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**ROBOCLASH 2025**

**亚太区 STEM\_AI 科技创新挑战赛**

**城市小英雄（新加坡站）**

**Asia-Pacific STEM\_AI Robotics Challenge**

**Rescue Rally (Singapore Edition)**

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“城市救援”计划——竞技挑战赛赛事章程 V1.5

Urban Rescue Challenge Rulebook V1.5

## 变更记录

版本号	修改项	日期
V1.0	规则正式输出	2024/11/7
V1.1	增加标签图示	2024/11/13
V1.2	内容校对，增加细节	2025/2/7
V1.3	内容矫正	2025/2/14
V1.4	删除警告判罚机制，修改 2.2	2025/3/3
V1.5	修改比赛时长，修改 2.2 和 6.5	2025/3/12

## Change Log

Version Number	Modifications	Data
V1.0	Formal Output of Rules	2024/11/7
V1.1	Added Tag Diagrams	2024/11/13
V1.2	Proofread the content to add details	2025/2/7
V1.3	Corrective content	2025/2/14
V1.4	Warning penalties removed; Updated Section 2.2	2025/3/3
V1.5	Modified match duration; Updated Section 2.2 and 6.5	2025/3/12

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## 1 赛事简介

随着全球气候变暖趋势加剧，自然灾害频发。洪灾作为最具破坏力的自然灾害之一，对人类居住环境、物资供应体系及生命安全构成了严重威胁。为了提升社会各界对洪水危害的重视程度，增强救援队伍的专业技能与团队协作能力，特举办「城市救援」计划——竞技挑战赛。

本赛事通过模拟真实城市的洪灾场景，并融入人工智能技术的应用，为学生选手提供了一个全面锻炼和提升的平台，参赛选手需迅速响应并实施救援计划，确保受困民众的安全救援与灾后物资供应，展现人类在面对自然灾害时的团结与智慧。赛事旨在通过人工智能技术与跨学科知识融合，培养学生解决实际问题的能力、应急响应、团队协作、创新思维、社会责任感及专业技能应用，为他们未来面对各种挑战打下坚实的基础。

## 1 Competition Overview

As global climate change accelerates, natural disasters are occurring with increasing frequency. Among these, flooding stands out as one of the most destructive, posing significant threats to human environments, supply chains, and safety. Roboclash 2025: Rescue Rally aims to raise awareness on the dangers of flooding while equipping youths with skills in STEM and Artificial Intelligence.

Situated in a flood-struck city, Roboclash: Rescue Rally, will see teams race against the clock to clear debris and evacuate citizens. Beware, for the terrain is unforgiving and the challenges daunting. Only teams equipped with exceptional technical expertise, innovative solutions, and outstanding teamwork will have the strength to overcome these challenges.

Roboclash: Rescue Rally provides youths with an opportunity to explore the field of



artificial intelligence, focusing on its practical applications in robotics. Through this platform, participants can enhance their problem-solving abilities, teamwork, creative thinking, and social responsibility. These 21st-century competencies are essential for equipping students with the skills needed to tackle complex real-world challenges in the future.

## 2 参赛要求

### 2 Participation Requirements

#### 2.1 参赛人员要求

每支参赛队伍由至少 2 名至多 6 名队员和 1 名指导老师组成。小学组参赛队员须在赛事报名时为小学在读学生，中学组参赛队员须在赛事报名时为中学在读学生。不允许小学组与中学组跨组别组队。

#### 2.1 Participant Requirements

Each team must comprise between 2 to 6 members, accompanied by an instructor or mentor. Participants are required to be enrolled in an institution corresponding to their competition category (e.g., participants in the middle school category must currently be enrolled in a middle school). Mixed-category teams are not permitted.

#### 2.2 参赛器材要求

每支参赛队伍须设计 2 台轮式可编程机械人（运输车与机械车），每支队伍至多可配备 1 套备用机械人（1 台运输车和 1 台机械车），所有机械人（含电池）以及其他可能需要的调试设备由参赛选手自带。

参赛队伍自主设计参赛机械人，机械人的执行器、传感器（电机、LED 灯、舵机等）均只能由开发板供电，电池供电电压限额 8.5V，每个机械人至多可使用 5 个舵机和 6 个电机，机械人尺寸限制见表 2.2。禁止在机械人上安装手电筒、激光灯等干扰比赛进行的装置。

参赛队伍可使用程序设计平台 CocoBlockly Pi 设计机械人程序，机械车可使用蓝牙手柄进行控制，运输车为自动运行不能使用任何控制器操控。

## 2.2 Equipment Requirements

Each participating team must design 2 wheeled programmable robots (a transport vehicle and a mechanical vehicle). Each team may have 1 set of backup robots (1 transport vehicle and 1 mechanical vehicle).

Teams may design their competition robots. The actuators and sensors of the robots (such as motors, LED lights, servos, etc.) must be powered exclusively by the development board, with a battery voltage limit of 8.5V. Each robot may use up to 5 servo and 6 DC motors. The size limitations for the robots are specified in Table 2.2. Teams are not allowed to install flashlights, laser lights, or any devices that may disrupt the competition on their robots.

Teams may use the CocoBlockly Pi programming platform to program the robot. The mechanical vehicle can be teleoperated via a Bluetooth controller. The transport vehicle must be fully autonomous.

