RoboCupJunior Rescue B 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 human to reach the victim! Your team has been given the most difficult tasks. It must be able to carry out the rescue mission is 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. The robot needs to seek out the victims, dispense rescue kit, and signal the position to the rescuers so the humans can take over.

由人類到達遇難的場地簡直是太危險了！你的隊伍已被給予最困難的任務。它必須能夠執行拯救的使命且是完全自治的模式，無需人為幫助。機械人必須是足夠強悍和聰明去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。機械人需要找出遇難者，分發救援包，和向救援人員發出位置信號，以便人類能夠接管。

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

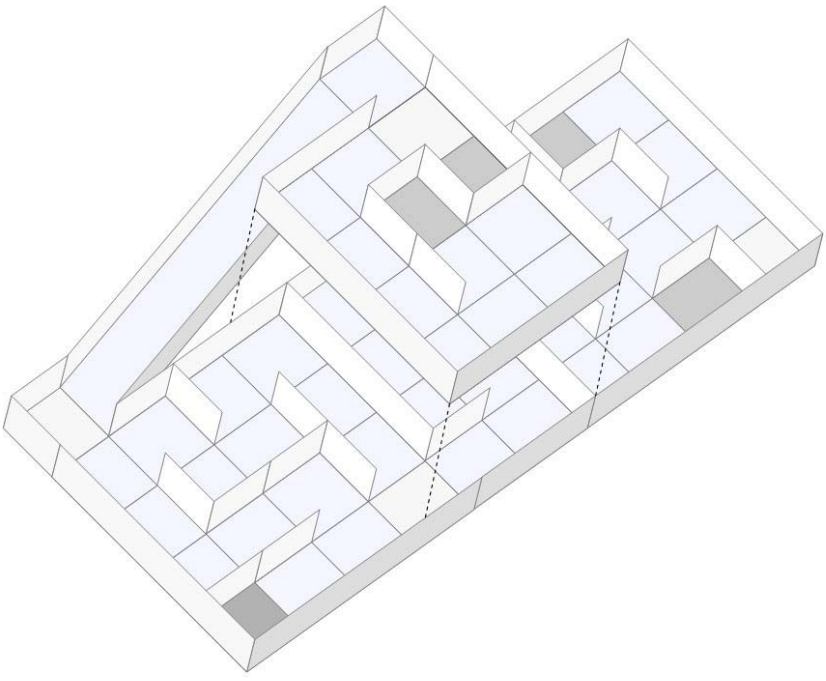
時間和技術技能都是非常重要！快來準備成為必勝的救援響應隊伍。

Differences from Rescue A　與拯救A的分別

There is no line on the floors of Rescue B arena. Instead, the robot must search inside of a labyrinth on its own. The paths in the labyrinth may vary between competition rounds (the walls inside will be repositioned each round). Also, there are more than one victim inside of Rescue B arena. The robot needs to signal where they are, but does not have to rescue the victims.

拯救B場沒有軌跡在地板上。相反，機械人必須在迷宮中自己搜索。迷宮中的路徑會隨比賽的回合改變(每回合牆將重新設置)。並且，多於一個遇難者在拯救B場內。機械人需要標記出他們的位置，但不能拯救他們。

Rescue-B



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1. Arena　場地

1.1. Description　描述

1.1.1 The maze may consist of different floors. Each floor is horizontal.
迷宮可以由不同的樓層構成。各個樓層是水平的。

1.1.2 Different floors of the maze will be connected by a ramp with an incline of maximum 25 degrees from the horizontal surface. The ramp is always straight.
迷宮的不同樓層將由一個斜坡連接，斜坡的斜面與水平面的夾角最大為25度。斜坡總是直的。

1.1.3 Walls that make up at least 15 cm high. Walls will be a light color (white, or close to white).
牆最少高15厘米。牆身是淺色的（白色或接近白色的）w 。

1.1.4 Doorways and ramps are at least 30 cm wide with +/- 2cm variation.
門口和斜坡的牆最少闊約30厘米，並容許+/- 2厘米的偏差。

1.2 Floor　地板

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.
地板為白色或接近白色的色調。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 Through the arena, there may exist black tiles that represent “no go” spaces. Black tiles will be placed randomly at the start of each round (see 3.3.7). Black tiles may not be completely fixed on the floor.
穿越整個賽場時，黑色階磚塊的存在表示”不可進入”的空間。黑色階磚塊將於每個回合開始時被隨機擺放(see 3.3.7)， 可能不是完全固定於地板上。

