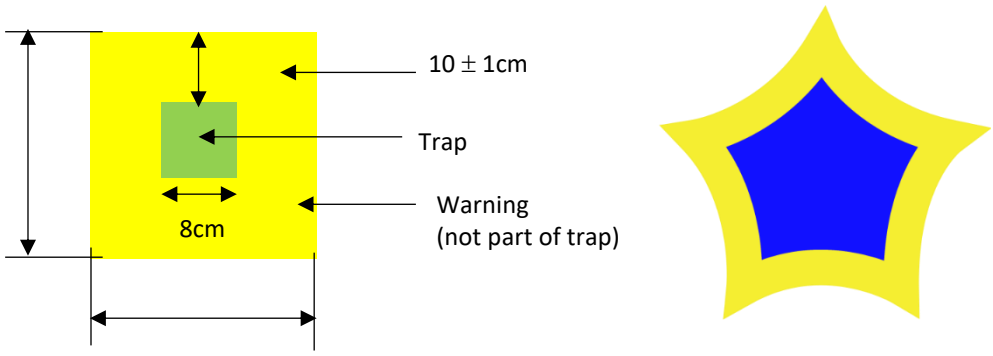


Figure 3: Sample of Traps

8.5 Object Collection Boxes

8.5.1 Figure 4 shows the object collection box. The collection box is ORANGE in colour. The dimensions can be (20 ± 3) cm x (20 ± 3) cm or bigger. The collection box can be any shape.

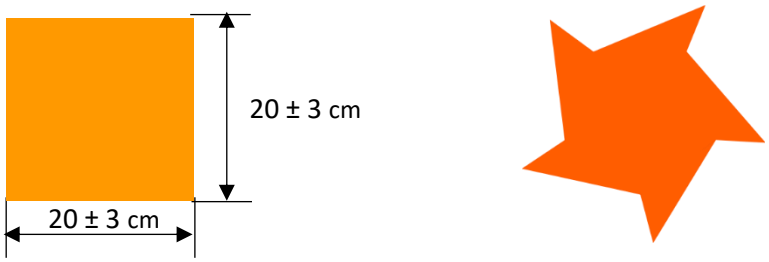
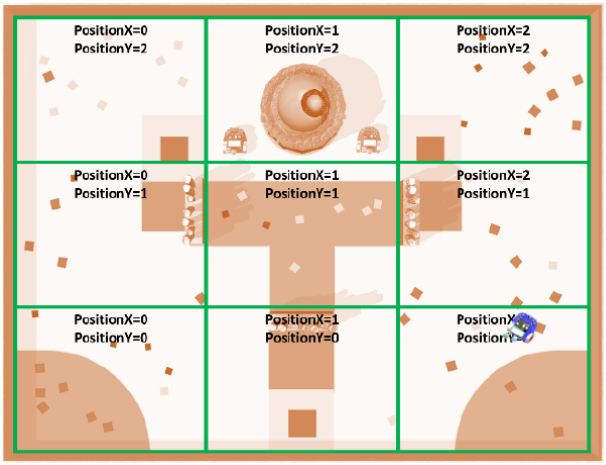
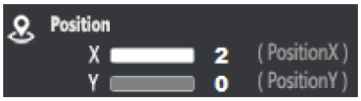


Figure 4: Sample of object collection boxes

8.6 Robot Coordinates

8.6.1 For RCAP CoSpace Rescue FirstSteps groups, the system will divide the map into a 3x3 matrix. The CoSpace Server will send the robot its approximate location while the robot is searching in the WORLD_2.





Display in CsBot Simulator

Figure 5: Position system for robot in WORLD_2

8.7 Objects

8.7.1 Basic Objects

8.7.1.1 There are THREE types of objects, RED, CYAN, and BLACK located randomly throughout the course. The thickness of each object is less than 2mm. Each type of objects worth different value.

8.7.1.2 Colour, size and shape of the objects

Colour, size and shape of the objects will be different for FirstSteps, U12 and U19 groups. Appendix C shows the details.