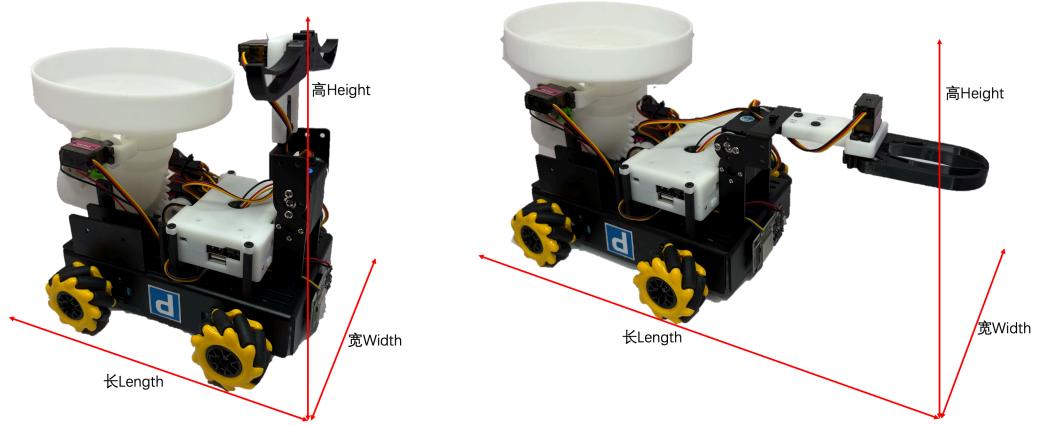


图 2.2 机械人尺寸示意图（左为最小收缩状态，右为最大展开状态）

Figure 2.2 Robot Size Diagram (Left: Unextended State, Right: Maximum Extended State)

机械人种类	形态	长度限制	宽度限制	高度限制
运输车	最小收缩状态	300	200	130
运输车	最大展开状态	300	200	160
机械车	最小收缩状态	220	200	250
机械车	最大展开状态	400	300	300

表 2.2 机器人尺寸限制（单位毫米）

Types of Robots	State	Length Limitation	Width Limitation	Height Limitation
Transport Vehicle	Unextended Size	300	200	130
Transport Vehicle	Maximum Extended Size	300	200	160
Mechanical Vehicle	Unextended Size	220	200	250



Mechanical Vehicle	Maximum Extended Size	400	300	300
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Table 2.2 Robot Size Limitations (Unit: Millimeters)

### 3 比赛场地

比赛地图尺寸为 2500mm\*3000mm。场地内有双方机械人出发区、物资补给站、被困人员救助站、障碍清理区、障碍坡道、排水道、物资补给总站、A 级浸水区和双方共有的一个 B 级浸水区，物资补给总站有物资，浸水区内有洪水和被困人员。中学组的比赛场地内还有障碍块，详见 3.2.4。场地概览如图 3.1 所示。

### 3 Playfield

Roboclash: Rescue Rally is played on a 2500mm by 3000mm field. The field contains team starting zones, supply stations, rescue stations, obstacle clearing zones, obstacle ramps, drainage channels, supply station terminals, and flood zones A and B. The Middle School Category contains additional obstacles which can be found in section 3.2.4.