1.2.3 There may also exist silver tiles that represent checkpoints (see 3.6.2). Silver tiles may not be completely fixed on the floor.
銀色階磚塊的存在代表檢查點(見3.6.2)，可能不是完全固定於地板上。

1.2.4 A tile is defined as a 30x30 space, which is aligned to the grid made up by the walls with +/-2 cm variation.
階磚塊被界定為一個30×30的空間，這與由壁組成的網格相一致，並容許+/- 2cm的偏差。

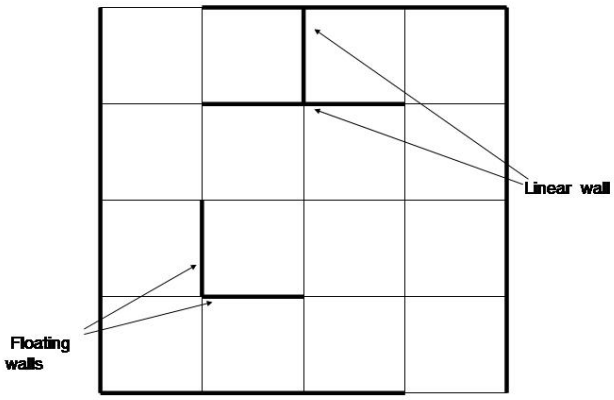
1.3 Path　路徑

1.3.1 Walls may or may not lead to the entrance/exit. Walls that lead to the entrance/exit are called linear walls. The walls that do NOT lead to the entrance/exit are called “Floating Walls”.
不是所有牆能引路至入口/出口。引路至入口/出口的牆稱作線性牆；不能引路至入口/出口的牆稱作”流動牆”。

1.3.2 Paths will be approximately 30cm wide with +/-2cm variation, but may open into foyers wider than the path.
路徑闊約30厘米並容許+/-2厘米偏差，但可能被打開變成比路徑寬闊的門廳。

1.3.3 One of the outermost tiles is the starting tile, where a robot should start and exit the run. This may be on the second floor but not on the ramp.
其中一個最外面的磚塊是起始磚塊，這是機械人開始和退出回合的地方。這可能是在第二層上但不會在斜坡。

1.3.4 The starting tile is always a checkpoint.
起始磚塊經常會作為一個檢查點。



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. Robots are expected to navigate around Obstacles. Obstacles that are moved/knocked over will remain where they fall and will be reset only once the robot has completed its scoring run.
障礙物可能為磚塊、積木、重物及其他大和重的物品。機械人應繞過障礙物。被移動/打翻的障礙物，將繼續倒下，只有機械人完成得分回合後才會重設。

1.4.5 Obstacles, when used, will never prevent the robot from discovering routes in the maze.
障礙物不會妨礙機械人在迷宮中發現路線。

1.4.6 The obstacles will have a maximum height of 40 cm and a width of 20 cm. Their shape can be everything from rectangular to cylindrical.
障礙物最高為40厘米和最闊20厘米，可以是由矩形至圓柱形的不同形狀。

1.4.7 The obstacles can only be placed in foyers with at least 20 cm to the nearest walls.
障礙物只會放在門廳並與最近的牆最少有20厘米的距離。

1.5 Victims　遇難者

1.5.1 Victims are heated sources located near the floor of the arena (centered approximately 7 cm above the floor).
遇難者的發熱源放置於接近賽場地板位置(其中心距離地板約7厘米)。

1.5.2 Each victim has a surface area greater than 25 sq cm.
每個遇難者表面積大於25平方厘米。

1.5.3 The organizers will try to keep enough difference (minimum of 10 degrees) between victims' temperatures and the indoor temperature. The temperature of victim simulates human body temperature between 28C to 40C.
大會將盡量使遇難者的溫度和室內的溫度保持足夠的差異(最少10度) 遇難者的溫度模擬人體溫度於28C至40C之間。

