6th International Youth Robot Competition (IYRC) 2019
Daejeon, Korea

I. Overview

1. Date: 2nd-3rd, August, 2019
2. Venue: Daejeon Convention Center (DCC)
3. Organizer: International Youth Robotics Committee (IYRA),
4. Co-organizer: My Robot Time (SZ) Co.,Ltd
5. Participants: More than 2,000 participants from 30 countries around the world

II. Competition Categories

1. Bowling (Junior Skill) · 5-7 years old
2. Basket Ball (Junior Skill) – 5-7 years old
3. Item Recycle (Junior Skill) · 7-12 years old
4. Animal Kingdom (Junior Coding) · 7-12 years old
5. Soccer (Junior Skill) · 7-12 years old
6. Push-push (Junior Skill) – 7-12 years old
7. Volleyball (Junior Skill) – 7-12 years old
8. Transporter (Junior Coding) – 7 -12 years old
9. Creative Design (Junior Creative) – 7-12 years old
10. Push-push (Senior Skill) - 13-17 years old
11. Volleyball (Senior Skill) - 13-17 years old
12. Save the Forest (Senior Coding) · 13-17 years old
13. Autonomous Rescue Robot (Senior Coding) – 13 – 17 years old
14. Creative Design (Senior Creative) - 13-17 years old
15. Humanoid Robot Dance - Open category
16. Humanoid Robot Mission – Open category
17. Humanoid Boxing – Open category

III. Awards

Category	Gold (Trophy)	Silver (Trophy)	Bronze (Trophy)	Excellent Awards (Medal)
Individual				
IYRC Bowling	1	1	1	5
IYRC Basketball	1	1	1	5
IYRC Item Recycle	1	1	1	5
IYRC Animal Kingdom	1	1	1	5
IYRC Save The Forest	1	1	1	5
On Site Programming				
IYRC Transporter	1 (US$100)	1 (US$100)	1 (US$100)	5
IYRC Autonomous Rescue Robot	1 (US$100)	1 (US$100)	1 (US$100)	5
Tournament				
IYRC Soccer 3 VS 3	1 Team	1 Team	1 Team	5 Teams

IYRC Push-push (Junior Skill)	1	1	1	5
IYRC Push-push (Senior Skill)	1	1	1	5
IYRC Volleyball (Junior Skill)	1 Team	1 Team	1 Team	5 Teams
IYRC Volleyball (Senior Skill)	1 Team	1 Team	1 Team	5 Teams
IYRC Creative Design (Junior Creative)	1 Team	1 Team	1 Team	5 Teams
IYRC Creative Design (Senior Creative)	1 Team	1 Team	1 Team	5 Teams
Open Category				
IYRC Humanoid Boxing	1	1	1	5
IYRC Humanoid Mission	1	1	1	5
IYRC Humanoid Dancing	1 Team	1 Team	1 Team	5 Teams

IV. Schedule

Time	Activities	Venue
1st August 2019		
9.00am – 11.30pm	Airport pick-up / Accommodation check-in	KT Human Resource Department (HRD) Dormitory
	Registration	
2nd August 2019		
7.30am – 9.00am	Breakfast & Transport to competition hall	KT HRD Dormitory / Daejeon Convention Center (DCC)
9.00am – 10.00am	Robot registration and quarantine	DCC
10.00am – 10.30am	Opening Ceremony	DCC
10.30am – 12.00pm	IYRC Competition	DCC
12.00pm – 1.00pm	Lunch	Lunch Hall
1.00pm – 5.00pm	IYRC Competition	DCC
5.00pm – 7.00pm	Transport to accommodation & dinner	DCC / KT HRD Dormitory
3rd August 2019		
7.30am – 9.00am	Breakfast & Transport to competition hall	KT HRD Dormitory / DCC
9.00am – 10.00am	Robot registration and quarantine	DCC
10.00am – 12.00pm	IYRC Competition	DCC
12.00pm - 1.00pm	Lunch	Lunch Hall
1.00pm – 5.00pm	IYRC Competition	DCC
5.00pm – 7.00pm	Dinner	DCC
7.00pm – 10.00pm	Prize Giving Ceremony & Cultural Performance	DCC
10.00pm – 11.00pm	Transport to accommodation	DCC / KT HRD Dormitory
7.30am – 8.30am	Breakfast	KT HRD Dormitory
Before 12.00pm	Check-out / Airport Transfer	

IYRC 2019

Rules & Regulations

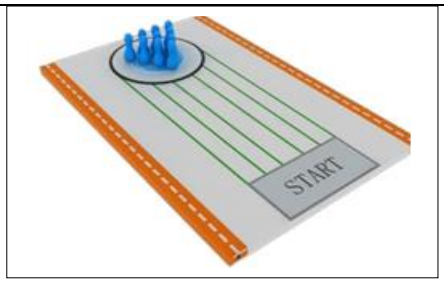
Document Change Log

Version No.	Date Changed	Description of changes
Ver. 2	22/3/2019	• New games added - Basketball (Junior Skill) - Push-push (Junior Skill) - Volleyball (Junior Skill) - Creative Design (Junior Creative) - Creative Design (Senior Creative) - LINE Humanoid Boxing (Open) • Cash Award for Gold, Silver & Bronze for category Transporter (Junior Coding) & Autonomous Rescue Robot (Senior Coding)

JUNIOR CATEGORIES

1) Bowling (Junior Skill)

Age	5-7 years old
Team	Individual
Robot Kits	Goma and Brain only
Mission	On the spot Card programming. Throw ball to knock down pins from start box
Robot Building	Pre-built and on the spot card programming
Game Method	Mission Completion



1.0 Objective

To provide an event that required students to build a robot that able to throw a ball to knock down as many pins as it can, the robot must program by using card reader and command cards provided during the game.

2.0 Robot Dimensions and Weight

The size of the robot at the starting box shall not exceed 35cm by 35cm by 35cm.

However, robots can **expand** to any size after the game starts.

3.0 Restrictions on Robot design

3.1 All Robots (whole or subdivided) must be using Goma Brain mainboard as core processor.

3.2 Organizer will provide programming cards and card reader for participant.

3.3 The robot must not have any foreign part (included rubber band, black tapes and scotch tapes). The player would be IMMEDIATELY disqualified if found guilty.

3.4 Robots shall not damage any part of the field or obstacles deliberately.

3.5 Robots are not allowed to have any power supply above 6V DC (Volt of Direct Current). The participant will be disqualified if batteries used does not have original voltage label indicating the battery voltage. VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.6 Robots shall not cause any danger to the arena and surroundings in anyway whatsoever.

4.0 Game Rules

4.1 Robot must always stay in the start box. If the robot exceeded the start box when shooting, the attempt is a foul play and no point will be given to the participant for the attempt.

4.2 Each of the participants given only 3 minutes

4.2.1 Upon being called by the referee, participant has to program their robot in front of the referee before the game start. If the participant unable to program the robot, can request referee to help and there will be not point for programming task.

4.2.2 After programming, participants may operate the robot to start the game.

4.3 Each participant has 2 rounds whereby each round has 3 attempts. After first round finished, game field restored to original stage and second round starts. Each thrown can only use 1 ball (Goma L-Gear) only.

4.4 During competition, participants allow to touch or hold robot in case the robot fall down when throw out the ball.

4.5 The number of pins knocked down is calculated and recorded.

4.6 Each knocked down pin scored 1 point. Total point for each attempt is 10 points max, so total 2 rounds can score 60 points.

4.7 Total points of 2 rounds are added and the participant with highest point becomes the winner.

4.8 If less than 10 pins being knock down in an attempt, the remaining pins have to knock down in the following attempt and so on.

4.9 If all 10 pins being knock down (strike) in an attempt, 10 pins will be replaced for following attempt and so on.

4.10 The time taken for pins replacement will not counted in the 3 minutes.

4.11 In case of same points occur, the point of first attempt is taken into consideration to determine the winner. If the first attempt has the same points too, the second attempt will be taken to determine the winner and so on. (The participant with higher point in first attempt is the winner.)

4.12 In case of points for each attempt is the same, the date of birth of participants will be considered to determine the winner. (Participant with younger age will become the winner).

4.13 Example of score sheet:

1) Participant B, C, D, E have the same total points.

2) Participant E is ranked higher than participant C because E has higher score during first attempt.

