International Robotic Olympiad 2021

Land-based Robot Competition Rules (V1)

(Secondary School Division)

General Rules

Game Rules

1. Single motor category robots may use only one set of motor-gear box.
2. Multi-motor category robots may use more than two sets of motor-gear boxes, but only two sets of them for walking.
3. All contestants should wear uniform during the competition.
4. Name list of the student contestants cannot be altered without the Organizer's permission.
5. Contestants not accompanied by their instructors or teachers are not allowed to take part in the competition.
6. Instructors or teachers cannot enter the restricted area to instruct students to play the game.
7. Judges have the right to give warning or disqualify the contestants, instructors or teachers who do not obey the rules or the decision of the judges.
8. Only applications from half-day/whole-day formal Primary and Secondary Government schools, Aided/Direct Subsidized schools or Private schools will be accepted (non-tutoring centers or institutes). The responsible teachers must by employed by the respective schools.

Robot Rules

9. All participating robots may only move in walking mode except the bouncing robot.
10. Except for the servo motor robot group, all participating robots must use Tamiya70093 gear box (203.7:1, 58.2:1, 16.6:1) and its matching motor for competition. The gear ratio may only be adjusted in accordance to the manufacturer's instructions. Contestants are not allowed to modify the motor or the gear box in any way. Gearbox should be exposed and cannot be sealed. Transparent materials must be used if gear box is to be sealed. Before and after the game, sealed gear box must be disassembled for checking.
11. Prior to the matches, all participants must submit their robots for inspection by the judges. These robots are then kept in a designated location. When the matches begin, participants may take their robots away from the designated location to the game field for competition. These robots must be returned to the same designated location after the competition. All these participating robots will then be sent to the testing center by the judges for motor performance check.
12. Participating robot and motor will be dissembled for further inspection if the performance of the motor is found exceeding that of the original motor. Participants will be disqualified if found not using original motor or additional devices are used for the competition and a three-year suspension penalty will be served to both the participants and their schools.
13. All motors must pass the power consumption check. The motor cannot consume more than 280mA when 3V supplied by the power regulator.
14. The weight of the robot means the total weight including all accessories and parts (including batteries).
15. Participating robots must comply with the dimensions, weights and specific requirements set by the Organizer.
16. All robots cannot add on electronic control devices not approved by the Organizer. All wireless devices must be able to alter frequency or channels. Participants must immediately change the frequency or channel of their transmitters found interfering others otherwise they would be disqualified for the competition. Participants are suggested to use 2.4G wireless control devices All approved models of electronic control accessories, wireless devices models and their suppliers would be announced on the website.
17. The competition aims to encourage participants to apply their science and technology knowledge to create and build their own robots. Through this process, their ability, skill set and experience of building robots will further be enhanced. As such, any commercial robotic kits available in the markets are not allowed to be used in the competition (except for Servo Motor Humanoid Robot Competition). Except for screws, nuts, washer and gear box, the mechanical parts (including

perforated plastic strip or metal strip) of the robots must be made by the participating students from raw materials themselves. No ready-made model nor toy be used as the major part of the robot. However, decorative accessories from ready-made toy components may be used but not exceeding 30% of the overall parts of the robot.

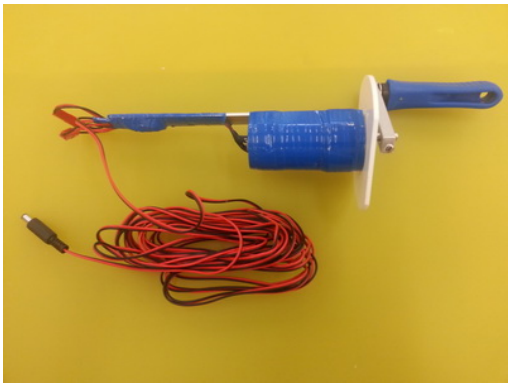
18. In the "Hand Generator Category Competitions", no more than two student contestants are allowed to operate the hand generator (attachment 1) and they can change at any time.
19. Pneumatic device cannot be used.

Other Points to Note

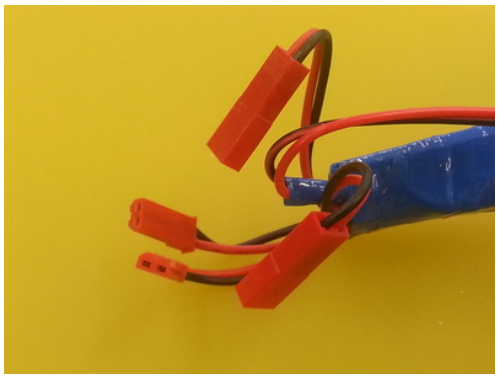
20. Except for specific competitions, participants should use the batteries (1.5V AA) provided by the Organizer in the International Competition. Participants will prepare their own batteries in the respective regional competitions.
21. All participants must use the hand generators (attachment 1) provided by the Organizer
22. Registration number of the robot must be engraved or printed with permanent ink on its chassis.
23. The Organizer may check robots on their design any time after registration. Units found not meeting specifications would be disqualified for the competition.
24. The Organizer reserves the right to use all participating items for marketing and publicity purposes.
25. Violation of the above rules would lead to immediate disqualification of the competition and its results.
26. Complaints must be submitted by the teacher within 30 minutes after the end of the competition.
27. The Organizer reserves the right to modify the game rules. Please visit our website regularly for updated games rules.

Hand Generator

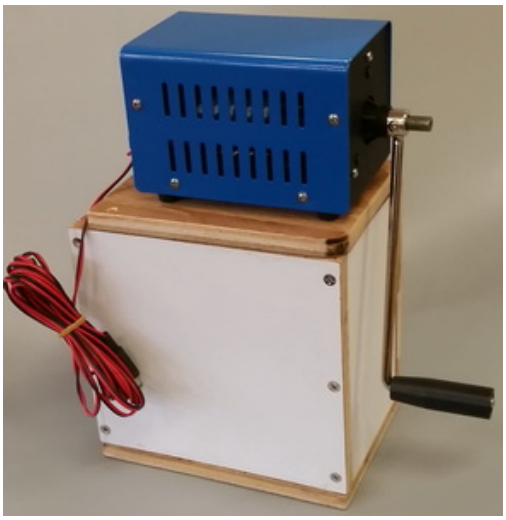
Attachment 1



Type 1 Generator: Hand Held Hand Generator

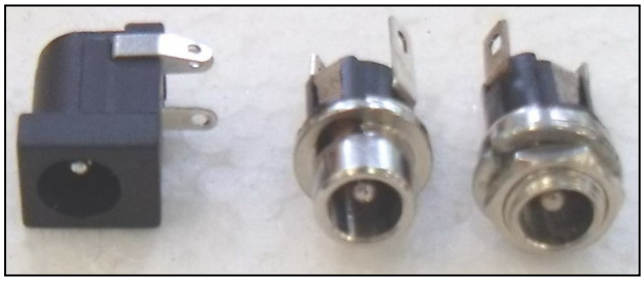


Switch the plugs to change the polarity and turning direction of handle

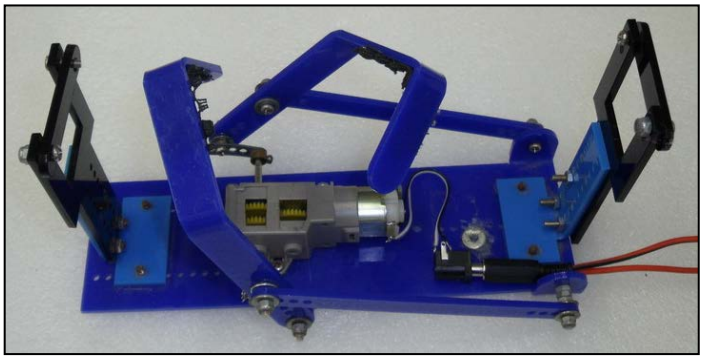


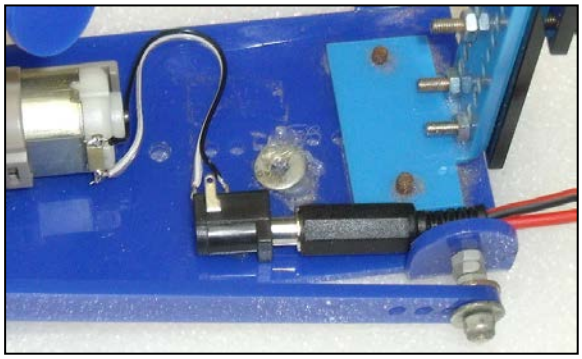
Type 2 Generator: Desktop Hand Generator

2.1mm plug and socket



Different types of 2.1mm socket





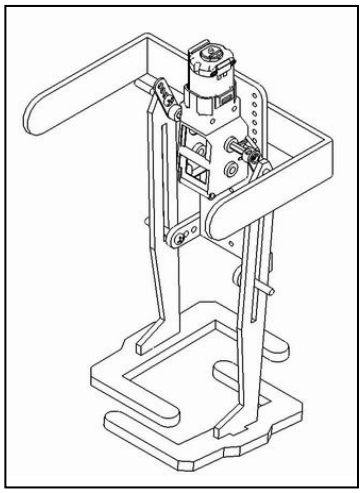
Each Single Motor Robot should be equipped with a 2.1mm socket for the plug of hand generator.

Individual Game Rules

Category A: Single Motor Robot (for students at Junior Secondary 2 or below)	
1.	Hand Generator 2 legs Robot Short Distance Run Competition
2.	Robot Horse Relay Competition
3.	Hand Generator Robot Sled Race
4	Hand Generator Robot Ladder Climbing Competition
5.	Hand Generator Robot Horizontal Bar Climbing Competition
6.	Hand Generator Triathlon Robot Relay Competition
7.	Hand Generator Single Motor Robot Appearance Design Competition
8.	Hand Generator Worm Robot Short Distance Run Competition
9.	Hand Generator Worm Robot Appearance Design Competition
Category B: Multi-motor Robot	
10.	Robot Boxing Competition
11.	Planet Exploration Competition
12.	Multi-motor Robot Appearance Design Competition
Category C: Wireless Controlled Robot	
13.	Robot Soccer Competition
14.	Robot Penalty shoot-out Competition
15.	Robot Basketball Competition
Category D: Servo Motor Robot	
16.	Multi-leg Servo Motor Robot Short Distance Run Competition
17.	C- shape Foot Two legs Servo motor Robot Short Distance Run Competition
18.	Interchange Centre of Gravity Two legs Servo motor Robot Short Distance Run Competition
19.	Humanoid Free Gymnastics Competition
20.	Humanoid Performance (Dance) Competition
21.	Servo Motor Robot Appearance Design Competition
22.	Heavyweight Humanoid Free Fighting Competition
23.	Lightweight Humanoid Free Fighting Competition
24.	Head Mounted Display Humanoid Obstacle Avoidance Competition
25.	Servo Motor Humanoid Robot - Super Brawl
26.	Servo Motor Humanoid Robot - Curling Race
27.	Servo Motor Humanoid Robot – Running Race
28.	Servo Motor Humanoid Robot - Relay Race
29.	Servo Motor Humanoid Robot – Soccer Race
30.	Servo Motor Humanoid Robot – Penalty Shoot-out Competition
31.	Servo Motor Humanoid Robot – Stair Walking Competition
Category E: Creative Design	
32.	Life Inspired Innovative Model Design competition

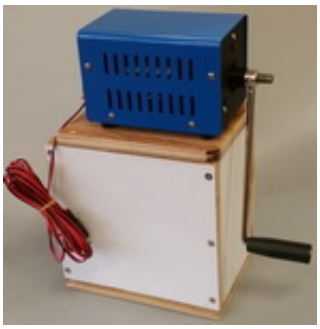
1. Hand Generator 2 Legs Robot Short Distance Run Competition

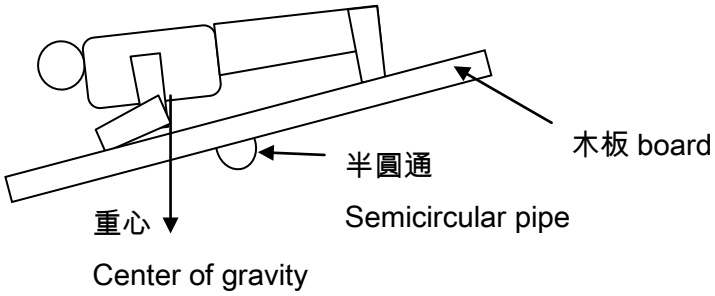
Robots compete for speed in this game. To protect the environment a hand generator (attachment 1) is used to provide power for the 2 legs robot instead of batteries. The robot that finishes 2M run with the shortest amount of time is the winner.

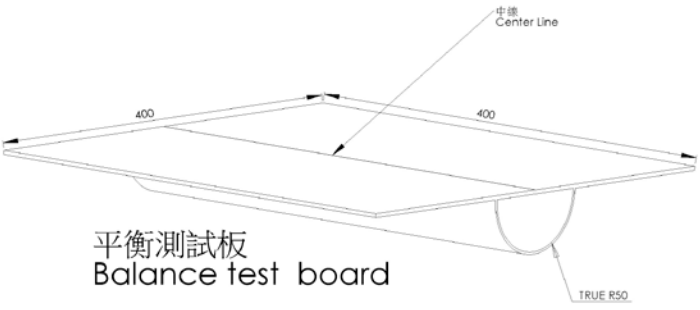


Robot Specification

1. The robot operates with single motor. Contestants must use the Desktop Hand Generator provided by the Organizer (*attachment 1*) to supply power to the robot. Hence, the robot must be equipped with a 2.1mm socket for connection of the Desktop Hand Generator.
2. The size of the robot cannot exceed 150mm long, 150mm wide and the height not less than 200mm (the length, width and height dimensions are not inter-changeable), nor overall weighs more than 500g.
3. The robot must complete the game in walking mode on 2 legs. No auxiliary parts of the robot can touch the ground except the 2 legs.
4. The robot cannot have any installation that will change its original dimension during competition.
5. The robot must pass the center of gravity test. The robot, with both arms curled in front of the body, is placed horizontally on a board with a semicircular pipe underneath. The center of gravity of the robot must be at the upper part of its body. That is the upper part of the robot's body slants down (see diagram below).

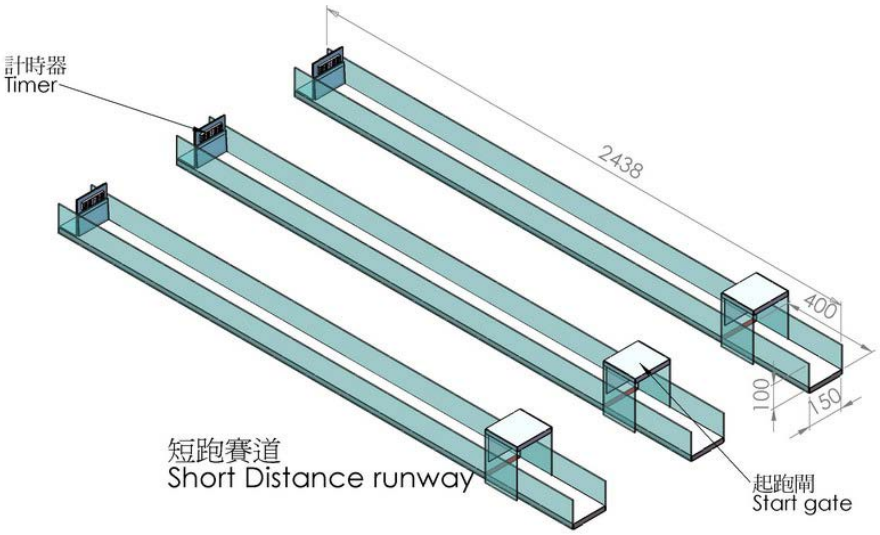






Game Field Specification

1. Level runway is used for the match. The track is 2000mm long. The start zone is 400mm long.
2. The runway has 3 tracks. Each track is 150mm wide.
3. A timer is placed at the end of each runway.



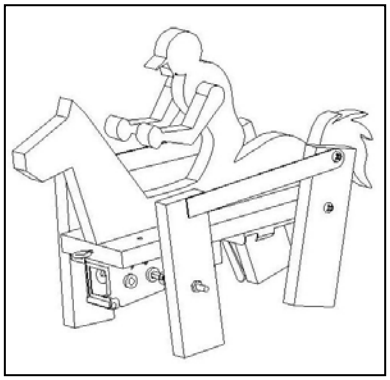
Game Rules

1. Each team plays twice and the best time is recorded. The team with the shortest amount of time to complete the game is the winner.
2. Contestants must use the Desktop Hand Generator (attachment 1) provided by the Organizer to supply power to the robot. Only the contestant himself/herself operates the Desktop Hand Generator and nobody is permitted to assist.
3. The wire of Desktop Hand Generator is long enough so that contestants must remain behind at the start zone. Moving along the runway with the robot is prohibited. Contestants may assign one student to help release the wire. Pulling the wire of Desktop Hand Generator is prohibited.
4. Contestant cannot touch the robot once it leaves the start zone. The competition is considered as incomplete if the robot stops moving or fails to reach the destination within the 30 seconds game time.

2. Robot Horse Relay Competition

4 legs robot horse relay competition is a team competition. The computer timer records the game time of the four robots in the team. The team with the shortest amount of total game time is the winner.

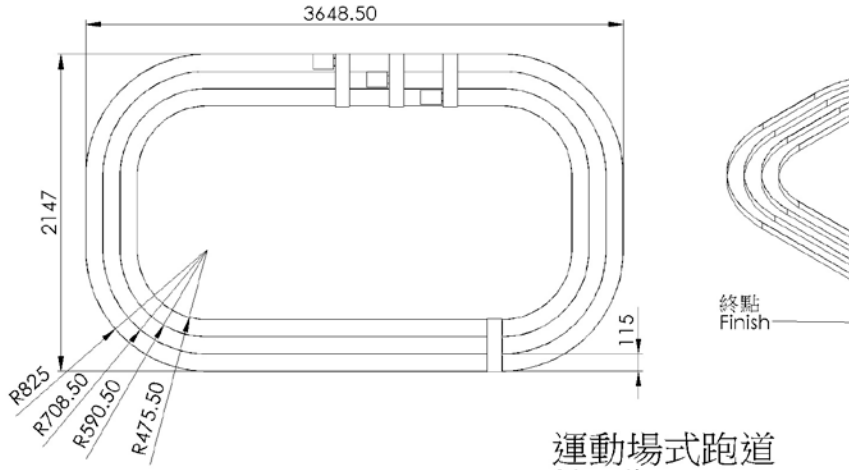
Robot Specification

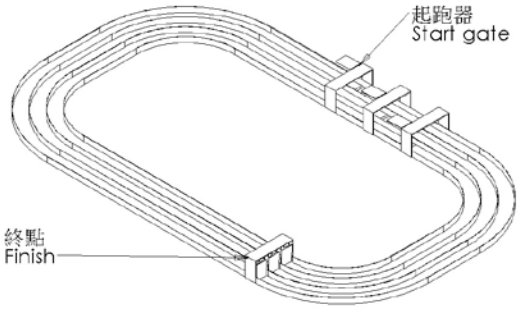


1. The robot operates with single motor and 2 pieces 1.5V AA alkaline batteries.
2. The size of the robot ***cannot*** exceed 200mm long, 110mm wide and 150mm tall (length, width and height dimensions are not inter-changeable), nor overall weighs more than 500g (including batteries).
3. The robot horse must have a horse appearance with a jockey and complete the game in walking mode.
4. The robot cannot have any installation that will change its original dimension during the competition.