CHAPTER 3: ROBOT

9 Robot

9.1 VIRTUAL_ROBOT Configuration

9.1.1 The RCAP CoSpace Rescue Challenge uses a Standard Platform. The Virtual_ROBOT has the following configuration:

- 3 ultrasonic sensors
- 1 gyro sensor
- 2 RGB sensors
- 2 DC motors
- 1 LED for status indication

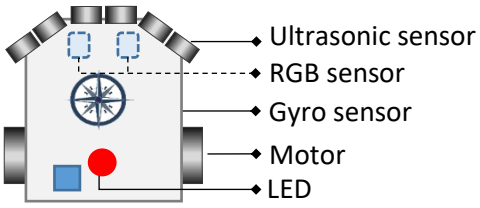


Figure 6: VIRTUAL_ROBOT configuration

9.2 ROBOT Control

9.2.1 VIRTUAL_ROBOT must be controlled autonomously. The use of a remote control, manual control, or passing information (by sensors, cables, wirelessly, etc.) to the robot is not allowed.

9.3 Lighting

9.3.1 The lighting condition for the virtual worlds could be varied. Teams must be able to perform calibration in order to complete the mission.

CHAPTER 4: GAMEPLAY, JUDGING AND AWARD

10 Competition content

10.1 Competition format

10.1.1 For RCAP CoSpace Rescue FirstSteps groups, students are only required code a virtual robot, and finally take part in the CoSpace Rescue Challenge. The game will last for 5 minutes and it will only take place in virtual world.

10.2 VIRTUAL_WORLD

10.2.1 In VIRTUAL_WORLD, VIRTUAL_ROBOT searches for 3 types of objects, RED, CYAN, BLACK objects. VIRTUAL_ROBOT has to collect the objects and deposit them in the collection box to receive points. It cannot collect more than 6 objects at any one time without depositing them in the collection box.

10.3 Competition Setup

10.3.1 A Team must be able to program the VIRTUAL_ROBOT.
10.3.2 Virtual robots must be controlled autonomously.
10.3.3 The use of a remote control to manually control virtual robot is not allowed.

11 Gameplay

11.1 Pre-setup

11.1.1 The layout of the VIRTUAL_WORLD will be released to teams prior to the tournament.

11.2 Pre-round Practice

11.2.1 Wherever necessary, the organizing committee will provide the teams with a timetable for entering the practice field for calibration.

11.3 Game Procedure

11.3.1 A referee is an official who receives and uploads teams' programs as well as runs the games.
11.3.2 The team captain is responsible for ensuring that the correct program is submitted to the designated referees on time. The team leader can submit two programs, one for the red robot and one for the blue robot.
11.3.3 At the end of each programming period
(a) The chief judge will announce the time for program submission in the competition hall.
(b) Each team must submit their first AI strategy which is created during the programming period (we'll call it AI_1) to the chief judge.

11.3.4 Start of Each Round of Game
(c) 5 minutes before each run, team captains must report to the referee at their respective game stations.
(d) The 1st run will use the AI_1 submitted at the end of the coding session. No re-submission of AI_1 is allowed.
(e) Starting from the 2nd run onwards, teams are allowed to submit a revised version of their AI to the referee if they wish to make a change to the previous AI. This has to be done 5 minutes before each run.
(f) The referee will continue to use the AI_1 or the previous version of AI if there is no submission of revised AI received 5 minutes before the run. The referee must confirm the correct AI to use with the team captain.
(g) No modification of AI is allowed once the run begins.

11.3.5 3 minutes after the scheduled game time
(a) If a team has not arrived at the game station 3 minutes after the scheduled game time, the team will forfeit the game. The opponent will gain 500 points and be declared as the winner. Kindly note that the scheduled game time might be delayed.

11.3.6 Pre-match Meeting

(a) Each team will be assigned a team colour (BLUE or RED). At the start of the game, the referee will toss a coin. The result determines the teams' colour.

11.3.7 Start of Play

- The referee will upload the programs to the CoSpace server, place the team's robot in the starting point in the virtual world and start the virtual game.
- It is the team captain's responsibility to ensure that the correct program is uploaded.
- Team captains must be present during the full length of the game.

11.4 Scoring

11.4.1 A team will be given 100 points at the beginning of each game.

11.4.2 Collecting objects

A team will gain points by collecting the objects.

To indicate that a robot has collected an object, it must stop and flash the LED for 3 seconds when any one of the color sensors has detected the object. The robot must move away from its stopping position autonomously at the end of 3 seconds.

Object Type	Points in Virtual World	
	Regular Zone	Special Zone
RED	10	20
CYAN	15	30
BLACK	20	40

(a) A virtual robot cannot collect more than 6 objects at any one time without unloading or depository them in the collection box.

(b) Objects in the virtual world will disappear after they are collected.

11.4.3 Depositing objects

When a robot deposits objects successfully, the points of the objects deposited will be doubled.