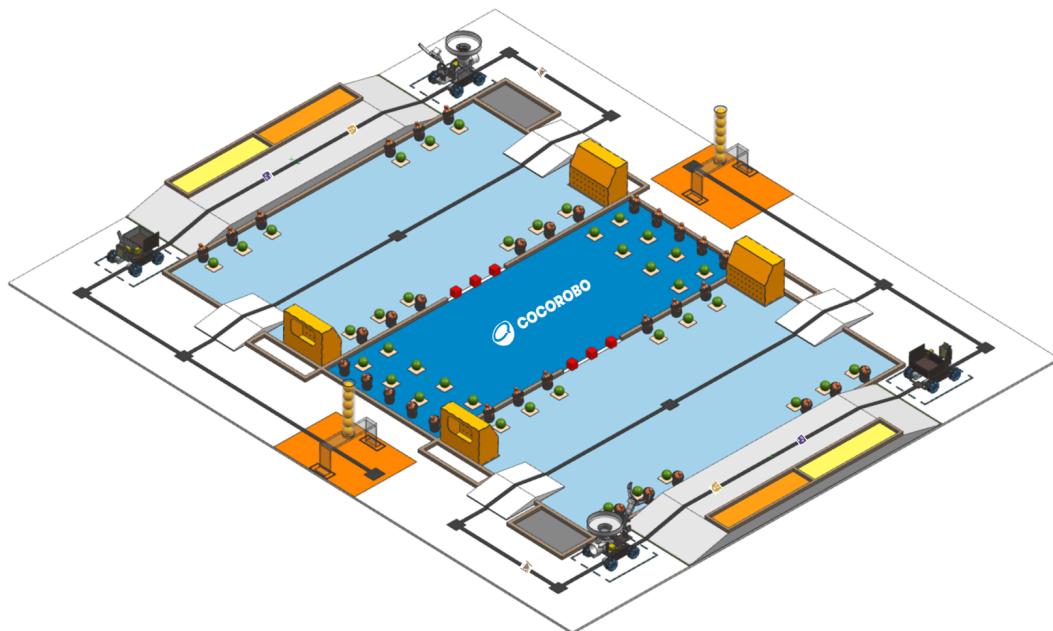


图 3 场地概览

Figure 3. Playfield Layout

### 3.1 场地区域

#### 3.1 Arena Zones

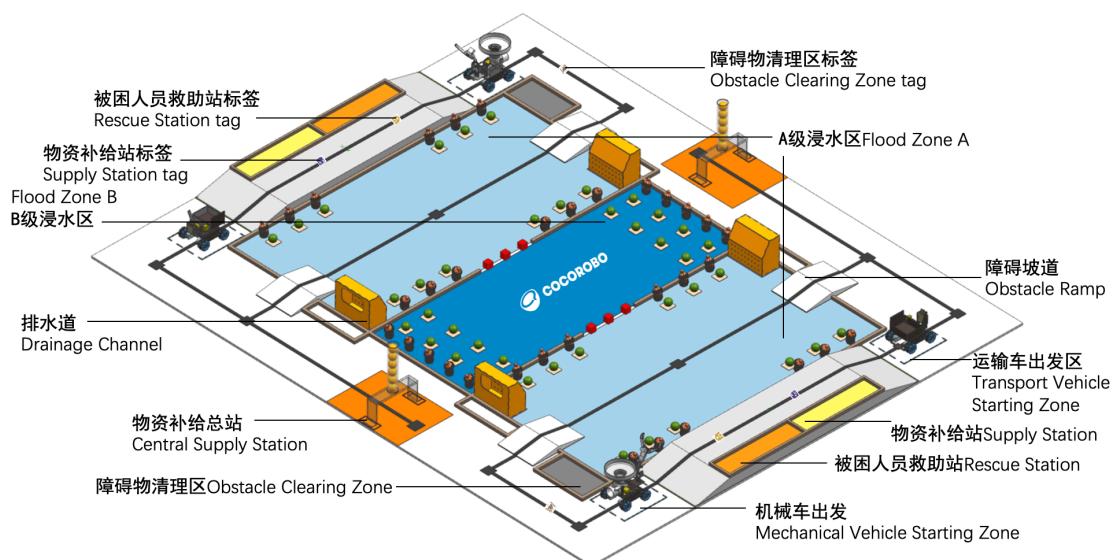


图 3.1 场地区域示意图



Figure 3.1 Different Zones on the Playfield

### 3.1.1 出发区

双方场地出发区靠近场地角落，尺寸为 250mm\*200mm，运输车的起始点位于近物资补给区一侧，机械车的起始点位于近被困人员救助站一侧。任务开始前，机械人垂直投影不得超过出发区，机械人须从对应出发区出发开始执行任务。

参赛选手可在出发区放置标签卡片，运输车识别标签切换运动程序。

### 3.1.1 Starting Zone

A 250mm by 200mm dotted rectangular zone located at the corner of the field. Each team has 2 starting zones. Transport Vehicles start on the side of the Supply Station whilst Mechanical Vehicles start on the side of the Rescue Station. All robots must be fully within the boundaries of the starting zone at the start of a match.

Participants may place identification tags in the starting zones, which the transport vehicle can recognise to switch its movement program.

### 3.1.2 物资补给站

双方场地的物资补给站位于双方两个出发区间靠场地外的一侧，与被困人员救助站相邻，运输车可在上坡后将物资运送至补给站完成任务（详见 4.1），区域旁边有对应图案标签供运输车识别使用（图案标签见表 3.1.2）。

### 3.1.2 Supply Station

Teams may ascend the ramp of the supply station to deliver supplies, as detailed in Section 4.1. Beside the supply station is the pattern tag seen in Figure 3.1.2, available

for recognition and use by the transport vehicle.

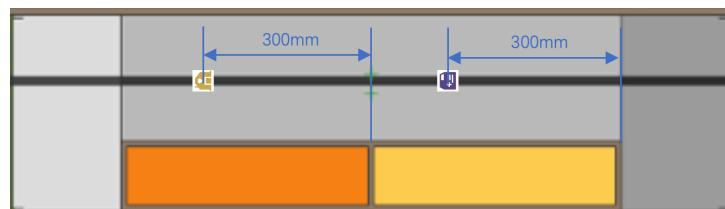


图 3.1.2 物资补给站与被困人员救助站标签位置

Figure 3.1.2 Supply Station and Rescue Station Tag Locations

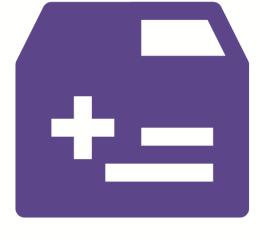
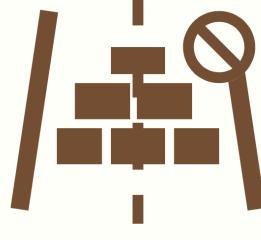
图案 Pattern			
尺寸 Size	50*50mm	50*50mm	50*50mm
位置 Location	物资补给站旁 Beside supply station	被困人员救助站旁 Beside rescue station	障碍物清理区旁 Beside Obstacle Clearing Zone

Table 3.1.2 Pattern Tag Details

### 3.1.3 被困人员救助站

双方场地的被困人员救助站位于双方两个出发区间靠场地外的一侧，与物资补给站相邻，机械人可在上坡后将被困人员运送至救助站完成任务（详见 4.3），救助站旁边有对应图案标签供运输车识别使用（图案标签见表 3.1.2）。

### 3.1.3 Rescue Station

Teams may transport stranded civilians by ascending the ramp to access the Rescue Station, as detailed in Section 4.3. Beside the rescue station is the pattern tag seen in

Figure 3.1.2, available for recognition and use by the transport vehicle.