1.5.4 There will be a minimum of five (5) active victims in any round.
任何回合最少有五個起作用的遇難者。

1.5.5 There may be objects that resemble victims in appearance, but are not heated. Such objects are not to be identified as victims by robots.
可能會有外觀類似遇難者的物件，但不是熱的。這些物件不應被機械人識別為遇難者。

1.5.6 Victims will never be located on black tiles or on tiles with obstacles.
遇難者不會被放置在黑色的階磚塊或有障礙物的階磚塊。

1.6 Rescue Kits 救援包

1.6.1 A Rescue Kit represents a basic health package distributed to a victim caught in a natural disaster. It symbolizes tools or devices used in rescue process, such as GPS Transponders or even something as simple as providing light source.
救援包代表分配給遇上自然災害的遇難者的一個基本醫療包。這象徵著於救援過程中使用的工具或設備，如GPS轉發器，甚至簡單至一些提供光源的東西。

1.6.2 A Rescue Kit should preferably contain a lit-up LED, but could contain other electronics, weights or magnets.
救援包最好含有一個點亮的LED，但可以包含其他的電子器件，砝碼或磁鐵。

1.6.3 Each rescue kit must have a minimum volume of 1 cubic cm.
每個救援包的體積必須最小有1立方厘米。

1.6.4 Each team could only carry up to a maximum number of 12 of those kits.
每隊伍僅可攜帶最多12個救援包。

1.6.5 Some sample instructions for creating the rescue lit-up kit can be found the end of this document, and may be found at the International RCJ Community Forum (http://www.rcjcommunity.org/). Each team is encouraged to design their own versions.
製作可點亮救援包的一些示例說明可於文件的末端找到，及可能於國際RCJ社區論壇(http://www.rcjcommunity.org/)找到。鼓勵每隊設計他們自己的版本。

1.6.6 Each team is responsible for the whole rescue kits system (the maximum of 12 kits), including bringing the rescue kits to the competition. Team captain is responsible for loading their own Rescue Kits on their robots and cleaning the field with the referee's/judges' authorization after the game is called to complete.
每個隊伍負責整個救援包系統(共最多12個)，包括帶同救援包往比賽。隊長負責加載他們自己的救援包至他們的機械人上，及比賽結束後在裁判的授權下清潔場地(拾回救援包)。

1.7 Environmental Conditions 環境條件

1.7.1 Teams should expect the environmental conditions at a tournament to be different from the conditions of at their home practice field.
隊伍應預期比賽的環境條件，有別於他們作自家練習場地的條件。

1.7.2 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。

1.7.3 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。

1.7.4 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)

1.7.5 Teams should prepare their robots to handle unexpected 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 interferences 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。

1.7.6 The Organizing Committee (OC) will try their best to fasten the walls onto the field floor so that the impact from regular robot's contact should not affect it. (Refer to 6.1)
組織委員會(OC)將會盡力以固定的牆在地板，所以正常的機械人接觸不應構成影響。(參見 6.1)

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 Robots may utilize various maze navigation algorithm. Pre-mapped type of dead-reckoning is prohibited.
機械人可以利用各種迷宮導航算法，禁止所有預先繪製地圖類型的航位推算。

2.1.4 The robot 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。

2.1.5 Robots should include a stop/pause button so they may be easily stopped/ paused by humans to avert any potentially damaging or illegal robot actions
機械人應包括一個停止/暫停按鈕，使人們可以很容易地把它們停止/暫停下來，以避免任何潛在的破壞或違規的機械人行為。

2.2 Construction　構造

2.2.1 The height of a robot must not exceed 30 cm.
機械人高度不能超出30厘米。

2.2.2 Robots may not have any sensor or other device that enables it to 'see' over the walls.
機械人不可有任何容許它的視野高於牆壁的傳感器或其他裝置。

2.2.3 Any robot kit or building blocks, either available on the market or built from raw hardware and materials, may be used, as long as the design and construction 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)。

2.2.4 Any commercially produced robot kits or sensors components that are specifically marketed to complete any single major task of RoboCupJunior Rescue will be disqualified. If there is any doubt, teams should consult the Technical committee (TC) at the International RCJ Community Forum (*http://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。