"Robot deposits objects successful" means:

- A robot must stop inside the collection box with the LED steady ON for 3 seconds to indicate the depositing process.

  A robot is only considered to be in the collection box when the colour sensor detects the collection box (the colour sensor is in the collection box).

- The robot must exit the collection box autonomously after deposition (the colour sensor is out of the collection box).

11.4.4 Bonus points

(a) For every ONE set of RED, CYAN and BLACK objects collected and deposited successfully (in one single trip to the collection box) in VIRTUAL_WORLD, 90 bonus points will be rewarded. There will be no SUPER objects generated in VIRTUAL_WORLD.

(b) For every TWO sets of RED, CYAN and BLACK objects collected and deposited successfully (in one single trip to the collection box) in VIRTUAL_WORLD, 180 bonus points will be rewarded. There will be no SUPER+ objects generated in VIRTUAL_WORLD.

11.4.5 Falling into a Trap

If a robot falls into a trap (refer to section 8.4), all objects that have been collected but not yet placed in the object collection box (refer to section 8.5) will disappear. Therefore, the points awarded for those objects collected will be deducted.

A virtual robot is considered to be in the trap if any one of the robot's color sensor has detected the trap.

11.4.6 Game Points

After each match, following GAME POINTS will be given accordingly.

Game	GAME POINTS
Win	3
Tie	1
Loss	0

11.5 Human Interference

11.5.1 Except for a lack of progress, human interference (e.g. re-locate a virtual robot to any reset point) during the game is not allowed unless permitted by the referee. A violation of the rules may be penalized by disqualification from the tournament, the round or may result in loss of points at the discretion of the referee, officials, organizing committee or general chairs.

11.5.2 In any case, only the team captain is allowed to communicate with the referee.

11.6 Relocation

11.6.1 In virtual game, the team captain can request to relocate the VIRTUAL_ROBOT to a different location for the following case:

(a) VIRTUAL_ROBOT is looping

(b) VIRTUAL_ROBOT is not performing well.

Upon team's request, the referee will call "RELOCATE" and relocate the VIRTUAL_ROBOT to a different location but close to where it was with different orientation. However, the robot will be frozen for 10 seconds after relocation. Each team can only call relocation up to 3 times in VIRTUAL_WORLD in each game. The referee will keep track of the number of relocations requested.

11.6.2 In virtual game, when a virtual robot is stuck for 10 seconds, the robot will be relocated to a different location but close to where it was with different orientation by the CoSpace server automatically. After relocation, the VIRTUAL_ROBOT will not be frozen for another 10 seconds. The relocation by CoSpace server will not be recorded as in section 11.6.1.

11.6.3 A team may decide to stop a round early if the lack of progress cannot be resolved within the first 4 minutes. In this case, the team captain must indicate to the referee the team's desire to terminate the game. The team will be awarded all points achieved.

11.7 Penalty

11.7.1 It is compulsory for teams to specify the team name in virtual games. Teams will be given a verbal warning if they failed to do so for the first time. The team will be disqualified for the current game if the team fails to add the team name for the second time in a virtual game.
11.7.2 Attacking Robot is defined as the robot has sensed another robot and hit it deliberately.
11.7.3 If a robot is hit/attacked by another robot, the attacking robot will be separated from the attacked robot and repositioned at the same location with different orientation (if there is collision) and be frozen for 10 seconds. There will be no point deduction.
11.7.4 If two robots bump into each other, both robots will be separated from each other and repositioned at the same location with different orientation (if there is collision). Both robots will be frozen for 10 seconds. There will be no point deduction.
11.7.5 The team needs to make an estimate of the situations caused by the robot being punished and prepare its own response plan.

11.8 Interruption of Game

11.8.1 In principle, a game will not be stopped during gameplay.
11.8.2 The referee can end a game when all objects have been collected by the robots.
11.8.3 The referee can pause a game when the game coordinator/referee needs to discuss an issue/problem with the OC/TC. The game will be called “time-out” in this case.
11.8.4 Teams are not allowed to quit a game 4 minutes after the game started.

11.9 Online Challenges

11.9.1 The organizing committee may need to adopt an online challenge mode in specific competitions. Guidelines will be given by the Technical Committee.
11.9.2 In the online challenge, Teams are only required to program the virtual robot in virtual world. Teams must submit code to the CoSpace online server at the end of coding session. Multiple submission is allowed but only the last submission will be used in the game.
11.9.3 It is the participant’s responsibility to ensure that the correct program is uploaded.
11.9.4 The official will download the program submitted, upload the programs onto the VIRTUAL_ROBOT on the referee station, place the VIRTUAL_ROBOT in the initial position in the starting point in the virtual world and start the virtual game.
11.9.5 The game could be a singles game or counteract game. The team should fully consider these factors.