Game Field Specification

1. The runway has 3 tracks. Each track is 115mm wide. The fence height is 45mm.
2. A 3648mm x 2147mm stadium runway is used for competition.





運動場式跑道
Stadium runway

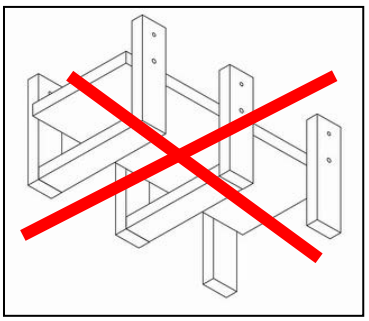
Game Rules

1. Contestants can choose to operate/place the robot before or after the gate is open.
2. The computer opens the gate and the timer begins to count. The gate will be closed automatically 3 seconds after the robot left the start gate. When the first robot arrives at the destination, the computer records the time and opens the gate to release the second robot. When the fourth robot arrives at the destination, the computer adds up the total amount of time. The team with the shortest amount of run time is the winner.
3. Contestants cannot touch the robot once it leaves the start gate until the game is over. The competition is considered as incomplete if the robot stops moving or fails to reach the destination within the 2 minutes game time.
4. Robots run in anti-clockwise direction.
5. Each team plays twice and the best time is recorded.

3. Hand Generator Robot Sled Race

This game primarily tests the strength of the robots. The robot is to move on a 4 leg walking mode. The robot that uses the shortest amount of time to pull the sled with a can of soft drink to the finish line is the winner.

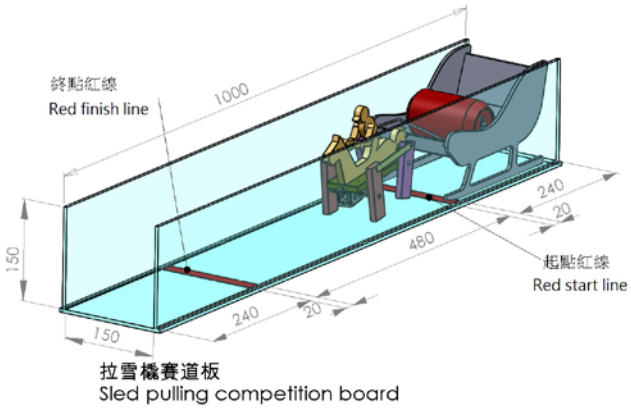
Robot Specification



1. The robot operates with single motor. Contestants must use the Desktop Hand Generator (attachment 1) provided by the Organizer to supply power to the robot. Hence, the robot must be equipped with a 2.1mm socket for connection to the Desktop Hand Generator.
2. The size of the robot cannot exceed 200mm long, 150mm wide and 150mm tall (length, width and height dimensions are not inter-changeable), nor overall weighs more than 500g.
3. A small hook or a screw with 3mm diameter and not less than 15mm long will be installed at the middle of the tail end of robot about 60mm-100mm above ground for connecting the sled wire.
4. The robot should move on 4 legs in walking mode. The area of the sole of the foot should not exceed 25mm x 50mm. Each foot should leave the ground as it walks. The robot cannot have any part touching the ground permanently. ***NO*** 6 legs walking robot structure (sample as shown in the figure on the right) be used.
5. The robot should be able to walk across an A-4 size paper. The part which touches the ground should not have high viscosity (that means it will not stick up a piece of 80g A4 typing paper for more than 3 seconds).

Game Field Specification

1. A sled pulling competition board is used. The board is 1000mm long x 150mm wide x 150mm tall.
2. The weight of the sled is 351g and the weight of a canned soft drink is 361g.



拉雪橇賽道板
Sled pulling competition board

Game Rules

1. The sled is placed with its legs close to the red start line. The judge signals the start of game. The robot that pulls the sled to the red finish line with the shortest amount of time is the winner. In case of draw, the lighter weight robot wins.
2. The game time is one minute. In case the robot fails to pull the sled to the red finish line within the game time, the distance covered is measured. In case of draw, the lighter weight robot wins.
3. The robot loses the game if it fails to move at the beginning or during the match.

4. Hand Generator Robot Ladder Climbing Competition

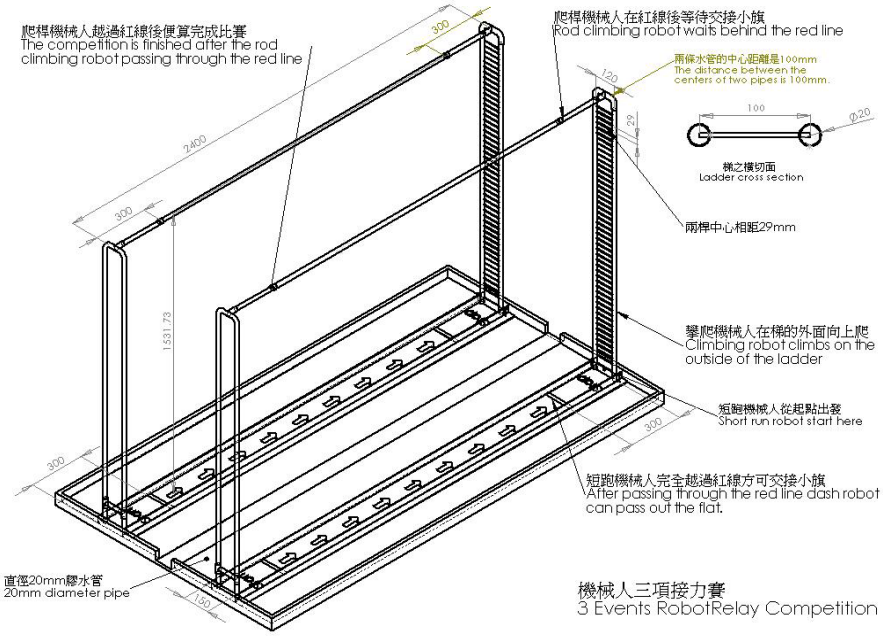
Participant is to build a ladder climbing robot for the competition. The robot that finishes the game with the shortest amount of time is the winner.

Robot Specification

1. The robot operates with single motor. Contestants must use the Hand Held Hand Generator (attachment 1) provided by the Organizer to supply power to the robot.
2. The size of the ladder climbing robot cannot exceed 300mm long, 150mm wide and 180mm tall (length, width and height dimensions are not inter-changeable). The gross weight of the robot cannot exceed 500g.
3. The robot cannot be powered by wheel actions (or rotate like a wheel) or auxiliary wheel.
4. The robot must be equipped with a 2.1mm socket for connection of the Hand Held Hand Generator.

Game Field Specification

1. A Triathlon Relay court is used. The maximum outer width of the ladder is 120mm and inner width is 80mm.
2. An easy hanging device should be designed for the ladder climbing robot. Contestants cannot pull out the ladder to place the robot.



Game Rules

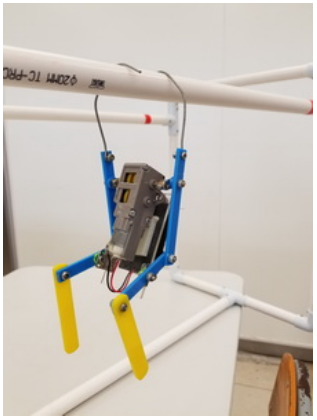
1. Each team may have a maximum of 2 members.
2. The game time is 1 minute. When the front end of the ladder climbing robot passes through the red line, the game ends.
3. Each team plays twice and the best time is recorded. The team with the shortest amount of game time is the winner.
4. If the robot fails to move during the match, it may retry from the starting point. There is no limit on the number of re-try.

5. Hand Generator Robot Horizontal Bar Climbing Competition

Participant is to build a horizontal bar climbing robot for the competition. The robot that finishes the game with the shortest amount of time is the winner.

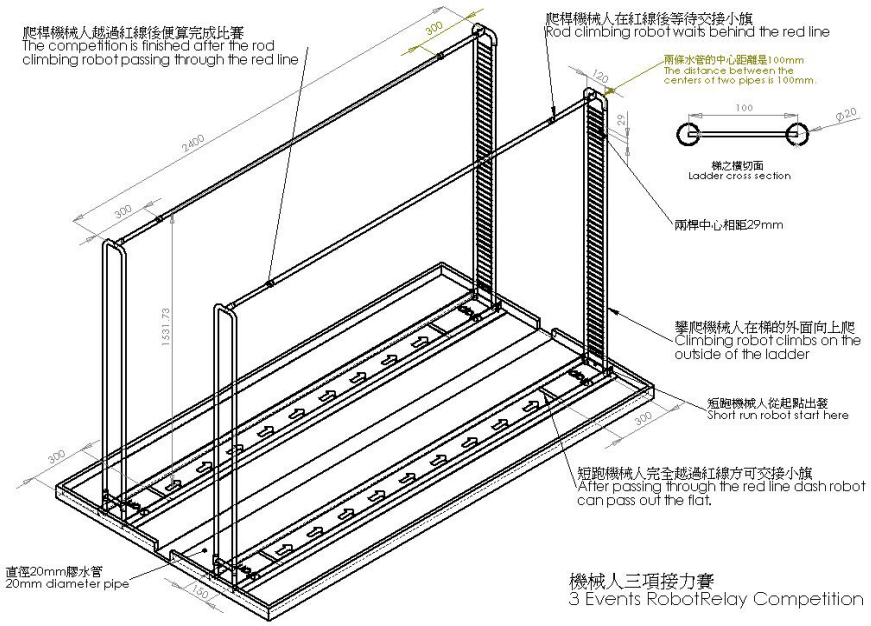
Robot Specification

1. The robot operates with single motor. Contestants must use the Hand Held Hand Generator (attachment 1) provided by the Organizer to supply power to the robot.
2. The size of the horizontal bar climbing robot cannot exceed 300mm long, 150mm wide and 180mm tall (length, width and height dimensions are not inter-changeable). The gross weight of the robot cannot exceed 500g.
3. The robot is to advance along the horizontal bar using the forearms only (in a 'hand-over-hand' movement) bringing the legs to swing. Except the two arms, the robot is not allowed to have any auxiliary support hanged on the bar or to use auxiliary wheels.
4. The robot must be equipped with a 2.1mm socket for connection of the Hand Held Hand Generator.



Game Field Specification

1. A Triathlon Relay court is used. An easy hanging device should be designed for the horizontal bar climbing robot. Contestants cannot pull out the horizontal bar to place the robot.



Game Rules

1. Each team may have a maximum of 2 members.
2. The game time is 1 minute. When the front end of the horizontal bar climbing robot passes through the red line, the game ends.
3. Each team plays twice and the best time is recorded. The team with the shortest amount of game time is the winner.
4. If the robot fails to move during the match, it may retry from the starting point. There is no limit on the number of re-try.

6. Hand Generator Triathlon Robot Relay Competition

This competition involves teams each formed by a set of 3 different robots racing in a triathlon relay. The team that finishes the competition with the shortest amount of time is the winner.

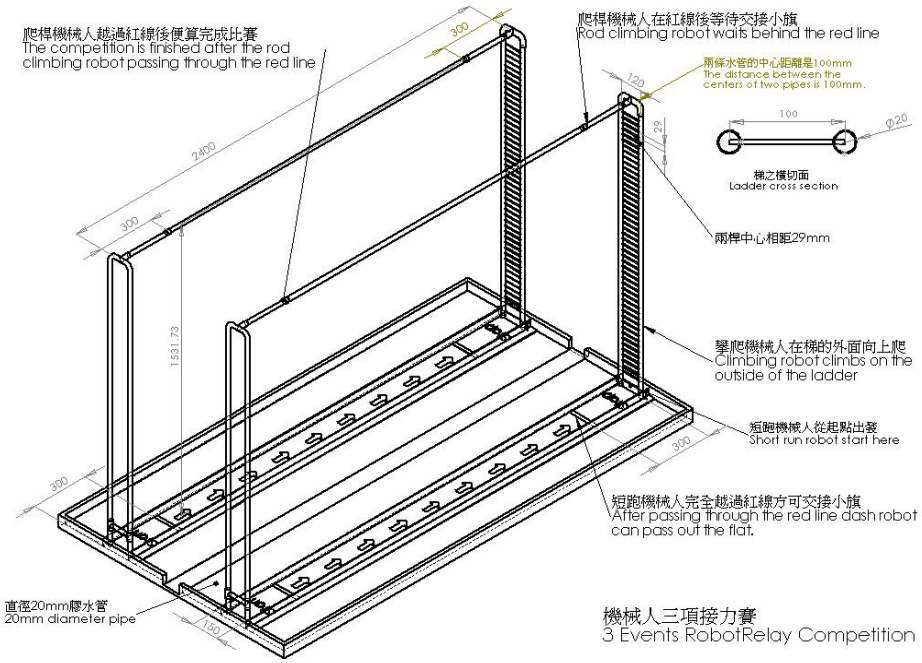
The first part is 2 legs robot short distance run; the second part is ladder climbing; the third part is horizontal bar climbing.

Robot Specification

1. Each robot operates with single motor. Contestants must use the Hand Held Hand Generator (attachment 1) provided by the Organizer to supply power to the robot. Only one Hand Held Hand Generator is used for all three robots.
2. Dimensions and weight of respective robots for this competition refer to the games rules on 2-leg robot short distance run, ladder climbing robot and horizontal bar climbing robot respectively.
3. The robot cannot be powered by wheel actions (or rotate like a wheel) or auxiliary wheel.
4. The plug of the Hand Held Hand Generator (attachment 1) is unplugged and transferred from one robot to the next during the relay hence each robot must be equipped with a 2.1mm socket for connection of the Hand Held Hand Generator.

Game Field Specification

1. A Triathlon Relay court is used. The maximum outer width of the ladder is 120mm and inner width is 80mm.
2. An easy hanging device should be designed for the ladder climbing robot and the horizontal bar climbing robot. Contestants cannot pull out the ladder and the top bar to place the robots.



Game Rules

1. Each team may have a maximum of 6 members.
2. The game time is 3 minutes. The first robot (2 legs short distance run robot) begins from the starting point. Once the front end of the first robot touches the red line at the end of the track, the plug of the Hand Held Hand Generator is unplugged and transferred to the second robot (the ladder climbing robot). The ladder climbing robot starts climbing up on the exterior of the ladder to the top. The plug of the Hand Held Hand Generator is unplugged and transferred to the third robot (the horizontal bar climbing robot) when the front end of the second robot passes through the red line. When the front end of the horizontal bar climbing robot passes through the red line, the game ends.
3. If the robot fails to move during the match, it may retry from the starting point of that particular race. There is no limit on the number of re-try.
4. Each team plays twice and the best time is recorded. The team with the shortest amount of time to complete the game is the winner.

7. / 12. Hand Generator Single Motor / Multi-motor Robot Appearance Design Competition

The robot appearance design competition encourages students' expression of creativity. The loose game rules allow more esthetic and creative approach to the design of robot appearance.

Competition Category

1. Single Motor Robot Category permits the use of single motor in the mechanism design. This category is only for Junior Secondary 2 students or below.
2. Multi-motor Robot Category permits the use of two or more motors in the mechanism design.
3. Each school may nominate up to two walking robots for each category in this competition

Game Rules

1. The participating robots may not take part in any other competitions.
2. Robots that took part in last year's competition cannot re-enter the same game this year.
3. The robot including its peripheral decorations cannot exceed 425mm X 300mm X 230mm (the length, width and height dimensions may be interchanged).
4. The robot under Single Motor Robot Category operates only with one set of motor-gear box and the power can only be supplied by the Hand Held Hand Generator.
5. The robot must be able to complete its basic maneuver.
6. The contesting student may submit an A4 size introduction on the design concept and features (annex 1) in the specified format. However, the contents must not reflect or imply in any way the name of contestant or school. No presentation is required on the day. Failure to comply may lead to disqualification of the item.

Evaluation Criteria

Appearance / Dynamics	Creativity	Production skills	Application of material	Total
25%	30%	25%	20%	100%

Annex 1

Hand Generator Robot Appearance Design Competition

Product Introduction

Category: *Single Motor* / *Multi-motor* Contest Registration No. : _____

Product Introduction :

Design concept:

Materials application:

Problems encountered:

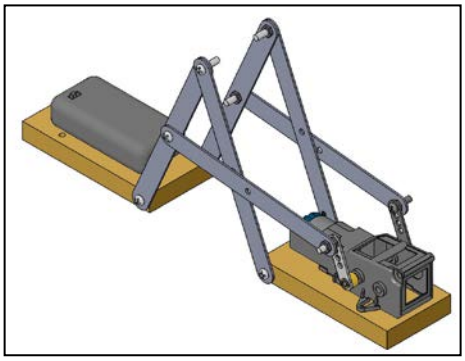
Solution:

Note: The content must not reflect or imply in any way the name of contestant or school. Failure to comply may lead to disqualification of the item.

8. Hand Generator Worm Robot Short Distance Run Competition

The robot moves like a worm, it is one of the simplest moving actions in the nature. The robot that finishes 2M run with the shortest amount of time is the winner.

