RoboCupJunior Rescue A Rules (2015)

Note: Changes from 2014 rules are highlighted in red.

Translated by RoboCupJunior Hong Kong

RoboCupJunior Rescue - Technical Committee 2015
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Preface　前言

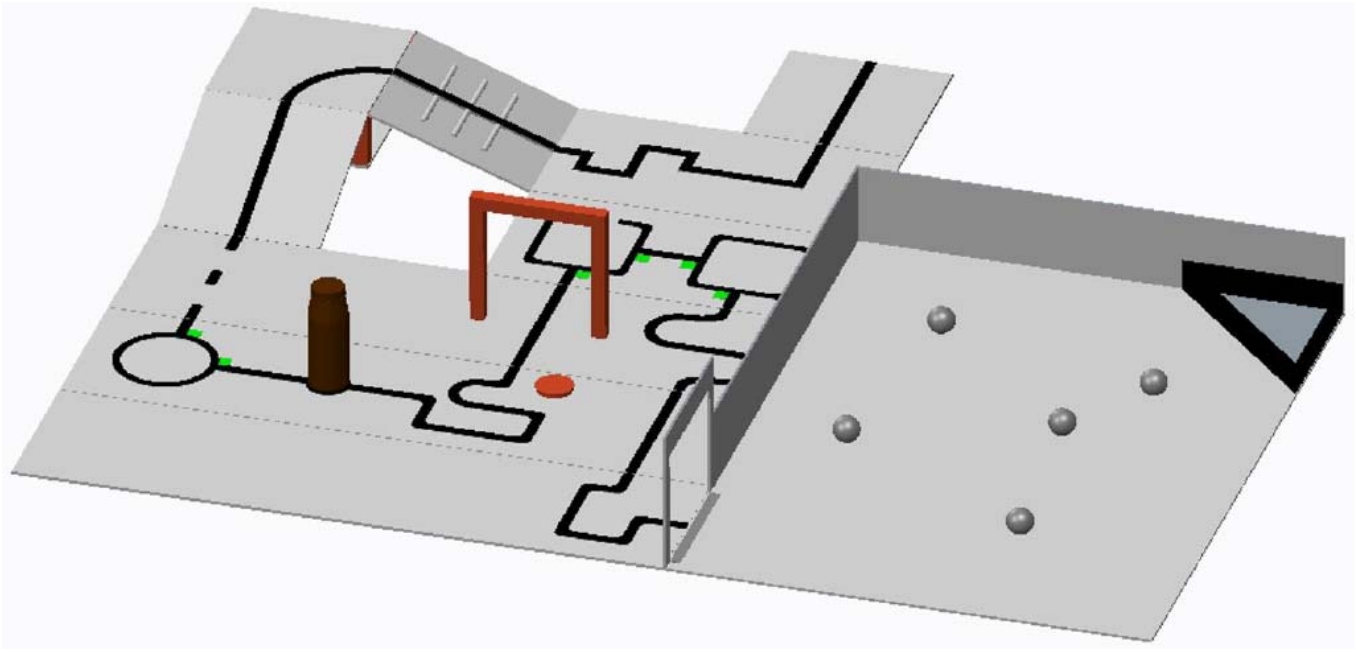
The land is simply too dangerous for humans to reach the victim! Your team has been given the most difficult tasks. It must be able to carry out the rescue mission in fully autonomous mode with no human assistance. The robot must be strong and smart enough to navigate through a treacherous terrain with hills, uneven lands and rubbles without getting stuck. When the robot finally finds the victim, it has to gently and carefully transport the victim to the safe evacuation point where humans can take over.

由人類到達遇難的場地實在是太危險了！你的隊伍已被給予最困難的任務。它必須能夠以完全自治的模式執行拯救的使命且，沒有人為幫助。機械人必須有足夠的力量和才智來穿梭於危險的地形與小山，凹凸不平的陸地和瓦礫而不被卡住。當機械人最終找到遇難者，它需要溫柔和小心地將遇難者送到有人類可以接管的撤離點。

Time and technical skills are the essential! Come and prepare to be the most successful Rescue Response Team.

時間和技術都是必不可少的！快來準備成為最成功的救援響應隊伍。

1. Arena　競技場地



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1.1 Description　描述

1.1.1 The arena is modular by tiles, which can be used to make an endless number of different courses for the robots to traverse and also provides with the ability to add new tiles in the future.
場地由階磚塊模組化組成的，可用來製作出數之不盡的不同航線讓機械人穿梭，並提供在將來添加新的階磚塊的能力。`

1.1.2 The field will consist of 300 mm x 300 mm tiles, with differing patterns. The final selection of tiles and their arrangement will not be revealed until the day of the competition. Competition tiles may be mounted on a hard backing material of any thickness.
賽場由多個300毫米 x 300毫米的階磚塊組成，階磚塊有不同圖案。最終被挑選的階磚塊及其編排會直到比賽當天才會公布。比賽的階磚塊可能固定裝在任何厚度的硬質背襯材料上。

1.1.3 There will be a minimum of 8 tiles in a competition field.
一個比賽場地最少有8個階磚塊。

1.1.4 There are different tile designs (examples can be found under rule “1.3 Line”).
階磚塊有不同的設計(例子可於本規則1.3下找到)。

1.1.5 Tiles on different levels are connected with a ramp. A ramp does not exceed an incline of 25 degrees from the horizontal surface.
不同高度的階磚塊會由斜坡連接。斜坡的斜面與水平面的夾角不超過25度

1.2 Dimensions　尺寸

1.2.1 The floor has a white or close to white tone. The floor may be either smooth or textured (like linoleum or carpet), and may have steps of up to 3 mm height at joins between tiles.
地板地板有可能是光滑或粗糙的(如油地毯或地毯)，階磚塊之間的接合處最多能高至3mm。

1.2.2 Competitors need to be aware that in some competitions, tiles may be mounted on thick backing or raised off the ground with the Elevation Blocks; which may make it difficult to get back on a tile should the robot come off. No provision will be made to assist robots that drive off a tile, from getting back on the tile.
參賽者需知在比賽中，階磚塊可能被安裝在厚的背襯或升起離地面的墊高塊上；如機械人偏離軌跡，可能難以返回到階磚塊上。大會不會提供任何協助予偏離階磚塊的機械人返回到階磚塊上。

1.2.3 Tiles will be used as ramps to allow the robots to ‘climb’ up to and down from the elevated tile. Elevation blocks are to be made of 30 mm x 30 mm wood painted in orange and placed in the corners of the tile.
階磚塊將作為斜坡讓機械人爬上和高層的階磚塊爬落，墊高塊由30毫米 x 30毫米的橙色木塊製成並被放在階磚塊的角落。

1.2.4 Robots, therefore, must be designed so that they can navigate along any tile that may be placed on the base of a ‘Tunnel’.
因此，機械人的設計必須造到可以通過任何放置在「地道」底部的階磚塊。