### 3.1.4 障碍物清理区

障碍物清理区位于机械车出发区附近，运输车可将障碍物运送至清理区完成任务（详见 4.4），清理区旁边有对应图案标签供运输车识别使用（图案标签见表 3.1.2）。

### 3.1.4 Obstacle Clearing Zone

Teams may use their transport vehicles to transport obstacles to their designated clearing zones, as detailed in Section 4.4. Beside the obstacle clearing zone is the pattern tag seen in Figure 3.1.2, available for recognition and use by the transport vehicle.

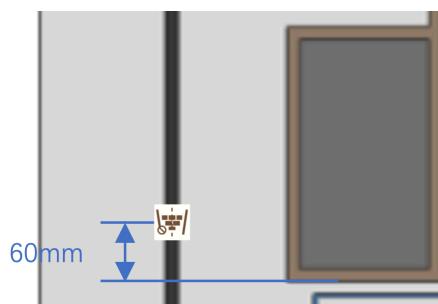


图 3.1.4 障碍物清理区标签位置示意

Figure 3.1.4 Obstacle Clearing Zone Tag Location

### 3.1.5 障碍坡道

双方场地的 A 级浸水区两侧有障碍坡道，障碍坡道是双方机械人进入 A 级浸水区的唯一路径。

### 3.1.5 Obstacle Ramp

Teams may only enter Flood Zone A through the Obstacle Ramps on either side of the zone.

### 3.1.6 排水道

排水道位于双方场地 A 级浸水区两侧的障碍坡道旁，排水道仅有一侧开孔，机械车可将浸水排入排水道完成任务（详见 4.2）。

### 3.1.6 Drainage Channel

Teams may locate the Drainage Channel beside the obstacle ramps on both sides of Flood Zone A. The channel features an opening on one side only, allowing the mechanical vehicle to drain floodwater into it to complete the task, as detailed in Section 4.2.



图 3.1.6 排水道示意图

Figure 3.1.6 Drainage Channel Diagram

### 3.1.7 物资补给总站

双方物资补给总站位于 B 级浸水区两侧外，靠近己方运输车出发区的物资补给总站为本方的物资补给总站。运输车可通过拨动补给站下方机关使物资掉落。

### 3.1.7 Central Supply Station

Teams may use their transport vehicle to interact with the Central Supply Station Mechanism to drop supplies.

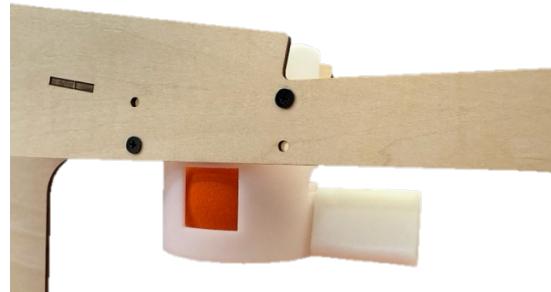


图 3.1.7 物资补给总站机关示意图

Figure 3.1.7: The Central Supply Station

### 3.1.8 A 级浸水区

A 级浸水区是双方场地中心区域，浸水区内有多个受困人员、洪水等道具。运输车仅可在 A 级浸水区中全部洪水离开该区域后进入（违规详见 6.2.5）。

### 3.1.8 Flood Zone A

Flood Zone A contains multiple stranded civilians, floodwater, and other game objects. Transport vehicles may only enter Flood Zone A after all the floodwater has been removed from the area. Teams should avoid the violations as detailed in Section 6.2.5.

### 3.1.9 B 级浸水區

比赛场地最中心区域为 B 级浸水区，浸水区内有多个受困人员与洪水。A 级浸水区没有洪水后机械车才可进入该区域，运输车不可进入该区域（违规详见 6.2.5）。

### 3.1.9 Flood Zone B

Flood Zone B contains multiple stranded civilians and flood water game objects. Mechanical Vehicles may only enter this area after all floodwater game objects have been cleared from Flood Zone A. Transport Vehicles are not allowed to enter Flood