2.2.5 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。

2.2.6 Bluetooth Class 2,3 and ZigBee communications are the only wireless type allowed in RoboCupJunior. Robots that have other types of wireless communication on board have to be either removed or disabled for possible interference with other leagues competing in RoboCup. If a robot has equipment for other forms of wireless communication, they must prove that they have been 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。

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

2.3.3 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 。

2.3.4 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

2.3.5 The number of team members per team is not limited but a 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-round Practice 賽前練習

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 Humans 隊員

3.2.1 Teams should designate one of its own team members as 'captain' and another one as 'co-captain'. Only these two team members will be allowed an access to the practice/competition arenas, unless otherwise directed by the referee. Only the 'captain' will be allowed to interact with the robot during a scoring run.
隊伍應委派自己隊伍的其中一名成員為'隊長'和另一成員為副'隊長'。 除非裁判另有指示，否則只允許這兩名成員進入練習/比賽賽場。得分回合期間只允許隊長可與機械人互動。

3.2.2 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。

3.2.3 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。

3.2.4 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 開始比賽

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 Once the run has begun, the robot playing is not permitted to leave the competition area for any reason. Each run lasts a maximum of 8 minutes.
比賽一旦開始，不論任何理由機械人不得離開比賽場區。每輪比賽最多為8分鐘。

3.3.3 Calibration is defined as the taking of sensor readings and modifying a robot's programming to accommodate such sensor readings. Once the clock has started, a team may calibrate their robot in as many locations as desired on the arena, but the clock will continue to count down. A robot is not permitted to move while calibrating.
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。計時一旦開始，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。

3.3.4 Calibration time is not for pre-mapping the arena and/or victim location. Pre-mapping activities will result in immediate robot disqualification for the round.
校準時間不是用作預先繪製賽場地圖或遇難者位置。 預先繪製的地圖將會被取消該回合比賽資格。

3.3.5 Before a scoring run begins, a dice will be rolled to determine the location of the black and silver tiles. The position of the black tiles will NOT be revealed to the team until when they are ready to start a scoring run (see 3.3.6). Referees will ensure the combination of black tile placement result in a maze is 'solvable' before a robot begins a scoring run.
得分賽開始前，將擲骰子決定黑色和銀色階磚塊位置。黑色階磚塊位置將不會被透露，直至隊伍準備開始得分賽(見3.3.6)。機械人於得分賽開始前，裁判將確保迷宮中的黑色階磚塊位置組合'是可解決的'。

3.3.6 Once the robot is started, the referee will place the black tiles and tiles (determined by roll of dice as per 3.3.5).
機械人一旦被啟動，裁判將放置黑色階磚塊和其他階磚塊(根據3.3.5，由擲骰子決定)。

3.3.7 Once a scoring run has begun, no more calibration is permitted (this includes changing of code/code selection).
得分賽開始後不再允許任何校準。(包括轉換代碼或代碼選項)。

3.4 Game play　比賽過程

3.4.1 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。

3.4.2 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。

3.4.3 The teams are not allowed to give a robot any advance information about the field. The robot is supposed to recognize the field by itself.
參賽隊伍不可預先將有關賽場的資料給予機械人。機械人應該是自行識別賽場。

3.4.4 A 'visited tile' means that more than half of the robot is inside the tile when looking down from above.
「已到訪階磚」意指當機械人從上向下看的時候，有一半以上的機身已進入階磚　。

3.5 Scoring　得分

3.5.1 Successful Victim Identification. Robots are rewarded points for each Successful Victim Identification in the arena:
成功辨識遇難者。機械人於賽場內成功辨識每個遇難者可獲得分。

