



NRC2023 CoSpace Coding Challenge

(CoSpace Rescue)

Newsletter #2

Dear Teams,

Welcome to the NRC 2023 CoSpace Coding Challenge! Please read the information regarding the CoSpace Rescue category provided below carefully.

1. Schedule

Date	Time	Activity
2 Sept 2023	08:30 – 12:00	Team Leader Meeting, Team Presentation, Super Team Draw Lots and Warm-Up
	12:00 – 13:00	Lunch
	13:00 – 13:30	Team Leader Meeting and Mission Release (Round 1)
	13:30 – 16:00	Programing
	16:00 – 17:30	Assessment
4 Sept 2023	08:30 – 09:00	Team Leader Meeting and Mission Release (Round 2)
	09:00 – 11:30	Programing
	11:30 – 12:30	Assessment
	12:30 – 13:30	Lunch
	13:30 – 14:00	Super Team Leader Meeting and Mission Release
	14:00 – 16:00	Programing
	16:00 – 17:30	Assessment

***Important note for teams using SSOE laptops, refer to Appendix A.**

2. Platforms

Please make sure that the correct version of the CoSpace Simulator is used, and it is activated.

NRC2023 CoSpace Coding Challenge (Rescue) Platform Download

Download link:	https://cospacerobot.org/phocadownload/2023_NRC_Coding_Rescue_Installer_V4.9.zip
Version:	V23.4.9.0

3. Competition

- **Individual Team Challenge**

We will play two rounds of Virtual Challenge. The score of two rounds will be combined to establish the ultimate ranking.

Before each round of the challenge, a team leader meeting will be held. During this meeting, today's coding challenge is introduced and USB drives containing the challenge materials are distributed.

During the programming phase, the team is required to complete five tasks (please give each project a separate name). Teams will present their challenge results using their own laptops. Once the programming period is end, teams should stop coding.

During the assessment phase, only the team leaders stay in the team area, others should leave the assessment area. The team leaders need to strictly follow the referee's instructions to play 5 tasks one by one on the **Team's own computer**.

The teams will have two rounds of matches in two days. Each round consists of 5 tasks, and each task allows for two attempts. After all attempts, if two teams achieve identical scores, the result of Task 5 in Round 2 will determine the final ranking. The runtimes of the other tasks in both rounds will not contribute to the final ranking.

Please carefully read Appendix B on how to create, program and build programs for 5 tasks.

- **CoSpace Super Team Challenge**

In SurperTeam Challenge, SuperTeams will work together. This is a good opportunity to learn from each other. Have fun!

Two to three teams will be formed into a super team. During the super team challenge, teams will receive a new map, all the members of this super team will collaborate on developing the AI strategy for **Task 5**. The ranking will depend on the total score of the robots. If two teams achieve the same score, the time taken to complete the tasks will be used to determine their ranking.

4. Challenge Map Release

- a) Every day, there will be a team leader meeting at 8:30 AM. Additionally, there will be a meeting on 2nd September at 1:00 PM and on 4th September at 1:30 PM. It's important for all teams to be punctual for these team leader meetings. Following the team leader meeting, the map designated for the current round of the competition will be released. The challenge map will be saved on thumb drives. Teams can collect the thumb drives from any referee and then copy the maps onto their own PCs.
- b) The thumb drive is used for file transfers during the competition. Once the competition map has been installed, teams are required to promptly return the thumb drive to a referee.

5. Tasks



Fig.1 Program in ASSESSMENTmode

- Teams will utilize the installation package within the thumb drive to complete the map installation. Subsequently, they will access the map by using the **ASSESSMENT** mode (Fig.1).
- The thumb drive will also contain the task description files. Please refer to **Appendix C** for more details.
- If you're uncertain about the actions the robot needs to perform in each task, don't hesitate to ask the referees for clarification. Remember, you should create 5 distinct projects for for these 5 tasks, meaning you'll need 5 different programs.
- For Super Team Challenge, teams only need to program Task 5.

Important Note

- Please indicate correct team name inf your program. **Your AI must show the Task ID and team's name on scoreboard in the format "TaskID_TeamName"**.
- It is the team captain's responsibility to ensure that the correct program is uploaded.
- The AI File (DLL file) must be named in the format:
TaskID_TeamName
For instance, if a team's name is "CSBot", the program for Task 1 should be "T1_CSBOT" and "T2_CSBot" for Task 2.
- Please carefully read Appendix B on how to create, program and build programs for 5 tasks.**

6. Challenge Rules Highlights

- At the end of the programming period, all teams must stop programing.
- You are AI program's file extension should be **"dll" or "py"**. **Your AI must show the Task ID and team's name on scoreboard in the format "TaskID_TeamName"**.
- Only Team Leader is allowed to talk to the referee during the assessment.
- Each task only has two attempts.
- Teams will present their challenge results using their own laptops.
- In special circumstances, rules may be modified by the NRC CoSpace Organizing Committee, even during a competition if necessary.

g) If any of the team leaders/members do not show up to the team meetings to discuss the problems and the resulting rule modifications described above, it will be considered as an endorsement.