12 Judging and Award

12.1 Technical Interview (Optional):

12.1.1 Judges are interested in determining students' understanding of the robotics AI and coding skills. Each team member must be prepared to answer questions about the technical aspects of their involvement in preparing the CoSpace Rescue Challenge. The duration is about 10 – 15 minutes. Teams may be asked to have second interview if judges consider it is necessary. Teams must show authenticity and originality with regards to the AI and code.
12.1.2 Teams may take the “interview key points” for reference while preparing their interview. Refer to Appendix D.

12.2 Friendship Tournament

12.2.1 A friendship tournament will be setup for teams that could not reach the quarter-finals. The minimum number of teams participating in the friendship tournament is 4.
12.2.2 Teams will draw lots to determine the team to play with. At the end of a match, the winning team must continue on to the next match. The losing team can modify the program and play again, or withdraw its participation. The challenge will be carried out during the specific

duration announced by the RCAP CoSpace Rescue Organizing Committee onsite. The last survivor will be the winner.

12.3 SuperTeam Challenge

12.3.1 At the RoboCup Asia Pacific Competition, teams may also take part in a SuperTeam Competition.

12.3.2 SuperTeams comprise of two or more participating teams. The SuperTeams are given a short period of time for collaboration at the competition venue. During this time, each SuperTeam must leverage on individual teams' strength and work together to create a new AI to solve a new task. SuperTeams are encouraged to express their friendship and cooperation and to demonstrate what they have learnt from each other.

12.3.3 The SuperTeam Challenge is a special program for the RCAP Finals and is not obligatory for regional events.

12.4 Winner

12.4.1 Round Robin

- The ranking of the Robbin is determined by the Game Points for each team.
- If two teams have the same game points, the winner of the meeting between the two will be winner.
- If the result of the two meeting teams is still tie, the team with the higher total scores in round robin will be the winner.

12.4.2 Quarter-Finals, Semi-finals and Final

- The winner of the quarter-finals, semi-finals and final will be decided solely based on the quarter- /semi- /final game result.
- If match tie, the team with the higher points in VIRTUAL_WORLD will be the winner.
- If the points in VIRTUAL_WORLD tie, the teams will move to go re-match.

12.4.3 Friendship Tournament

- The winner will be the last survivor of the Friendship Tournament.

12.4.4 SuperTeam Challenge

- The first place in SuperTeam Challenge will be the winner.