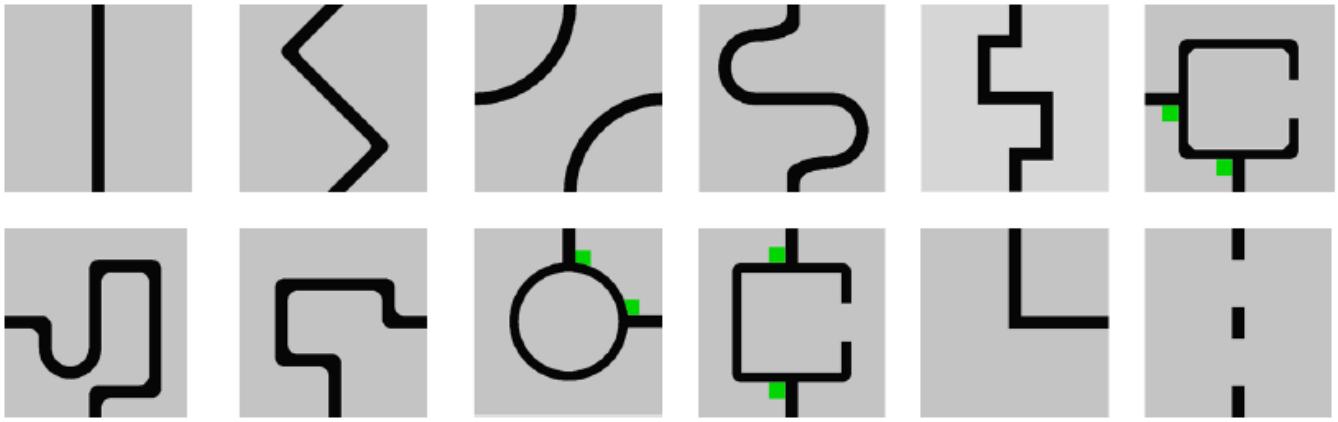
1.3 Line　軌跡線

1.3.1 The black line, 1-2 cm wide, may be made with standard electrical (insulating) tape or printed onto paper or other materials. The black line forms a path on the floor. (The grid lines indicated in the drawings are for reference only and competitors can expect tiles to be duplicated, different and/ or omitted.)
黑線寬 1-2 厘米，可能為標準電線(絕緣)膠布或列印於紙張或其他物料上。黑線於地板上形成路徑。(顯示在圖畫中的網格線只供參考，參賽者應預料階磚塊可能被複製，不同的及/或省略)

1.3.2 Straight sections of the black line may have gaps with at least 5 cm of straight line before each gap. The gap is 20 cm at most.
直線區的黑線可能有空隙，但每道空隙前最少有5厘米長的直線。空隙最長達20厘米。

1.3.3 The arrangement of the tiles may vary between rounds.
階磚塊的編排於不同回合間可能會有變化。

1.3.4 Due to the nature of the tiles, there may be a step and/or gap in the construction of the arena. These are not intentional and will be minimized as much as possible by the organizers.
鑑於階磚塊的材質，比賽場地的結構可能有台階或空隙。大會強調這並非有意的安排和將盡力減少情況出現。



1.4 Debris and Obstacles　碎片及障礙物

1.4.1 Speed bumps are maximum height of 1cm. They are white and fixed on the floor. They may be angled.
減速坡最高為1厘米。它們為白色和固定在地板上。它們可能呈一定的角度放置。

1.4.2 Debris are maximum height of 3mm, and will not be fixed on the floor. They are small materials such as toothpicks or small wooden dowel,etc.
碎片最高為3毫米，將不會固定在地板上。它們是細小的材料如牙籤或細小的木釘等。

1.4.3 Debris may be spread towards or adjacent to walls.
碎片可能擴散至牆或於牆的毗鄰。

1.4.4 Obstacles may consist of bricks, blocks, weights and other large, heavy items.
障礙物可由磚塊、積木、重物及其他大件重物組成。障礙物不會被放置在走廊及斜坡。

1.4.5 An obstacle does not occupy more than one line.
障礙物不會佔據一條以上的軌跡。

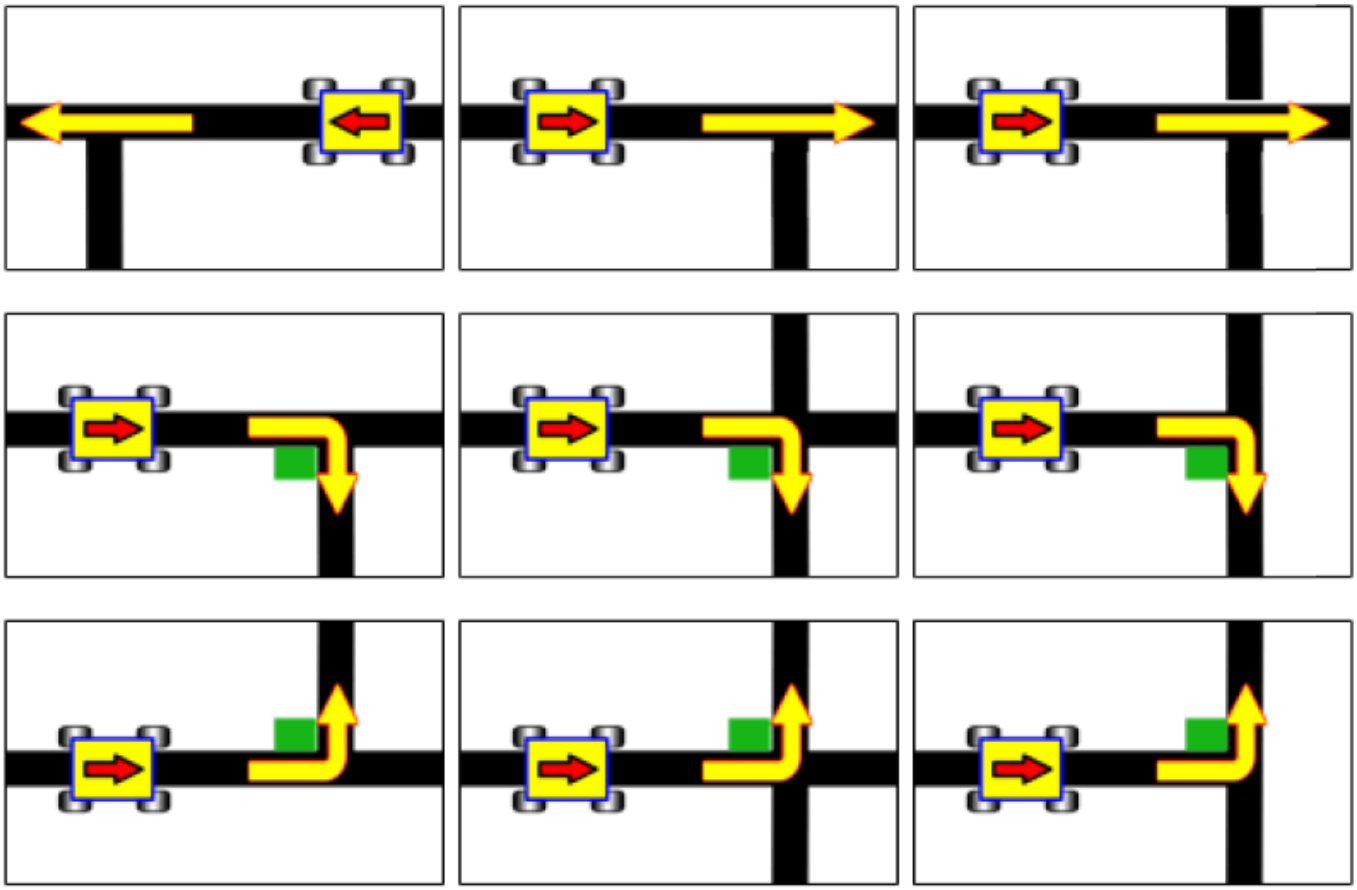
1.4.6 A Robot is expected to navigate around obstacles. Obstacles that are moved in any way will remain where they are moved to, even when it ends up prohibiting your robot from proceeding. If you have any doubt on any scenario, consult at the International RCJ Community Forum (htty://www.rcjcommunity.org/)
機械人被期望繞過障礙物， 被以任何方式移動的障礙物將保留在被移動後的位置，即使當障礙物最終阻止機械人繼續進發。如果對上述描述有任何疑問，請在國際RCJ社區論壇(htty://www.rcjcommunity.org/)查詢。