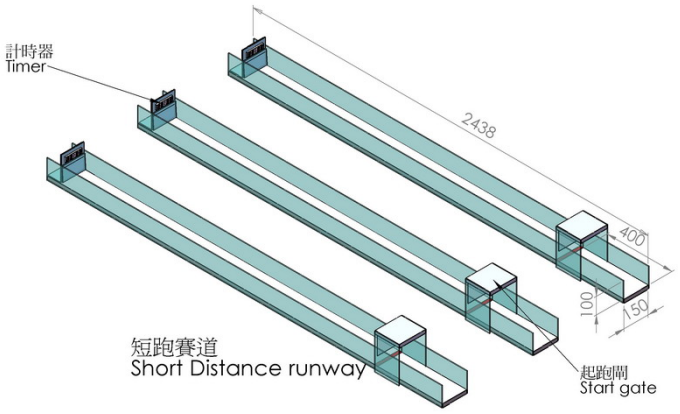
Robot Specification



1. The robot operates only with one motor. Contestants must use the Desktop Hand Generator (attachment 1) provided by the Organizer to supply power to the robot hence the robot must be equipped with a 2.1mm socket.
2. The size of the robot cannot exceed 300mm long, 150mm wide and 180mm tall (length, width and height dimensions are not inter-changeable), nor overall weighs more than 500g.
3. The robot moves by 'contraction and extension' method and should not use ratchet to assist the motion.
4. Only the soles of the feet are allowed to touch the ground. Any other parts of the robot touching the ground are prohibited.
5. The robot cannot have any installation that will change its original dimension during competition.

Game Field Specification

1. Level runway is used for the match. The track is 2000mm long. The start zone is 400mm long.
2. The runway has 3 tracks. Each track is 150mm wide.
3. A timer is placed at the end of each runway.



Game Rules

1. Each team plays twice and the best time is recorded. The team with the shortest amount of time to complete the game is the winner.
2. Contestants must use the Desktop Hand Generator (attachment 1) provided by the Organizer to supply power to the robot. Only the contestant himself/herself operates the Desktop Hand Generator and nobody is permitted to assist.
3. The wire of the Desktop Hand Generator is long enough so that the contestants must remain behind at the start zone. Moving along the runway with the robot is prohibited. Contestants may assign one student to help release the wire. Pulling the wire of Desktop Hand Generator is prohibited.
4. Contestants cannot touch the robot once it leaves the start zone. The competition is considered as incomplete if the robot stops moving or fails to reach the destination within the 1 minute game time.

9. Hand Generator Worm Robot Appearance Design Competition

The worm robot appearance design competition encourages students to fully use their creativity. The loose game rules allow more esthetic and creative approach to the design of robot appearance.

Competition Category

It is the Single Motor Robot Category and permits the use of one set of motor-gear box in the mechanical design. This competition is for Junior Secondary 2 students or below only.

Game Rules

1. The participating robots may not take part in any other competitions.
2. Robots that took part in last year's competition cannot re-enter the same game this year.
3. The robot including its peripheral decorations cannot exceed 425mm X 300mm X 230mm (the length, width and height dimensions may be interchanged).
4. The robot must be able to complete its basic maneuver. The robot operates only with one motor and the power can only be supplied by the Hand Held Hand Generator. It moves by 'contraction and extension' method and should not use ratchet to assist the motion.
5. The contesting student may submit an A4 size introduction on the design concept and features (annex 2) in the specified format. However, the contents must not reflect or imply in any way the name of contestant or school. No presentation is required on the day. Failure to comply may lead to disqualification of the item.

Evaluation Criteria

Appearance / Dynamics	Creativity	Production skills	Application of material	Total
25%	30%	25%	20%	100%

Annex 2

Hand Generator Worm Robot Appearance Design Competition

Product Introduction

Category: *Single Motor Worm Robot* Contest Registration No. : _____

Product Introduction :

Design concept:

Materials application:

Problems encountered:

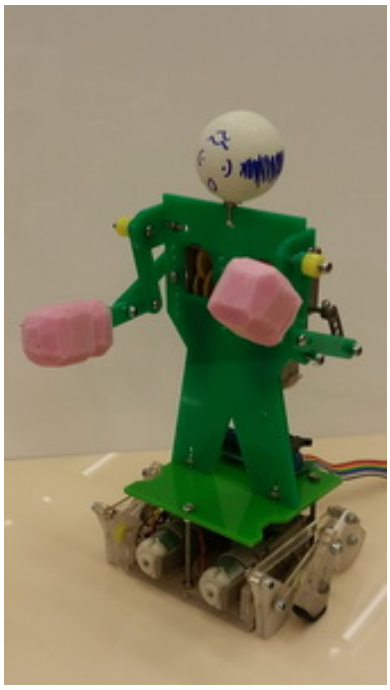
Solution:

Note: The contents must not reflect or imply in any way the name of contestant or school. Failure to comply may lead to disqualification of the item.

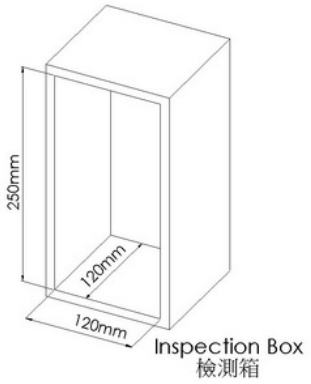
10. Robot Boxing Competition

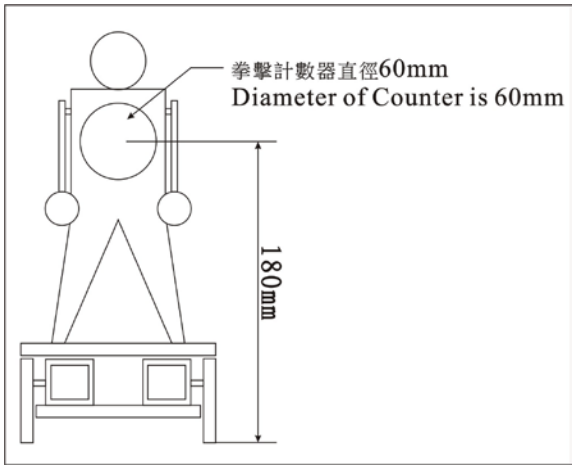
This game tests the power of the robot as well as players' controlling skill and team work. The team that knocks down the opponent with the most scores within the time limit wins. This game uses micro:bit board as wireless control during the competition.

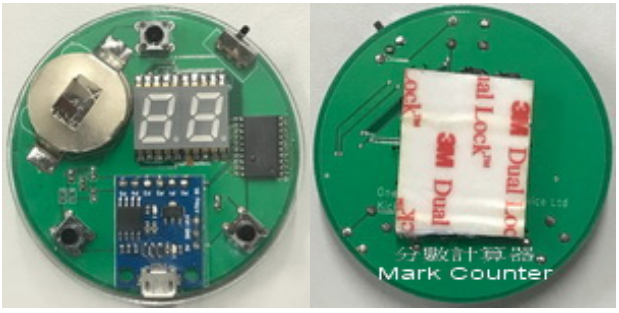
Robot Specification



1. The robot may use up to 4 sets of gear box, in which 2 sets for walking and 2 sets for boxing. The robot must have a head and two hands in boxing gloves.
2. Contestants may only use 1 piece of micro:bit board and 1 piece of expansion board (no restriction on expansion board model) as transmitter to wireless control the robot. There is no restriction on the batteries used (participants are to prepare for their own batteries).
3. The robot is equipped with 1 piece of micro:bit board as receiver and 1 piece of expansion board (no restriction on expansion board model) as motor actuator. No more than 4 pieces 1.5V AA alkaline batteries be used.
4. The height of the robot must be between 240-250mm. A 60mm diameter score counter is installed on the chest of the robot 180mm above the ground. The score counter and magic tape are provided by the Organizer. The front panel of the score counter is not allowed to be shielded by any objects (including the fists/gloves or arms of the robot itself) .
5. Before the game the robot is placed inside an inspection box for dimension check to ensure no part of the robot is protruding out of the box. The inner base of the box is 120 x 120mm and the height is 250mm (see diagram below). The total weight of the robot cannot exceed 1.5kg.
6. The robot is not required to undergo the center of gravity test.

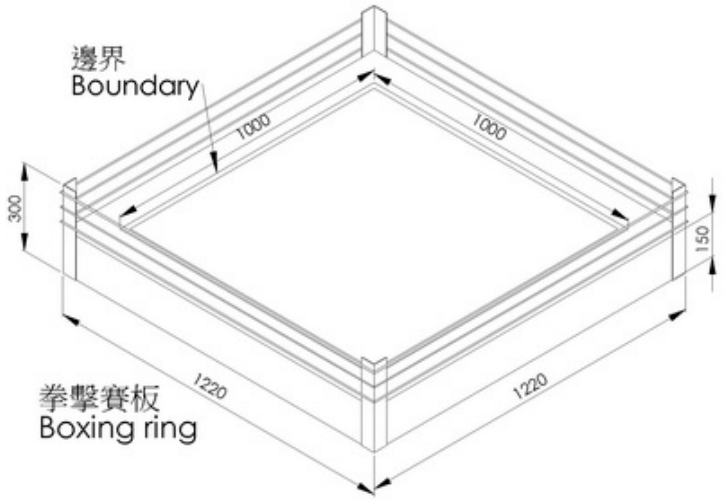






Game Field Specification

1. The boxing ring is 1220mm long, 1220mm wide and 300mm tall.



Game Rules

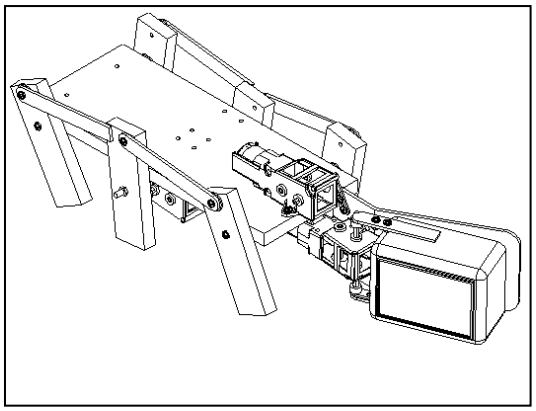
1. Each team assigns one robot for the competition. The robot is controlled by one member.
2. The robots are placed at the corner opposite to each other. The judge checks the robots to ensure that there is no movable dangerous mechanism design before the game starts.
3. A winner is determined in a 2-minute match. 1 point is scored if the score counter on the chest of the robot is hit. The score counter will only take record after every 5-second interval to avoid scoring by continuously throwing punches. Each successful knock down the opponent scores 3 points. No score if the opponent falls down itself. At the end of the match, the sum of the scores will be taken from the points recorded by the opponent's score counter and the scores from each successful knock down the opponent. The robot with the most scores wins.
4. In case of draw, the lighter weight robot wins.
5. The judge will warn the team that continuously dodges the opponent and refuses to attack. The team will be disqualified upon receiving the second warning.
6. Both robots stop combat if a robot falls down. The match continues after the judge has put up the fell down robot and signaled to re-start the match. The robot loses the match if it fails to move or punch anymore.
7. There is a red line on the floor along the boundaries of the boxing ring. A warning will be served when the robot steps outside of the red boundary line. The opponent will be awarded 1 point after 3 warnings are served.
8. The Panel judges' decision is final.

11. Planet Exploration Competition

Students are encouraged to design flexible gripper to explore the planet but not a mining tool. Robots have to pick up stones (ping pong) and deliver them to a designated storing area. They are to pick the 'useful' stones (white ping pong) and avoid the 'harmful' stones (orange ping pong).

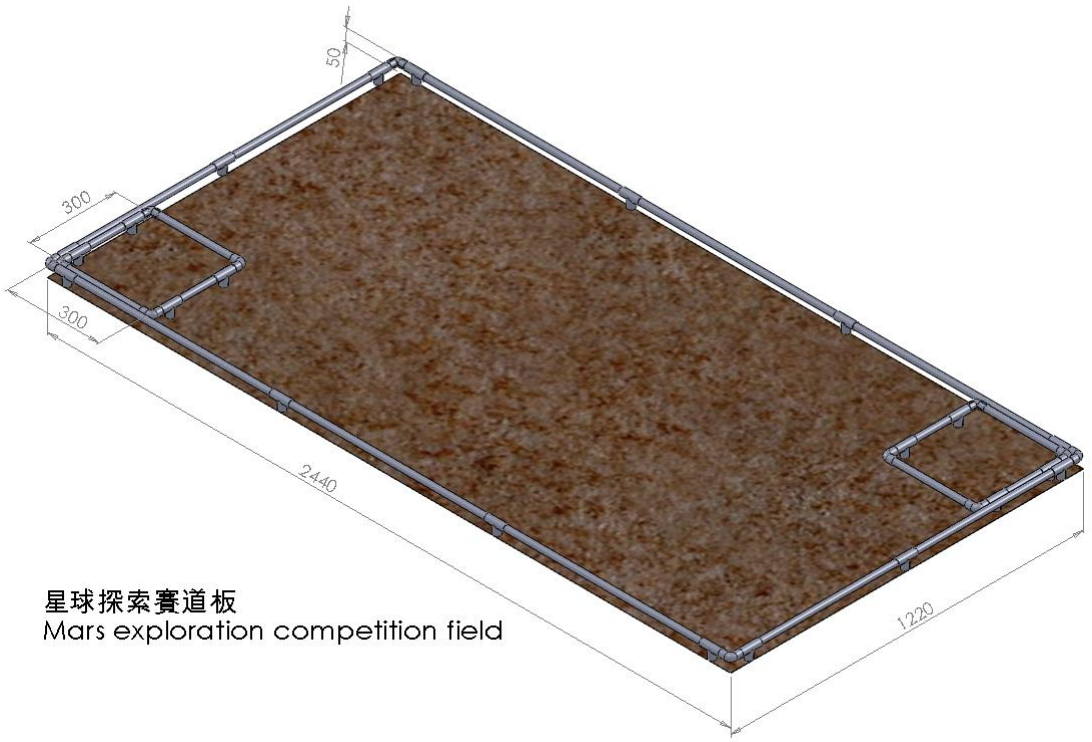
Robot Specification

1. The robot, with its arm contracted, cannot exceed 300mm long, 200mm wide and 240mm tall (length, width and height dimensions are not inter-changeable) nor overall weighs more than 1.5kg.
2. The robot may use up to five sets of gear boxes. It must move in walking mode. There is no limit on the number of stones for each pick as long as gripper or hand-folding action is used. 'Shoveling' or 'sweeping' actions are not allowed.
3. The robot is controlled by wired manual controller supplied by not more than six pieces 1.5V AA alkaline batteries.



Game Field Specification

1. This game uses a universal playing field. Approximately 200 number each yellow and white ping pongs are used as stones.
2. The area of playing field is 2440mm × 1220mm with 50mm tall fencing surrounding the four sides.
3. A base tank for storing stones (ping pongs) is located at both ends of the universal playing field, the size of the base tank is 300mm long x 300mm wide x 50mm tall.



星球探索賽道板
Mars exploration competition field

Game Rules

1. Only one team plays at a time in the game. Each robot is controlled by one member.
2. The robot attempts to pick up as many stones (ping pong) as possible within the 2 minutes game time. Different color stones score different points. The team has the stones in the base tank with the most points is the winner. The stones (white and orange color ping pongs) on the body of the robot will not be scored. If the points are same, the team with more orange color stones wins.
3. The points of the colored stones are as follows:

Color	Points
White	-50
Orange	+10

4. During the competition, a robot may receive repair off the field with the judge's permission. After repair, the judge then places it back at where it left and continues the game. No extra time would be compensated to the robot.

13. Robot Soccer Competition

This is a team competition. Each team has four robots with one of them as substitute. Students are encouraged to work as a team to build robots with efficient walking actions for the competition. During the game, the two competing team players use their "legs" to kick the ball into their opponent's goal. The team with the most scores is the winner.

Robot Specification

1. The size of the robot cannot exceed 300mm long, 200mm wide and 240mm tall (length, width and height dimensions are not inter-changeable) nor weighs more than 1.5kg (including batteries and receiver).

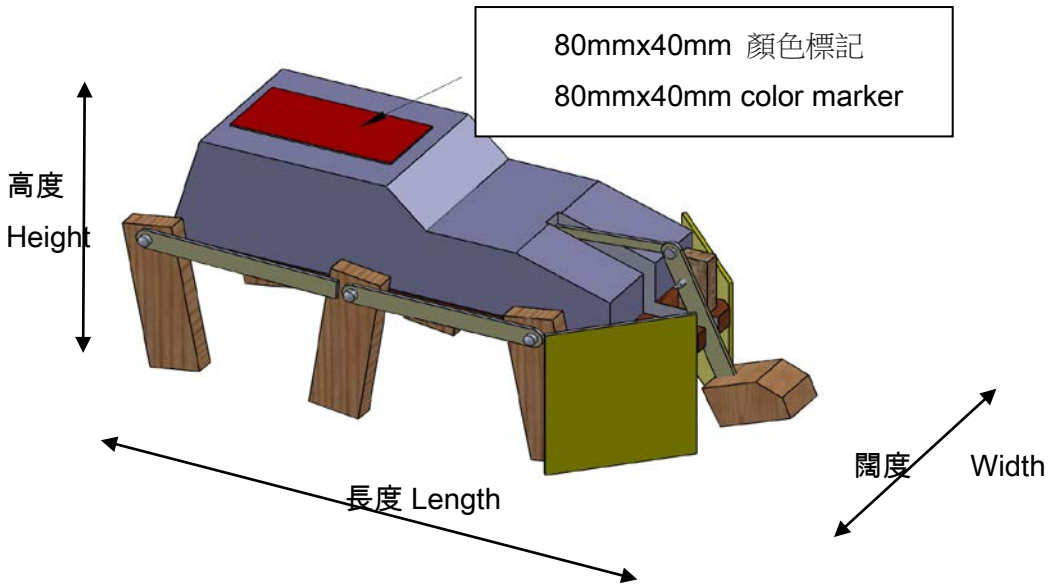
2. Each team consists of three robots.
   a) The Forward robot identifies itself with a 80 x 40 mm yellow label on top of its body and it may move around in the self front half including the opponent's penalty area.
   b) The Midfield robot identifies itself with a 80 x 40 mm red label on top of its body. It may move around the entire playing field except the two penalty areas.
   c) The Defending robot identifies itself with a 80 x 40 mm blue label on top of its body. It may move around in the self rear half including its own penalty area.

3. A flap is installed on each side of the robot front end, slanting backward at 30-45 degree from the gear box to prevent the robot front legs from kicking the football. The opening between the two flaps at the robot front end should not be more than 30mm wide. Therefore, the foot or board for kicking the ball may not be larger than 30mm (diagram referred).

4. All robots are controlled by wireless controllers approved by the Organizer. It is suggested to use 2.4G wireless control devices.