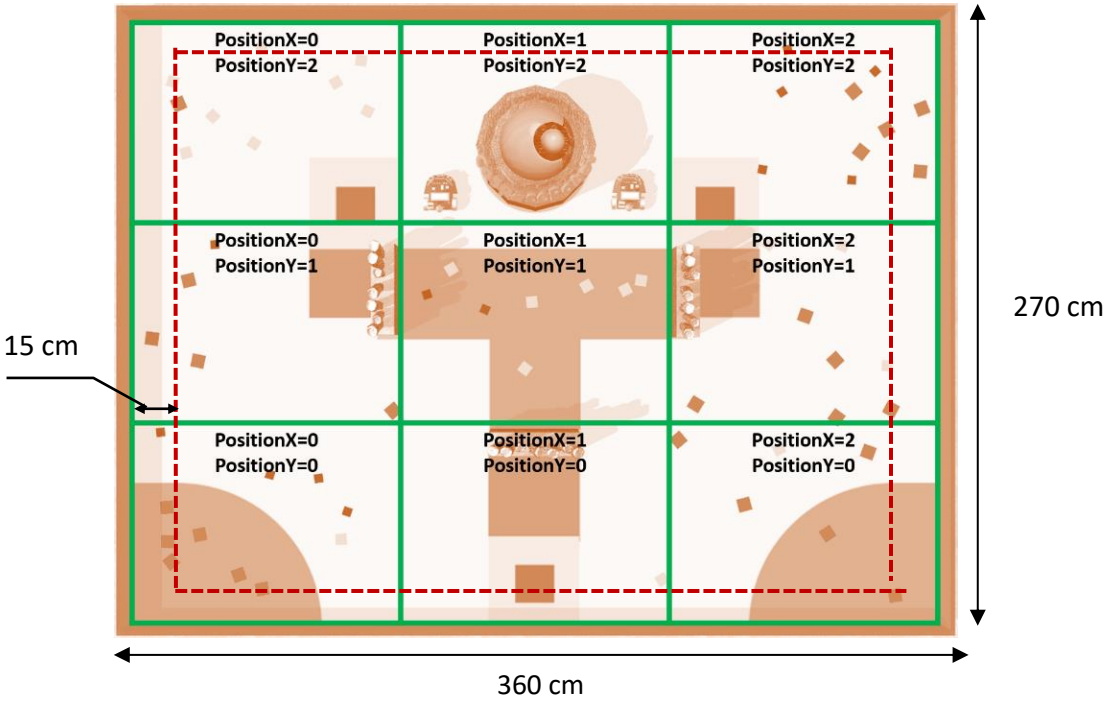
12.5 Awards

Depending on the number of teams entering the competition, there will be awards for trophies and certificates. The Organizing Committee can adjust the award type (trophy or certificate) if needed.

RCAP CoSpace Technical Committee
Contact us:
Rule clarification: cospace@robocupap.org
Technical support: support@CoSpaceRobot.org

13 APPENDIX A: Competition Setup

VIRTUAL_WORLD (FirstSteps Group)



14 APPENDIX B: Real Arena Suggested Building Instructions

Real Arena is only available in the U12 and U19 categories.

The inner dimensions of the real arena are 180cm x 240cm which is about the same as the RCJ soccer field. The following is the suggested instruction for building the real arena. These instructions are applicable only for the World Championship organizers.

(a) Cut a piece of 243 cm x 183 cm plywood or fiberboard (about 1.5cm thickness is adequate). The surface of the board may be either smooth or textured. You may also join a few small ones together. Please make sure the joint is smooth. It should not affect the real robot movement.

(b) Lay the board on the floor. The floor should be level.

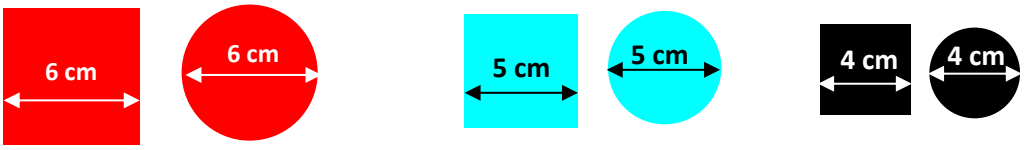
(c) Paint the surface to white colour.

(d) A simple frame should be added at the edge to prevent the robot from falling if the arena is not placed on floor.

15 APPENDIX C: List of Objects

U12 & FirstSteps Category

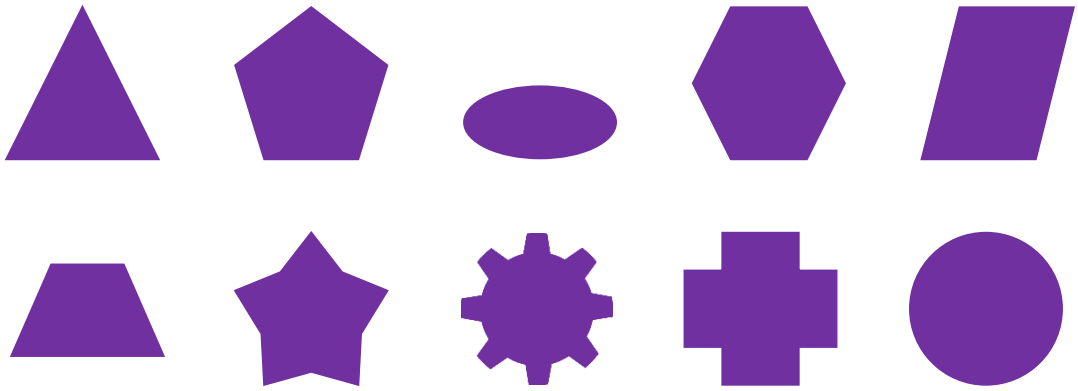
The colour, shape, and size of objects is fixed. They are square or round shape in general.