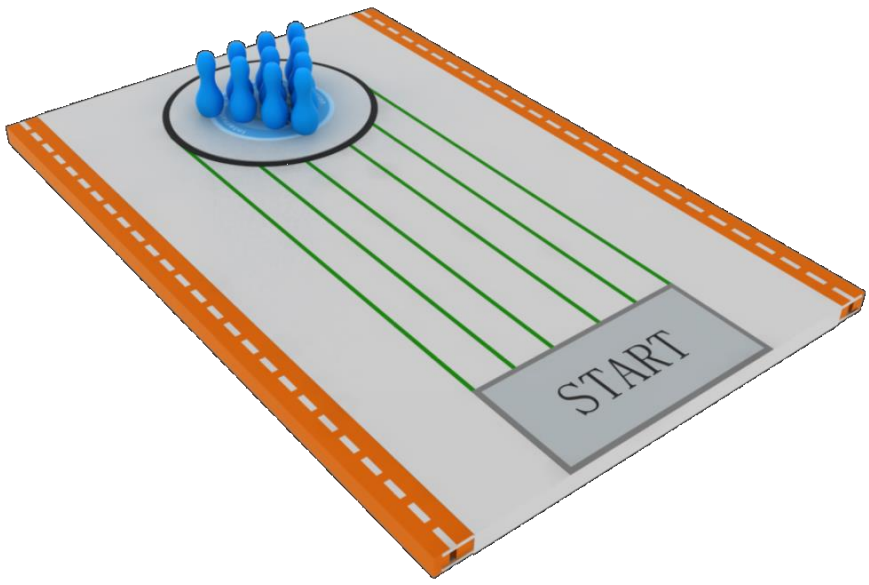
3) The first attempt score of participant B and E is the same, hence score of second attempt is compared to determine the winner.

4) Participant C and D have same total points and same point for each of their attempt, hence their age is taken into consideration. Participant C gets a higher rank because he is younger.

Sample score record

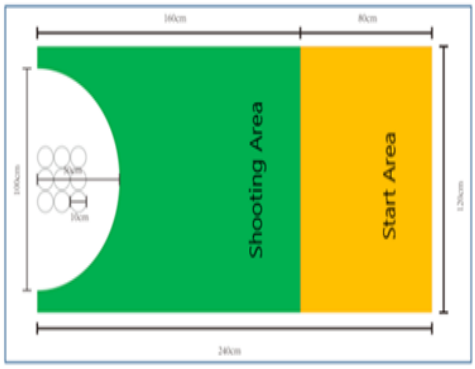
Name	1st	2nd	3rd	4rd	5rd	6rd	Card Programming	Total	Rank
A	10	10	10	10	10	10	10	70	1
B	4	3	1	10	8	2	10	38	3
C	10	7	3	10	5	5	0	40	2

5.0 Game Field



2) Basketball (Junior Skill)

Age	5-7 years old
Team	Individual
Robot Kits	Goma and Brain only
Mission	Bring table tennis ball from the start area, enter into shooting area and throw the ball
Robot Building	Pre-built and pre- program
Game Method	Mission Completion



1.0 Objective

To provide an event that required students to build a robot that able to move from start area to shooting area and then throw the ball into the cup to get as much point as it can.

2.0 Robot Dimensions and Weight

The size of the robot at the starting box shall not exceed 30cm by 30cm by 30cm.

However, robots can **expand** to any size after the game starts.

3.0 Restrictions on Robot design

3.1 All Robots (whole or subdivided) must be using Goma Brain mainboard as core processor and pre-program.

3.2 Only one start button is allow, DC Motor and other sensors has no limit.

3.3 The robot entered shooting area, participant is not allow to touch or control the robot.

3.4 Participant robot should be carried out the mission autonomously.

3.5 The robot must not have any foreign part (included rubber band, black tapes and scotch tapes). The player would be IMMEDIATELY disqualified if found guilty.

3.6 Robots shall not damage any part of the field or obstacles deliberately.

3.7 Robots are not allowed to have any power supply above 6V DC (Volt of Direct Current). The participant will be disqualified if batteries used does not have original voltage label indicating the battery voltage. VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.8 Robots shall not cause any danger to the arena and surroundings in anyway whatsoever.

4.0 Game Rules

4.1 Robot should place in the Start Area with a ball ready. Once the whistle blow, game start. Participant can start the robot by one touch button.

4.2 Robot will move automatically into the Shooting Area and throw the ball into the basket. Then, it will return to the Start Area. Participant now can put a ball onto it. Robot will automatically go forward into Shooting Area and throw the ball. Do the same process until 3 minutes game time end.

4.3 For participant to put the ball on the robot, the robot must fully inside the Start Area, else this is a foul. Same as throwing ball, robot must fully inside Shooting Area, else it is a foul.

4.4 Once the game end, referee will count the number of ball which successfully shot inside the basket. Red basket 1 point, Blue basket 2 points, white basket 3 points and Yellow basket 6 points.

4.5 Each time robot can only bring 1 ball to the Shooting Area and throw. If robot is not fully back to the Start Area

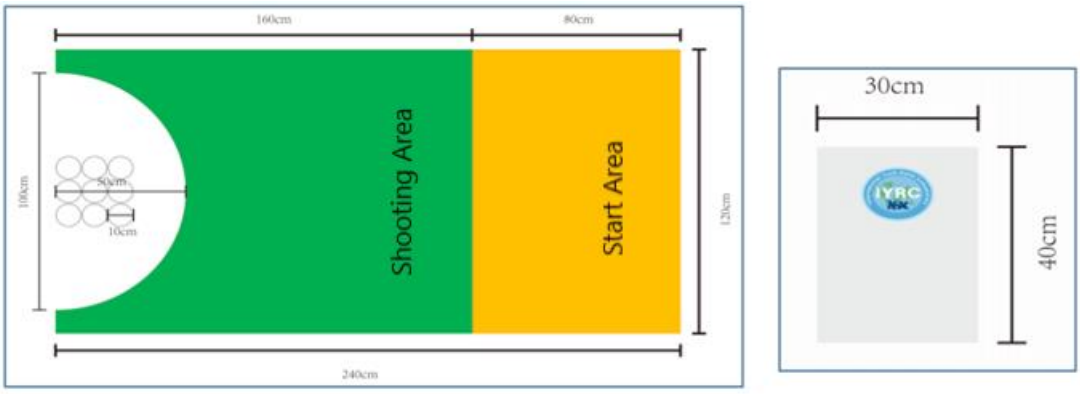
and participant adjust the direction of the robot, this will lead to minus 1 point. The correct way is wait until the robot fully back to the Start Area and do the necessary direction adjustment.

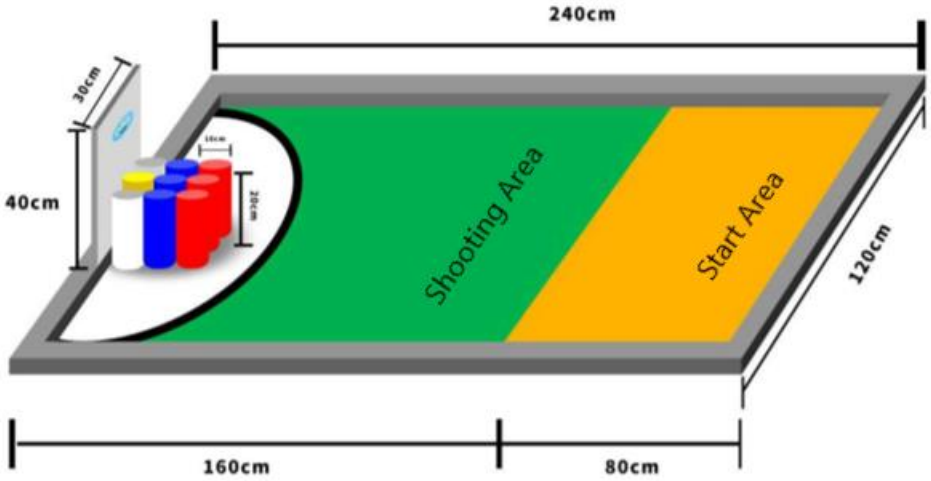
4.6 If same point, then will refer to the number of ball in Yellow basket, then White basket , Blue basket and Red basket. The winner will be the higher number of ball in higher point basket as per the sequence above.

Sample score record

Name	Red	Blue	White	Yellow	Total	Rank
A	3	2	6	12	23	1
B	3	2	12	6	23	2
C	5	2	6	6	19	3

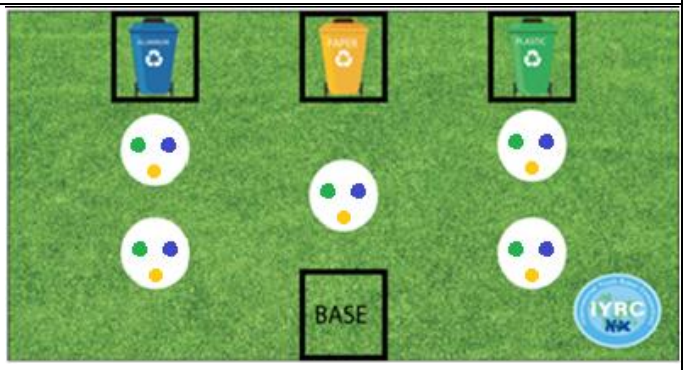
5.0 Game Field





3) ITEM RECYCLE (Junior Skill)

Age	7-12
Team	Individual
Robot Kits	MRT Series & HUNA educational robot kits (not include My Robot Time Toy series and MRT Soccer Robot)
Mission	Require participant to use remote control robot to sort and place recyclables into different categories: Aluminum, Paper, and Plastic.
Robot Building	Pre-build
Game Method	Mission completion



1.0 Objective

The goal of this game is to test student skill to construct and control a robot to push recyclables to its destination according to its category in shortest time.