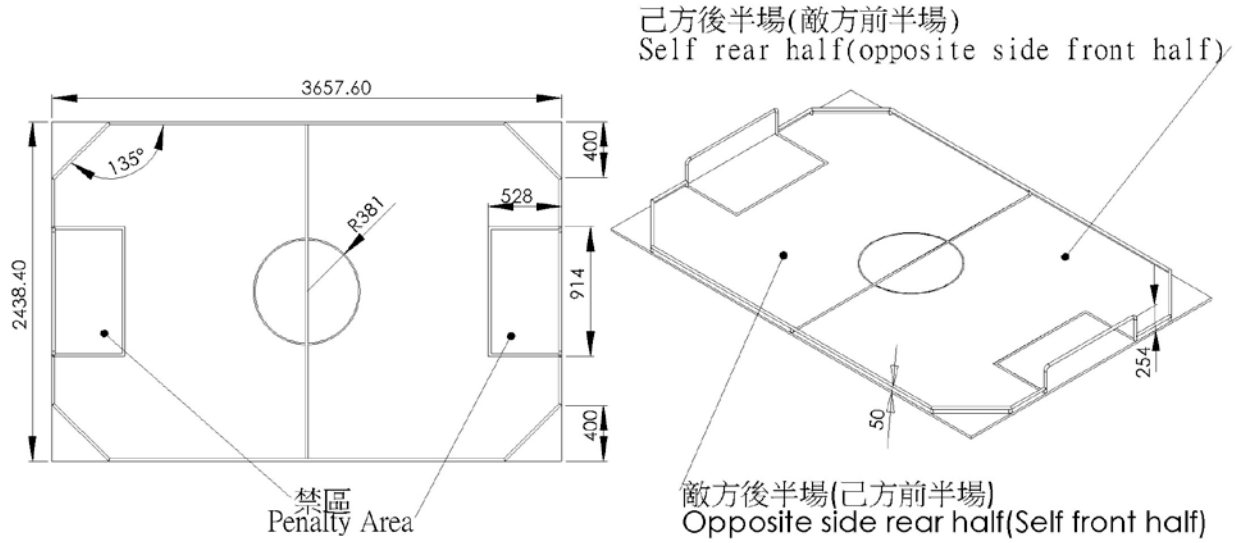
5. Motor driver of robot cannot use more than 9V Alkaline batteries, 7.2V rechargeable battery or 7.4V Lithium-polymer battery. There is no limit on the batteries for transmitter and receiver. Participants are to prepare their own batteries.

6. The robot must kick the ball in a swing (not rotation) action between its left and right flaps.

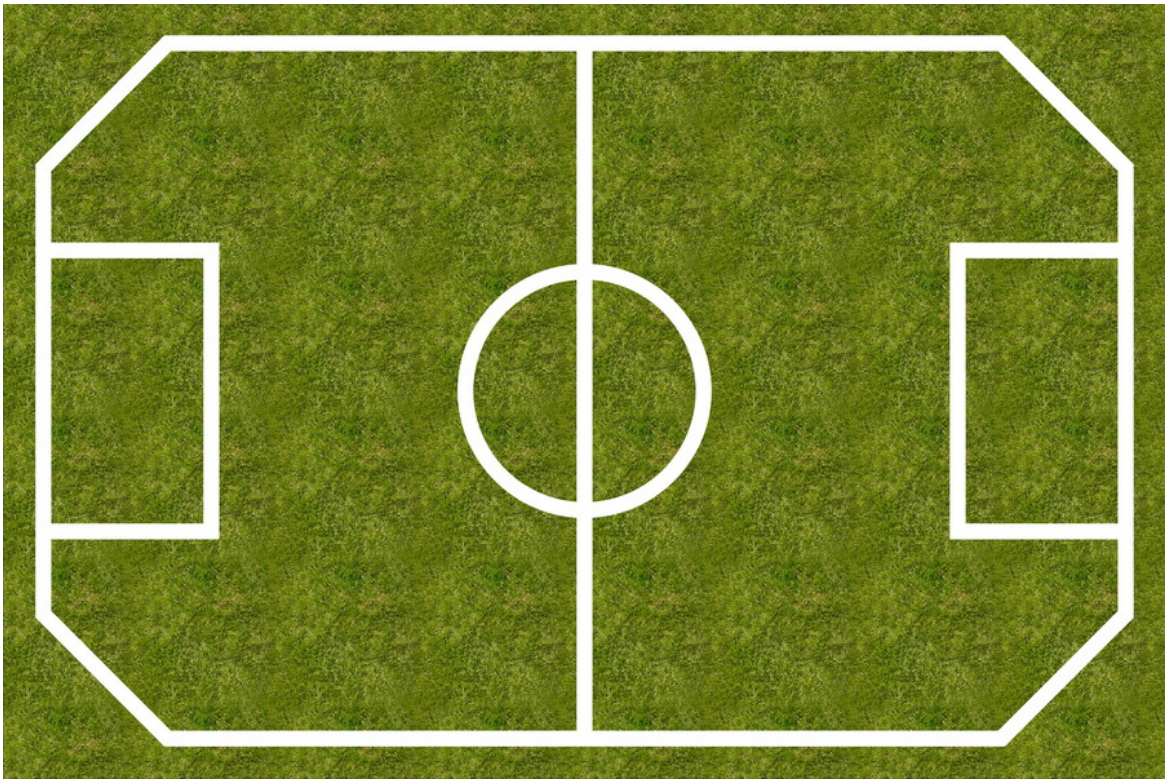


Game Field Specification

1. Football court is used for the competition.
2. The area of playing field is 3658mm (12ft) x 2438mm (8ft), surrounded by 100mm tall 45 degree triangular fence. The goal is 915mm (width) x 200mm (height) x 200mm (depth). A 60mm diameter rubber ball is used for the competition.



機械足球賽板
Robot Soccer Field



Game Rules

1. Each robot is controlled by one member. The robot may only kick but not hold or push the ball.
2. The substitute robot and its controller must be placed in a location specified by the referee; otherwise contestants will not be allowed to replace the robot.
3. The game has two halves, the first and second, each lasts for 2 minutes. The game is conducted on a knockout basis.
4. Choice of goal and opening kick-off is determined by toss of coin. Both teams place their Forward robots in position first and then the Defending robots in their own respective penalty area. The kick-off team places its Midfield robot inside the center circle first follows by the opposing team to place its Midfield robot outside the center circle afterwards.
5. The timer begins to count when the referee signals start of the game. The team taking the kick-off must kick the ball within five seconds otherwise the ball goes to the opposing team. All other robots may only move after the kick-off.
6. If the robots tangle over the ball for over 10 seconds, the referee may pause the match and separate the robots 300mm away from the ball and re-start the match.
7. Players of each team should stay at the designated areas to control their robots. Once the game starts, players are not allowed to touch the robots or the ball until either the ball goes into the opponent's goal or the match ends.
8. A goal directly from the opening kick-off or pushing the opponent and the ball together into the goal will not be counted.
9. During the match, request should be made to the referee for repair or replacement of robot. Upon approval, the robot should only be removed from and placed back to the field by the referee. The timer does not pause and the match continues. The robot on returning to the field at where it left should wait for the referee's permission to move and continue to play.
10. The team scores 1 point with the ball kicked into the opponent's goal. The opposite team re-starts the game from the midfield and the timer does not pause. The team with the most goals at the end of the game wins.
11. If it is unable to determine a winner at the end of the match, it will be treated as tied in the round-robin match. If it tied at the end of the knockout match, an extra time of 2 minutes is added to determine a winner via 'sudden death'. Each team sends 1 robot for the extra time match.
12. If it is still unable to determine a winner at the end of the extra time game, each team assigns 3 robots to takes turn for the Spot Kick* Time of each goal is recorded and the team with the most goals wins. In case of draw, the team with the shortest amount of total goal scoring time wins. Second round will be conducted if they still draw until a winner is identified.
13. *Spot Kick: The ball is positioned in the center circle and the robot is given one minute, with no limit on the number of attempts, to shoot the open goal (i.e. without a defending robot) until a goal is scored and its time is recorded. Robots are not allowed to enter the penalty area to shoot but may get the ball inside the penalty area.
14. A warning will be served to the robot for purposely charges against its opponent not handling a ball, ignoring the referee's instruction or disobeying the referee's judgment. Upon receiving two warnings, the team will be penalized with a penalty kick**.
15. **Penalty kick: The ball is placed at the middle of the top of the penalty area. The team taking the kick is to place the shooting robot outside the penalty area first. The defending team then places its defending robot (the robot must with its forward movement facing the ball) at the middle of the goal line. The Defending robot cannot move before the shooting robot touches the ball otherwise it will receive a warning and the kick will be retaken.
16. The Panel Referee's decision is final.

14. Robot Penalty Shoot-out Competition

The penalty shootout is a method of determining a winner in football matches that would have otherwise been drawn or tied. Contestant controls the robot to make five penalty kicks. The team with the most scores using the shortest amount of time is the winner.

Robot Specification Competition

1. The size of the robot cannot exceed 300mm long, 200mm wide and 240mm tall (length, width and height dimensions are not inter-changeable) nor weighs more than 1.5kg (including batteries and receiver).

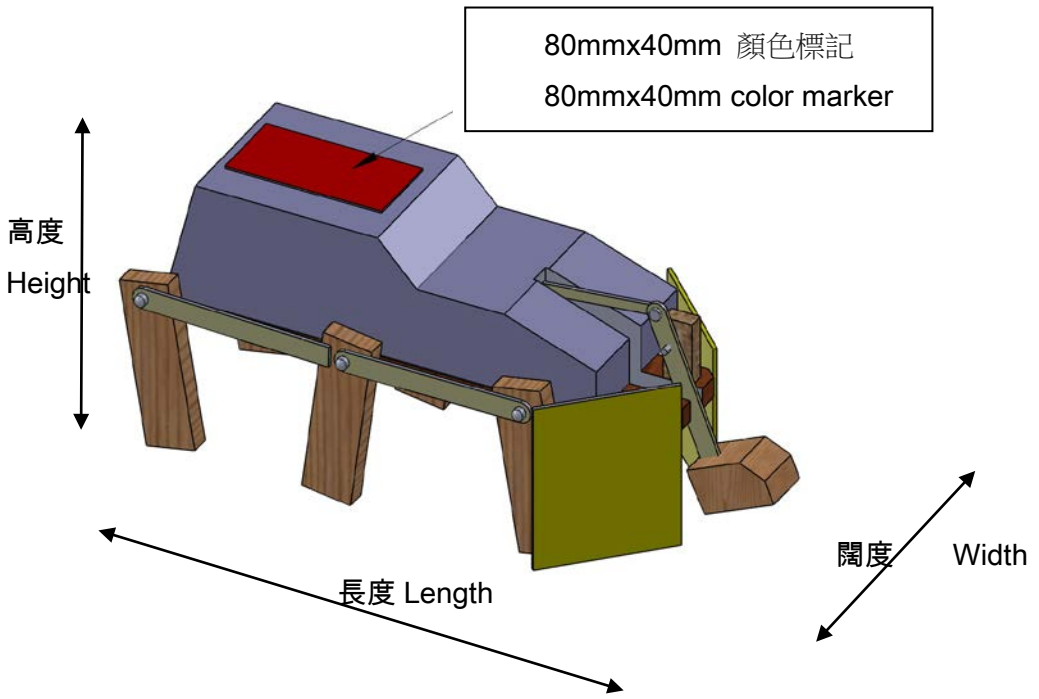
2. The robot may use up to three sets of gear boxes and must move in a walking mode.

3. A flap is installed on each side of the robot front end, slanting backward at 30-45 degree from the gear box to prevent the robot front legs from kicking the football. The opening between the two flaps at the robot front end cannot be more than 30mm wide. Therefore, the foot or board for kicking the ball may not be larger than 30mm (diagram referred). The direction of kicking the ball must be in the same direction as the robot is walking forward.

4. All robots are controlled by wireless controllers approved by the Organizer. It is suggested to use 2.4G wireless control devices.

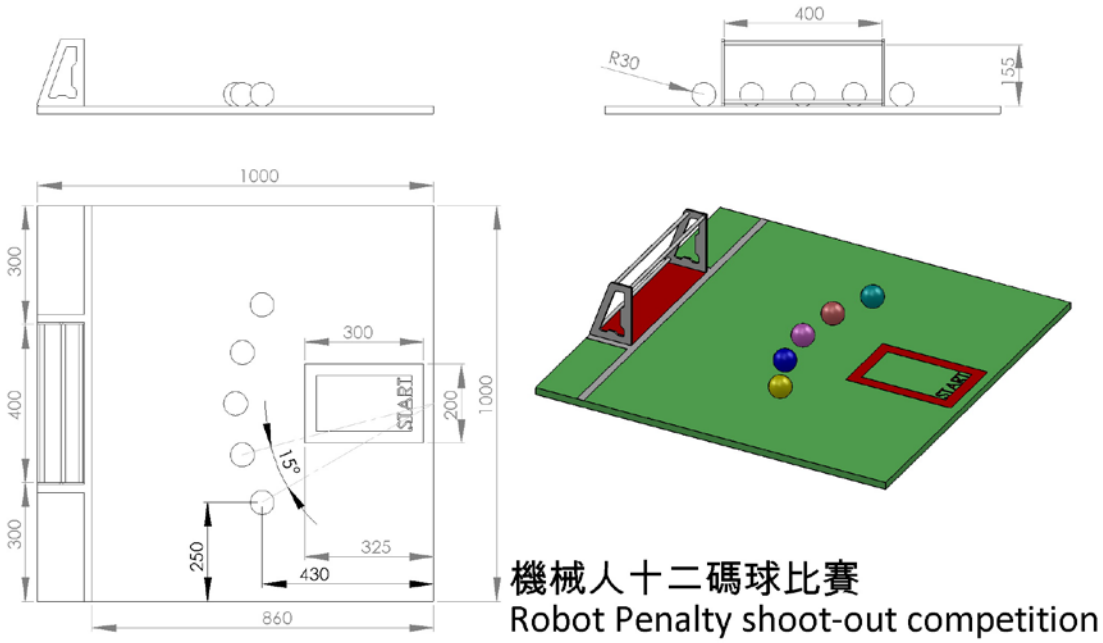
5. Motor driver of the robot cannot use more than 9V Alkaline batteries, 7.2V rechargeable battery or 7.4V Lithium-polymer battery. There is no limit on the batteries for transmitter and receiver (participants are to prepare their own batteries).

6. The robot must kick in a swing (not rotation) action between its left and right flaps. `



Game Field Specification

1. This game uses a penalty shoot-out playing field.
2. Five 60mm rubber balls are arranged in the form of an arc on a rack (diagram referred).



Game Rules

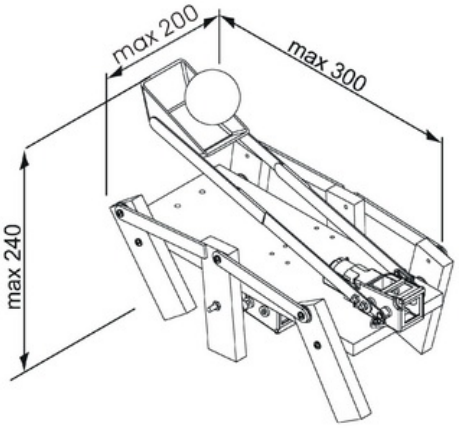
1. The robot is placed in the start position prior to the game begins and it may move to kick the ball upon receiving the judge's signal.
2. Contestant has 4 minutes to finish 5 penalty kicks**.** Each goal scores 2 points. A goal will be counted if the ball crosses the line in front of the goal even it rebounds. However, it is not a goal if the ball rebounds from the goal posts.
3. The robot kicks the ball only once per each penalty kick. Two or more attempts to kick the ball is not allowed.
4. The judge will immediately remove the ball(s) from the field that is/are either accidentally touched by the robot or hit by the ball that is kicked by the robot.
5. Each team continuously plays 2 rounds and the sum of all the scores is recorded. If the scores are the same at the end of the game, the team with the shortest amount of time to finish all kicks is the winner.

15. Robot Basketball Competition

Robot basketball match is another team competition. It emulates human basketball match including passing and shooting activities. Each team has 2 robots with good ability to pick up and throw balls. Each match has one game of six minutes duration. Each score counts for two points and the team with the most points at the end of the match is the winner.

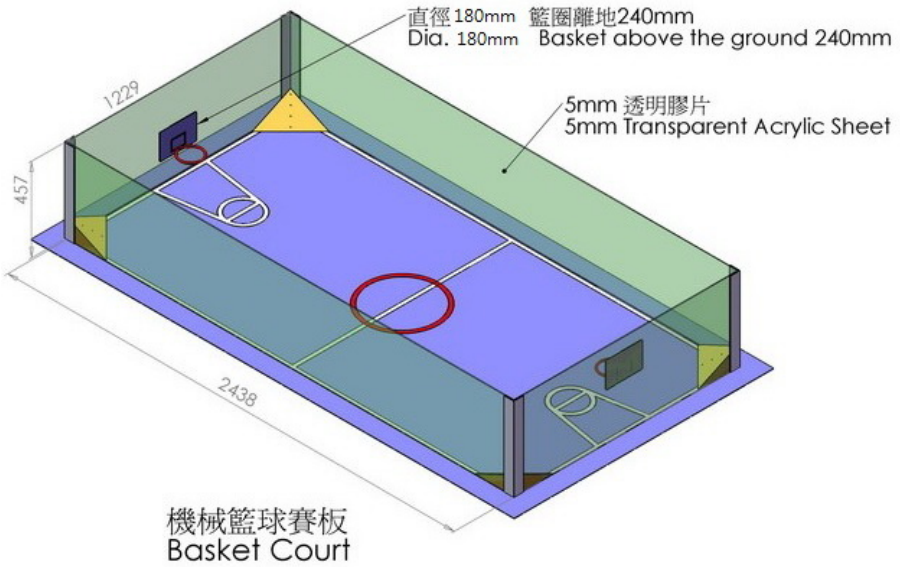
Robot Specification

1. The size of the robots when fully stretched (including pick-up arm and shooting mechanism) cannot exceed 300mm long, 200mm wide and 240mm tall (length, width and height dimensions are not inter-changeable) nor an overall weight of 1.5kg (including batteries and receiver).
2. The robot may use up to five set of gear boxes. It must move in walking mode.
3. All robots are controlled by wireless controllers approved by the Organizer. It is suggested to use 2.4G wireless control devices.
4. Motor driver of robot cannot use more than 9V Alkaline batteries, 7.2V rechargeable battery or 7.4V Lithium-polymer battery. There is no limit on the batteries for transmitter and receiver (participants are to prepare their own batteries).



Game Field Specification

1. Basketball court is used for the match. The four sides are fenced with 457mm tall transparent panels. The 180mm diameter basket is 240mm above ground.
2. An orange ping-pong is used as a basketball.