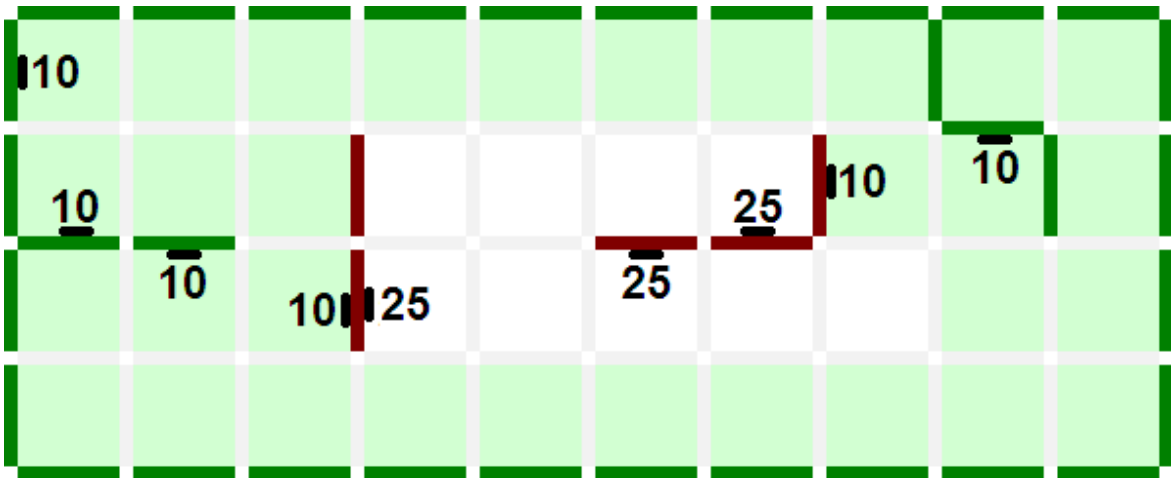
a)10 points per "victim" located at a tile adjacent to a linear wall (even diagonally),
每個當被放置在線性牆毗鄰的階磚塊(甚至斜線)的遇難者10分。

b) 25 points per "victim" at other walls.
每個在其他的牆時遇難者25分。

RoboCupJunior Rescue B Rules (2015)

Note: Changes from 2014 rules are highlighted in red.

Translated by RoboCupJunior Hong Kong



In the above diagram, red lines mean floating walls while the green ones represent linear walls.
於上圖，紅色線為流動牆，綠色線為線性牆。

Note that some of the victims on the floating walls are worth 10p, this is because the 10p victims are located in a tile near a linear wall. The colors on the diagram are just for illustrative purposes.
注意：部分在流動牆的遇難者只有10分，原因是該10分的遇難者身處的階磚塊與線性牆相鄰。示意圖上的顏色純粹為作為例證用途。

To identify a victim, a robot must stop within 15 cm of the victim while flashing a lamp on and off for five seconds, and/or release a Rescue Kit before moving on. When a robot completes both, it counts as one victim identification and one rescue kit deployment (see below).
辨識遇難者時，機械人必須停在遇難者15厘米的範圍內，接著閃燈5秒，和/或放下救援包後才繼續。完成這兩項的機械人才算是辨識了一個遇難者和配置一個救援包。

3.5.2 Successful rescue kit deployment. Robot should drop a rescue kit on the tile where the victim is, and the deployment point needs to be within 15 cm proximity of the victim. The robot is awarded 10 points per successful rescue kit deployment. No extra points for multiple kit deployments per victim.
成功配置拯救包。機械人應該把拯救包放在遇難者所在的階磚上，配置點需要在遇難者的15厘米範圍內。機械人每次成功配置拯救包可獲10點。對每個遇難者重複配置拯救包不會獲額外分數。

3.5.3 Reliability Bonus. Reliability bonus = the number of ‘successful victim' identification" x 10 + the number of ‘successful rescue deployment’ x 10, minus the number of ‘Lack of Progress’ x 10. However, Reliability Bonus score can only be reduced down to the minimum of 0 points.
可靠性分。可靠性分 = (「成功辨識遇難者」數目 x 10 + 「成功配置拯救包」數目 x 10) 減 「進展中斷」數目 x 10。然而可靠性分最多只會被扣至 0 分

3.5.4 Successful Speed Bump Crossing. For each passed tile with speed bumps, a robot is awarded 5 points.
成功跨越減速坡。每通過有減速坡的階磚，機械人可獲5分。

3.5.5 Successful Up Ramp Negotiation. A robot is awarded 20 points for a successful climb of the ramp. To successfully climb up the ramp, a robot needs to move from the flat tile before the ramp to the flat tile after the ramp.
成功攀上斜坡。成功攀上斜坡的機械人可獲20分。成功地攀上斜坡，機械人需要由斜坡底部平坦的階磚駛至斜坡頂部平坦的階磚。