2.0 Robot Dimension and Weight

The size of the robot at the starting box shall not exceed 25cm (H) by 25cm (W) by 25cm (L).

Robot is **NOT allowed** to expand at any time.

3.0 Restriction on Robot Design

3.1 Only MRT Series & HUNA educational robot kits (not include My Robot Time Toy series and MRT Soccer Robot) parts are to be used to build the robot. There is no limitation to the number of blocks used to build the robot. You are allowed to cross use the parts from the above mentioned robot kits for the robots.

3.2 Only allowed to3 use maximum up to 4 numbers of DC motors, and 1 mainboard .

3.3 Robots shall not damage any part of the field or obstacles deliberately.

3.4 Robots are not allowed to have any power supply above 9V DC (Volt of Direct Current). VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.5 Robots shall not cause any danger to the arena & surroundings in anyway whatsoever.

3.6 Robots will need to protect their sensors if necessary from any outside interferences.

3.7 Robots RC receivers will need to be protected from any outside interferences.

4.0 Game Rules

4.1 Length of a Match

4.1.1 Each game is stipulated for 3 minutes only.

4.1.2 In the following cases, a match will end before 3 minutes

- When all the recyclables have been placed to the destination.
- In the event of disqualification.
- When the referees judge that continuation of the match is impossible.

5.0 Building of Robot

Pre-built

6.0 Starting of Robot

6.1 Whistle will be blown as a sign at start of the match.

6.2 Participant is allowed to start (switch on) the robot using single switch operation.

6.3 The participant who remote control the robot shall keep distance with the game field area without touching or disturbing the game.

7.0 Competition Task

7.1 Once the match has begun, the robot can move from BASE to push the recyclables to its destination.

7.2 There are 3 pcs of different recyclables and 3 categories of recycle storage:

Plastic : (2 pcs of big wheel spindle and 1 pcs of M-shaft)

Aluminum : (2 pcs of AL Sprocket, 3 pcs of 15 AL Frame, 3 pcs of Pillar Block 45. 6 pcs of Bolt-8mm, 6 pcs of bolt-16 mm and 12 pcs of Nut)

Paper: MRT Paper Cup

7.3 There are 5 spots on the map where each spot has 3 pcs of different types of recyclables. Participant has to separate and push each recyclable to its destination (correct category)

7.4 Timing will begin after whistle blown.

7.5 All robots will be collected by referees before the competition begin, cannot share the same robot with other participants.

7.6 The parts which are fallen or broken from the robots cannot be fixed back onto the robot during match.

7.7 Timing will stop once all recyclables are cleared and robot back to BASE.

8.0 Deciding the winner

The winner will be the participant who has the highest score and back to BASE. If the participant scored the same points, the winner will be the robot completed the mission with the shortest time.

8.1 Points, Penalties and Disqualification

8.1.1 Points

Points will be calculated after the game end. Each recyclable correctly placed in the recycle storage will be awarded 5 points. Items which place on the black line (not fully into the recycle bin) does score any points.

8.1.2 Penalties

- If recyclable is wrongly place in the recycle storage, 5 points will be deducted for each recyclable.
- If the recyclables not fully placed into the recycle storage, no point will be awarded.

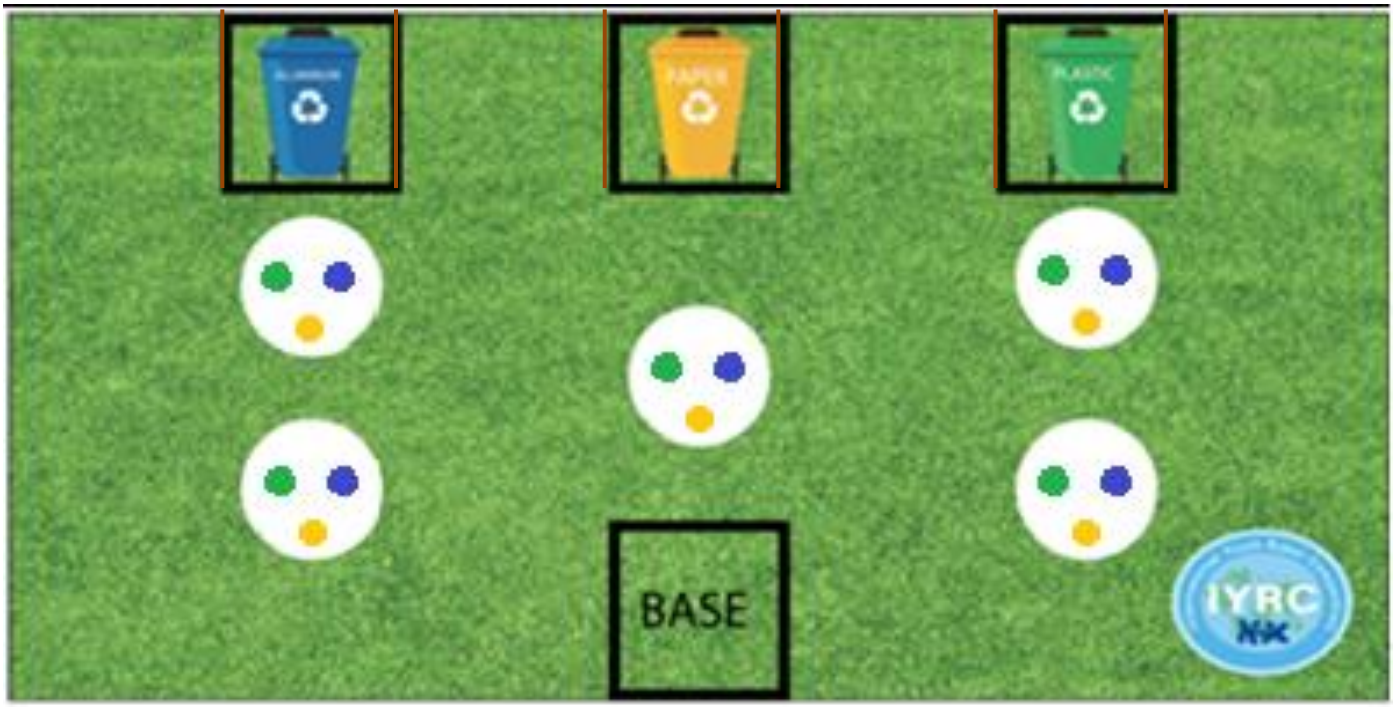
8.1.3 Disqualification

- Touching the robot while the match is in progress.
- A stalemate of more than 10 seconds.
- Robot does not comply with the size restriction.

Sample score record

Name	Plastic	Paper	Aluminum	Penalties	Back to BASE	Total Points	Time Taken(s)	Ranking
A	25	20	20	5	10	70	150	2
B	20	25	15	0	10	70	156	3
C	25	25	25	0	10	85	160	1

9.0 Game Field :



•Game Field surrounded by a wall height 8cm.

•3 types of recyclables on each white spot with labeling (Paper, Plastic, Aluminum)

Paper

Plastic

Aluminum

Example of items placement

There are 3 pcs of different recyclables and 3 categories of recycle storage:

Plastic : (2 pcs of big wheel spindle and 1 pcs of M-shaft)

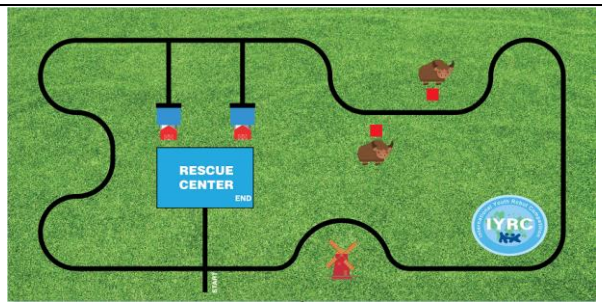
Aluminum : (2 pcs of AL Sprocket, 3 pcs of 15 AL Frame, 3 pcs of Pillar Block 45. 6 pcs of Bolt-8mm, 6 pcs of bolt-16mm and 12 pcs of Nut)

Paper: MRT Paper Cup

	Wall height 8 cm

4) ANIMAL KINGDOM (Junior Coding)

Age	7-12
Team	Individual
Robot Kits	MRT Series, MRT-X & HUNA educational robot kits (not include My Robot Time Toy series and MRT Soccer Robot)
Mission	Program the line tracing robot that able to trace the line and push the block into the barn (feeding animals), carrying injured animals back to Rescue Center and stop
Robot Building	Pre-build
Game Method	Mission completion and Time record



1.0 Objective

The goal of this game is to test student's ability to program the robot to help and assist human in completing the daily task in the farm. The task covered in this mission must be completed in order.

2.0 Robot Dimension and Weight

Robot must not exceed 20cm(H), 20cm(W), 20cm(L).

Robot is **NOT allowed** to expand at any time.

3.0 Restriction on Robot Design

3.1 Only MRT Series, MRT-X & HUNA educational robot kits (not include My Robot Time Toy series and MRT Soccer Robot). No limitation to the number of blocks used to build the robot.