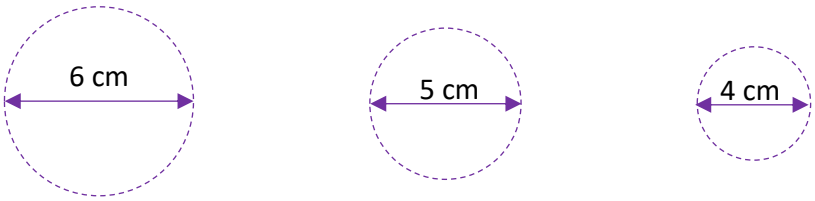
RED CYAN BLACK

U19 Category

- Shape: The shape of the objects will be any one of the following. There might be different shapes of objects in a map.



- Size: the inscribed circle for the 3 types object are:



- Colour: the colour of the objects will be in the RED/ CYAN categories or BLACK.

RED CYAN BLACK

16 APPENDIX D: Interview Key Points

For FirstSteps and U12 Categories

1. What was the strategy to solve certain task in your program? Was there any other way to do it? What was the advantage of your method over the others?
2. How would you modify your program if……? (e.g. collection box in a different location, swampland here, lots of black objects in the special zone)
3. Are you able to program a robot to complete a certain task?
4. What have you learnt through the CoSpace Rescue Challenge?
5. The explanation should be clear and logical.

For U19 Category

1. What kind of strategy / methodology / AI algorithm was used to program the search and rescue robot?
2. How did you use the above mentioned method to solve the problem? Please explain in details.
3. What was the major issue you need to consider during the implementation?
4. Can the algorithm be able to adapt to other search and rescue scenarios?
5. What was the most innovative idea in your program?
6. Have you considered other algorithms? If yes, why did you select the current method instead of others? What was your evaluation criteria?

17 APPENDIX E: MY FIRST ROBOCUP JOURNEY Template

- "My First RoboCup Journey" is only required for teams participating in the following leagues/sub-leagues:
    - RCAP Entry Leagues
        - RCAP Soccer Entry, Primary & Secondary
        - RCAP Rescue Line Entry, Primary & Secondary
        - RCAP Rescue Maze Entry, Primary & Secondary
        - RCAP CoSpace Autonomous Driving, FirstSteps U12
        - RCAP CoSpace Rescue, FirstSteps U12 & FirstSteps U19
- There is no page limit for document.
- All figures and tables should be properly numbered.
- Please submit this document as a PDF file.

ROBOCUP ASIA-PACIFIC 2023

MY FIRST ROBOCUP JOURNEY

(Cover Page)

League Name:	
Age Group:	
Team Name:	
Team Website:	
Team Members and Roles in Team	
Team Photo	
Mentor Name:	
Institution:	
Region:	
Contact Person:	
Contact Email:	
Date:	

ROBOCUP ASIA-PACIFIC 2023

MY FIRST ROBOCUP JOURNEY

League Name

Team Name

Student 1, Student 2, …

(Region)

1. About the Team

- Team background, including website and video link (if you have).
- How did you meet?
- Brief description of roles of each participant in the team and past experiences.

2. What inspired you to participate in RoboCup/RCAP?

- What sparked your interest in robotics?
- What do you hope to achieve by participating in RoboCup/RCAP?
- What are your goals for the competition?

3. Description of your league.

- What is your task?
- How did you make the hardware robot? Did you use Lego robot or other hardware robot? If yes, what is the name of the robot?
- What programming language did you use to complete the task? Logo programming? Python? Scratch, CoSpace or C?
- Can you complete the task and achieved your goal?
- Did you mentor/teacher helped you when you work on the robot and programming?

4. What challenges did you face?

- What were the biggest challenges you faced in the planning and development of your robot to complete the task?

5. How did you overcome these challenges?

- How did you work together as a team to overcome these challenges?
- What resources did you use to help you overcome these challenges?

6. What did you learn from participating in RoboCup/RCAP?

- What did you learn about robotics?
- What did you learn about teamwork?
- What did you learn about yourself?

7. List down your achievement in the past years

8. What are your plans for the future?

- What do you plan to do with the knowledge and skills you have gained from participating in RoboCup/RCAP?
- Do you plan to continue participating in RoboCup/RCAP?
- What other challenges do you want to tackle in the future?

9. Your reflection on your first journey to RoboCup.

- What was the most challenging part of the experience?
- What was the most rewarding part of the experience?
- What did you learn from the experience?
- What advice would you give to other teams who are thinking about participating in RoboCup/RCAP?

10. Acknowledgements

- This could be someone from a sponsoring institution, a funding agency, other researchers, or even family members or friends who have helped in the preparation.

11. References

- References to external sources used for major parts of the development process.