3.5.6 Successful Down Ramp Negotiation. A robot is awarded 10 points for successfully landing at the bottom of the ramp. A robot needs to move from the top horizontal tile of the ramp to the bottom horizontal tile of the ramp. A successful landing means that the robot can leave the tile without assistance.
成功駛落斜坡。機械人成功著陸於斜坡的底部可獲10分。機械人需要由斜坡頂部水平階磚駛至斜坡底部水平的階磚塊。成功著陸意思是機械人在無需要人為協助下完成

3.5.7 Successful Checkpoint Negotiation. A robot is awarded10 points for each visited checkpoint. Refer to 3.4.4 for definition of visited tile.
成功通過檢查點。到訪每個檢查點，機械人可獲10分。參考3.4.4已到訪階磚的定義。

3.5.8 Successful Exit Bonus. A successful exit bonus is awarded when a robot successfully finishes a round on the start tile. It needs to stay there until judges approve that it is stationary. (This is to simulate the retrieval of a robot from the disaster zone.) The points awarded will be 10 points per victim successfully identified.
成功離開得分。當機械人成功完成回合並回到起始階磚可以獲得成功離開得分。機械人需要停留在此直至裁判認定機械人已靜止。(這模擬機械人從災難場回收。) 獲得的分數為每一個被成功辨識的遇難者獲10分。

3.5.9 Ties at the end. Ties in scoring will be resolved on the basis of the time each robot took to complete the run.
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。

3.5.10 No duplicate rewards. For example, if a robot successfully crosses a tile with speed bumps multiple times, only one Successful Speed Bump Crossing will be rewarded per tile. Same applies to all rewarding entries specified here.
沒有重複計分。例如，如果一個機械人成功地跨越有減速坡的階磚多次，只會對每個階磚給予一次成功跨越減速坡的分數。這同樣適用在所有可得獲分數的項目。

3.5.11 A score sheet template is provided on the official RoboCupJunior website.
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 進展中斷發生當

A) The team captain declares a Lack of Progress. 隊長宣佈進展中斷。

B) A robot fails to retreat from a 'visited' black tile, For a successful retreat it needs to back up without turning inside the black tile (it has to move straight backwards inside of a black tile). See definition of visited, 3.4.4.
機械人無法從已到訪的黑色階磚撤退。成功撤退的機械人需要後退而沒有往黑色階磚內轉向(這需要在黑色階磚內垂直倒車離開)。已到訪的定義見3.4.4。

C) The robot or a team member damages the arena.
機械人或隊伍成員損壞了賽場。

D) A team member touches the arena or their robot without permission from a referee.
隊員未得到裁判同意下，接觸賽場或機械人。

3.6.2 If a Lack of Progress occurs, the robot must be returned to the last visited checkpoint. The robot can be placed in any direction. Refer to 3.4.4 for definition of visited tile.
如發生進展中斷，機械人必須返回到上一個到訪的檢查點。機械人的放置可朝任何方向。(已到訪階磚的定義參見3.4.4)。

3.6.3 After a Lack of Progress the team captain may reset (turn on and off) the power supply and program. He is not allowed to change the program or give any information about the maze to the robot.
進展中斷後，隊伍可以重新啟動電源及程式，但不允許改變機械人程式或給予機械人有關迷宮的資料。


Reset


Power OFF & ON


Change program

3.7 End of Play　比賽結束

3.7.1 The team captain may declare an "end of round" if the team wants to stop the round early. The team will be awarded all points achieved up to the call for end of round.
隊長可以宣佈"回合結束"，如隊伍需要提前結束回合。隊伍將獲得於回合結束前，已獲得的分數。

3.7.2 The round ends when: 回合結束當：
A) The time expires. 時間耗盡
B) The team captain calls end of round. 隊長要求回合結束
C) The robot returns to the start tile and gets the exit bonus. 機械人折返起點階磚塊及獲得離開得分