3.2 May use maximum up to 4 DC motors, 5 IR sensors,2 servo motors, 1 tracer sensor block and 1 mainboard.

3.3 Robots shall not damage any part of the field or obstacles deliberately.

3.4 Robots are not allowed to have any power supply more than 9V DC.). VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.5 Must not cause any damage to the arena

4.0 Game Rules

4.1 Length of a match

4.1.1 Each game is stipulated for 3 minutes only. Allow to make two attempts and the highest score attempt will be recorded.

4.1.2 In the following cases, a match will end before 3 minutes.

- In the event of disqualification.
- When the referees judge that continuation of the match is impossible.
- Completion of task

4.2 Building of Robot

Pre-built and program

4.3 Starting of Robot

4.3.1 Robot should stay behind the starting line (distance from starting line to the Robot IR sensors not exceed 5cm) and facing west (R&R map position as the reference). Timer starts when the robot's IR sensors cross the starting line.

4.3.2 Whistle will be blown as a sign of start of the match.

4.3.3 Participants is allowed to start (switch on) the robot using single switch operation.

4.4 Completion Task

4.4.1 Once the match has begun, the robot must move by its own to complete the task.

4.4.2 Task 1 : Robot must push the food into horse barn and cow barn.

4.4.3 Task 2 : bring the injured animals to the rescue center.

4.4.4 Task 3 : switch on the power generator by passing through the semi-circle.

4.4.5 Task 4 : make sure all injured animals carry into rescue center.

4.4.6 Task 5 is to stop the robot at the Rescue Center. Any part of the robot body stays inside the Rescue Center will do.

4.5 Deciding the Winner

The winner will be the participants who able to gain the highest score. If the participants scored the same points, the winner will be the robot completed the mission with the shortest time.

4.6 Points, Penalties and Disqualification

4.6.1 Points

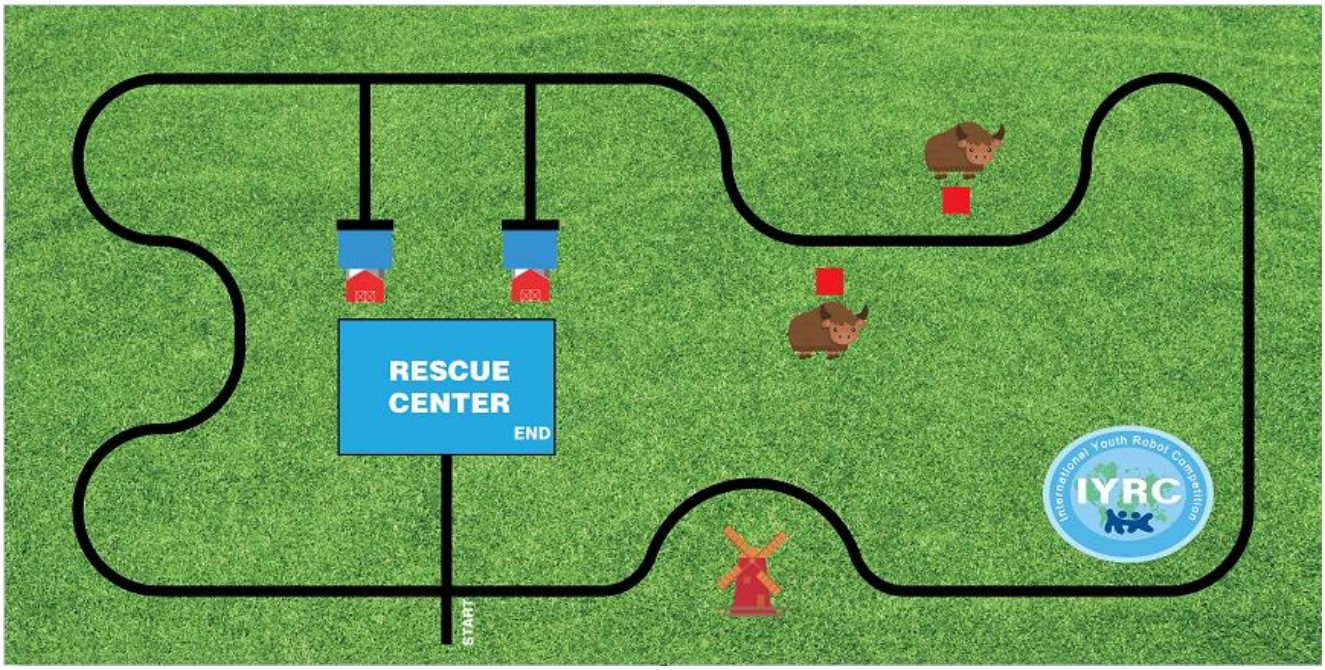
- If the robot successfully push food into barn shed, each will get 15 points. Total 30 points.
- Collect the injured animals at the road side. There are 2 injured animals, each animal will earn 5 points if successfully remove it from the injured area.
- Switch the generator on by spinning the long stick at the semi-circle. The robot must only follow the line and go to the next checkpoint then 20 points will be awarded.
- Successfully bring the injured animals back to the Rescue Center can earn 10 points for each animal. If any part of the injured animals out of the Rescue Center black box, there is no point.
- Stop the robot at the Rescue Center will be given 20 points.

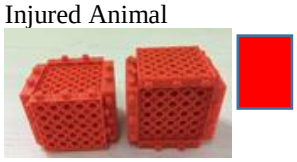
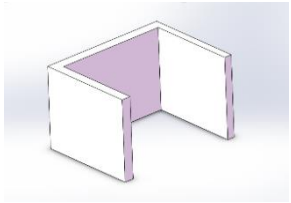
4.6.2 Disqualification

- Touching the robot or the item in the arena while the match is in progress.
- Robot does not comply with the size restriction.
- A stalemate of more than 10 seconds.
- Robot moves out of the line for more than 10s.

NAME	TASK 1	TASK 2	TASK 3	TASK 4	TASK 5	TOTAL POINTS	TIME TAKEN (S)	RANKING
1	30	10	20	20	20	100	130s	1
2	30	10	20	20	20	100	150s	2
3	30	10	20	20	0	80	98s	3

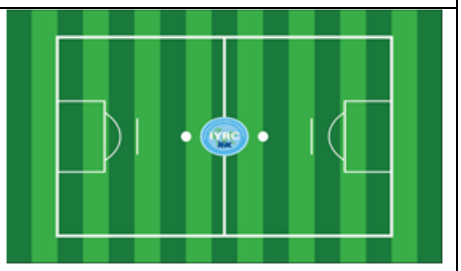
5.0 Game Field :



Injured Animal 	As picture shows it assembled with 4 pcs of 5*5 blocks.
Food 	As picture shows it assembled with 4 pcs of 5*5 blocks. Food will be placed on a stage of 6cm height
Animal barn 	H- Horse barn： L : 8cm, H : 8cm , W:8cm C- Cow barn: L : 8cm, H : 8cm , W:8cm
Switch 	Switch L: 20cm, H : 7cm , Cube: L : 7cm, H : 5cm , W:7cm

5) Soccer (Junior Skill)

Age	7-12
Team	Team 3 VS 3
Robot Kits	MRT Series & HUNA educational robot kits (not include My Robot Time Toy series and MRT Soccer Robot)
Mission	Soccer match using remote control
Robot Building	Remote Control programmed robot
Game Method	Tournament



1.0 Objective

Test student ability to construct a robot with high stability and controlling skill to play soccer game.
Teamwork is the key to success.

2.0 Robot Dimensions and Weight

The size of the robot at the starting box shall not exceed 25cm (H) by 25cm (W) by 25cm (L).
However, robot is not allowed to expand larger than the size 25cm x 25cm x 25cm after the game starts.

3.0 Restrictions on Robot design

3.1 Only MRT Series & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot) parts are to be used to build the robot. There is no limitation to the amount of blocks used to build the robot. You are allowed to cross use the parts from the above mentioned systems for the robots.

3.2 May use maximum up to 2 DC motors, 2 servo motors and 1 mainboard are allowed to use for the competition.

3.3 Robot built is not allow to modify its mechanical parts (painting/folding) and electronic parts. The player would be IMMEDIATELY disqualified if found guilty.

3.4 Robots shall not damage any part of the field or obstacles deliberately.

3.5 Robots are not allowed to have any power supply above 9V DC (Volt of Direct Current). VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.6 Robots shall not cause any danger to the arena and surroundings in anyway whatsoever.

3.7 Robots RC receivers will need to be protected from any outside interference.

3.8 Robot cannot be design in a closed structure to handle the ball. The judge will check the robot structure before the competition start.

4.0 Game Rules

4.1 Length of a Match

Each game is stipulated for **3 minutes**.

Starts from Round of 16, first half (1.5 minutes), participants are required to change ends follow the judge instructions.

4.2 Building of Robot

Prebuilt and programmed

4.3 Starting the Robot

4.3.1 Whistle will be blown as a sign of start of the match.

4.3.2 The participant who remote controls the robot shall keep distance with the game field area without touching or disturbing the game field.

4.4 Competition Tasks

4.4.1 All the games will be based on “knock out” system. All the teams will be distributed in opposing pairs by IYRC committee randomly.