1.5 Intersections　交叉路口

1.5.1 Intersections can be placed anywhere except in the evacuation zone.
交叉路口可被放置在撤離區外的任何地方。

1.5.2 Intersections markers are green and 25 mm x 25 mm in dimension and indicate the suggested path to follow. If no green marks are placed at an intersection, it means it is recommended to continue straight.
交叉路口標記是綠色的，尺寸為25毫米 x 25毫米，標示 着建議跟隨的路徑。如果交叉路口沒有綠色標記，意思即建議繼續直行。

1.5.3 The intersections are always perpendicular, but may have 3 or 4 branches.
交叉路口總是垂直相交，但可能有 3 或 4 個分支。



1.6 Doorway 門口

1.6.1 The doorway will:　門口將：

- Consist of three (3) pieces of solid wood. 由3塊木組成
- Have all pieces fixed together. 並固定在一起
- Be painted color orange 被油成橙色
- Be 250 mm wide and 250 mm high (+/- 20mm) 寬度及高度均是250mm(+/-20mm)

1.6.2 The doorway wll be placed on a straight section of the line.
門口將放置在直線區上。

1.7 Evacuation Zone　撤離區

1.7.1 The black line ends at the entrance to the evacuation zone, and robots are required to utilize some form of search strategy to locate the victims.
黑線於最後撤離區的入口結束，機械人需要應用一些搜索策略來確定遇難者的位置。

1.7.2 The Evacuation Zone is approximately 120 cm by 90 cm with walls in the 4 sides that are at least 10 cm high.
撤離區尺寸大約120 cm x 90 cm，四面為最少10cm高的牆。

1.7.3 At the entrance to the evacuation zone, there is a 25 mm x 250 mm strip of reflective silver tape on the floor.
在撤離區入口處的地板上將會有一條25mm x 250mm的反射銀帶。

1.7.4 For the primary competition, an Evacuation Point tile is placed at one corner of the evacuation zone. The Evacuation Point tile is a right angled triangle with sides of 30 cm x 30 cm, and it is painted in black with a bump of 5mm..
初級組比賽，一個"撤離點" 階磚位於撤離房間的一個角落。"撤離點"為直角三角形，其邊為30cm x 30cm，黑色和有5mm高的圍欄。

1.7.5 For the Secondary competition, the Evacuation Point tile is a right angled triangle, sides of 30 cm x 30 cm and elevated by 6 cm, and it is painted in black and hollow.
高級組比賽，"撤離點" 階磚由一個直角三角形組成，其邊為30cm x 30cm，塗上黑色，高6cm的空心體。

1.7.6 The evacuation zone does not have an exit door.
撤離區沒有出口。

1.8 Victims　遇難者

1.8.1 Victims may be located anywhere on the floor of the evacuation zone.
遇難者可放於撤離區任何地方

1.8.2 The victims take the form of a 5 cm diameter ball. Teams need to be prepared for minor variations.
遇難者為直徑5cm的球。參賽隊伍須作好準備以應付輕微的變化。

1.8.3 The victim represents a "person with life" and will be electrically conductive. Its surface is silver and reflects light.
遇難者代表有生命的人和可以導電，其表面是銀色的及會反光。

1.9 Environmental Conditions　環境條件

1.9.1. Teams must come prepared to adjust their robots to the lighting conditions at the venue.
隊伍必須有備而來，在會場的照明條件下調整他們的機械人。

1.9.2. Lighting and magnetic conditions may vary along the course in the rescue arena.
在拯救賽場上，照明及磁場情況可隨比賽過程有所變化。

1.9.3 The arena may be affected by magnetic fields (e.g. generated by under floor wiring and metallic objects).
場地可能受磁場影響(如：由地板下的電線和金屬物體產生的)

1.9.4 Teams should prepare their robots to handle expected lightning interference. While the organizers and referees will try their best to minimize external lighting interference, it is not possible for them to foresee all unexpected ones such as camera flash from spectators.
隊伍所準備的機械人應能應付不可預期的照明干擾。雖然大會和裁判將竭盡所能減少外在光線的干擾，但他們不可能預知所有意外的事，如來自觀眾相機的閃光燈。

2. Robot　機械人

2.1 Control　控制

2.1.1 Robots must be controlled autonomously. The use of a remote control or manually control, or passing information (by sensor, cables, other interfaces, etc.) to the robot is not allowed.
機械人必須是自主控制。禁止使用遙控或人為控制，或傳輸資料(透過傳感器、電纜、其他干擾等)至機械人 。

2.1.2 Robots must be started manually by the team captain.
機械人必須由隊長以人手啟動。

2.1.3 Pre-mapped type of dead reckoning (Movements predefined based on known locations) is prohibited.
禁止所有預先繪製地圖類型的航位推算(基於已知位置的預定義移動) 。

2.1.4 Robots must not damage any part of the arena in any way.
機械人不得以任何方式損壞競技場任何部分。

2.2 Construction　構造

2.2.1 Any robot kit or building blocks, either available on the market or built from raw hardware, may be used, as long as the design and construction of the robot are primarily and substantially the original work of the students (see section 2.5. below).
任何機械人套件或構成要素，無論是在市場上的或從原始硬件製造的，均可以使用，只要機械人設計和構造主要及很大程度上為學生的原創作品(見以下章節第2.5）。

2.2.2 Any commercially produced robot kits or sensor components that are specifically marketed to complete any single major tasks of RoboCupJunior Rescue will be disqualified. For example, pre-programmed sensors with special features for line-following or obstacle tracing are not allowed. If there is any doubt, teams should consult the Technical Committee (TC) at the International RCJ Community Forum http://www.rcjcommunity.org
使用專門銷售給完成 RoboCupJunior 拯救的任何一個重大任務的任何商業生產的機械人套件或傳感器部件將被取消資格。例如，預先編程的傳感器具有特殊功能用作軌跡跟蹤或障礙物追蹤是不允許的。如有任何疑問，隊伍應在國際 RCJ 社區論壇 http://rcjcommunity.org 向技術委員會(TC)諮詢。

2.2.3 For the safety of participants and spectators, no lasers are allowed on any robot.
為保參加者及觀眾安全，禁止在任何機械人上使用雷射。

2.2.4 Bluetooth Class 2, 3 and ZigBee communications are the only wireless communication types allowed in RoboCupJunior. Robots that have other types of wireless communications on board will need to be either removed or disabled for possible interference with other types of wireless communication can interfere with other leagues competing in RoboCup. If the robot has equipment for other forms of wireless communication, they must prove that they have disabled them. Robots that do not comply may face immediate disqualification from the tournament.
RoboCupJunior允許的無線通訊類型只有藍芽組別2, 3和ZigBee通訊。 附有其他類型的無線通訊的參賽機械人，需要將其移除或關掉，以免有機會干擾其他類型的無線通訊，干擾到RoboCup其他聯盟的賽事。如機械人已裝設了其他形式的無線通訊，隊伍必須證明它們已版關掉。違規的機械人可能會遭到立即取消比賽資格。

2.2.5 Robot must be able to pass through the doorway without moving it from its original position.
機械人必須能夠通過出入口而沒有移動它的原有位置。

2.3 Team　隊伍

2.3.1 Each team must have only one robot in the field. (This rule can be modified in a Super Team Competition such that two or more robots are deployed together and have to cooperate in completing given tasks.)
每隊必須只有一個的機械人在競技場內。(這規則於超級隊比賽中可被修改，如兩個或以上的機械人被調配在一起和需要合作以完成給予的任務。)