Game Rules

1. Each team may have three robots. Two for the game and the third one serves as a substitute kept by the referee. The team without a substitute robot may only repair the damaged robot during the course of the game.
2. Prior to the game begins, both teams place their robots in their own half outside of the center circle facing their offensive team. Referee releases a ball at the center of the center circle 300mm above ground for both teams to scramble for.
3. The robot must pass the ball within five seconds once it is in its possession otherwise it is a foul (for holding) and a warning will be served by the referee. The ball goes to the opposite team to start the game at where it is. The ball passes into the opponent's basket scores two points. It is also a goal if the ball bounces from the ground or hits the backboard into the basket. It is not a goal if the ball hits the panels on the two long sides of the court into the basket.
4. Request should be made to the 2nd referee for repair or replacement of robot during the match. Upon approval, the robot may only be removed from and returned to the field by the referee. The timer does not pause and the match continues. The robot on returning to the field at where it left should wait for the referee's permission to move and continue to play.
5. After a goal is scored, the opposite team starts the game at the baseline of its own half court.
6. Robots of both sides are not allowed to enter the restricted area exceeding 5 seconds otherwise will receive a warning from the referee and the ball goes to the opposite team to start the game at where it is.
7. The same robot that has committed 2 fouls will be penalized with the opposite team awarded a free throw to shoot outside the restricted area. A successful free throw scores 2 points and the team not scoring starts the game at the baseline of its own half. The game continues to play immediately if it misses.
8. The duration of the game is 6 minutes. The team with the most points wins. The first stage of the competition is conducted on a round-robin basis. The winning team gets 3 points, losing team 0 point and each team 1 point in case of a draw. The second stage is conducted on a knockout basis.
9. If it is still drawn at the end of the knockout stage, an overtime of 3 minutes is given to determine the winner via 'sudden death'. Switch of goal and replacement of robot are not allowed. Both teams place their robots in their own half court outside the center circle facing their offensive team. Referee releases a ball at the center of the center circle 300mm above ground for both teams to scramble for. The team that first scores a goal wins.
10. If it is still unable to identify a winner at the end of the overtime game, each team sends 2 robots to take turn for the ***Spot Shooting***. Time of each goal is recorded and the team with the most goals wins. In case of draw, the team with the shortest amount of goal scoring time wins. Second round will be conducted if they still draw until a winner is identified.
11. **Spot Shooting**: The ball is placed at the top of the key without a defending robot. The robot advances from the center circle to pick up and shoot the ball into the basket. If it misses, the robot may pick up the ball and shoot again, with no limit on the number of attempts, within the 1 minute game time until a goal is scored and its time is recorded. Robot cannot enter the restricted area to shoot the ball.

16. Multi-Leg Servo Motor Robot Short Distance Run Competition

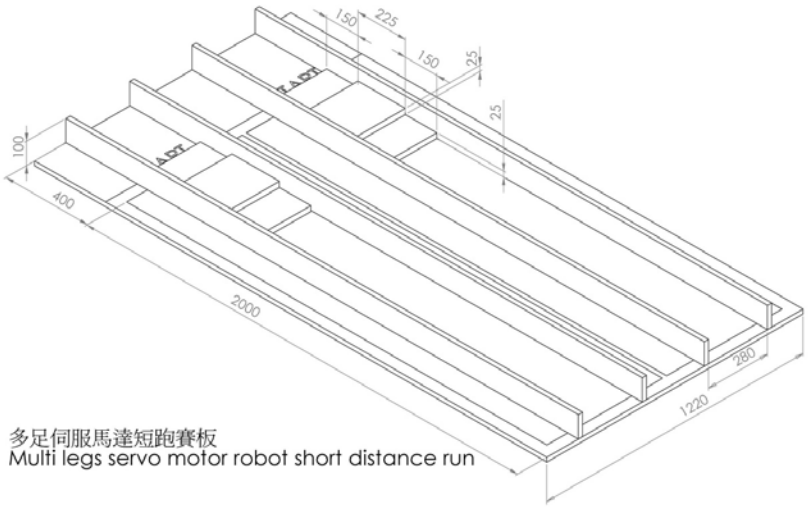
Servo motors are used to make different kinds of joint type robots and multi-leg servo motor robot is one of the simplest forms of joint type robot. Contestant has to build a servo motor robot that walks with many legs, and program the motion with computer. The robot that finishes 2M run with the shortest amount of time is the winner.

Robot Specification

1. No market robot can be used. The robot should be built with servo motors. There is no restriction to the number of servo motors used. Each leg must have at least 2 servo motor joints.
2. The size of the robot cannot exceed 400mm long, 280mm wide and 400mm height. There is no weight limit.
3. The robots must move in walking mode autonomously without connecting to a computer or external power supply.
4. The robot cannot have any installation that will change its original dimension during competition, such as the head is at an upright position at the beginning but is level when it approaches the destination.

Game Field Specification

1. Multi-Legs Servo motor Robot Short Distance Run Competition Board is used for the match. The track is 2400mm long. The start zone is 400mm long.
2. The runway has 2 tracks. Each track is 280mm wide. A stepping block is placed at the starting point as shown in figure



多足伺服馬達短跑賽板
Multi legs servo motor robot short distance run

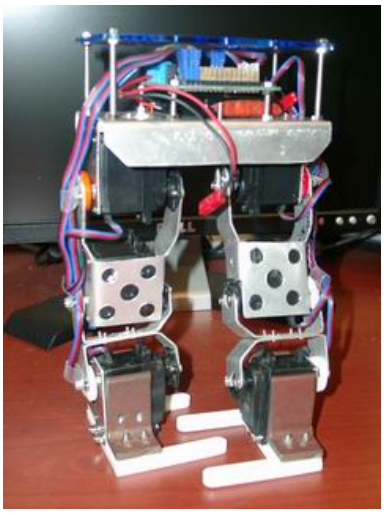
Game Rules

1. The robot that uses the shortest amount of time to complete the specified distance is the winner.
2. The robot may be switched on and placed behind the “START” line. Contestants may release the robot after the judge signals start of the race and the timer begins to count.
3. If the robot stops moving or falls down during the run, contestant can pick up the robot and place it back at the start zone and restart again. The timer continues without reset.
4. The game time is 2 minutes. Robots that cannot complete the game is recorded 2 minutes game time.

17. C-Shape Foot Two Legs Servo Motor Robot Short Distance Run Competition

Servo motors are used to make different kinds of joint type robots and 2 legs servo motor robot is considered one of the complicated forms of joint type walking robot. Contestant has to make a servo motor robot which walks on 2 legs in C-Shape feet and program the motion with computer. The robot that finishes 2M run with the shortest amount of time is the winner. The C-Shape feet overlap and have larger touching ground area, so it walks more steadily and easy for programming (diagram refers).

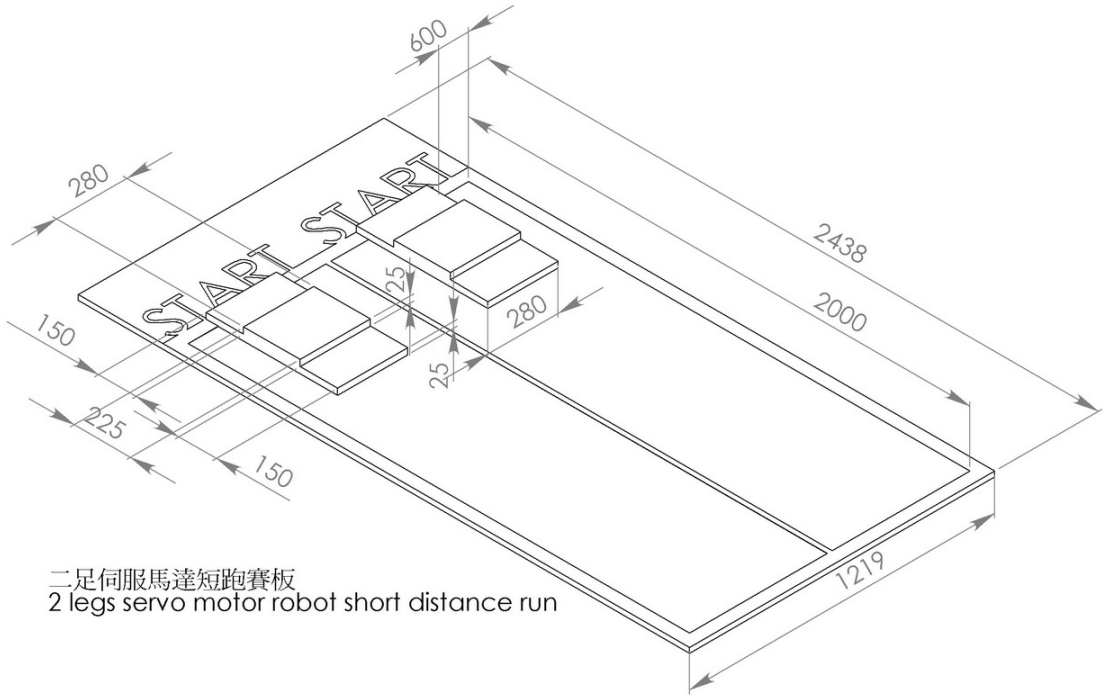
Robot Specification



1. No market robot can be used. The robot should be built using not more than 8 servo motors and move in walking mode. Robot cannot use “interchange center of gravity” method to move nor walk sideways.
2. The size of the robot cannot exceed 200mm long, 200mm wide and 300mm tall. There is no weight limit nor size of the sole.
3. The robots must move in walking mode autonomously without connecting to a computer or external power supply.

Game Field Specification

1. 2-Leg Servo motor Robot Short Distance Run Competition Board is used for the match. The track is 2438mm wide and 1219mm long.
2. The runway has two tracks. Each track is 600mm wide and 2000mm long. A stepping block is placed at the start zone as shown in figure.



二足伺服馬達短跑賽板
2 legs servo motor robot short distance run

Game Rules

1 The game time is 3 minutes. The robot must finish the following specified motion:

a) First, step up and then step down each 'stepping block'

b) Stand at attention

c) Walk 3 steps forward

(e.g. First, the right leg steps out, Second, the left leg steps out, Third, the right leg steps out again)

d) Stand at attention

e) Make a forward somersault 2 times

f) Stand at attention

g) Walk 2 steps forward

h) Stand at attention

i) Make a backward somersault 2 times

j) Stand at attention

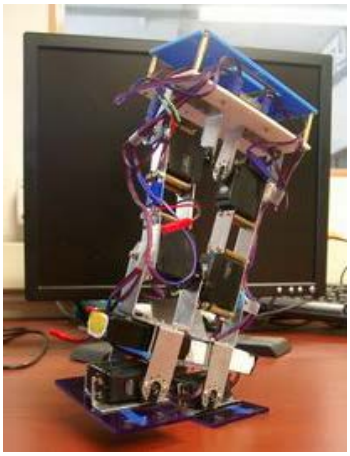
k) Walk to the destination quickly.

2. Marks will be deducted if the robot fails to perform the specified motion in specified sequence.
3. 10 marks will be deducted for each missing motion.
4. 10 marks will be deducted for each vague motion.
5. The foot should clearly leave the ground for each step the robot made (no dragging step). 10 marks will be deducted for each dragging step.
6. If the sole of the foot touches the center line of the competition board, a corrective action must be made immediately by the contestant. If the sole of the foot touches the left or right border line and the robot has not fallen, correction is not necessary.
7. Contestant can correct the walking direction of robot or put the robot up right again after falling, but 10 marks will be deducted for each touching.
8. If the robot fails to complete performing all the motions or fails to reach the destination within the game time limit, total marks deducted and the distance between the destination are recorded.
9. The robot will be disqualified if it reaches the destination without completing all the specified motions.
10. Each team plays twice and the best result is recorded.
11. The result of the competition is first based on the team that reaches the destination with the least marks deducted is the winner. If same marks are deducted, the team uses the shortest amount of time to finish the game is the winner.
12. If all teams fail to reach the destination within the game time, the team with the least marks deducted wins otherwise the team whose robot is the nearest to the destination wins.

18. Interchange Centre of Gravity Two Legs Servo Motor Robot Short Distance Run Competition

Servo motors are used to make different kinds of joint type robots and 2 legs servo motor robot is considered one of the complicated forms of joint type walking robot. Contestant has to make a servo motor robot that walks on 2 legs and program the motion with computer. The robot that finishes 2M run with the shortest amount of time is the winner. The robot walks by interchanging the center of gravity between the two legs. This motion is closed to the walking motion of human. It is critical to maintain balance to avoid falling down while walking which is hard to program (diagram refers).

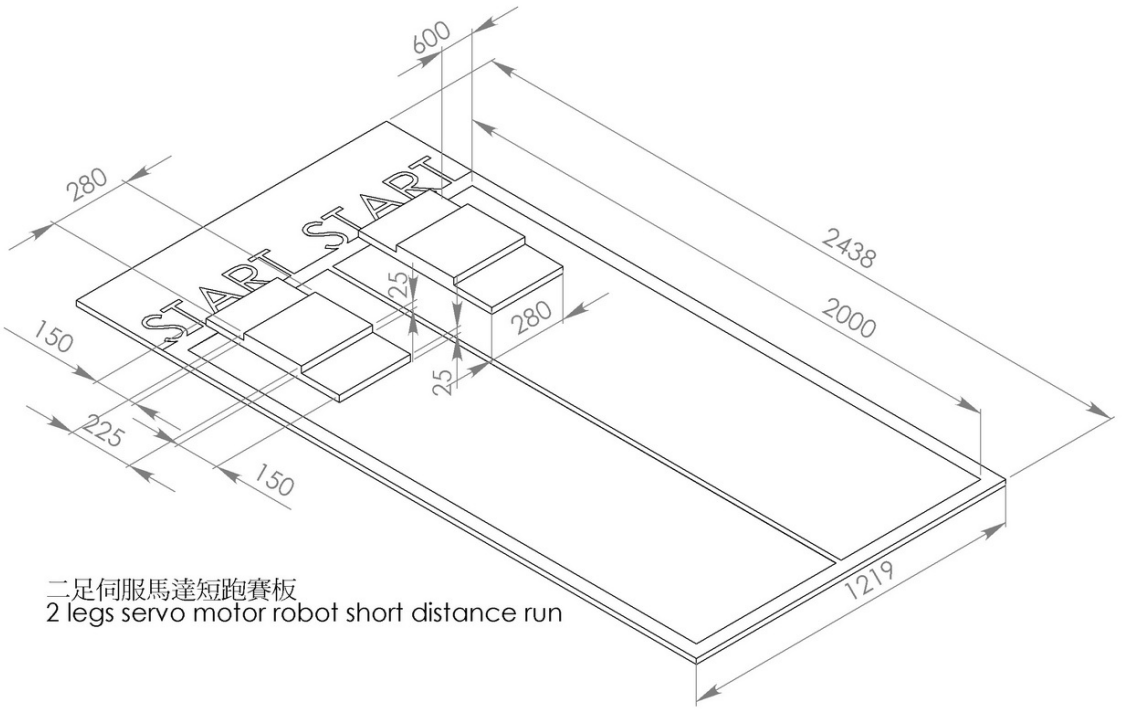
Robot Specification



1. No market robot can be used. The robot should be built using not more than 8 servo motors and move in walking mode. Robot cannot walk sideways.
2. The size of the robot cannot exceed 200mm long, 200mm wide and 300mm tall. The area of each sole must not exceed 150mm long x 60mm wide. There is no weight limit
3. The robots must move in walking mode autonomously without connecting to a computer or external power supply.

Game Field Specification

1. 2-Leg Servo motor Robot Short Distance Run Competition Board is used for the match. The track is 2438mm wide and 1219mm long.
2. The runway has two tracks. Each track is 600mm wide and 2000mm long. A stepping block is placed at the start zone as shown in figure.



二足伺服馬達短跑賽板
2 legs servo motor robot short distance run

Game Rules

1. The game time is 3 minutes. The robot must finish the following specified motion:
   a) *First, step up and then step down each 'stepping block'*
   b) *Stand at attention*
   c) *Walk 3 steps forward*
      (e.g. First, the right leg steps out, Second, the left leg steps out, Third, the right leg steps out again)
   d) *Stand at attention*
   e) *Make a forward somersault 2 times*
   f) *Stand at attention*
   g) *Walk 2 steps forward*
   h) *Stand at attention*
   i) *Make a backward somersault 2 times*
   j) *Stand at attention*
   k) *Walk to the destination quickly.*
2. Marks will be deducted if the robot fails to perform the specified motion in specified sequence.
3. 10 marks will be deducted for each missing motion.
4. 10 marks will be deducted for each vague motion.
5. The foot should clearly leave the ground for each step the robot made (no dragging step). 10 marks will be deducted for each dragging step.
6. If the sole of the foot touches the center line of the competition board, a corrective action must be made immediately by the contestant. If the sole of the foot touches the left or right border line and the robot has not fallen, correction is not necessary.
7. Contestant may correct the walking direction of robot or put the robot up right again after falling, but 10 marks will be deducted for each touching.
8. If the robot fails to complete performing all the motions or fails to reach the destination within the game time limit, total marks deducted and the distance between the destination are recorded.
9. The robot will be disqualified if it reaches the destination without completing all the specified motions.
10. Each team plays twice and the best result is recorded.
11. The result of the competition is first based on the team that reaches the destination with the least marks deducted is the winner. If same marks are deducted, the team uses the shortest amount of time to finish the game is the winner.
12. If all teams fail to reach the destination within the game time, the team with the least marks deducted wins otherwise the team whose robot is the nearest to the destination wins.

19. Humanoid Free Gymnastics Competition

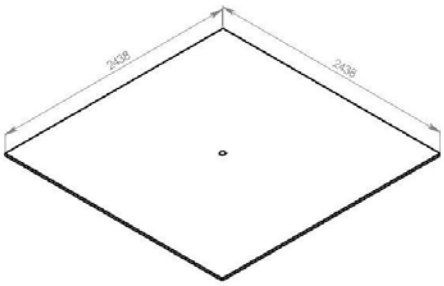
This event requires students to design a dexterous and steady servo motor robot applying their creativity and presentation skill. The participating robot will play alone and perform different gymnastic motions. All motions of the robot are computer programmed without manual control.

Robot Specification

1. No market robot can be used.
2. The robot should be built with servo motors, there is no limit on the quantity used.
3. The size of the robot must not exceed 400mm long x 300mm wide x 300mm tall (length, width and height dimensions are inter-changeable). There is no weight limit.
4. The participating robot must move in walking mode without connecting to a computer or external power supply.
5. The robot must perform autonomously without manual control.

Game Field Specification

Two Polly boards (2438mm x 1219mm) are put together to form a 2438mm x 2438mm competition area.