Please note:

- **No mobile phone or earphones are allowed during the challenge.**
- **Keep your mobile phone in your bag, don't take it out during the programming session.**
- **No laptop is allowed to be taken out of the competition venue.**

Best of luck,

NRC CoSpace Challenge Organizing Committee


Appendix A: SSOE Laptops (For Singapore teams using SSOE laptops only)

1. Kindly note that there is **NO SSOE NETWORK in the competition hall**. If your teams are using SSOE PC, please login in school.
2. Please install and activate the relevant CoSpace Simulator in school. Test run is necessary to ensure the platform is working properly. There will not be TA in competition hall to solve any SSOE laptop related issues.
3. Please contact support@cospacerobot.org. if you need any assistance.

Appendix B: How to create, program and build programs for 5 tasks

- **Step 1:** Launch CoSpace Rescue Simulation and start with ASSESSMENT. As shown below, within the Control Panel, click on the AI button to open the AI Development Panel (AI Panel) and initiate programming.



- **Step 2:** In AI panel, click new project button  to create a new project. Enter same string for Team ID, Team Name and Project Name fields. The string's format is "Task ID_Team Name", where Task ID is T1 to T5 for 5 tasks, and Team Name is your team's name or its abbreviation (if the team name is longer than ten letters).


Create New Project

Create New Project

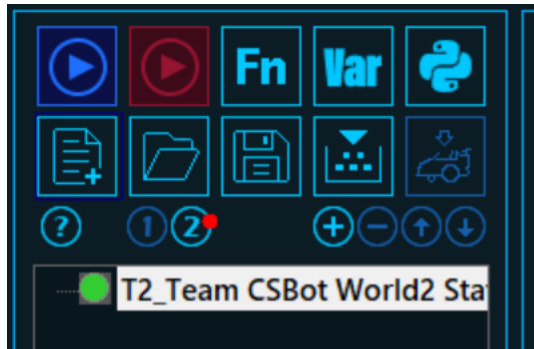
Team ID


Team Name

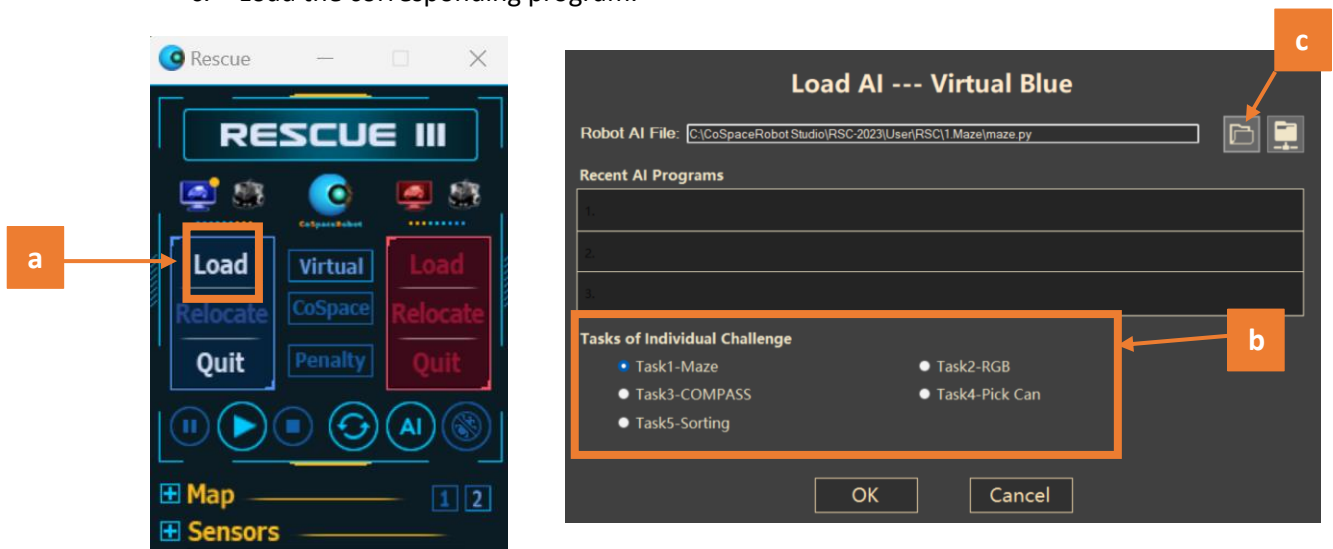
Project Name Create a directory for project

Root Directory 






- **Step 3:** As shown below, check the name in AI Panel to make sure Task 1 is the current task and the AI project is for Task 1.