4.4.2 Each team shall consist of 3 robots and 3 students with each student controlling one robot.

Teams can choose between two roles variants:

Eg: 1 defender + 2 strikers or 2 defenders + 1 striker.

Defender

- cannot leave his area (his half of the field), therefore cannot enter opponents area.
- allowed to enter own penalty area with non-stop movement to protect the gate, but not more than 10 seconds

Striker

- allowed to enter both own and opponent’s area
- allowed to enter opponent’s penalty area to hit the gates, but stay there not more than 10 seconds.
- Not allow to enter own penalty area.

4.4.3 During the match, the participants who control their robot please keep distance with game field, and don’t touch or damage the field.

4.4.4 The team should distribute the roles prior the game and provide this information to referee. Roles cannot be changed during the match, but can be changed between the matches.

4.4.5 A robot is not allowed to purposely block the ball against the side of the field and not moving. If doing it more than 2 times, the participant will be removed and isolated for 1 minute.

4.4.6 Upon removal of a robot from the playing field, it can only re-enter the game upon referee’s approval.

4.4.7 Robots can deploy any tactics or maneuvers, as long as it does not constitute a foul.

4.4.8 An offender will be issued a yellow card. Upon receiving 2 yellow cards, the player will be removed and being isolated for 1 minute before it can reenter the game field.

4.4.9 Extra time of 1 minute shall be played only in the event of a draw.

4.4.10 Penalties ball will be placed on a certain point (white dot). Robot which making a shot should start its movement behind the white dot to hit the ball and any part of robot body cannot push the ball exceed the white line.

4.4.11 All robots will be collected by referees before the competition begin, cannot share the same robot with other participants.

4.4.12 The parts which are fallen or broken from the robots cannot be fixed back onto the robots during the match.

4.4.13 While the match is in progress, at any time the referee whistles, the participants should stop the robot.

4.4.14 During the match, if both defender and striker enter into opponent’s area, even if score a goal but the goal is not valid.

4.4.15 During the match, if the ball is holding by a robot and not moving (stalemate) for more than 5 seconds, It is consider as “Dead Ball”. Referee will blow whistle and all robots must stop moving. Referee will place the ball accordingly and the game will resume with referee’s instruction. If more than 3 times, ball will put at the middle field and all robots back to their start point. Game resume with whistle blow.

4.5 Deciding the Winner

4.5.1 Within 3 minutes, the team with highest goals will be the winner.

4.5.2 The ‘knock-out’ stage shall not consist of any points and the winner of the game shall proceed to the next round.

4.5.3 The time limit for extra time shall be 1 minute.

4.5.4 In the event of a DRAW by the end of extra time, a penalty shoot-out shall decide the match with each team being allocated 3 penalties.

4.5.5 'Sudden death' penalty shall decide the match in the event both teams are still tied for score. The team that misses the penalty with the other team scoring their penalty, losses the game. If still tied for score, then 1 vs 1 game starts, the one who score the first goal will be the winner team.

4.6 Disqualification

A team shall be disqualified if it commits any of the following during the match:

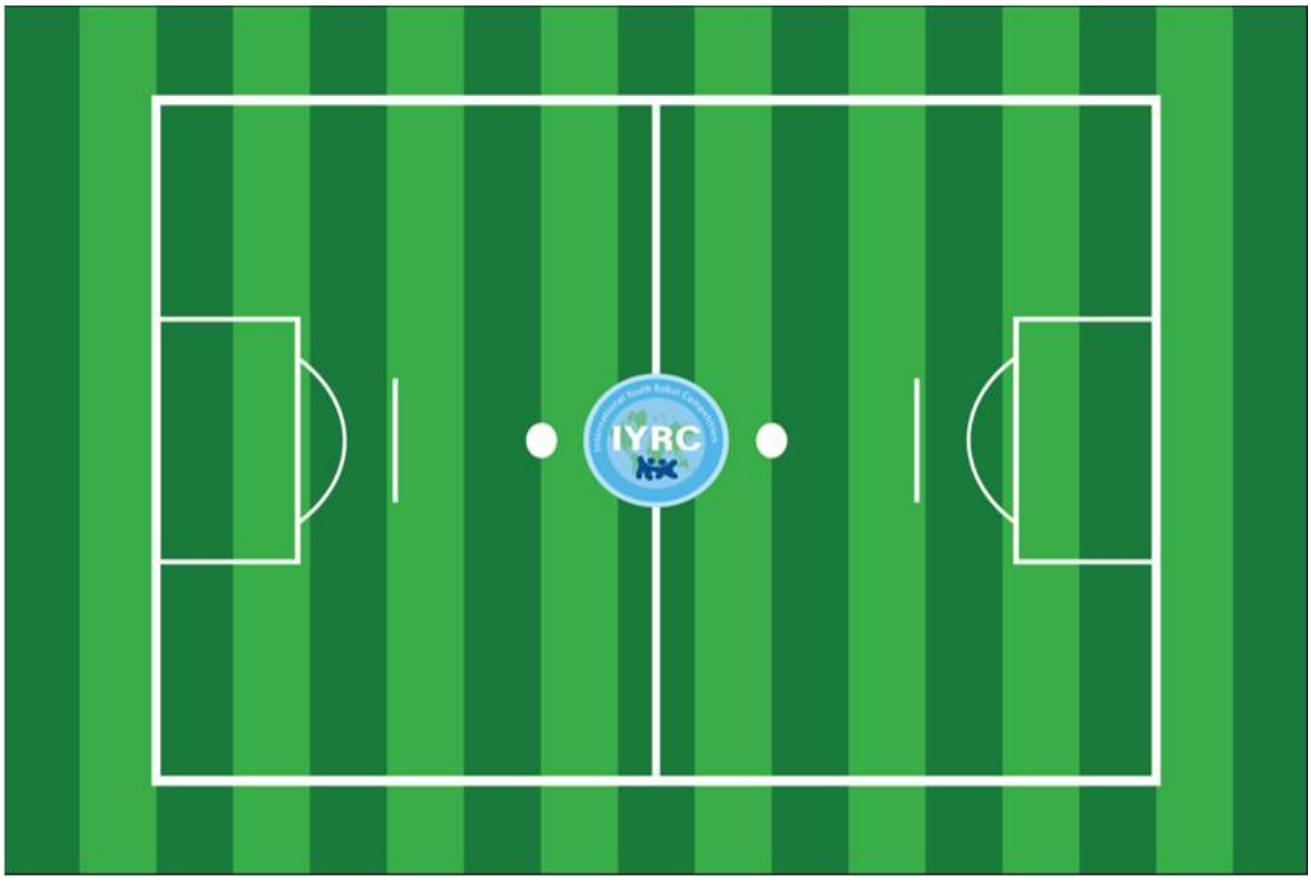
• Touching the robots while the match is in progress.

• Robot does not comply with the size restrictions.

4.7 Soccer Robot Placement

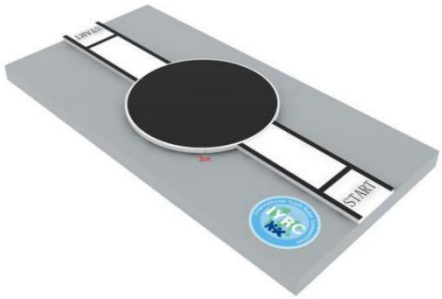
4.7.1 Before game start , robots should place in front of the white line at each ends as per figure below.

5.0 Game Field



6) Push-push (Junior Skill)

Age	7-12
Team	Individual
Robot Kits	MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot)
Mission	Remote control robot to pass through the runway and push opponent outside of the black ring
Robot Building	Pre-build remote control robot
Game Method	Tournament



1.0 Objective

Test and challenge the student ability to construct and program a robot with high stability and controlling skill to pass through the runway and push opponent out of the ring.

2.0 Robot Dimensions and Weight

2.1 The size of the robot at the starting box shall not exceed 20cm (H) by 20cm (W) by 20cm (L) Refer to the robot specification diagram. However, robots are **not** allowed to expand to any size after the game starts.

2.2 The maximum weight of the robot is 800 grams (Include batteries).

3.0 Restrictions on Robot design

3.1 Only MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot) are to be used to build the robot. There is no limitation to the amount of blocks used to build the robot. You are allowed to cross use the parts from the above mentioned robot kits for the robots.

3.2 However, ONLY maximum 2 number of DC motors,2 number of servo motors and 1 mainboard are allowed to use for the competition.

3.3 Electronic parts are not allow to do any modification. If found guilty, the participant would be IMMEDIATELY disqualified.

3.4 Robots shall not damage any part of the field or obstacles deliberately.

3.5 Robots are not allowed to have any power supply above 9V DC (Volt of Direct Current). VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.6 Robots shall not cause any danger to the arena and surroundings in anyway whatsoever.

3.7 Robots will need to protect their sensors if necessary from any outside interferences.

3.8 Robots RC receivers will need to be protected from any outside interferences.

4.0 Game Rules

4.1 First whistle, robot must pass through the runway and stop at the black ring waiting area. Second whistle only robot can start to engage opponent and push.