Game rule

1. The robot has to carry out a not more than 4-minute gymnastics performance on a 2M size platform The performance includes:

   Opening motion ➔ Standard motions + Self-design motions ➔ Closing motion

   a) Opening motion: stand at attention, bow and single hand waving
   b) Standard motions:
      - forward somersault 360°
      - backward somersault 360°
      - left hand push up
      - right hand push up
      - two hands push up
      - left cartwheel 360°
      - right cartwheel 360°
      - a handstand
      - a handstand with two legs open at 180°

   The standard motions may be repeated once only and the sequence may differ from the above.
   c) 11 self-design motions.
   d) Closing motion: stand at attention, bow and single hand waving.

2. Contestants design a total of 20 motions (9 Standard motions +11 Self-design motions).
   Note: After each motion performed, contestants have a 3-second break to state the name of the motion to the judges. Sequence of the motions must be written down on the mark sheet and handed in to the judges before the competition.

Markings:

1. If the robot walks out of the boundary or falls down, contestants can pick up and place the robot at where it falls and continue the performance. Time lost will not be compensated.
2. Each complete motion scores 5 marks and no score for incomplete motion.
3. 10 marks are deducted for each touching the robot.
4. Marks for the respective motion will be deducted for missing the 3-second break to state the name of the motion.
5. The total marks equals to the sum of motion marks and judges' marks minus the marks deducted. The team with the most scores wins. If the marks are the same, the team uses the shortest amount of time to finish the performance is the winner.

Assessment criteria

Appearance / Creativity	Dynamics / entertaining	Production Technique	Action Difficulty	**Total Score**
20%	30%	15%	35%	**100%**

Humanoid Free Gymnastics Competition Mark Sheet

Contest Registration No. : _____

order	Motion	completed	Not completed	order	Motion	completed	Not completed
	Stand at attention			11			
	Bow and single hand waving			12			
1				13			
2				14			
3				16			
4				16			
5				17			
6				18			
7				19			
8				20			
9					Stand at attention		
10					Bow and single hand waving		
					Motion **marks** ***Total*** :		

*** *Each complete motion gets 5 marks, no marks will be given for incomplete motion.*

Time completed : _____

Assessment criteria

Appearance/Creativity 20%	Dynamics/Entertaining 30%	Production Technique 15%	Action Difficulty 35%	**Total Score** 100%

Interference	Number of touching (@ -10 marks)	**Marks Deducted**
Put up a fell down robot		
Adjust the position of robot which is out-of-bounds		

Total marks = *Motion marks*_____ + *Judge's marks*_____ - *Deduction*_____ =

Signature of Judge _____

20. Humanoid Performance (Dance) Competition

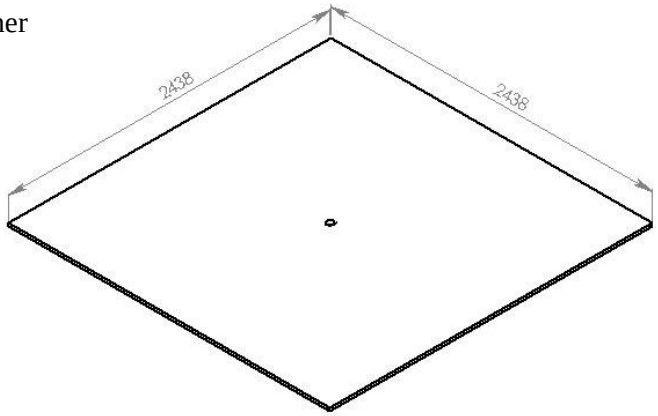
This competition requires students to build a set of sophisticated humanoids using their creativity and presentation skill. It may be in the form of solo or team performance. During the competition the robot may demonstrate a series of difficult actions in coordination to the background music or various audio effects. Organization of the entire performance should match the characteristics of the robot and controlled by a computer program via a wired or wireless control. Manual control is not allowed.

Robot Specification

1. Market robot can be used.
2. The robots must be mainly built with servo motors along with gear boxes as an auxiliary. There is no limit on the quantity of motors used and the number of participating robots for each team.
3. The size of the robot must not exceed 500mm long x 500mm wide x 500mm tall. There is no weight limit.
4. The participating robots must move in walking mode without connecting to a computer or external power supply.
5. The robot must be computer programmed to perform autonomously without manual control.

Game Field Specification

Two Polly boards (2438mm x 1219mm) are put together to form a 2438mm x 2438mm competition board.



Assessment Criteria

1. Contestants can create their own background music or use music with no copyright restrictions.
2. Each team has five minutes for setting and performance.

Appearance / Creativity	Dynamics / entertaining	Action Difficulty	Production Technique	**Total Score**
20%	15%	15%	50%	**100%**

Production Technique	
Fully homemade robot	50%
75% of the structure of the robot is homemade	40%
50% of the structure of the robot is homemade	30%
25% of the structure of the robot is homemade	20%
Market robot without modification.	0%

21. Servo Motor Robot Appearance Design Competition

The Servo Motor Robot appearance design competition encourages students to fully use their creativity. The loose game rules allow more esthetic and creative approach to the design of robot appearance.

Competition Category

Servo Motor Robot Category permits the use of Servo Motor in mechanical design. This category is suitable for all Secondary students.

Robot Specification

1. No market robot can be used.
2. The robot must be built mainly with servo motors along with gear boxes as auxiliary. There is no limit on the quantity of motors used. Each team has one participating robot.
3. The size of the robot must not exceed 500mm x 500mm x 500mm . There is no weight limit.
4. The robots must not be connected to a computer or external power supply.
5. The robot must be computer programmed to perform autonomously without manual control .

Game Rules

1. The participating robots may take part in other competitions.
2. Robots that took part in last year's competition cannot re-enter the same game this year.
3. The robot including its peripheral decorations cannot exceed 1m × 1m × 1m.
4. The robot is free to move in different style.
5. The contesting student may use 2 minutes to introduce and demonstrate the robot to the judges.

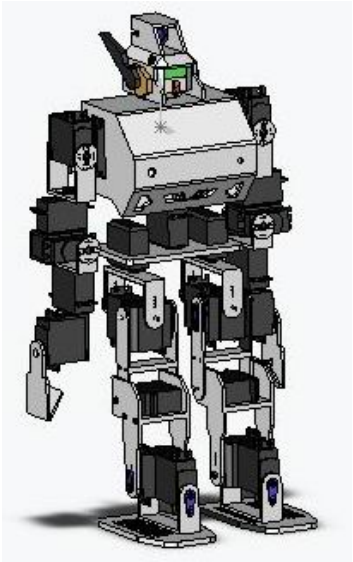
Evaluation Criteria

Appearance / Creativity	Dynamics / entertaining	Action Difficulty	Production Technique	Total Score
20%	15%	15%	50%	**100%**

Production Technique	
Fully homemade robot	50%
75% of the structure of the robot is homemade	40%
50% of the structure of the robot is homemade	30%
25% of the structure of the robot is homemade	20%
Market robot without modification.	0%

Servo Motor Humanoid Robot Competition – Robot Specification

Servo motor humanoid robot is considered one of the complicated forms of joint type walking robots. Contestants are required to build a 2-leg walking humanoid robot using servo motors and to computer program its motion.



All robots participating in the Robotic Olympic Servo Motor Humanoid Robot Competitions should comply with the following servo motor humanoid robot specifications:

Non-Market Robot Specification

1. The overall weight of the robot should be 3 kg or below (including power devices).
2. Supporting devices/mechanical structure/body parts (excluding servo motors) are built by the participant.
3. There is no restriction on the number of servo motors used and torque.
4. The robot is built with simple human figure such as head, body, two hands and two legs etc. However, the robot cannot have more than two legs, either movable or non-moveable limbs and any supporting devices.
5. Table 1 shows the size of the sole (the part making contact with the ground) which varies according to the weight of the robot). The length of the sole from front to back is X% of 'the length of the leg'. The width of the sole from left to right is Y% of 'the length of the leg'. Vacuum/suction devices cannot be used on the sole of the foot.

   The length of the leg refers to the measurement taken from the shaft (for forward and backward movement) at the uppermost part of the leg to the sole (bottom part of the foot) with the legs at fully-stretched position.

Table 1
Size of sole according to weight of robot

Weight of robot	X	Y
Below 1kg	60%	40%
Below 2kg	55%	35%
Below 3kg	50%	30%

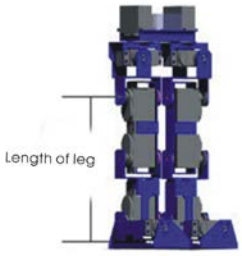


Fig. 1

Fig. 2

Fig.1 – shows the Length of Leg from the shaft (for forward and backward movement) at the uppermost part of the leg to the sole of the foot with the legs at fully stretched position

Fig. 2 – shows the size of sole (from front to back, left to right)

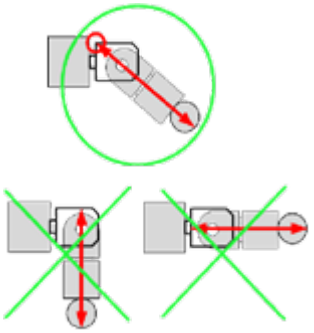
Length of leg(cm)	Weight of robot below 1KG		Weight of robot 1KG-2KG		Weight of robot 2KG-3KG	
	Length of sole X (cm) (front to back of foot)	Width of sole Y (cm) (left to right of foot)	Length of sole X (cm) (front to back of foot)	Width of sole Y (cm) (left to right of foot)	Length of sole X (cm) (front to back of foot)	Width of sole Y (cm) (left to right of foot)
10	6	4	5.5	3.5	5	3
15	9	6	8.25	5.25	7.5	4.5
20	12	8	11	7	10	6
25	15	10	13.75	8.75	12.5	7.5
30	18	12	16.5	10.5	15	9

Note: The size of the sole is based on the weight of robot. In case of dispute, the referee will make the decision and his decision is final.

6. Length of arm
   According to table 2, the length of arm refers to the length between the body and the moving parts (such as wrist, tail, neck etc. except foot) is **Z.**

Table 2
Length of arm (Z) based on the weight of robot

Weight of robot	Z
Below 1kg	20 cm
Below 2kg	25 cm
Below 3kg	30 cm



Market Robot Specification

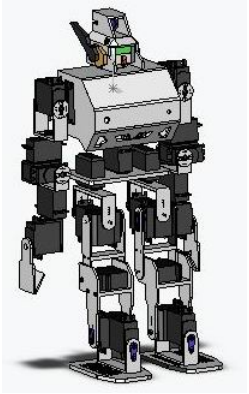
1. The overall weight of the robot is 2 kg below (including power devices).
2. Usage of 'market robot', or robot that is built with the supporting devices/mechanical structure from a market robot.
3. The robot has a simple 2-leg human figure such as head, body, two arms, two legs etc. However, the robot cannot have more than two legs, either movable or non-moveable limbs and any supporting devices.

All robots participating in the servo motor humanoid robot competitions must comply with the following criteria:

1. Contestants are free to design their weapon but without any movable dangerous devices such as the use of launcher, gun powder or spring. High speed rotating weapons are not allowed.
2. The robot must move in walking mode and cannot be connected to a computer or external power supply. It must be controlled manually.
3. Vacuum/suction devices cannot be used on the sole of the foot.
4. Power devices must be installed on the body of the robot.
5. No interference to other robots' wireless communication devices.
6. No further alternations are allowed on the day of competition once the robot has gone through standard checks by the organizer.

22. Heavyweight Humanoid Free Fighting Competition

2 legs servo motor robot (humanoid) is a complicated form of joint type walking robot. Contestant has to build a 2 legs servo motor walking robot using computer to program its motion. The team that knocks down the opponent's robot wins the game.

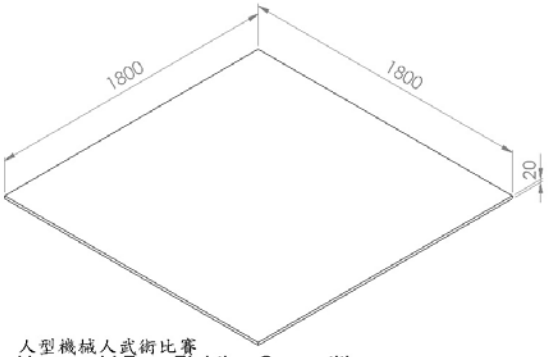


Robot Specification

1. The robot must comply with the Servo Motor Humanoid Robot specification (as stated on pages 41 and 42).
2. The total weight of the robot is 3 kg or less (including the power unit).

Game Field Specification

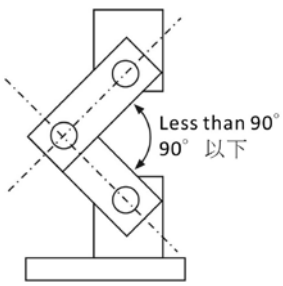
1. The platform is 1800mm long, 1800mm wide and 20mm tall.
2. The robots are placed at the opposite corners of the platform before the game starts.



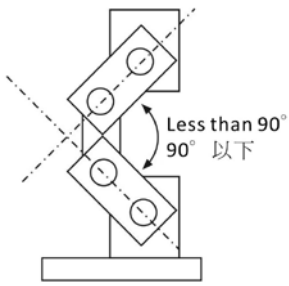
人型機械人武術比賽
Humanoid Free Fighting Competition

Game rule

1. The referee checks the robots for any movable designs that would harm the opponent or damage the platform before the game.
2. Crouched walking** is prohibited when the robot moves. Whether it is regarded as crouched walking or not during the competition is subject to the decision of the referee.



One axle-knee joint less than 90°



Two axles-knee joint less than 90°

**"Crouched walking" means from the side view of the robot, the knee joint of the 'foot' that touches the ground is bent less than 90 degree during the course of walking. Same standard applies to robots with knee joint of the 'foot' using 2 axles (Two axles-knee joint) .

3. Matches are conducted in one 3-minute round. Team with the least number of 'DOWN' is the winner. If a winner cannot be determined at the end of the game, the match will be extended for two minutes. If a winner still cannot be determined after the extension, the robots will be weighed and the lighter weight robot wins the match.
4. The moves or actions executed by the robot must be in compliance with the rules and confirmed by the referee. Objections must be raised at the time when the judgment is made. Any objections or requests raised after the game is over will not be accepted.
5. If the 'confirmation of action' is under reviewed, the match will be suspended and the timer paused.
6. If the team finds that the referee's judgment is inconsistent with the rules, they should raise objections before the game starts or resumes. The objections will then be reviewed and the decision made by the event referee is final. The result whether it is "Confirmation change" or "Restart" will be carried out according to the decision made by the referee.
7. The referee has the final decision right, even after reviewing the video, the verdict will not be changed.
8. Scores will not be changed after they are confirmed by the team.
9. If a team is declared disqualified by the referee, the team with their robot should retire immediately and will be given zero score in that round.
10. The Organizer has the right to disqualify the team who violates the rules.
11. During the game, it is prohibited to use any communication devices except for remote control competition category. The offending team will be disqualified and retire immediately.
12. The referee may arrange for a rematch if the match is delayed caused by the game field, props or scoring. If a team suspects their scores is affected by the field and props, they should voice out and request for a rematch immediately on the spot. Any comments raised after the team has left the game field will not be accepted. If there is a rematch, the scores attained in the rematch will be final whether the robot is able to complete the game or not.
13. If the team has any doubts or questions, they should raise to the referee on the spot immediately. The referee will give a reasonable explanation. The Organizer does not accept any comments made by the team after they left the field. The referee has the final decision right.
14. After the robot is knocked down or fell down, it has to get back up on its feet itself and continue the game, otherwise it loses and the game ends immediately.
15. The competing robots will be separated by the referee and return to the initial position for rematch if the following situation occurs:
    a. Robots entangled together and cannot be separated or they are unable to touch each other for more than five seconds.
    b. When the robots stuck with each other, with the referee's permission, contestants may cut off the power to protect the robot.
    c. Both robots almost fall outside of range at the same time.
    d. Both robots lost mobility.
    e. The referee determines that both parties cannot win the game.

    If any of the above situations happens again after rematch, the referee may place the two robots in a designated position and restart the match. In case of draw again, the lighter weight robot wins the game.

16. In case the rules are not comprehensive enough to address all situations, the Organizer will make the final decision. The Organizer has the ultimate authority on the interpretation and implementation of rules.

Points Scoring rules：

Item	Guidelines	Points
1	Receive1 red card	1 DOWN
2	Receive 2 yellow cards	1 DOWN
3	Successfully launch a valid attack and knock down the opponent. (Knocked down by instant hit during pause or senseless attack is not counted.)	1 DOWN
4	Falls out of field caused by its own actions (whether in the course of advancement or attack)	1 DOWN
5	Falls out of field due to opponent's attack (it is not end of the round)	1 DOWN
6	Unable to leave the start position within 10 seconds. Countdown will be repeated every 10 seconds.	1 DOWN
7	If the robot stands still and fails to move within three seconds. Countdown will be repeated every 5 seconds.	1 DOWN
8	Pause (the pause duration is 2 minutes).	1DOWN
9	Attacked by opponent's suicide attack**. Suicide attack (each robot has only one chance having two or more points of its body touching the floor of the playing field) can only be used once in each round, regardless if the attack is successful. **"Suicide attack" refers to the attacking technique with other parts of the body (except for the sole of the feet) touching the floor of the playing field. For example, pouncing itself on the opponent, hit the opponent with its head while having its hands and feet touching the floor.....and so on, are regarded as suicide attack.	1DOWN
10	If the robot fails to get back up on its feet within 10 seconds after it is knocked down or falls on the floor itself.	5 DOWN
11	Fail to keep a distance away from its opponent after each knock down (includes causing the opponent cannot get back up on its feet)	1 yellow card
12	If the robot attacks the opponent immediately when the opponent gets back on its feet after it is knocked down or fell down before the 3 seconds countdown is over. (This attack is considered invalid)	1 yellow card
13	Except for suicide attacks, robot cannot have more than 2 points of its body touching the ground whether it is walking or making attacks. It will get 1 yellow card for each failure.	1 yellow card
14	If the robot continuously making meaningless attacks or swing actions (for example when the opponent is very far away from itself, etc.)	1 yellow card
15	The robot falls on the ground on its own when it attacks but fails to strike down the opponent.	0 DOWN
16	If a robot goes out of the boundary while recovering from a "down" caused by a valid attack, it will not be considered another "down".	0 DOWN
17	Use 'crouch' style of walking (advancement) or attack and knock down the opponent	0 DOWN
18	Disobey or disrespect for the referee	1 red card
19	Use sideway attack and knock down the opponent	0 DOWN

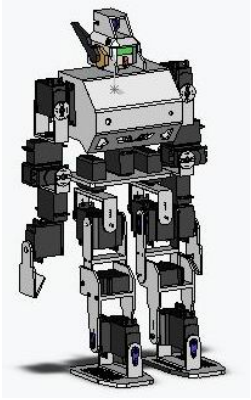
Note: Reference is made to the Hong Kong Robot Boxing League's tournament Regulations

23. Lightweight Humanoid Free Fighting Competition

2 legs servo motor robot (humanoid) is a complicated form of joint type walking robot. Contestant has to build a 2 legs servo motor walking robot using computer to program its motion. The team that knocks down the opponent's robot wins the game.