2.3.2 Students will participate in ONLY ONE (1) of the three (3) divisions: Primary Rescue Line, Secondary Rescue Line or Rescue Maze.
學生只能參加三個分組中的其中一個：小學組拯救、中學組拯救或拯救迷宮 。

2.3.3 Eligibility for each division is: 每個分組的參加資格：

- Primary Rescue Line: Open to students aged 14 years old and under. Age is calculated as of July 1 for the international RCJ event each year.
  小學組拯救：學生年齡為14歲或以下。年齡計算截至每年國際RCJ比賽日的7月1日。
- Secondary Rescue Line: Open to students of any age up to and including 19 years of age. Team members may compete in Secondary Rescue at most, twice (2 international events). After competing twice they must move to Rescue Maze.
  中學組拯救：任何19歲或以下的學生。隊伍成員最多可以參加中學組拯救兩次(凡指兩次國際賽)。兩次後，他們必須轉到拯救迷宮比賽。
- Rescue Maze: Open to students of any age up to and including 19 years of age.
  拯救迷宮：任何19歲或以下的學生

2.3.4 Each team must have a minimum of 2 members.
每隊最少有兩名成員。

2.3.5 The number of team members per a team is not limited but team should choose their team size in a way that the learning experience of each member is maximized. Mentors/parents are not allowed to be with the students during the competition. The students will have to self-govern themselves (without mentor's supervision) during the long stretch of hours at the competition.
每隊的隊員人數不限，但隊伍應該選擇他們的隊伍規模，達至每個成員的學習經驗最大化。比賽期間不允許教練/父母和學生在一起。在悠長的比賽期間學生必須自行管理(沒有教練的監督)。

2.3.6 Every team member can be registered in only one team, and every team can compete in only one RoboCupJunior league and division.
每名隊員都只可註冊在一支隊，以及每支球隊只能在一個RoboCupJunior聯盟和分組比賽。

2.4 Inspection 檢查

2.4.1 The robots will be examined by a panel of referees before the start of the tournament and at other times during the competition to ensure that they meet the constraints described above.
比賽開始前和比賽過程中的其他時間，機械人將被一組裁判檢查，以確保機械人符合上述要求。

2.4.2 It is highly unlikely that a team will be able to legally use a robot identical to another team's robot from previous years, or use a robot that is identical to another team's robot.
隊伍不得與其他隊伍使用相同的機械人，也不能使用往年其他隊伍使用過的機械人。

2.4.3 It is the responsibility of teams to have their robots re-inspected, if their robots are modified at any time during the tournament.
比賽期間任何時間機械人若有修改，參賽隊伍有責任讓機械人重新接受檢查。

2.4.4 Students will be asked to explain the operation of their robot in order to verify that the construction and programming of the robot are their own work.
學生將會被要求講解其機械人的操作，以證實機械人的構建和編程是由他們自己完成的。

2.4.5 Students will be asked questions about their preparation efforts, and may be requested to answer surveys and participate in video-taped interviews for research purposes.
學生將會被問及準備工作事宜，可能會被要求回答調查問卷及參與錄影訪問，作為研究目的。

2.4.6 All teams must fill a web form that will be provided once the team is officially registered, and should be submitted at least one week prior to the competition. The purpose of this document is to allow judges to be more prepared for the interviews. For samples documentation, please refer to the "Description of Materials Sample" at the official RCJ website under Rescue rules. Information about how to submit your document will be announced prior to the competition to the teams.
所有隊伍在正式注冊後必須必須填寫網上表格，而且需要在比賽前至少一星期前提交。這文件的目的是允許評審有較多時間準備面試。文件範例，請參考RCJ官方網站拯救規則下的"Description of Materials Sample"。關於如何提交文件的資料將於比賽前向隊伍宣佈。

2.4.7 All teams have to submit their codes prior to the competition. The code is never shred with other teams without the team's permission.
比賽前所有隊伍需要提交他們的程式碼。沒有隊伍的允許，程式碼不會與其他隊伍分享。

2.5 Violations　違規

2.5.1. Any violations of the inspection rules will prevent the offending robot from competing until modifications are applied.
任何違反檢查規則的機械人不得參賽，直至修改妥當。

2.5.2. However, modifications must be made within the time schedule of the tournament and teams must not delay tournament play while making modifications.
然而，修改必須在比賽規定的時間內完成，進行修改的同時，隊伍不得耽誤比賽。

2.5.3. If a robot fails to meet all specifications (even with modification), it will be disqualified from that round (but not from the tournament).
若機械人不能符合所有的規定(即使已作修正)，將被取消其該輪比賽資格(但非整個比賽)。

2.5.4. No mentor assistance during the competition is allowed. See 6. Code of Conduct.
比賽期間禁止導師的協助。見章節6 行為守則。

3. Play　比賽

3.1 Pre-game Set-up　賽前設置

3.1.1. Where possible, competitors will have access to practice arenas for calibration, testing and tuning throughout the competition.
大會盡可能給予參賽者在整個比賽中進入練習場區進行校準、測試和調優的機會。

3.1.2.Whenever there are dedicated independent arenas for .competition and practice, it is the organizers' discretion if testing is allowed on the competition arena.
賽場和練習場是各自獨立的區域，而大會有決定權是否允許在賽場區域內測試。

3.2 Game Zone　比賽場區

3.2.1 An area around the game fields will be designated as the "game zone".
賽場周圍的區域被劃分為「比賽場區」。

3.2.2 Teams should designate one of its own team members as the captain, and (s)he will be allowed to move the robot, based on the stated rules and/or as directed by a referee. Only the captain is allowed to enter the game zone and interact with the robot during a scoring run.
隊伍應委派他們其中一名隊員作為隊長及僅隊長被允許根據既定的規則和在裁判作指示下移動機械人。得分回合期間只允許隊長可進入比賽場區及與機械人互動。

3.2.3 The captain can move the robot only when (s)he is told to do so by a referee.
只有得到裁判指示時，隊長才可移動機械人。

3.2.4 Other team members (and any spectators) within the vicinity of the rescue arena have to stand at least 150 cm away from the arena while their robot is active, unless otherwise directed by a referee.
在機械人行動期間，除非獲裁判指示，否則其他 隊員(及任何觀眾)需要與場地保持最少150厘米(約60寸)的距離。

3.2.5 No one is allowed to touch the arenas intentionally during a scoring round.
得分回合期間，沒有人可故意觸摸賽場。

3.3 Start of play 比賽開始

3.3.1 A run begins at the scheduled starting time whether or not the team is present/ready. Start times will be posted prominently around the venue.
不管參賽隊伍是否已到場/準備，比賽會按照預定時間開始。開始時間將張貼在賽場周圍的當眼位置。

3.3.2. Drop Tile Puck: The Drop Tile Puck is the signal that changes a common tile to be a “Drop Tile”. It can be made of any wood or plastic based material 5mm to 12mm thick and 70mm in diameter. It is to be painted in orange.
放置點階磚塊冰球表示把普通的階磚塊即變成放置點階磚塊。它可以由任何木材或塑料製成，5毫米至12毫米厚及直徑為70毫米，顏色為橙色。

3.3.3 The referee will ask the captain if (s)he would like to nominate Drop Tile(s). These tiles will have an orange disk placed in one of the corners. Once the time has begun (see 3.3.6), the Drop Tile(s) cannot be changed.
裁判將會問隊長是否指定放置點階磚塊。這些階磚塊會有一個放置在其中一個角落的橙色圓盤。一旦比賽開始(見3.3.6)，放置點階磚塊不可改變。