- **Step 4:** When you finish Task 1, press the build  button and quit AI Panel to return Control Panel.
- **Step 5:** Load the program for Task 1 and proceed with testing.
 - a. Click the Load button.
 - b. Select target Task from the list.
 - c. Load the corresponding program.

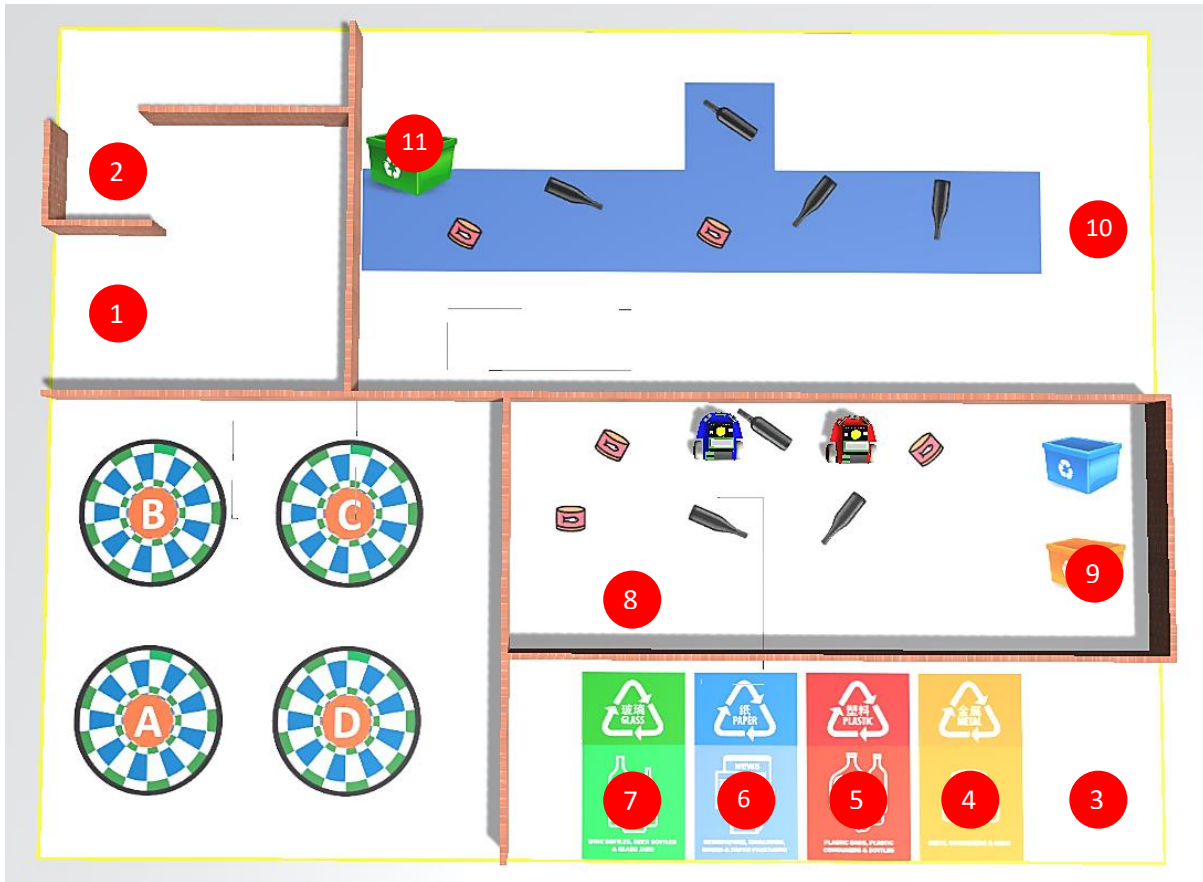


- **Step 6:** When you're ready to design for other tasks, you can repeat steps 1 to 3 to create a new project for each of them.
- **Step 7:** At the end of programming period, five projects should be created for five tasks as shown below.