4.2 If robot drop from the runway before reaching the black ring, the participant will lose the current round.

4.3 If within 1 minute the robot still unable to enter the black ring waiting area, the participant will lose the current round.

4.4 Within 1 minute, the robot pushed the opponent robot off the playfield (black color ring) first considered win. Draw match if both robots fall off from the playfield at the same time.

4.5 If more than half of the robot body being push out of the ring onto the runway (decision is on referee), or robot unable to go back into the ring, consider lose.

4.6 Each game is stipulated for **3 minutes** and within 3 minutes total of 3 rounds with each round 1 minute will be given to both sides, if ;

a.) **Draw**: both robots still moving and stay inside the play field) both scored 1 mark.

b.) **Win**: Push the opponent outside the play field or the robot not able to move back into the play field) winner score 2 marks.

c.) **Lose**: Half of the robot's body being push out by opponent to the runway or not able to move back into play field) loser score 0 mark.

d.) **Final:** After 3 rounds, if participants get same scores , both of the robot will be placed in back to back position and continue the final round to get the winner.

e.) If draw match, then will measure the center point to each robot after the game stop. Robot which nearer to the center point of the ring will be the winner.

4.7 Robots MUST be placed behind the start line on the runway before the match starts. Robots are to remain stationary until the START whistle has been blown.

4.8 While the match is in progress, at any time the referee whistles, the human operator should stop the robot.

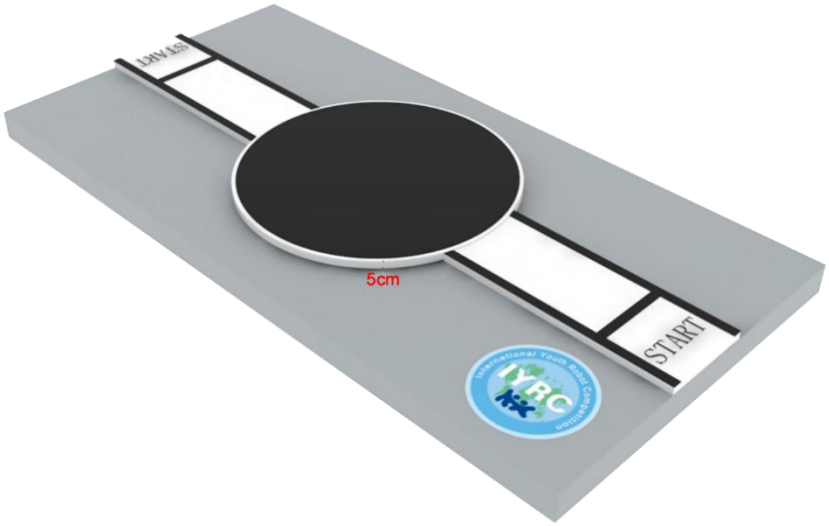
4.9 Fouls

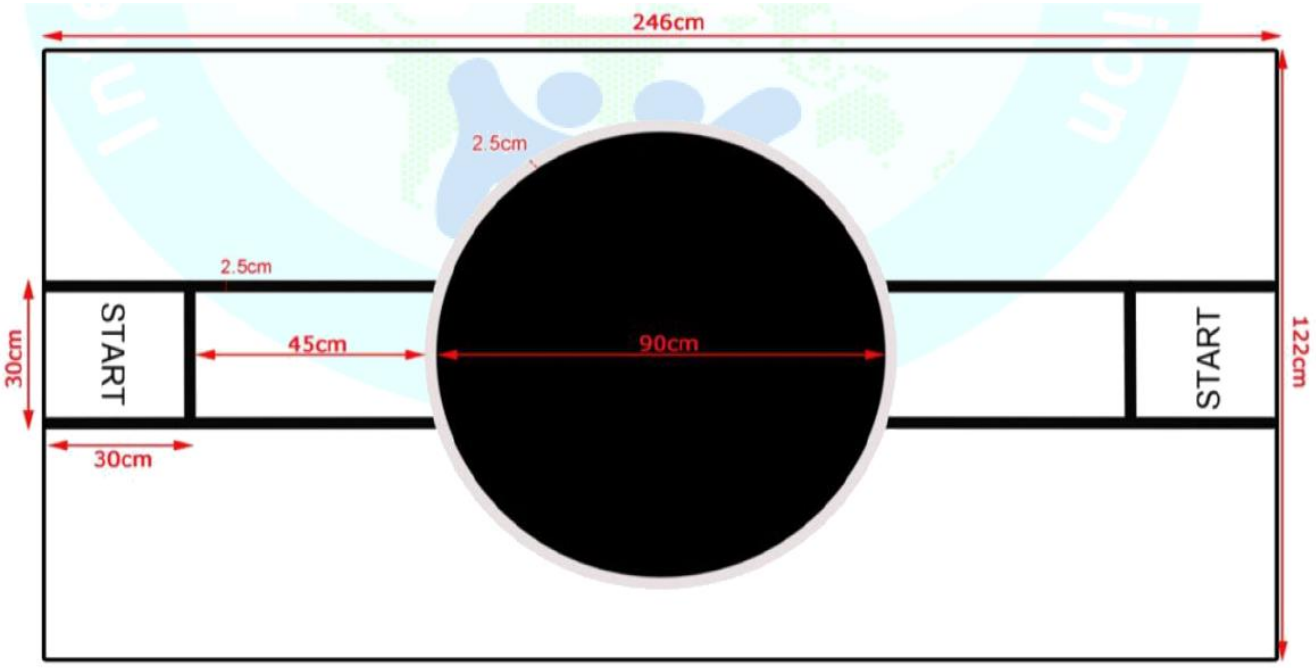
4.9.1 Touching the robot while the match is in progress.

4.9.2 A stalemate of more than 5 seconds.

4.9.3 More than 2 fouls in a round, opponent win.

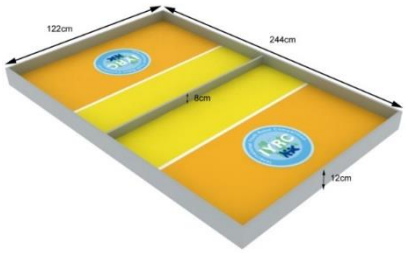
5.0 Game Field





7) Volleyball (Junior Skill)

Age	7-12
Team	2 VS 2 (Team)
Robot Kits	MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot)
Mission	Remote control robot to transfer table tennis ball into opponent's field.
Robot Building	Pre-build remote control robot
Game Method	Tournament



1.0 Objective

Volleyball Junior is a game that 2 robots work as a team to collect all table tennis balls from their own game field and throw or place on the opponent game field. It is essential to understand own robot fully, dynamics and physical laws about robot, sensor control techniques, and programming in order to construct and program it. This game challenge student ability to construct a robot with high stability and controlling skill to throw as much table tennis balls as possible to the opponent's side.

2.0 Robot Dimensions and Weight

The size of the robot at the starting box shall not exceed **25cm (H) by 25cm (W) by 25cm (L).** However, robot is **not allowed to expand to** any size after the game starts.

3.0 Restrictions on Robot design

3.1 Only MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot) are to be used to build the robot. There is no limitation to the amount of blocks used to build the robot. You are allowed to cross use the parts from the above mentioned systems for the robots.

3.2 However, ONLY maximum **2 number of DC motors, 2 number of servo motors and 1 mainboard** are allowed to use for the competition, There is no limit on other electronic parts..

3.3 Electronic parts are not allow to modify. If found guilty, the player would be IMMEDIATELY disqualified.

3.4 Robots shall not damage any part of the field or obstacles deliberately.

3.5 Robots are not allowed to have any power supply above **9V DC (Volt of Direct Current).** VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.6 Robots shall not cause any danger to the arena and surroundings in anyway whatsoever.

3.7 Robots will need to protect their sensors if necessary from any outside interferences.

3.8 Robots RC receivers will need to be protected from any outside interferences.

4.0 Game Rules

4.1 Length of a Match

4.1.1 Each game is stipulated for 3 minutes.

4.2 Building of Robot

4.2.1 Prebuilt and programmed.

4.3 Starting the Robot

4.3.1 Whistle will be blown as a sign of start of the match.

4.3.2 All robots must place at the 4 corners of the game field before the referee start the game.

4.4 Competition Tasks

4.4.1 All the games will be based on “Knock out” system. All the teams will be distributed in opposing pairs by IYRC committee randomly.

4.4.2 Each team will have 2 students and each student need to control their own robot.

4.4.3 Each team will have 20 table tennis balls in their own field.

4.4.4 Both teams have to grab the ball and transfer the ball into the opponents’ field.

4.4.5 If the table tennis ball is thrown outside the field, the ball will be put back into the field immediately by the referee.

4.4.6 In the event of a draw will have 1V1 PK game. If still draw, change player for 1V1 PK game until one of the team win.

4.4.7 All teams will compete based on a ‘knock-out’ system with only the winning teams will proceed to the next round of competition.