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。

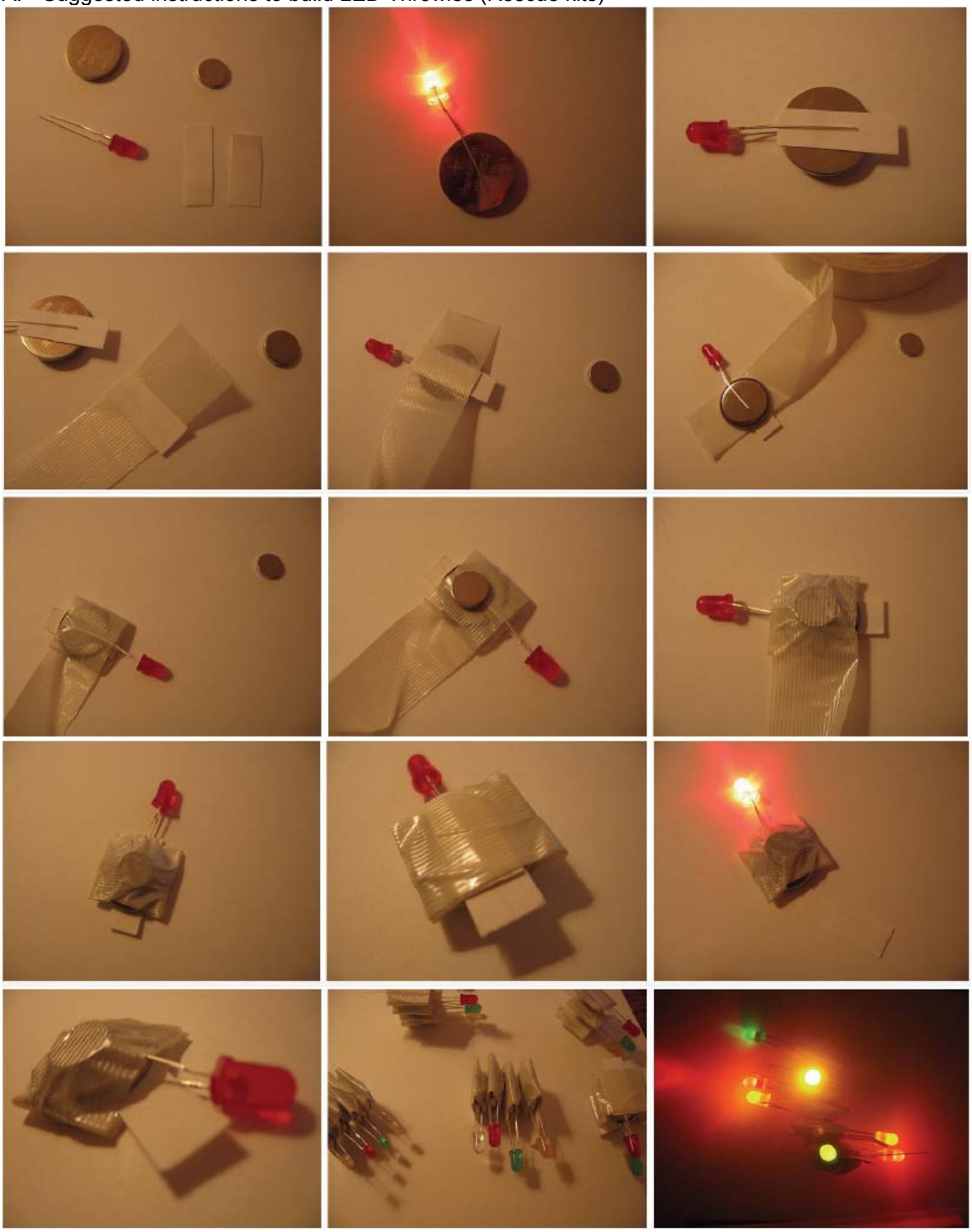
6.6.2 Any developments may be published on the RoboCupJunior website after the event.
所有的進展均於比賽後，公佈於 RoboCupJunior 的網站上。

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。

A. Suggested instructions to build LED Throwies (Rescue kits)



References

Joyce, A. (n.d.). *LED Throwies with On/Off Tab How--To.* Retrieved October 2013, from Flickr: http://www.flickr.com/photos/everythingdigital/sets/72057594069888500/