Zone B. More violations are detailed in Section 6.2.5

### 3.2 场地道具

#### 3.2 Game Objects

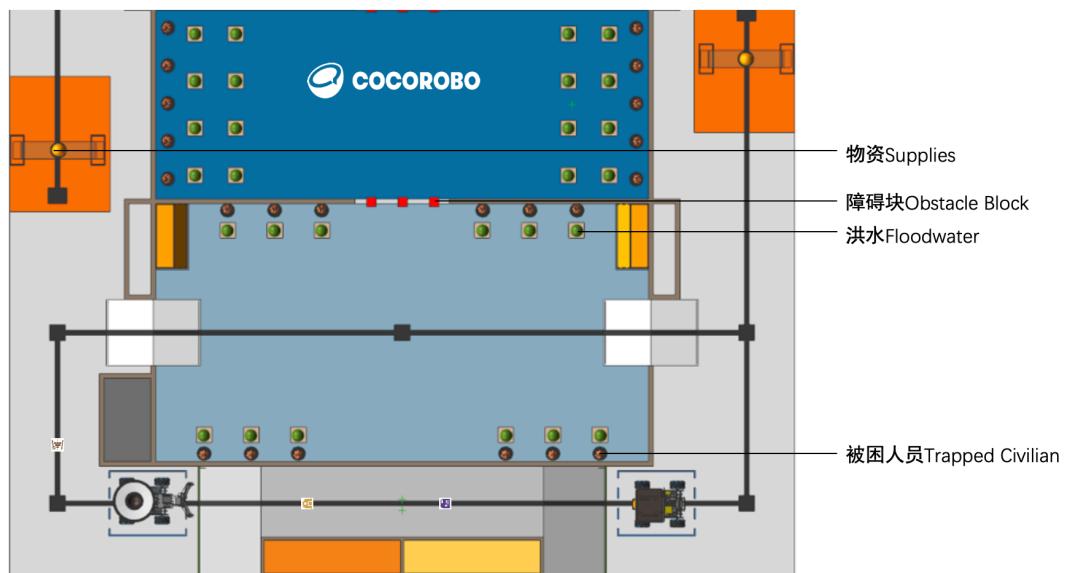


图 3.2 场地道具位置示意图

Figure 3.2 Location of Game Objects

##### 3.2.1 物资

物资为直径 40mm 橙色小球，比赛开始前物资放置在物资补给总站，运输车可到物资补给总站获取。双方物资补给总站会无限提供物资，1 个物资可供 1 名人员使用，物资与被救人员数量匹配可获得额外加分（详见 5.1）。

##### 3.2.1 Supplies

Supplies are orange balls with a diameter of 40mm. Before the start of each match, supplies are placed at the Central Supply Station. Only transport vehicles may collect



supplies from the Central Supply Station. Each Central Supply Station will provide an unlimited number of supplies. Supplies can be paired with rescued civilians for bonus points, as detailed in section 5.1.

### 3.2.2 洪水

洪水为直径 40mm 绿色小球，位于 A 级和 B 级浸水区指定位置，双方 A 级浸水区内各有 12 处洪水，B 级浸水区内有 16 处洪水。

### 3.2.2 Floodwater

Floodwater is represented by green balls with a diameter of 40mm, located at their designated positions within Flood Zones A and B. Flood Zones A and B each contain 12 and 16 floodwater game objects respectively.

### 3.2.3 被困人员

被困人员为小公仔，在 A 级浸水区中位于每 1 处洪水后方，在 B 级浸水区中的两侧各有 5 位被困人员。被困人员需要所在浸水区内没有洪水才能被救援（违规详见 6.2.6）。

### 3.2.3 Trapped Civilians

In Flood Zone A, trapped civilians are located behind each floodwater game object. In Flood Zone B, 5 trapped civilians are located on each side of the zone. Trapped Civilians may only be rescued after all floodwater game objects are cleared from their respective zones. Teams should avoid the violations as detailed in Section 6.2.6.

### 3.2.4 障碍块（中学组）

障碍块为边长为 40mm 的红色方块，场地中共有 6 个障碍块，分别位于双方 A 级浸水区与



B 级浸水区交界处。己方 A 级浸水区中的洪水全被排走后才可搬运障碍块(违规详见 6.2.6) ,  
障碍块须被搬运走后机械人才可进入 B 级浸水区 (违规详见 6.2.5)。

小学组没有障碍块。

### 3.2.4 Obstacle Blocks (For Middle School Category)

Obstacle blocks are represented by red cubes with a side length of 40mm. There are a total of 6 obstacle blocks located on the sides of Flood Zones A and B. The obstacle blocks may only be moved after all floodwater game objects in Flood Zone A are drained (violations are detailed in section 6.2.6). All obstacle blocks must be cleared before the mechanical vehicle can enter Flood Zone B (violations are detailed in section 6.2.5).

This section is not applicable for the elementary school category.

## 4 比赛任务

比赛时长为 7 分钟，双方队伍须使用机械人完成收集物资、浸水区排水、救援被困人员，中学组还可执行搬运障碍块任务。

## 4 Competition Tasks

Teams play a series of 7-minute matches. Both teams are required to use robots to complete the tasks of collecting supplies, draining the flooded zones, and rescuing trapped civilians. Middle school teams may also perform the additional task of moving obstacle blocks from the Flood Zones.



## 4.1 收集物资

运输车须自动运行到物资补给总站，通过撞击特定结构的方式使物资掉落到运输车运输结构。运输车获取物资后须将物资运送至物资补给站，运输车单次最多装载 3 个物资（违规详见 6.4.2）。

完成运送 1 个物资至物资补给站获得 5 分，物资与被救援的被困人员数量匹配的部分可额外加分（详见 5.1）。

## 4.1 Collecting Supplies

Transport vehicles may autonomously move to the Supply Depot and trigger the release of supplies. After obtaining the supplies, transport vehicles may deliver them to the Supply Station. The transport vehicle may carry up to 3 supplies at a time. Teams are advised to avoid the violations detailed in Section 6.4.2.

Each supply delivered to the Supply Station earns 5 points, and additional points may be awarded for matching the number of supplies with the number of rescued civilians (Refer to section 5.1 for details).

## 4.2 浸水区排水

机械车可到己方 A 级浸水区和 B 级浸水区进行排水任务。机械车可使用特殊装置控制洪水（夹起小球），并使用一定装置将洪水排进己方排水道。成功将 1 处洪水排进排水道为完成 1 次排水。

完成 1 次排水获得 5 分。

## 4.2 Draining Flooded Zones

Teams may drain floodwater from their own Flood Zones A and B. Teams may decide to use a separate mechanism for the collection of floodwater game objects and the depositing of floodwater objects into the drainage channel.