4.4.8 Upon removal of a robot from the playing field, it can only re-enter the match upon referee’s approval.

4.4.9 Robots can deploy any tactics or maneuvers, as long as it does not constitute a foul.

4.4.10 In case of technical problem such as robots are uncontrollable, the referee will pause the match and help participants to turn off and on the robot only. If the robots still cannot function, then the robot will leave it there until game over.

4.4.11 The parts which are fallen or broken from the robots cannot be fixed back onto the robots during the match.

4.4.12 While the match is in progress, at any time the referee whistles, the participant should stop the robot.

5.0 Deciding the Winner

5.1 Within 3 minutes, the team who successfully transfer the most number of balls into opponents’ field in the match will be the WINNER.

5.2 If one of the team can transfer all of their balls into opponent’s field within 3 minutes during the match, the opponents is considered “SUDDEN DEATH” and lost in the match.

5.3 In the event of a DRAW, PK Round will be played by selecting one robot from each team to compete in 30 seconds to determine the final result.

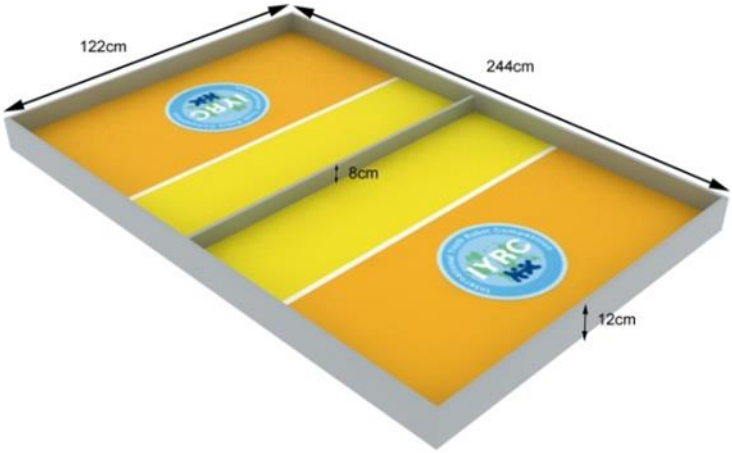
6.0 Disqualification

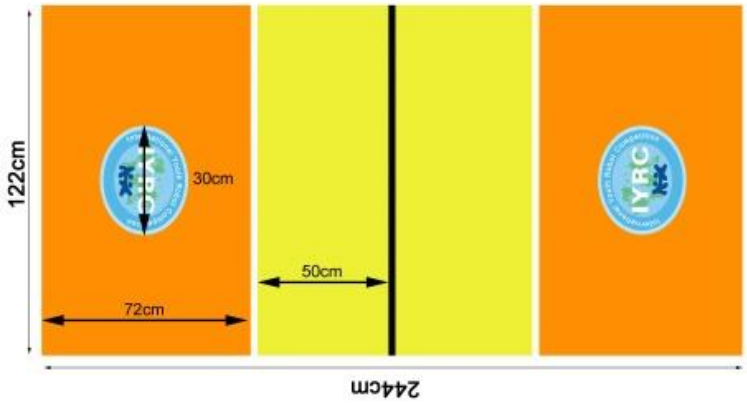
A team shall be disqualified if it commits any of the following during the match :

6.1 Touching the robot while the match is in progress.

6.2 Robot does not comply with the size restrictions.

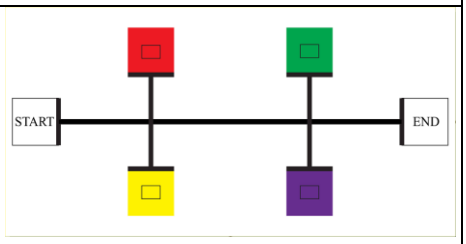
7.0 Game Field





8) Transporter (Junior Coding)

Age	7-12
Team	Individual
Robot Kits	MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot)
Mission	Program the robot on the spot. Move item from one color box to the other. Mission will be announced during the competition.
Robot Building	Pre-build
Game Method	On site program robot to complete missions and Time record



1.0 Objective

The goal of this game is to test students' ability to construct and program robot to follow line. This game relies heavily on good programming skill.

2.0 Robot Dimension and Weight

The size of the robot at the start and end box shall not exceed 20cm (H) by 20cm (W) by 20cm (L).

Robots **allowed** to expand during the game.

3.0 Restriction on Robot Design

3.1 Only MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot) parts are to be used to build the robot. There is no limitation to the amount of blocks used to build the robot. You are allowed to cross use the parts from the above mentioned robot kits for the robots.

3.2 May use maximum up to 5 IR sensors, 4 DC motors, 2 servo, 1 tracer sensor block and 1 mainboard are allowed to use for the competition.

3.3 Robots shall not damage any part of the field or obstacles deliberately.

3.4 Robots are not allowed to have any power supply above 9V DC (Volt of Direct Current).

VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.5 Robots shall not cause any danger to the arena & surroundings in anyway whatsoever.

4.0 Computer and software requirement

4.1 Using MRT Programming software

4.2 Participant should bring their own computer during the competition.

4.3 Not allow to bring any external devices into competition area (external drive, handphone, etc)

4.4 Robot bring into the competition area must clear all program inside the mainboard. Onsite checking will be carried out.

5.0 Game Rules

5.1 Length of the match

5.1.1 Coding & Testing will be given 3 hours. Each game is stipulated for 3 minutes. There will be two attempts and highest score will be recorded.

5.1.2 In the following cases, a match will end before 3 minutes

- When the robots reached the end point.
- In the event of disqualification.

• When the referees judge that continuation of the match is impossible.

5.2 Possibilities of mission

Referee will announce the mission on the spot whether to move Blue/Red box item to Green/Yellow box.

5.3 Building of Robot

Prebuilt and allow to modify

5.4 Game start

5.4.1 Game start after whistle blow

5.4.2 Participant allows to press start button to activate the robot.

5.4.3 Robot must reside in the star box when the game start.

5.5 Mission

5.5.1 Once the game started, robot shall finish the mission autonomously.

5.5.2 There will be two items (sponge cube) put on a 3cm height platform in two of the color box separately. Participant has to program the robot to GRAB the item and send it to a specific color box. (only will announce on the spot)

5.5.3 Robot must stop in the end box after the mission.

5.6 Deciding the winner

The winner will be the team completed the mission with the highest point and shortest time.

5.7 Points

5.7.1 Robot able to finish all mission and stop at the End Box will get 20 points (programming points)

5.7.2 If the item grabbed and moved out of the initial color box, will get 10 points each.

5.7.3 If successfully put the item into the desire color box (fully inside), each will get 10 points.

5.7.4 Robot stops in the End Box will get 20 points, if any part of robot is on the black line of End Box, only get 10 points.

5.8 Disqualification

• Touching the robot while the match is in progress.

• A stalemate of more than 10 seconds.

• Robot does not comply with the size restriction.

• Robot move out of the route for more than 10s

6.0 Competition Length

6.1 Time given is 3 hours for on site programming and testing.

6.2 All participants are under quarantine during the programming period. Participants are allow to do testing and modify robot during this period.

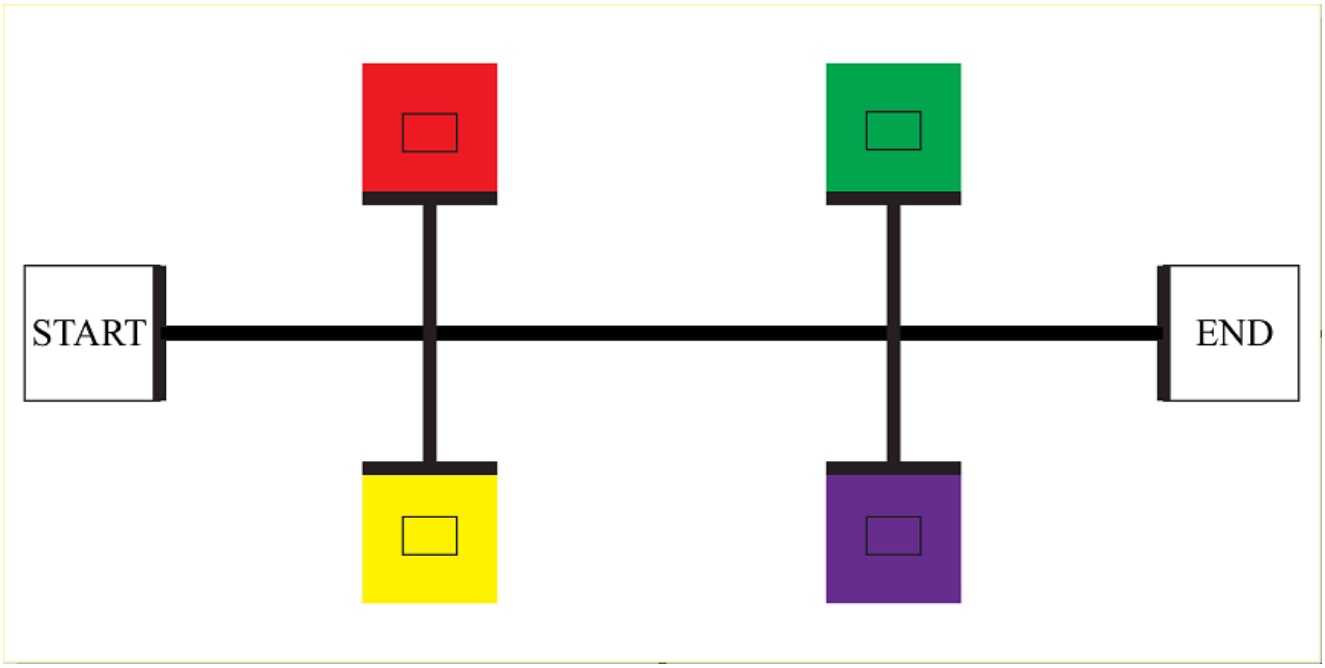
6.3 Once the participant satisfies with the robot performance, the participant may hand over their robot to referee for quarantine. No more program or structure modification is allow after this.