Note: It can be as many ‘Drop Tiles’ as the referee specify and they can be different for each round. This will depend on the length of the course.
注意：由裁判指定，這些放置點階磚塊的數目和位置於每輪比賽都可以不同。這將取決於該賽場軌跡的長度。

3.3.4 The referee will ask the captain if they are happy with the course. After positive acknowledgement the round begins.
裁判將會問隊長是否滿意賽場。得到肯定回確認後該輪比賽開始。

3.3.5 Once the run has begun, the robot playing is not permitted to leave the competition area for any reason.
比賽一旦開始，不論任何理由機械人不得離開比賽場區。

3.3.6 A robot will be given a maximum time of 8 minutes to both calibrate their robot and complete the course. The time for each round will be kept by the referee.
機械人將有最多 8 分鐘時間進行調試和完成比賽。每一輪的時間將由裁判負責計時。

3.3.7 Calibration is defined as the taking of sensor readings and modifying of the robot programming to accommodate such sensor readings. Any and all pre-mapping activities will result in immediate disqualification of the robot for the round.
校準的定義是取得傳感器讀數和修改機械人程式以配合傳感器的讀數。任何及所有預先繪製的地圖將會被取消該回合比賽資格。

3.3.8 Teams may calibrate their robot in as many locations as desired on the arena, but the clock will continue to count down. Robots are not permitted to move under power while calibrating.
隊伍可於賽場內校準他們的機械人至多個位置，但時鐘將會繼續倒數。校準的時候不允許啟動機械人使其移動。

3.3.9 Once teams are ready to perform a scoring run, they must notify the referee. To begin a scoring run, the robot is placed on the starting tile in the first room as indicated by the referee. Once a scoring run has begun, no more calibration is permitted.
隊伍已就緒得分賽回合時，必須通知裁判。得分賽開始時，根據裁判指示把機械人放置在首間房間的起點方格上。得分賽開始後不再允許任何校準。

3.4 Game Play　比賽過程

3.4.1 Robots are to start behind the join between the start tile and the next course tile towards the evacuation zone. Correct placement will be checked by the Referee.
機械人從起點階磚和通往撤離場區的下一個軌跡階磚塊的連接處後面開始出發，準確位置由裁判覆核。

3.4.2 Modifying the robot during a run is prohibited; which includes remounting parts that have fallen off.
比賽回合期間禁止修改機械人，其中包括把已脫落的部件重新安裝。

3.4.3 All parts that the robot is losing intentionally or unintentionally are left in the arena until the run is over. Neither the team nor the judge is allowed to remove parts from the arena during a run or Lack of Progress.
機械人之所有部件，不論有意或無意地留在賽場均保持原狀，直至回合結束。比賽和進展中斷期間，都不允許隊伍和裁判將部件從賽場中移走。

3.4.4 Teams are not allowed to give their robot any advance information about the field. A robot is supposed to recognize the field by itself.

3.4.5 The robot must follow the line completely to enter the evacuation zone.
機械人必須完全跟隨軌跡以進入撤離區。

3.4.6 Wherever there are multiple paths and one is marked, the robot may take any of them. Only following the intersection markers will grant points for the intersection decision.
每當在多條路徑中有一條路徑被標示，機械人可選擇任何一個。只有在交叉路口沿著有標示的路徑行走才能得分。

3.5 Scoring　計分

3.5.1 A robot is awarded points for successfully negotiating each hazard (gaps in the line, speed bump, intersections and obstacles).
機械人成功設法越過每個危險物(斷線、減速坡、交叉路口和障礙物)可以得分。

3.5.2 Successfully negotiating is defined as completely following the line, negotiating all line gaps, intersections, speed bumps, obstacles, and going through a doorway without human interaction.
成功設法越過的定義是在沒有人為干涉下，完全跟隨軌跡、越過所有斷線、交叉路口、減速坡、障礙物和通過出入口。

3.5.3 Failed attempts at negotiating elements of the arena are defined as “Lack of Progress” (see 3.6).
嘗試通過賽場內的元素失敗時，定義為“進展中斷”(見3.6)

3.5.4 Points available for successfully reaching each ‘Drop Tile': 成功到達每個「放置階磚塊」可得分數：

1st Attemp) = 60 pts
第1次嘗試 = 60分
2nd Attempt = 40 pts
第2次嘗試 = 40分
3rd Attempt= 20 pts
第3次嘗試 = 20分

3.5.5 There are no points available for reaching a 'Drop Tile' beyond the third attempt.
於3次嘗試後，即使到達放置階磚塊也不會獲得分數。

3.5.6 If green marks at intersections are used, the path may go to the opposite direction through the course (going back to the path that a robot already took).
如在交叉路口使用了綠色標示，路徑可能會經過軌跡走向相反方向 (返回機械人已走過的路徑)。

3.5.7 Points available for successfully negotiating each gap in the black line. 10 pts per gap
成功通過黑線上的每個斷線可獲10分。

3.5.8 Points available for successfully avoiding each obstacle blocking the black line. 10 pts per obstacle
成功通過黑線上的每個障礙物可獲10分。

3.5.9 A robot is considered to have successfully negotiated an obstacle when it moved through the tile where an obstacle was placed.
當機械人越過放置了障礙物的階磚，將被視為成功越過障礙物。

3.5.10 Points available for successfully completing a tile that has speed bumps. 5 pts per speed bump tile
成功通過每個減速坡階磚可獲5分。

3.5.11 Points available for successfully negotiating an intersection tile. 15 points per direction through intersection tile. Successfully means that the robot followed the suggested path. See 1.5.2..
成功通過每個交叉路口階磚，同一方向可獲15分。成功意思是機械人跟隨建議的路線(見1.5.2)。

3.5.12 Each gap, obstacle, speed bump and intersection tile can only be scored once per direction through the course, not each attempt through the course.
每個斷線、障礙物、減速坡和交叉路口階磚的得分只有一次，得分依據越過路線的方向，而不是每次越過路線的嘗試。

3.5.13 Successful victim rescue: Robots are also awarded points for successfully rescuing victims. A successful victim rescue occurs when the victim is moved to the evacuation point (it needs to be completely inside of the evacuation point, and no part of the robot is in contact with the victim). 40 points per a successful victim rescue.
成功拯救遇難者：機械人成功拯救遇難者可獲得分。成功的遇難者拯救是指遇難者被移至撤離點(遇難者需要完全移入撤離點，機械人沒有觸碰着遇難者)。每成功拯救一個遇難者可獲40分。

3.5.14 Ties in scoring will be resolved on the basis of the time taken by each robot (or team of robots) to complete the course (this includes calibration time).
如出現平分現象，將參考各個機械人(或隊伍的機械人)完成任務的時間分出優劣（包括機械人的校準時間）。

3.5.15 Check RoboCupJunior official website for a score sheet template.
計分紙的範本可於RoboCupJunior官方網頁找到。

3.6 Lack of Progress　進展中斷

3.6.1 A lack of progress occurs when: 進展中斷出現當：

- The robot ceases to follow the line when it is present.
  機械人停止跟隨軌跡線
- The robot is stuck in the same place or loses the black line without regaining it by the next tile in the sequence (see figures below).
  機械人停留在同一地方或偏離黑線而沒有於
  順序的下一個階磚塊折返(見下圖)。
- The robot moves completely out of the field.機械人完全離開賽場。

3.6.2 The team captain can also call for a Lack of Progress at any time (s)he wants (for example if the robot is in danger).
如有需要，隊長可於任何時間要求進展中斷(如機械人處於危險)。