Teams may earn 5 points for removing one floodwater game object.

## 4.3 救援被困人员（被困人员救助站）

机械车与运输车合作救援被困人员。机械车在完成浸水区排水后可救援被困人员，并放到运输车上。运输车可以通过识别机械车身上的特定标签的形式控制自身的运行，并且须自动识别到被困人员救助站标签（标签见表 3.1.2）将被困人员运送至被困人员救助站。不允许机械车直接将被困人员放至被困人员救助站（违规详见 6.2.6）。

完成救援并运送 1 个被困人员至被困人员救助站获得 5 分，物资与被救援的被困人员数量匹配的部分可额外加分（详见 5.1）。

## 4.3 Rescuing Trapped Civilians (Rescue Station)

The mechanical vehicles and transport vehicles must work together to rescue trapped civilians. After draining the flooded zones, the mechanical vehicles are responsible for rescuing the trapped civilians and bringing them to the transport vehicles. The transport vehicle may recognise specific tags on the mechanical vehicle and control its own operation. It must recognise the tags as described in Section 3.1.2 and autonomously transport the rescued civilians to the rescue station. The mechanical vehicles are not allowed to bring the rescued civilians straight to the rescue station.



Teams are awarded 5 points for each trapped civilian successfully delivered to the rescue station. Bonus points may be awarded depending on both the number of supplies delivered and civilians rescued (Details given in section 5.1).

#### 4.4 搬运障碍块（中学组）

中学组参赛队伍可执行搬运障碍块任务。己方 A 级浸水区中的洪水全被排走后机械车可搬起障碍块放到运输车上，运输车须自动运行将障碍块运送至障碍物清理区。不允许机械车直接将障碍块搬运至障碍物清理区（违规详见 6.2.6）。

完成搬起并运送 1 个障碍块至障碍物清理区获得 5 分。

#### 4.4 Clearing Obstacle Blocks (For Middle School Category)

The Middle School teams are assigned an additional task of moving obstacle blocks. Once flooded zone A is drained, the mechanical robot can pick up the obstacle blocks and bring them to the transport vehicle. The transport vehicles, using pattern tag recognition as described in Section 3.1.2, must autonomously navigate to the obstacle clearing zone by identifying the tags and transport the obstacle block to the obstacle clearing zone. The mechanical vehicles are not allowed to carry the obstacle blocks straight to the rescue station. Teams are advised to avoid the violations detailed in Section 6.2.6.

Teams are awarded 5 points for each obstacle block successfully shifted to the obstacle clearing zone

## 5 优胜评判

### 5 Victory Criteria

#### 5.1 得分标准

单场得分=任务得分+额外加分；

任务得分：

任务	运输一个物资	完成一次排水	救援一个被困人员	搬运一个障碍快 (中学组)
得分	5 分	5 分	5 分	5 分

表 5.1 任务得分汇总

额外加分：

- ◆ 若运送物资数量 > 救援被困人员数量，则额外加分 = 救援被困人员数量\*10；
- ◆ 若运送物资数量 <= 救援被困人员数量，则额外加分 = 运送物资数量\*10。

例：小学组队伍 A 运送物资数量为 7，排水次数为 12，救援被困人员数量为 5，则该队伍的得分如下：

任务得分=5\*7+5\*12+5\*5=120 分；

额外加分=5\*10=50 分；

单场得分=120+50=170 分。

#### 5.1 Scoring Criteria

The total score for a match = Task Score + Bonus Score;

### Scoring Tasks:

Task	Collected One Supply	Removed One Floodwater Game Object	Rescued One Trapped Civilian	Moved One Obstacle (For Middle School Category)
Score	5 points	5 points	5 points	5 points

Table 5.1 Summary of task scores

### Bonus Points Awarded:

- ◆ If the number of supplies collected > number of trapped civilian rescued, Bonus Points = (Number of Trapped Civilian Rescued \* 10)
- ◆ If the number of supplies collected <= number of trapped civilian rescued, Bonus Points = (Number of Supplies Collected \* 10)

### Example:

For an elementary school team A with 7 supplies collected, 12 floodwater game objects removed, and 5 trapped civilians rescued, the score would be:

$$\text{Task Score} = (5 * 7) + (5 * 12) + (5 * 5) = 120 \text{ points}$$

$$\text{Bonus Points} = 5 * 10 = 50 \text{ points}$$

$$\text{Total Score} = 120 + 50 = 170 \text{ points.}$$

## 5.2 获胜

比赛时间结束，单场分高的一方获胜。若单场得分相同则任务得分高的一方获胜。

## 5.2 Winning Condition

At the end of the match, the team with the higher score wins. If the scores are tied, the team with the higher task score wins.