 T1_Team CSBot	8/17/2023 9:34 AM	
 T2_Team CSBot	8/17/2023 10:24 AM	
 T3_Team CSBot	8/17/2023 10:34 AM	
 T4_Team CSBot	8/17/2023 10:34 AM	
 T5_Team CSBot	8/17/2023 10:34 AM	

Appendix C: Task Description

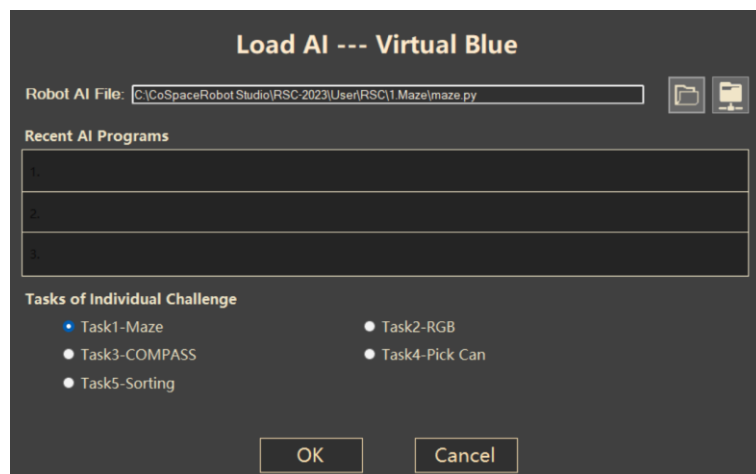
1. Challenge Field



2. Tasks

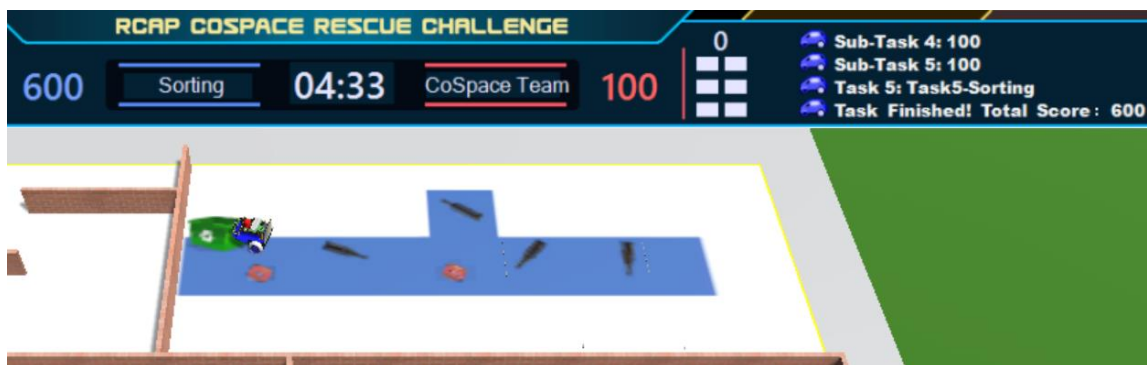
Please complete 5 tasks listed below. In each task, you are required to program your robot to pass or stop at all waypoints. At each waypoint, the robot needs take the action as stated in the table below. or every subtask completed, the robot will earn 100 points.

When the participants load the program, the robot will be automatically placed at the starting position of each task.



S/N	Tasks	Route and Actions	
		Waypoint	Action
1	Task 1	2	At the beginning of the task, the robot will depart from point 1 and needs to reach point 2.
2	Task 2	4	At the beginning of the task, the robot will depart from point 3. Pass with both wheel speed of "+10" and flash LED.
		5	Pass with both wheel speed of "+20" and LED "ON".
		6	Pass with both wheel speed of "+30" and flash LED.
		7	Stop with LED "FLASH" for 3 seconds
3	Task 3	B	At the beginning of the task, the robot will depart from point A.
		C	Pass the waypoint and flash LED.
		D	Stop with LED "FLASH" for 3 seconds
4	Task 4	8	At the beginning of the task, the robot will depart from point 8.
		Metal Can	Pass by each metal can (pink) on the map at a speed of 10 and flash the LED.
		9	Stop with LED "FLASH" for 3 seconds
5	Task 5	10	At the beginning of the task, the robot will depart from point 10.
		Glass bottle	Pass by each metal can (pink) on the map at a speed of 10 and flash the LED.
		11	Stop with LED "FLASH" for 3 seconds

3. Testing



You can try loading and compiling the [SMP file](#) into task 5 for testing. After the robot completes the specified actions, you will be able to see changes in scores on the scoreboard.