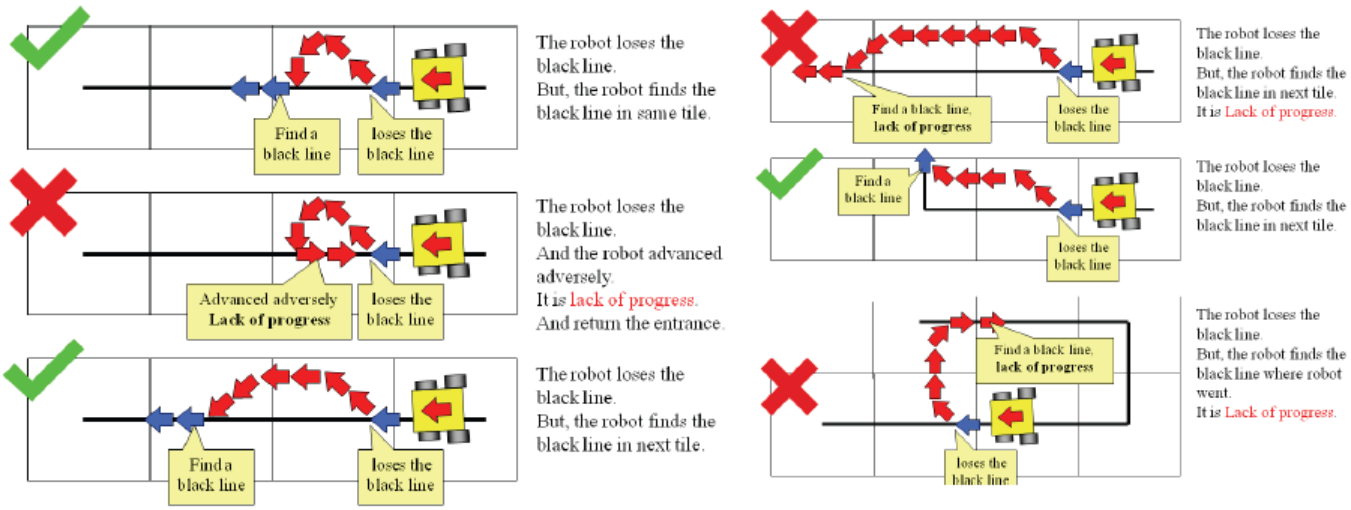
3.6.3 If a Lack of Progress happens, the robot must be positioned at the beginning of the course or at the previous 'Drop Tile' facing the evacuation zone, and checked by the referee.
如進展中發生，機械人必須被放到賽場的起點或前一個「放置階磚塊」並面向撤離區，並由裁判檢閱。

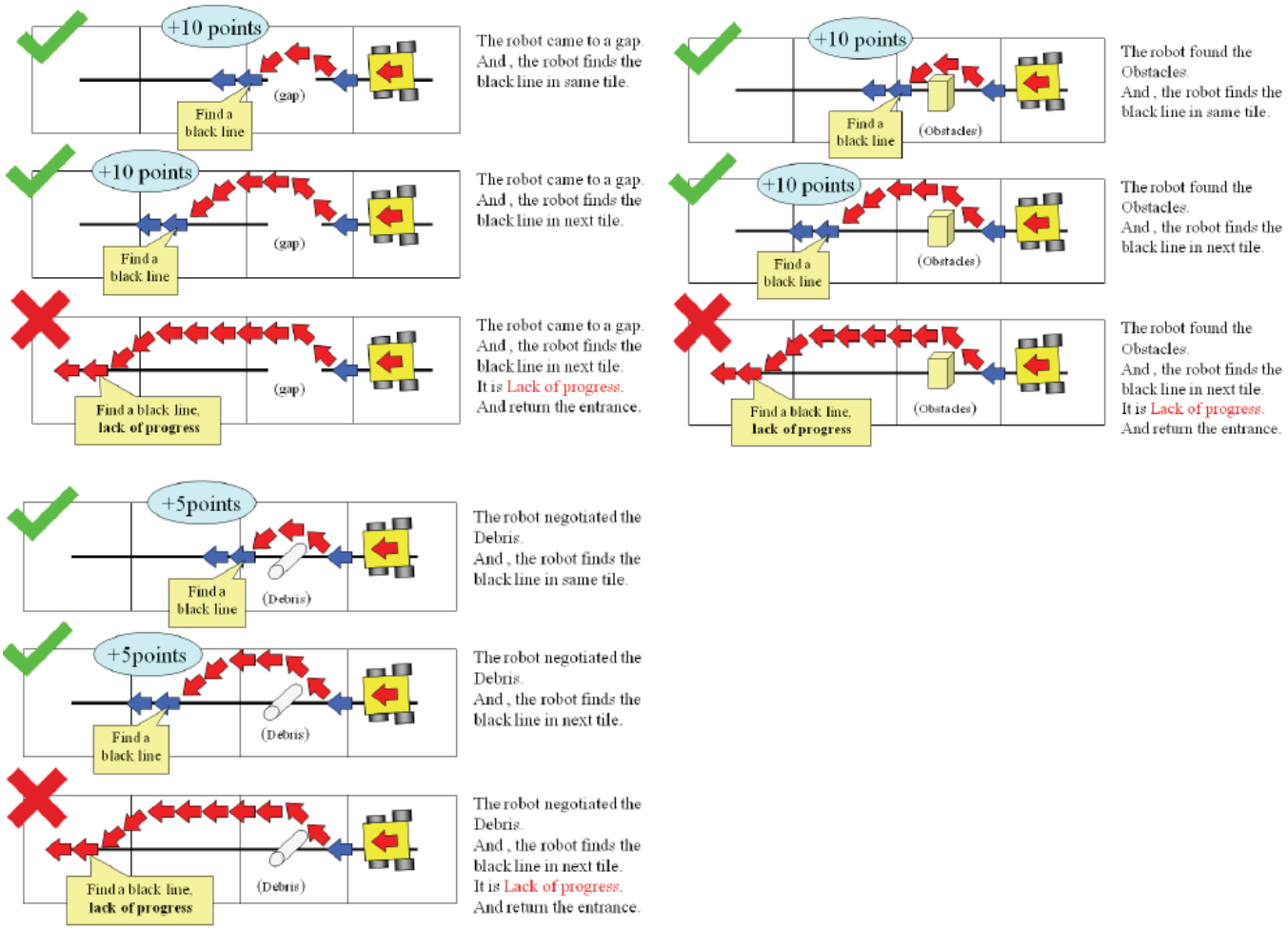
3.6.4 Only the team captain is allowed to restart the robot without changing programs and/or modifying the robot.
只有隊長可以重新開動機械人，但不能改變程式和/或修改機械人。

3.6.5 There is no limit to the number of restarts within a game.
比賽期間，重新開動機械人的次數沒有限制。

3.6.6 A robot is allowed to proceed to the following 'Drop Tile', if the robot fails to reach it after the third attempt.
如機械人於三次嘗試後失敗，機械人可被放到下一個「放置階磚塊」。

3.6.7 The team captain may also choose to make further attempts at the course to earn the additional points available for overcoming obstacles, gaps in the line, and speed bump points that have not already been earned before reaching the 'Drop Tile'.
隊長仍可選擇於該段軌跡繼續嘗試獲取另外的得分，如克服障礙物、碎片、斷線、減速坡的得分，這是到達「放置階磚塊」前未取得的分數。





3.7 Victim Placement　遇難者放置

3.7.1 The victims will be allocated in a random way on the Evacuation Zone. The number of victims will be decided by the Organizing Committee. The number of victims will be the same for each field (or arena) layout.
遇難者會以隨機方式放在撤離區，遇難者的數目由大會決定，每個賽場佈置的遇難者數目相同。