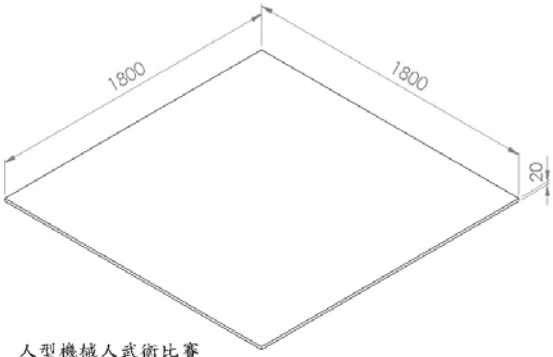
Robot Specification

1. The robot must comply with the Servo Motor Humanoid Robot specification (as stated on pages 41 and 42).
2. The total weight of the robot is 2 kg or less (including the power unit).



Game Field Specification

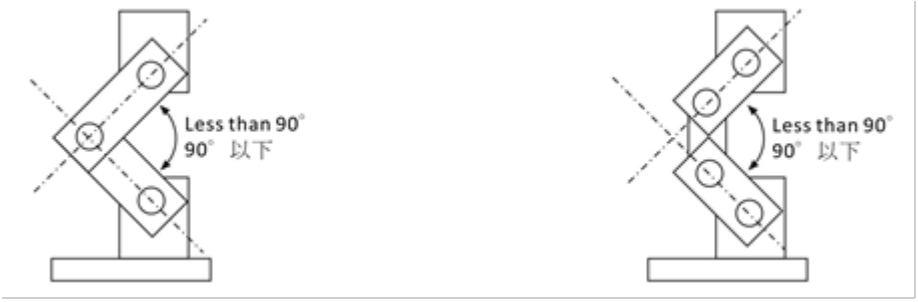
1. The platform is 1800mm long, 1800mm wide and 20mm tall.
2. The robots are placed at the opposite corners of the platform before the game starts.



人型機械人武術比賽
Humanoid Free Fighting Competition

Game rule

1. The referee checks the robots for any movable designs that would harm the opponent or damage the platform before the game.
2. Crouched walking** is prohibited when the robot moves. Whether it is regarded as crouched walking or not during the competition is subject to the decision of the referee.



One axle-knee joint less than 90° Two axles-knee joint less than 90°

**"Crouched walking" means from the side view of the robot, the knee joint of the 'foot' that touches the ground is bent less than 90 degree during the course of walking. Same standard applies to robots with knee joint of the 'foot' using two axles (Two axles-knee joint).

3. Matches are conducted in one 3-minute round. Team with the least number of 'DOWN' is the winner. If a winner cannot be determined at the end of the game, the match will be extended for two minutes. If a winner still cannot be determined after the extension, the robots will be weighed and the lighter weight robot wins the match.
4. The moves or actions executed by the robot must be in compliance with the rules and confirmed by the referee. Objections must be raised at the time when the judgment is made. Any objections or requests raised after the game is over will not be accepted.
5. If the 'confirmation of action' is under reviewed, the match will be suspended and the timer paused.
6. If the team finds that the referee's judgment is inconsistent with the rules, they should raise objections before the game starts or resumes. The objections will then be reviewed and the decision made by the event referee is final. The result whether it is "Confirmation change" or "Restart" will be carried out according to the decision made by the referee.
7. The referee has the final decision right, even after reviewing the video, the verdict will not be changed.
8. Scores will not be changed after they are confirmed by the team.
9. If a team is declared disqualified by the referee, the team with their robot should retire immediately and will be given zero score in that round.
10. The Organizer has the right to disqualify the team who violates the rules.
11. During the game, it is prohibited to use any communication devices except for remote control competition category. The offending team will be disqualified and retire immediately.
12. The referee may arrange for a rematch if the match is delayed caused by the game field, props or scoring. If a team suspects their scores is affected by the field and props, they should voice out and request for a rematch immediately on the spot. Any comments raised after the team has left the game field will not be accepted. If there is a rematch, the scores attained in the rematch will be final whether the robot is able to complete the game or not.
13. If the team has any doubts or questions, they should raise to the referee on the spot immediately. The referee will give a reasonable explanation. The Organizer does not accept any comments made by the team after they left the field. The referee has the final decision right.
14. After the robot is knocked down or fell down, it has to get back up on its feet itself and continue the game, otherwise it losers and the game ends immediately.
15. The competing robots will be separated by the referee and return to the initial position for rematch if the following situation occurs:
    a. Robots entangled together and cannot be separated or they are unable to touch each other for more than five seconds.
    b. When the robots stuck with each other, with the referee's permission, contestants may cut off the power to protect the robot.
    c. Both robots almost fall outside of range at the same time.
    d. Both robots lost mobility.
    e. The referee determines that both parties cannot win the game.

    If any of the above situations happens again after rematch, the referee may place the two robots in a designated position and restart the match. In case of draw again, the lighter weight robot wins the game.

16. In case the rules are not comprehensive enough to address all situations, the Organizer will make the final decision. The Organizer has the ultimate authority on the interpretation and implementation of rules.

Points Scoring rules：

Item	Guidelines	Points
1	Receive1 red card	1 DOWN
2	Receive 2 yellow cards	1 DOWN
3	Successfully launch a valid attack and knock down the opponent. (Knocked down by instant hit during pause or senseless attack is not counted.)	1 DOWN
4	Falls out of field caused by its own actions (whether in the course of advancement or attack)	1 DOWN
5	Falls out of field due to opponent's attack (it is not end of the round)	1 DOWN
6	Unable to leave the start position within 10 seconds. Countdown will be repeated every 10 seconds.	1 DOWN
7	If the robot stands still and fails to move within three seconds. Countdown will be repeated every 5 seconds.	1 DOWN
8	Pause (the pause duration is 2 minutes).	1DOWN
9	Attacked by opponent's suicide attack**. Suicide attack (each robot has only one chance having two or more points of its body touching the floor of the playing field) can only be used once in each round, regardless if the attack is successful. "Suicide attack" refers to the attacking technique with other parts of the body (except for the sole of the feet) touching the floor of the playing field. For example, pouncing itself on the opponent, hit the opponent with its head while having its hands and feet touching the floor.....and so on, are regarded as suicide attack.	1DOWN
10	If the robot fails to get back up on its feet within 10 seconds after it is knocked down or falls on the floor itself.	5 DOWN
11	Fail to keep a distance away from its opponent after each knock down (includes causing the opponent cannot get back up on its feet)	1 yellow card
12	If the robot attacks the opponent immediately when the opponent gets back on its feet after it is knocked down or fell down before the 3 seconds countdown is over. (This attack is considered invalid)	1 yellow card
13	Except for suicide attacks, robot cannot have more than 2 points of its body touching the ground whether it is walking or making attacks. It will get 1 yellow card for each failure.	1 yellow card
14	If the robot continuously making meaningless attacks or swing actions (for example when the opponent is very far away from itself, etc.)	1 yellow card
15	The robot falls on the ground on its own when it attacks but fails to strike down the opponent.	0 DOWN
16	If a robot goes out of the boundary while recovering from a "down" caused by a valid attack, it will not be considered another "down".	0 DOWN
17	Use 'crouch' style of walking (advancement) or attack and knock down the opponent	0 DOWN
18	Disobey or disrespect for the referee	1 red card
19	Use sideway attack and knock down the opponent	0 DOWN

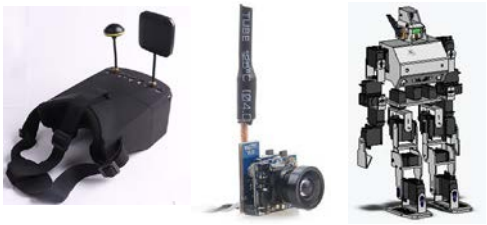
Note: Reference is made to the Hong Kong Robot Boxing League's tournament Regulations

24. Head Mounted Display Humanoid Obstacle Avoidance Competition

2 legs servo motor robot (humanoid) is one of complicated joint types walking robot. Contestant has to use servo motors to build a 2 legs walking robot and to use computer to program its motion. The robot is to finish the race in the shortest amount of time.

Robot Specification

1. The robot must comply with the Servo Motor Humanoid Robot specification (as stated on pages 41 and 42).
2. The total weight of the robot is 3 kg or less (including the power unit).
3. Participants must use a wireless Head Mounted Display to manipulate the robot.



Head Mounted display

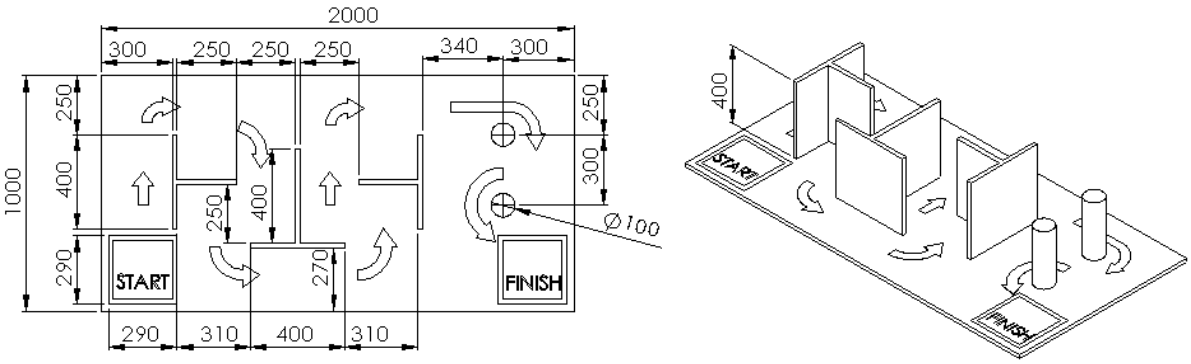
ttps://item.taobao.com/item.htm?spm=a1z09.2.0.0.54722e8dTEnuXi&id=562484595449&_u=6222cnr8d341

Camera

https://item.taobao.com/item.htm?spm=a1z09.2.0.0.54722e8dTEnuXi&id=563404314799&_u=6222cnr83191

Game Field Specification

1. The platform is 2000mm long, 1000mm wide and 20mm tall.

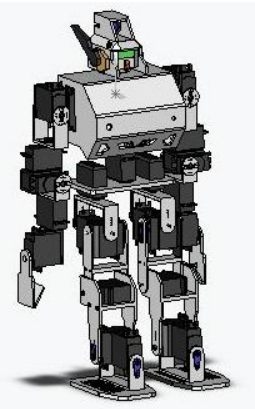


Game rule

1. Each robot plays once and the game time is 3 minutes.
2. The robot stands at the “START” position. The timer begins upon receiving the signal of the judge.
3. The robot is to advance according to the direction of the arrows bypassing all the obstacles on its way to the FINSIH position. The robot may resume the match at where it falls down.
4. The timer stops once the robot completely enters the “Finish” zone. The robot with the shortest amount of time to finish the race is the winner

25. Servo Motor Humanoid Robot – Super Brawl

2 legs servo motor humanoid robot is a complicated form of joint type walking robot. Contestant has to build a 2 legs servo motor walking robot using computer to program its motion. All participating robots are placed on the game field and combat among themselves simultaneously using their own methods to knock down or push the opponents out of the arena until the last one remains on the field.

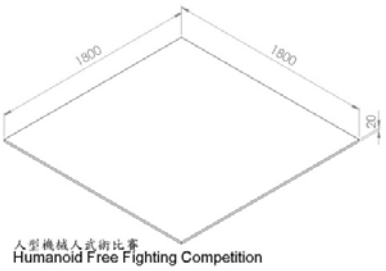


Robot Specification

The robot must comply with the Servo Motor Humanoid Robot specification (as stated on pages 41 and 42).

Game Field Specification

1. The platform is 1800mm long, 1800mm wide and 20mm tall.
2. All participating robots are placed along the borders inside the game filed.



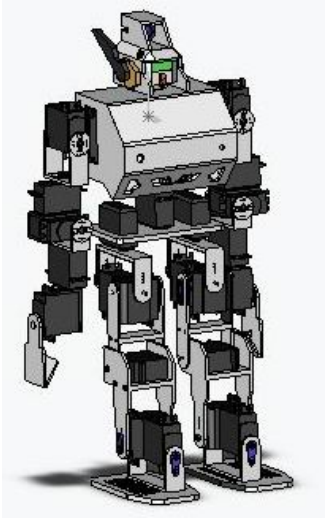
Game Rules

1. The referee inspects all robots to ensure they are not equipped with any dangerous movable devices before the match begins.
2. Participants have to ensure the robot's power devices, wireless controller and its mobility are functioning properly.
3. There is no game time limit. The last robot remains on the game field is the winner.
4. Once the match begins, only the referee may touch the robots. All participants are not allowed to touch any robots.
5. There is no pause during the match.
6. The robot is allowed to continue with the match as long as it is able to stand up on its feet after being knocked down or fell down to the floor within 10 seconds. The robot loses the match and is removed from the arena if it fails to stand up on its feet after 10 seconds.
7. The robot loses the match once it falls out of the arena under any circumstances.
8. The robot loses the match and is removed from the arena if it stands still and fails to move within 5 seconds.
9. Participating robots may knock down their opponents by attacking them in the front, sideways or using 'suicide attack' or push their opponents out of the arena.
10. Referee may separate the robots and return them to a safe position for rematch if the following situation occurs:
    a. Robots entangled together and cannot be separated
    b. When the robots stuck with each other, with the referee's permission, contestants may cut off the power to protect the robot.
11. The Organizer has the authority to disqualify any teams violating the game rules.
12. In case the rules are not comprehensive enough, the Organizer will make the final decision. The Organizer has the ultimate authority on the interpretation and implementation of rules.

26. Servo Motor Humanoid Robot - Curling Race

Curling is a sport in which players slide stones on a board towards a target area which is segmented into three concentric circles. Contestant has to build a 2 legs humanoid walking robot using servo motor and to computer program its motion. It is a one to one match and the robot is to kick the 'curling stone' to the target, the house. The team with the highest number of accumulated points at the end of the match is the winner.

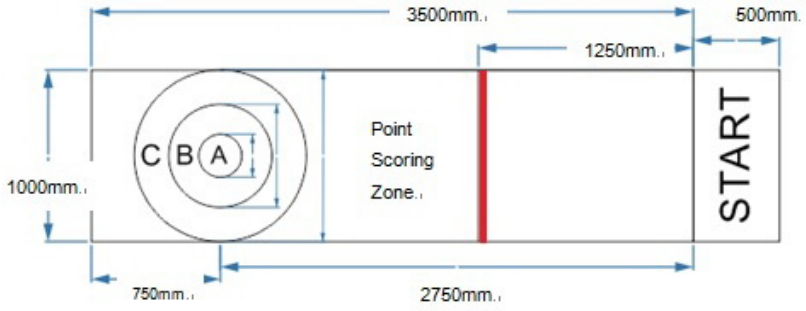
Robot Specification



The robot must comply with the Servo Motor Humanoid Robot specification (as stated on pages 41 and 42).

Game Field Specification

1. The arena (3500mm x 1500mm) is made up of several PVC boards.
   The diameters of Circle A: 250mm, Circle B: 600mm,
   Circle C: 1000mm respectively
2. The 'curling stone' is 70mm in diameter, 25mm tall and weighs 20g. It is made of PLA materials created by a 3D printer.



Game Rules

1. The match consists of three rounds. A draw is used to determine which team plays first. Each team is given a culing stone for curling in each round. For example in the first round, each team assigns one robot to take turn to kick its curling stone into the points scoring zones within the 2-minute game time. The match ends upon completion of the three rounds and points are scored. The team with the most scores wins.
2. Before the match begins, contestant using market robot may place the robot and the curling stone at any position between the red line and the 'START' zone while contestant using non-market robot may place the robot and curling stone at the START zone only. After that contestant is not allowed to touch the robot until end of the round.
3. The robot is allowed to touch the curling stone maximum 3 times during each round. However, the robot is not allowed to touch the curling stone once the curling stone gets into the points scoring circles and the round ends. The curling stone remains where it is on the arena.
4. Under whatever situation, once the robot touches the curling stone is regarded as one touching.
5. The game will immediatley stop once the curling stone or the robot leaves or falls out of the arena during the match. Points scored during such round will be forfeited and the team will not get a repleacement curling stone.
6. It is only acceptable to use its own curling stone to hit against other curling stones and even the opponent's curling stone out of the Point Scoring Zone.

7. Points are scored and summed up according to the positions of the stones on the arena at the end of the match to deterime the winner. Below is the scoring:

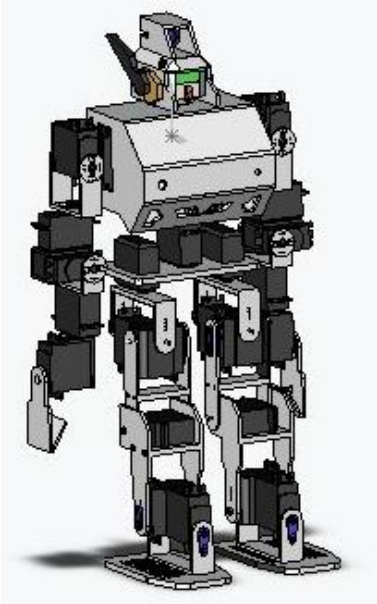
Final resting position of the curling stone	Points
Inside zone Circle A	5
Inside zone Circle B	3
Inside zone Circle C	1

If the curling stone rests across two different point scoring zones, the higher one will be used.

8. A rematch will be arranged in case of draw and both teams swap their order of play. In case of draw again, the lighter weight robot wins.

27. Servo Motor Humanoid Robot – Running Race

Contestants are required to build a 2-leg servo motor humanoid robot using computer to program the robot to run and pass over the obstales. The robot is to complete the race in the shortest amount of time.



Robot Specification

The robot must comply with the Servo Motor Humanoid Robot specification (as stated on pages 41 and 42).

Game Field Specification

1. The surface of the game field is covered with 2mm thick felt fabric. The dimensions of the game field refers to the diagram (1) below.