## 6 判罚补充

# 6 Additional Details on Penalties

## 6.1 维修/重置

### 6.1 Repairing/Resetting

#### 6.1.1 机器人维修

每支参赛队伍每场比赛有 5 次维修机会，参赛队员可向旁边裁判口头发起维修请求“申请维修运输车”或“申请维修机械车”，当裁判回答同意后，参赛队员须将机器人拿出场外进行维修调适后从对应出发区再次出发。维修时不允许将道具带出场地，裁判会将申请维修的机器人上的道具拿走并恢复到场地上。

#### 6.1.1 Robot Repair

Each participating team is permitted up to five repair opportunities per match. To request a repair, team members must verbally notify the nearby referee, stating that they wish to repair their transport or mechanical vehicle. The team may only remove the robot from the field for repairs once the referee has granted their approval. After repairs are completed, the robot must be returned to the designated starting zone for re-entry. During the repair process, no scoring objects may be removed from the field. The referee will handle any scoring objects on the robot, returning them to their original positions on the field.

## 6.1.2 机器人重置

每支参赛队伍每场比赛有可以无限次重置机器人，参赛队员可向旁边裁判口头发起重置请求“申请重置运输车”或“申请重置机械车”，当裁判回答同意后，参赛队员须将机器人拿到对应出发区再次出发。重置期间禁止将机器人拿出场外维修（违规详见 6.2.6）。

### 6.1.2 Robot Reset

Each participating team is permitted an unlimited number of robot resets per match. To request a reset, team members must verbally inform the referee of their request. Upon the verbal approval of the referee, the team must return the robot to the designated starting zone for re-entry into the field. During the reset process, robots are not allowed to be removed from the field for repairs as outlined in section 6.2.6.

## 6.2 违规情形

### 6.2 Rule Violations

#### 6.2.1 触碰对方已完成任务道具

禁止触碰对方已完成任务道具，如已运输到物资补给站的物资、已救援至被困人员救助站的人员、已运送到障碍物清理区的障碍块和已排至排水道的洪水。若触碰到上述对方道具，则在裁判确认违规后本方队员须将违规机器人拿回对应出发点，并且机器人须在出发区停止 15s，期间裁判会恢复触碰的道具和机器人上的道具。

#### 6.2.1 Contacting The Opposing Team’s Scoring Objects

Teams should not contact the scoring objects of the opposing team. These include supplies transported to the Supply Station, trapped civilians brought to the Rescue



Station, obstacles moved to the Obstacle Clearing Zone, and floodwaters drained into the Drainage Channel. The referee will call for a violation if any of the above items are touched by the opposing team. After the calling of the violation, the offending team's robot must be brought back to the designated starting zone, and kept stationary for 15 seconds. During this time, the referee will restore the touched scoring objects and any other scoring objects held by the offending robot to their original position.

### 6.2.2 破坏道具

比赛过程中禁止破坏场地道具。若机械人通过撞击等形式导致场地道具等结构被破坏，裁判确认违规后违规一方须将违规机械人拿回对应出发点，并且机械人须在出发点停止 15s，裁判确认不可继续本场比赛则违规一方本场比赛得分为 0 分。

### 6.2.2 Destroying The Field

Teams should not destroy the field during the match. If a robot causes damage to the field through impact or similar actions, the referee will call a violation. The offending team's robot must be brought back to the designated starting zone, and kept stationary for 15 seconds. If the match cannot be continued due to the damage, the violating team will receive a score of 0 for the match.

### 6.2.3 恶意冲撞

比赛过程中禁止恶意冲撞对方机械人。若机械人通过撞击等方式明显导致对方机械人运动状态被改变或影响任务进行，裁判确认违规后违规一方须将违规机械人拿回对应出发点，并且机械人须在出发点停止 15s，期间裁判会恢复违规机械人上的道具。

若因恶意冲撞导致一方机械人丧失运动能力，则违规一方本场比赛得分为 0 分。

因机械人冲撞导致的判罚，现场裁判有最终解释权。

### 6.2.3 Colliding with Opposing Robots

Teams should not intentionally collide with opposing robots. Teams will be issued a violation if their robot causes a clear disruption to the movement of the opposing team's robot. After the calling of the violation, the offending team's robot must be brought back to the designated starting zone, and kept stationary for 15 seconds. During this time, the referee will restore the touched scoring objects and any other scoring objects held by the offending robot to their original position.

If the collision causes the opponent's robot to lose its ability to move, the offending team will receive a score of 0 for the match.

The on-site referee retain final authority in determining penalties arising from robot collisions.

### 6.2.4 跨越格挡物

场地中用于隔离分开各个区域的黑色道具禁止跨越，若机械车的轮子投影与隔挡物接触面积大于零，裁判确认违规后违规一方须将违规机械车拿回对应出发点，期间裁判会恢复违规机械车上的道具。

### 6.2.4 Crossing the Separation Barrier

The different zones are separated by a black barrier, and robots are strictly prohibited from crossing any part of this barrier. If any part of a robot comes into contact with the barrier, the referee will call a violation. The offending team must return the robot to its designated starting position, and any scoring objects the robot was carrying at the

time of the violation will be returned to their original positions.

### 6.2.5 违规进入区域

以下情形为违规到达区域，若违反，裁判确认违规后违规一方须将违规机械车拿回对应出发点，期间裁判会恢复违规机械车上的道具。

- ◆ A 级浸水区仍存在洪水的情况下运输车进入该浸水区；
- ◆ A 级浸水区仍存在洪水的情况下机械车进入 B 级浸水区；
- ◆ 运输车进入 B 级浸水区；
- ◆ 机械车进入对方 A 级浸水区；
- ◆ 中学组比赛中障碍块未被完全搬运走机械车进入 B 级浸水区。

### 6.2.5 Entering Unauthorised Areas

The following situations constitute unauthorised entry into a restricted area. If any of these occur, the referee will call a violation. The offending team must return the robot to its designated starting position, and any scoring objects the robot was carrying at the time of the violation will be returned to their original positions.