3.8 Evacuation Point Placement　撤離點安置

3.8.1 The Evacuation Point is placed in any of the non-entry corners in the evacuation room.
撤離點將放置在撤離房屋入口以外的任何一個角落。

3.8.2 Once a robot begins its scoring round and has entered the Arena, the referee will roll a standard 6 sided dice to determine in which corner the Evacuation Point will be located.
當機械人開始得分回合和已進入賽場，裁判將投一粒標準的六面骰子來決定撤離點位於哪一個角落。

3.8.3 After a Lack of Progress happened in any room, the referee may roll the dice once more and place the Evacuation Point at a new corner.
在房間任何一處發生進展中斷後，裁判可再次擲骰子，將撤離點放到新的角落。

3.8.4 The RoboCupJunior Organizing Committee (OC) will try their best to secure the Evacuation Point down, but you should expect slight shift at times.
RoboCupJunior組織委員會(OC)將嘗試固定撤離點，但參賽者應預期略有改變。

3.9 End of Play　比賽結束

3.9.1 A team may elect to stop the round early at any time. In this case, the team captain must indicate to the referee the team's desire to terminate. The team will be awarded all points achieved up to the call for end of round.
隊伍可選擇在回合結束前任何時間停止。在這種情況下，隊伍的隊長必須向裁判提出要求終止。隊伍將獲得於回合結束前已獲得的分數。

3.9.2 The round ends when the time expires, when the team captain calls at the end of round or when all the victims are successfully rescued.
回合會於時限而滿、隊伍要求結束回合、或當所有遇難者被成功拯救時結束。

4. Open Technical Evaluation　公開技術評估

4.1 Description　描述

4.1.1 Your technical innovation will be evaluated during a dedicated time frame. All teams need to prepare for an open display during this time frame.
你們的技術革新將於特定的時間環節被評估，所有隊伍需在這時間範圍內準備好公開展示。

4.1.2 Judges will go around interacting with teams. It will be set up as more like a casual conversation or "questions and answers" atmosphere.
評審將巡察並與隊伍互動，形式和氣氛將是一般的交談或"問與答"。

4.1.3 The main objective of the Open Technical Evaluation is to emphasize the ingenuity of innovation. Being innovative may mean technical advance as compared to the existing knowledge, or an out-of-the-ordinary simple but clever solution to existing task.
公開技術評估的主要目的是強調創作力的革新。革新意指相對於現存知識的技術領先，或非凡簡單但聰明的解決方法完成現存任務。

4.2 Evaluation Aspects　評估層面

4.2.1 A standardized rubric system is used focusing on:　採用標準指示系統集中在：

a) creativity　創造力
b) cleverness　靈巧性
c) simplicity　簡易性
d) functionality　功能性

4.2.2 "Your work" can include (but is not limited to) one of the following aspects:
"你的作品"可以包括(但不限制於)以下其中一方面：

a) creation of your own sensor instead of a pre-built sensor
創建你自己的傳感器而不是一個預先建立的感測器

b) creation of a "sensor module" which comprises of various electronics to provide a self-contained module to provide a certain special functionality
創建一個"傳感器模塊"，以各種電子設備構成的獨立模塊，以提供特定的特殊功能

c) creation of a mechanic module which is functional, but out of the ordinary
創建一個實用但與眾不同的機械模塊

d) creation of a new software algorithm to a solution
創建一個新的軟件運算法則作為解決方案

4.2.3 Teams must provide documents that explain their work. Each invention must be supported by concise but clear documentation. The documents must show concise inventive steps.
隊伍必須提供文件解釋他們的作品。每個發明必須有簡潔而清晰的記錄支持。該文件必須顯示簡明扼要的發明步驟。

4.2.4 Documents must include one poster and one engineering journal (see the Engineering Journal document for more details). Teams are expected to be readily prepared to explain about their work.
文件必須包括一張海報和一張工程日誌(詳情見工程日誌文件)。隊伍需隨時準備會被要求解釋有關他們的作品。

4.2.5 Engineering Journal should demonstrate your best practice in your development process.
工程日誌應展示你於研發進程中的最佳實踐。

4.2.6 The poster must include:　海報必須包括：
- Identification of your team such as team name, league, country, etc. 隊伍識別例如隊名、聯盟、國家等。
- Important aspects of your hardware/software design　硬體/軟體設計的重要方面

You may also include additional information of your interest, such as:　你可包括你感興趣的額外資料如：
- Interesting or unusual features of the robot;　機械人有趣或獨特的特徵；
- Images throughout your teams development, etc.　整個隊伍進展的圖片等。

4.2.7 Guidelines may be provided at the official RCJ website under Rescue rules (Engineering Journal document).
指引可在RCJ官方網站救援規則下(工程日誌文件)提供。

4.3 Awards　獎項

4.3.1 Awards may be divided into several categories. 獎項可能劃分成幾個類別。
a) Innovation:　革新
- Mechanical innovation　機械革新
- Electronic innovation　電子革新
- Algorithm innovation　運算法則革新

b)Robust Design:　健全的設計
- Mechanical design　機械設計
- Electronic design　電子設計
- Algorithm design　運算法則設計

c) Team work – demonstration of great collaborations within the team.　團隊合作 – 展現隊伍內的通力協作。

d) Best Practice (in development) – demonstration of the best development practice from brainstorming, designing, prototyping, development, test plan, quality assurance plan, etc.
最佳實踐(於開發中) – 展現最佳開發實踐由集思廣益、設計、原型機製造、開發、測試計劃、以至質量保證計劃等。

4.3.2 Awards will be given in the form of certification.
獎項將以證書形式頒發。

4.4 Sharing　分享

4.4.1 Teams are encouraged to review other's posters and presentations.
鼓勵隊伍評閱其他隊伍的海報和報告

4.4.2 The awarded teams are required to post their documents and presentation at the International RCJ Community Forum (http://www.rcjcommunity.org/)
獲獎隊伍會被要求刊登他們的文件及報告到國際RCJ社區論壇(http://www.rcjcommunity.org/)。

5. Conflict resolution　衝突排解

5.1 Referee and Referee Assistant　裁判及助理裁判

5.1.1 All decisions during game play are made by the referee or the referee assistant who are in charge of the arena, persons and objects surrounding them.
比賽進行期間， 由裁判或負責場地和場地周圍的人和物體的助理裁判作出所有決定。

5.1.2 During game play, the decisions made by the referee and/or the referee assistant are final.
比賽進行期間，以裁判和助理裁判的決定作為最終決定。

5.1.3 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.
比賽結束時，裁判會要求每隊隊長在計分紙上簽名，隊長有最多一分鐘的時間檢閱計分紙及簽名。簽名表示隊長代表整支隊伍接受最終分數；如需要進一步闡明，隊長剛應在計分紙上寫上註釋及簽名。

5.2 Rule clarification　規則闡明

5.2.1 If any rule clarification is needed, please contact the International RoboCupJunior Rescue technical Committee through the International RCJ Community Forum (*http://www.rcjcommunity.org/*)
如需任何規則闡明，請透過國際RCJ社區論壇（網止：*http://www.rcjcommunity.org/*）聯絡國際RoboCupJunior救援技術委員會。

5.2.2 If necessary even during a tournament, a rule clarification may be made by members of the RoboCupJunior Rescue Technical Committee and Organizing Committee.
在比賽期間，如有必要， 規則闡明可以由RoboCupJunior救援技術委員會及組織委員會的成員執行。