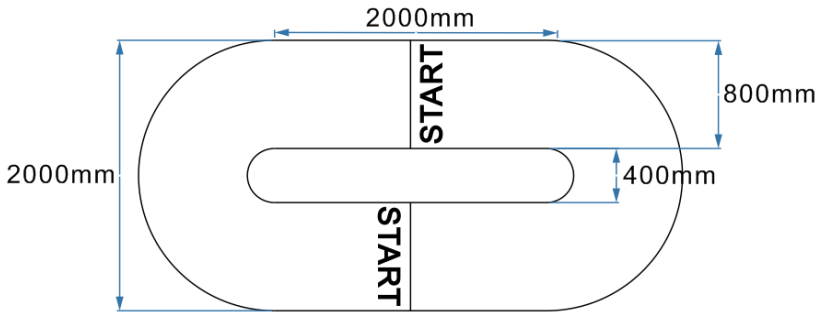


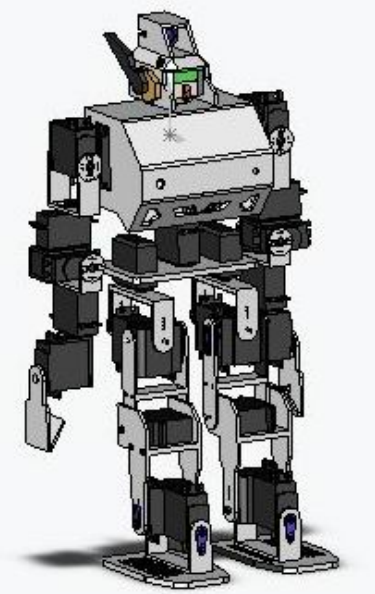
Diagram (1)

Game Rules

1. Constestants are required to complete one lap in anti-clockwise within 3 minutes.
2. Contestants are not allowed to touch the robots once the match begins.
3. Robots are required to run in a backward and forward movement mode. Robot is allowed to make right or left turns to adjust its direction only (robots are prohibted to run in a left or right movement mode under any circumstances).
4. Robots are required to make forward movement to pass over the obstacles (for example hurdling, somersaulting etc.)
5. Robot with any parts of its body touching the exterior of the track boundary will be disqualified.
6. There is no pause during the match.
7. Each team plays 2 rounds and the best time is recorded. If no robot complete the race, the one covers the longest distance wins.

28. Servo Motor Humanoid Robot - Relay Race

Contestants are required to build two 2-leg servo motor humanoid running robots using computer to program their motions. Each robot has to complete 3 laps in the shortest amount of time. As each team has 2 robots so they have to complete a total of 6 laps.



Robot Specification

The robot must comply with the Servo Motor Humanoid Robot specification (as stated on pages 41 and 42).

Game Field Specification

1. The surface of the game field is covered with 2mm thick felt fabric. The dimensions of the game field refers to the diagram (1).

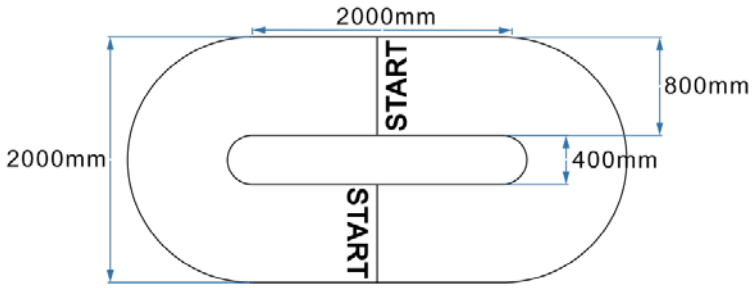


Diagram (1)

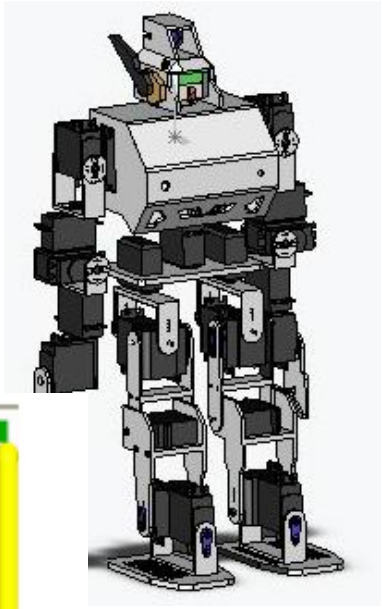
Game Rules

1. Each team sends out 2 robots for the match.
2. Two robots, each from two different teams, will compete simutaneously. Each robot is to complete 3 laps in anti-clockwise in the shortest amount of time. Each team has 2 robots which means they need to complete a total of 6 laps.
3. If one of the two teams completes 6 laps or the 10-minute game time expires, whichever is earlier, the match ends.
4. Robots are required to run in a backward and forward movement mode. Robot is allowed to make right or left turns to adjust its direction only (robots are prohibited to run in a left or right movement mode under any circumstances).
5. Contestants are not allowed to touch the robots once the match begins
6. If the robot with any parts of its body touches the exterior of the track boundary for 5 seconds, the referee will place it back in the middle of the track.
7. If the robot wants to overtake its opponent, it should not collide with its opponent. The robot in the front also should not intentionally obstruct its opponent behind. Robot violating these rules will be disqualified.
8. The handoff baton robot must first have its whole body crossed the START line which implies transferring of baton. The recipient robot will then set-off from the START line .
9. There is no pause during the match.
10. Each team competes once only and the team completes the 6 laps with the shortest amount of time is the winner. If none of the teams finishes the game within the game time, the team covers the longerest distance wins the match.

29. Servo Motor Humanoid Robot – Soccer Race

This event requires the contestants to computer program a humanoid robot for the soccer race. Soccer is one of the world's most pouplar sports. Through this exercise, the contestants' interest in the structure and programming of the robots will be raised as well as their team spirit willl further be enhanced.

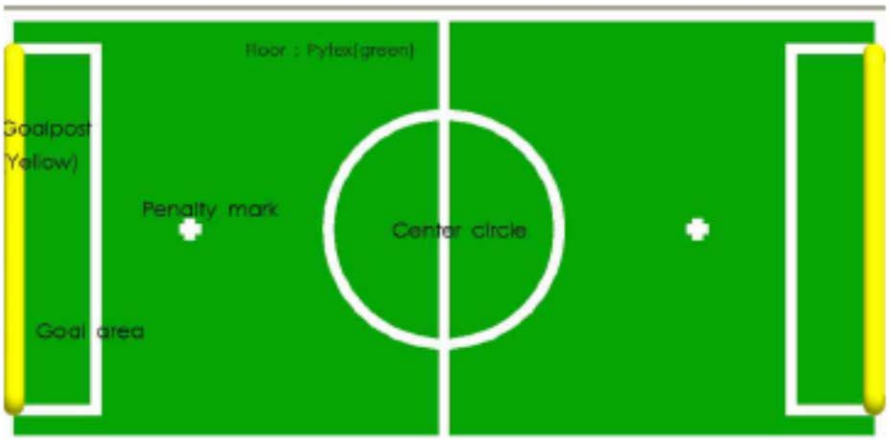
Robot Specification

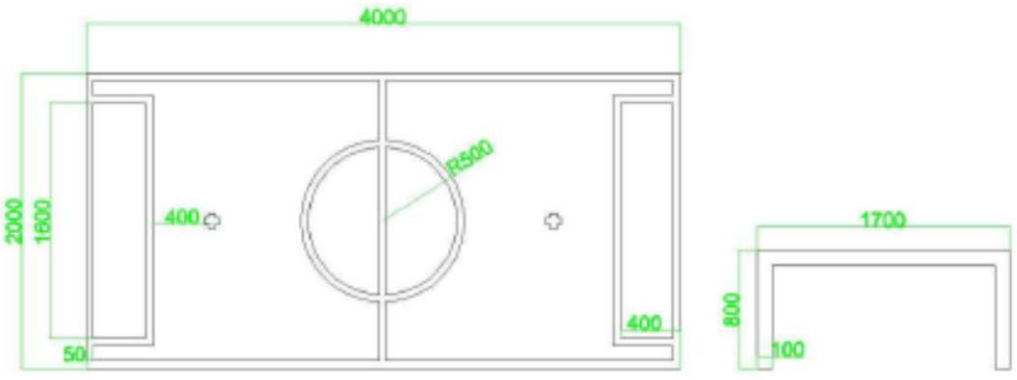


The robot must comply with the Servo Motor Humanoid Robot specification (as stated on pages 41 and 42).

Game Field Specification

1. The surface of the game field is covered with 2mm thick felt fabric. The dimensions of the game field refers to the diagram below.





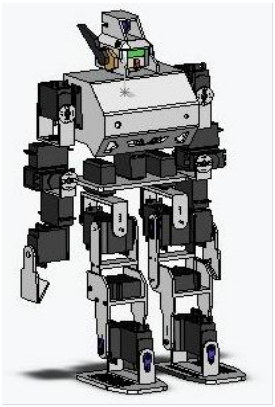
2. Size of soccer:
   It is a hollow rubber ball with 12cm in diameter.

Game Rules

1. Eech teams sends out 2-3 robots for the match and one of which must be the goalkeeper. It is acceptable to have one extra robot as substitute.
2. Contestants are not allowed to touch the robots once the match begins.
3. The match is comprised of two 3-minute halves. There is a 1-minute half-time period between the halves. If it is tied at the end of the match an extra 2-minute game time will be added. If it still ties, a winner will be determined by a penalty mark kick.
4. There is no pause during the match. With the referee's permission, the robot that requires repair may be removed from the arena and the timer will not pause.
5. Except the robot goalkeeper may use its hands to touch the ball, all other robots are not allowed to use their hands to touch the ball. Robot that commits a foul will be required to leave the field for 30 seconds.
6. The robot goalkeeper may only move around within the goal area, touch the ball and defend the goal from scoring by the opponent team.
7. Other than the robot goalkeepers, robots of both teams are not allowed to enter the goal area. All robots on the field are not allowed to attack other robots. Robot that commits a foul will be required to leave the field for 30 seconds.
8. If the ball falls out of bound, the game is restarted with a free kick on the touch line of the field.
9. The team with the most goals wins.

30. Servo Motor Humanoid Robot – Penalty Shoot-out Competition

The penalty shootout is a method of determining a winner in football matches that would have otherwise been drawn or tied. Contestant controls the robot to make five penalty kicks. The team with the most scores and the shortest amount of time is the winner.

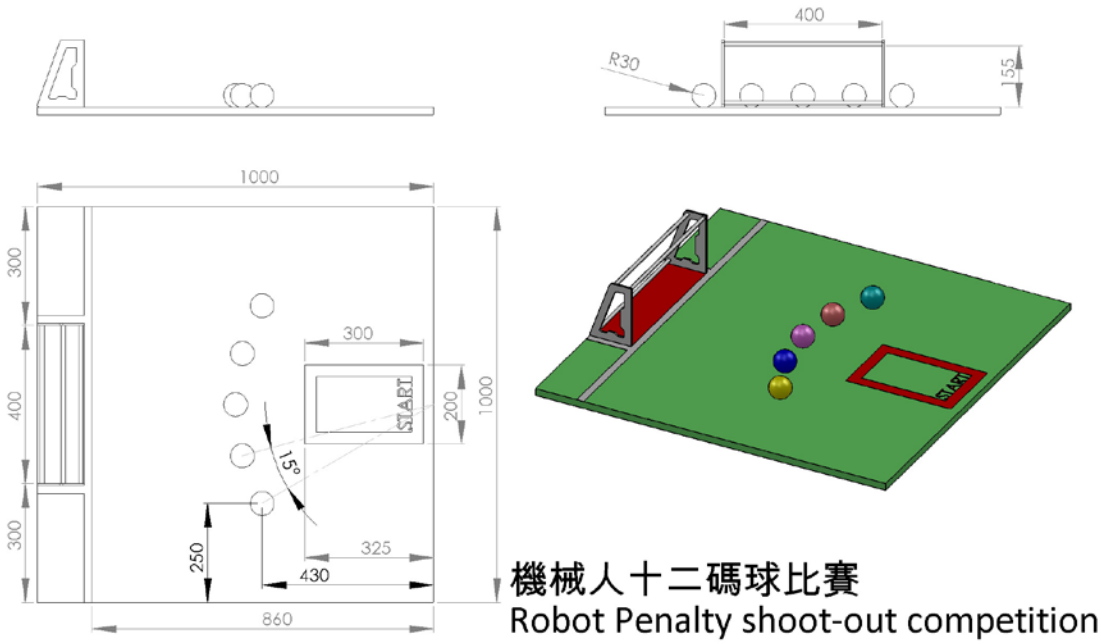


Robot Specification

The robot must comply with the Servo Motor Humanoid Robot specification (as stated on pages 41 and 42).

Game Field Specification

1. This game uses a penalty shoot-out playing field.
2. Five 60mm rubber balls are arranged in the form of an arc on a rack (diagram referred).



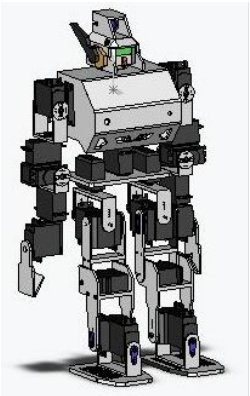
機械人十二碼球比賽
Robot Penalty shoot-out competition

Game Rules

1. The robot is placed in the start zone prior to the game begins and it may move to kick the ball upon receiving the judge's signal.
2. Contestant has 4 minutes to finish 5 penalty kicks. Each goal scores 2 points. A goal will be counted if the ball crosses the line in front of the goal even it rebounds. However, it is not a goal if the ball rebounds from the goal posts.
3. The robot may kick the ball only once per each penalty kick. Two or more attempts to kick the ball is not allowed.
4. The judge will immediately remove the ball(s) from the field that is/are either accidentally touched by the robot or hit by the ball that is kicked by the robot
5. Each team continuously plays 2 rounds of the five penalty kicks and all the scores is totaled. If the scores are the same at the end of the game, the team with the shortest amount of time to finish all kicks is the winner.

31. Servo Motor Humanoid Robot – Stair Walking Competition

Walking is the basic ability of humanoid robot and the ability of walking up and down stairs further enhances the maneuverability of the humanoid robot.

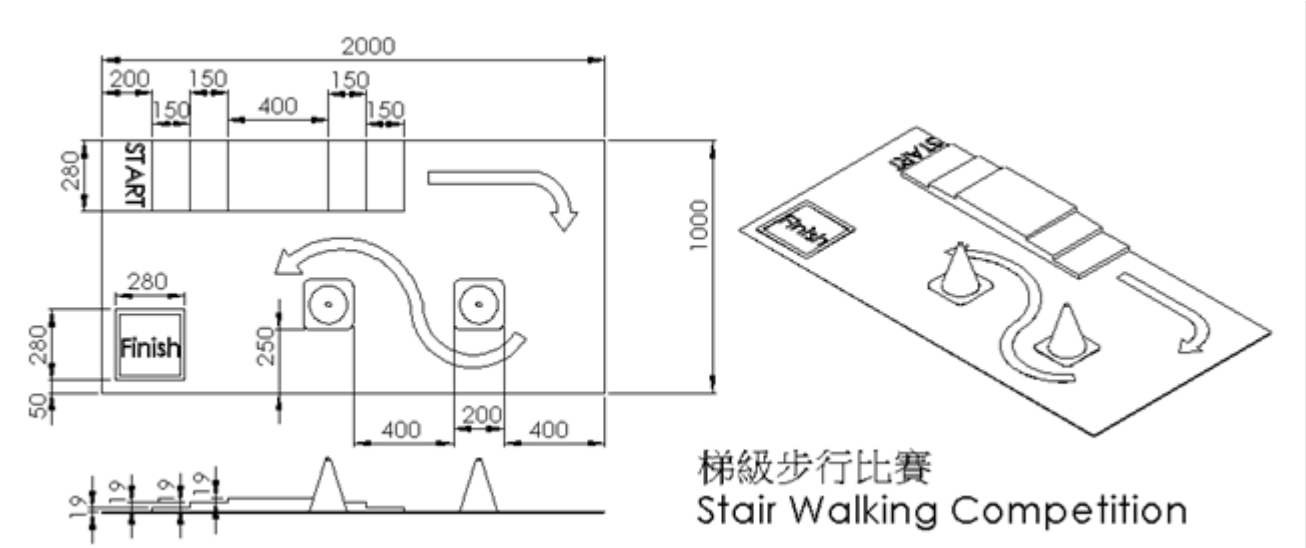


Robot Specification

The robot must comply with the Servo Motor Humanoid Robot specification (as stated on pages 41 and 42).

Game Field Specification

1. The playing field is 2m long x 1m wide.
2. The staircase is 1m long x 280mm wide. The stair riser height of each step is 19mm.



Game Rules

1. Each robot plays once and the game time is 3 minutes.
2. The robot stands at the “START” position in front of the staircase. The timer begins after receiving the judge’s signal.
3. The robot must step up or step down each step of the staircase. The robot may resume the match at where it falls down.
4. The robot is to bypass two obstacles after stepping down the staircase on its way to the FINSIH zone.
5. The timer stops once the robot completely enters the “Finish” zone. The robot with the shortest amount of time to finish the race is the winner.

32. Life Inspired Innovative Model Design Competition

The competition encourages students to transform the everyday objects into cute and delightful characters using their imagination and creativity.

Game Rules

1. The participating article may not take part in any other competitions.
2. Article can be made with daily life appliances, such as faucets, brushes, wrenches, etc. The article can only use up to three different appliances but there is no limit on the quantity used. The article should try to retain the original appearance of the appliance as much as possible and reduce using add-on parts.
3. The article including its peripheral decorations cannot exceed 500mm X 500mm X 500mm. Peripheral decoration is optional.
4. The contestant may submit an A4 size introduction on the design concept and features (annex 3) in the specified format. However, the contents must not reflect or imply in any way the name of contestant or school. No presentation is required on the day. Failure to comply may lead to disqualification of the item.

Evaluation Criteria

The original shape of the article should be kept as much as possible and use of additional parts should be minimised.

Appearance / Dynamics	Creativity	Production skills	Application of material	Total
25%	30%	25%	20%	100%

Examples: French artist Gilbert Legrand using his imagination and creatively by painting or adding small details to our everyday domestic objects and turn them into cute characters and give them new life….. a tap becoming a running lady, a brush seen as a Native American, a toilet brush conjures a lion …..

Annex 3

Life Inspired Innovative Model Design Competition

Product Introduction

Category: _____ Contest Registration No. : _____

Product Introduction :

Design concept:

Materials application:

Problems encountered:

Solution:

Note: The content must not reflect or imply in any way the name of contestant or school. Failure to comply may lead to disqualification of the item.