- ◆ The transport vehicle enters Flood Zone A whilst floodwater is still present.
- ◆ The mechanical vehicle enters Flood Zone B while floodwater is still present in Flood Zone A.
- ◆ The transport vehicle enters Flood Zone B.
- ◆ The mechanical vehicle enters the opposing team's Flood Zone A.
- ◆ The mechanical vehicle enters Flood Zone B without clearing all the obstacle blocks (For Middle School Category only).



## 6.2.6 违规执行任务

以下情形为违规执行任务，若违反，裁判确认违规后违规一方须将违规机械人拿回对应出发点，并且机械人须在出发点停止 15s，期间裁判会恢复违规机械人上的道具。

- ◆ 浸水区内仍存在洪水，机械车夹起被困人员；
- ◆ 中学组比赛中，A 级浸水区内仍存在洪水，机械车夹起障碍块；
- ◆ 机械车直接将被困人员放至被困人员救助站；
- ◆ 重置期间将机械人拿出场外维修。

## 6.2.6 Violating Task Rules

The following situations are considered violations of task rules. If any of these occur, the referee will call a violation. The offending team's robot must be brought back to the designated starting zone, and kept stationary for 15 seconds. During this time, the referee will restore the touched scoring objects and any other scoring objects held by the offending robot to their original position.

- ◆ The mechanical vehicle rescues a trapped civilian while floodwater is still present in the flood zone.
- ◆ The mechanical vehicle lifts an obstacle block while floodwater is still present in Flood Zone A (For Middle School Category only)
- ◆ The mechanical vehicle directly places the civilian rescued at the Rescue Station.
- ◆ The robots are taken out of the arena for repairs during a reset period.

## 6.3 固连

若 2 个或以上机械人因结构问题导致 10s 内不能主动分开，裁判确认后参赛选手可将固连



机械人拿回对应出发点，期间裁判会恢复违规机械人上的道具。

## 6.3 Entanglement

If two robots become entangled and are unable to separate within 10 seconds, the referee will evaluate the situation. Teams will then be permitted to move the entangled robots back to their designated starting zones. During this process, the referee will return any scoring objects on the entangled robots to their original positions.

## 6.4 补充

### 6.4 Additional Information

#### 6.4.1 禁止随意触碰机械人

比赛期间没有裁判允许禁止触碰机械人，若违反，裁判确认违规后违规一方须将违规机械人拿回对应出发点，并且机械人须在出发点停止 15s，期间裁判会恢复违规机械人上的道具。若情形严重则违反一方本场比赛得分为 0 分。

#### 6.4.1 No Robot Contact During Matches

During the match, no robots may be touched without the permission of the referee. If violated, the referee will call a violation. The offending team's robot must be brought back to the designated starting zone, and kept stationary for 15 seconds. During this time, the referee will restore the touched scoring objects and any other scoring objects held by the offending robot to their original position. In the case of a serious violation, the offending team will receive a score of 0 for the match.



## 6.4.2 运输车运送物资限制

最多 3 个物资同时在运输车上，若超过限制，裁判会在不影响运输车正常执行任务的情况下取出多余物资。

## 6.4.2 Supply Block Possession Limit

Each transport vehicle may only carry a maximum of 3 supplies at any point in time. If this limit is exceeded, the referee will remove the excess without interfering with the transport vehicle.

## 6.4.3 运送道具补充

运输车在运送物资、被困人员、障碍块到达指定任务区域时，以下情况仍被认定为完成任务：

- ◆ 物资接触物资补给站后弹出补给站；
- ◆ 被困人员接触被困人员救助站后弹出救助站；
- ◆ 障碍块接触障碍物清理区后弹出清理区。

## 6.4.3 Transporting Supplies

This section provides additional examples for situations when the transportation of supplies is considered successful.

- ◆ A supply block contacts the supply station but later leaves the zone.
- ◆ A trapped civilian contacts the rescue station but later leaves the zone.
- ◆ An obstacle block contacts the obstacle-clearing zone but later leaves the zone.

## 6.5 取消参赛资格

参赛队伍不得使用其他队伍的机械人参加比赛，一经发现，取消两支相关队伍的参赛资格；比赛过程中，禁止使用技术手段等干扰其他参赛队伍的控制信号，禁止选手为任何机械人照



射任何种类灯光，一经发现，取消参赛资格。

比赛过程中，不得使用任何具危险性的方法执行任务，如：火、液体（水、硫酸）、化学物质、高压电等。如果裁判认为机械小车的行为对人员或设备有危险或可能有危险，裁判可裁定该机械人丧失比赛资格。

## 6.5 Other Violations

During the competition, participating teams are not allowed to use another team's robot. If discovered, both teams will be disqualified. Additionally, teams will be disqualified if found using technical means to interfere with the control signals of other teams, or if any participant is discovered shining any type of light onto a robot.

During the competition, teams are strictly prohibited from employing any hazardous methods to complete tasks, including but not limited to: fire, liquids (e.g., water, sulfuric acid), chemical substances, or high-voltage electricity. If the referees determine that a robot's actions pose or may pose a danger to personnel or equipment, they may disqualify the robot immediately.