5.3 Special circumstances　特殊情況

5.3.1 If special circumstances, such as unforeseen problems or capabilities of a robot occur, rules may be modified by the RoboCupJunior Rescue Organizing Committee Chair in conjunction with available Technical Committee and Organizing Committee members, if necessary even during a tournament.
比賽期間，如有特殊情況，例如意料之外的問題或機械人的能力問題出現， 規則有可能由RoboCupJunior拯救組委員會主席配合技術委員會和大會委員會成員作出修改。

5.3.2 If any of team captains/mentors do not show up to the teams meeting to discuss the problems and the resulting rule modification described at 5.3.1, it is considered as an agreement.
如任何隊長或教練沒有出席隊伍會議，對於會議中所討論的問題或任何規則的修改（見5.3.1)，則被視為同意。

6. Code of Conduct　操守準則

6.1 Spirit 比賽精神

6.1.1 It is expected that all participants (students and mentors alike) will respect the aims and ideals of RoboCup Junior as set out in our mission statement.
所有參加者(學生和教練)應尊重RoboCup Junior宗旨上所述的目標和理念 。

6.1.2 The volunteers, referees and officials will act within the spirit of the event to ensure the competition is competitive, fair and most importantly fun.
義工、裁判和工作人員會遵從活動的精神以確保比賽是公平競爭、 和參賽者享受過程。

6.1.3 *It is not whether you win or lose, but how much you learn that counts!*
比賽的意義不重於輸贏，重於學習！

6.2 Fair Play　公平比賽

6.2.1 Robots that cause deliberate or repeated damage to the arena will be disqualified.
如有機械人故意或重複損壞比賽場地， 該組將被取消比賽資格 。

6.2.2 Humans that cause deliberate interference with robots or damage to the arena will be disqualified.
如有故意干擾其他機械人損壞比賽場地，肇事者將被取消比賽資格。

6.2.3 It is expected that the aim of all teams is to participate fairly.
所有參賽隊伍皆應以公平比賽為目標。

6.3 Behavior　行為

6.3.1 Participants should be mindful of other people and their robots when moving around the tournament venue.
參加者在比賽場館行走時，應留意其他人和他們的機械人。

6.3.2 Participants are not allowed to enter setup areas of other leagues or other teams, unless explicitly invited to do so by team members.
除非明確地獲得其他隊伍隊員的邀請，否則參加者不得進入其他聯盟或其他隊伍的設置區域。

6.3.3 Teams will be responsible for checking update information (schedules, meetings, announcements, etc.) during the event. Update information will be provided on notice boards in the venue and (if possible) on the local competition website and/or the RoboCup or RoboCupJunior websites.
活動期間，參賽隊伍有責任留意比賽的最新消息(如賽程表、會議、宣佈等)，最新消息將會在場館內的告示板上公佈，以及(如可能)在地區比賽的網頁及/或RoboCup或RoboCupJunior的網頁公布。

6.3.4 Participants who misbehave may be asked to leave the building and risk being disqualified from the tournament.
任何行為不端的參加者可能被要求離開會場或被取消參賽資格。

6.3.5 These rules will be enforced at the discretion of the referees, officials, tournament organizers and local law enforcement authorities.
這些規則將會由授權的裁判、工作人員、賽事舉辦者和地方當局嚴謹執行。

6.4 Mentors　教練

6.4.1 Adults (mentors, teachers, parents, chaperons, translators and other adult team members) are not allowed in the student work area.
成人(包括教練、教師、父母、同伴、翻譯員和其他的成人組員)禁止駐足於學生工作區域。

6.4.2 Sufficient seating will be supplied for mentors to remain in a supervisory capacity close to the student work area.
大會將於學生工作區域附近提供足夠座位給教練，以便監督和指導。

6.4.3 Mentors are not permitted to repair robots or be involved in programming of their team's robots.
大會不允許在場教練修理機械人或參與編寫程式。

6.4.4 Mentor interference with robots or referee decisions will result in a warning in the first instance. If this recurs, the team will risk being disqualified.
教練干擾機械人或裁判的決定，首犯者會被警告處分，再犯則取消該隊比賽資格。

6.4.5 Robots have to be mainly students' own work. Any robot that appears to be identical to another robot may be prompted for re-inspection.
機械人主要需由學生自己製作。任何機械人與另一機械人看似相同，可能會被要求重新檢查。

6.5 Ethics and Integrity 道德和正直

6.5.1 Fraud and misconduct are not condoned. Fraudulent acts may include the following:
大會不會縱容欺詐和不當行為。欺詐行為可能包括以下內容：

a) Mentors working on the software or hardware of students' robot(s) during the competition.
比賽期間教練修理或改善學生的機械人軟件或硬件。

b) "Higher league group" and/or more advanced group of students may provide advice, but should not do the work for "Lower league group". For example, a secondary group helped to fix its peer primary group's work, software or hardware prior to and/or during the competition. This may risk the secondary group to be disqualified as well. See "Code of Conduct, 6.4.3 & 6.4.5". This applies not just to mentors, but also to higher league (advanced) group of students as well.
屬於"較高級聯賽組別"和/或較高級的學生隊伍可提供意見，但不應為較低級聯賽組別提供協助。例如，比賽之前或期間，中級組幫助解決初級組的工作，軟件或硬件，可能會導致中級組同被取消資格。見 行為守則的6.4.3 及 6.4.5。這不僅適用於教練，較高級聯賽(高級)組別的學生一樣適用。

6.5.2 RoboCupJunior reserves the right to revoke an award if fraudulent behavior can be proven after the awarding ceremony took place.
頒獎典禮舉行後，如有欺詐行為被證實，RoboCupJunior保留權利撤銷獎項。

6.5.3 If it is clear that a mentor intentionally violates the code of conduct, and repeatedly modifies and works on the students' robot(s) during the competition, the mentor will be banned from future participation in RoboCupJunior competitions.
比賽期間，如教練顯然故意違反行為守則，並在比賽期間重複修改和改善學生的機械人，該教練將被禁止參與未來舉辦的RoboCupJunior比賽。

6.5.4 Teams that violate the code of conduct can be disqualified from the tournament. It is also possible to disqualify only a single team member from further participation in the tournament.
隊伍違反行為守則可被取消比賽資格。亦有可能是取消隊伍中某一成員繼續比賽的資格。

6.5.5 In less severe cases of violations of the code of conduct, a team will be given a warning. In severe or repeated cases of violations of the code of conduct, a team can be disqualified immediately without a warning.
在違反行為守則不太嚴重的情況下，隊伍會被給予警告。在嚴重或反復違反行為守則的情況下，隊伍會立即被取消資格而無須警告。

6.6 Sharing 分享

6.6.1 The spirit of world RoboCup competitions is that any technological and curricular developments should be shared with other participants after the tournament.
世界RoboCup比賽的主導精神是在比賽後， 與其他參加者分享任何技術增長和課程發展。

6.6.2 Any developments may be published on the RoboCupJunior website after the event.
所有的進展均於比賽後，公佈於 RoboCupJunior 的網站上。

6.6.3 Participants are strongly encouraged to ask questions to their fellow competitors to foster a culture of curiosity and exploration in the fields of science and technology.
大會鼓勵參加者互相發問，以促進在科技領域上的求知和探索的文化。

6.6.4 This furthers the mission of RoboCupJunior as an educational initiative.
提倡分享的做法推進了RoboCup Junior 作為一項教育倡議的使命。

Note: The English version of these rules shall prevail wherever there is a discrepancy between the English and the Chinese versions.
注意：本賽規的中英版文本如有歧義，一概以英文本為準。