6.4 Participant will be called for competition in the following session.

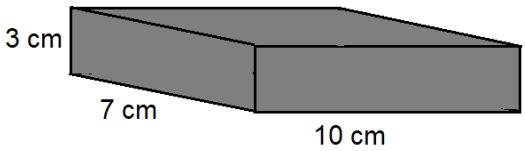
Sample score record

Name	Mission 1		Mission 2		Stop in End Box	Total Points	Time Taken(s)	Ranking
	Grab item out of initial color box	Drop item inside desire color box	Grab item out of initial color box	Drop item inside desire color box				
A	10	10	10	10	20	80	150	1
B	10	10	10	10	0	50	156	2
C	10	10	0	0	0	30	140	3

7.0 Game Field :



6cm x 6cm x 6cm sponge cube (item to be moved)



Platform

9) Junior Creative		
Age	Senior : 7-12 years old	
Team	Team (3-5 students and 1 teacher)	
Robot Kits	MRT series of products	
Mission	Create a robot expressing the given theme	
Robot Building	Pre-build	
Game Method	Presentation and on/off-line evaluation by panel	

1.0 Objective

Provide a platform for student to showcase their creativity, innovative and programming skills. They are required to work together as a team to design a robot based on the given theme. Besides, they will also need to present and demonstrate their robot creation well to convince and impress the judges.

2.0 Robot Dimensions and Weight

The size and weight of the robot is not limited.

3.0 Restrictions on Robot design

3.1 Only MRT series of products are to be used to build the robot. There is no limitation to the amount of blocks used to build the robot. You are allowed to cross use the parts from the above mentioned systems for the robots.

3.2 Robots shall not damage any part of the field or obstacles deliberately.

3.3 Robots shall include LSM ((Line Core M Servo motor) or MRT products (include all MRT new products: MRT-Coconut, MRT-duino, Blacksmith-Coding Board, etc) and there is no limitation on number of sensors and motors used.

3.4 Robots allowed to move or make motion autonomously OR use remote control.

3.5 Robots can use and add other materials such as camera, sensors, paper, rings, clips, chopsticks, paper cups, and 3D Printing materials etc.

3.6 VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.7 Robots shall not cause any danger to the arena & surroundings in anyway whatsoever.

3.8 Robots will need to protect their sensors if necessary from any outside interference.

3.9 Robots RC receivers will need to be protected from any outside interference.

4.0 Game Rules

4.1 Method of a Match

4.1.1 Participants shall build a robot in advance.

4.1.2 Participants are given 2 hours duration to prepare their robot.

4.1.3 Each group has presentation time of 5 minutes to introduce their robots to the referee on the stage. Presentation can be done in English. If they are unable to present in English they have to prepare their own translator.

4.1.4 Robots may be displayed in/around the venue. The team members or teacher may keep the robots and explain to the public.

4.1.5 Participants should carry the printed manual (presentation). About the manual, please refer to the rule 4.3.3 & 4.3.4

4.2 Theme : UN's Sustainable Development Goals (SDGs)

4.2.1 The 5 themes are selected among 17 SDGs proposed by the United Nations. The robot can be based on one of the following field ONLY:

- Zero Hunger
- Good Health and Well-Being
- Clean Water and Sanitation
- Affordable and Clean Energy
- Sustainable Cities and Communities

You are strongly recommended to study what the themes above mean at https://www.un.org/sustainabledevelopment/sustainable-development-goals/

4.3 Robot Registration in Advance

4.3.1 Participants should submit the requirements IN ADVANCE to the official email (HQ.IYRA@gmail.com)

4.3.2 Please check the important dates;

- Deadline for sending requirements to email : **June 31 2019 (all participants)**
- Confirmation to the qualified teams : **July 15 2019 (IYRA HQ)**

4.3.3 The requirements are as below;

- More than 3 pictures containing robot, all your team member faces, and teacher together in one photo
- Video showing your robot working/moving (10 seconds to 1 min.
- Manual (Presentation file) including 1) Robot Name 2) Purpose 3) Team Member introduction and task allocation 4) Introduction of the project 5) Specification and features 6) how to program (if needed) 7) functionality of robot

4.3.4 The manual must be in English.

4.4 Deciding the Winner

4.4.1 The judges will check if the team meets the requirements or not, and evaluate teams' works online first.

4.4.2 The judges will notice the results If the participants are qualified or disqualified.

4.4.3 If the participants are qualified, then they are allowed to advance to the final round,a.k.a. 6th IYRC Korea

4.4.4 Score shall consist of :

- Relevance to theme (10 score) : online evaluation
- Creativity & Uniqueness (30 score) : online evaluation
- Robot Functionality (30 score) : on site evaluation
- Team work (10 score) : on site evaluation
- Presentation skill (20 score) : on site evaluation

5.0 Awards:

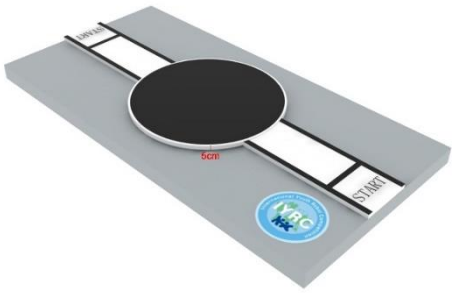
6.1 ALL the qualified team will be awarded.

Gold, Silver, and Bronze winners may get Trophy + Certificates, and the others may get certificates only

6.2 The teachers of the winning team will be awarded separately.

Judges will be 5-9 experts from various nations recommended by National Partners of IYRA

SENIOR CATEGORIES

1) Push-Push Senior (Senior Skill)		
Age	13-17	
Team	Individual	
Robot Kits	MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot)	
Mission	Require participants to use remote control robot to pass through the runway and push opponent outside of the black ring	
Robot	Pre-build	
Game Method	Mission completion	

1.0 Objective

The goal of this game is to test and challenge student ability to construct and program a robot with high stability and controlling skill to pass through the runway and push opponent out of the ring (The black ring).

2.0 Robot Dimension and Weight

The size of the robot at the starting box shall not exceed 20cm (H) by 20cm (W) by 20cm (L).
Robot is **not** allowed to expand to any size after the game starts.
The maximum weight of the robot is 800 grams (Including batteries)

3.0 Restriction on Robot Design

3.1 Only MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot) parts are to be used to build the robot. There is no limitation to the amounts of block used to build the robot. You are allowed to cross use the parts from the above mentioned robot kits for the robots.

3.2 May use maximum up to 2 motors, 2 servos motor, 1 mainboard only. No restriction on other electronic parts.

3.3 Participant is not allow to modify electronic parts. If found guilty, the player would be IMMEDIATELY disqualified.

3.4 Robots shall not damage any part of the field or obstacles deliberately.

3.5 Robots are not allowed to have any power supply above 9V DC (Volt of Direct Current). VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.6 Must not cause any danger to the arena.

3.7 RC Receiver will need to be protected from outside interference.

4.0 Game Rules

4.1 First whistle, robot must pass through the runway to enter the black ring and wait there. Second whistle only can start to attack opponent.

4.2 If the robot drop out of the runway before enter the black ring, this round consider lose.

4.3 If after 10 seconds still not yet enter the black ring, this round consider lose.

4.4 Push the opponent out of the ring within 1 minute will win. If both drop out of the ring at the same time, consider draw.

4.5 If more than half of the robot body being push out of the ring onto the runway (decision is on referee), or robot unable to go back into the ring, consider lose.

4.6 Game length is 3 minutes, there will be 3 rounds, each round 1 minutes.

4.6.1 Draw : Both robots still remain inside the ring or drop out of the ring at the same time (both get 1 point)

4.6.2 Win : Push opponent out of the ring or opponent's robot unable to get back to the ring after 10 seconds to continue the game (2 points)

4.6.3 Lose : More than half of robot body being push out of the ring, or unable to get back to the ring after 10 seconds (consider lose and no point)

4.6.4 Total points : Highest points after 3 rounds total will be the winner. If same point happen, both robot has to fight again in the ring (back to back).

4.6.5 If draw match, then will measure the center point to each robot after the game stop. Robot which nearer to the center point of the ring will be the winner.

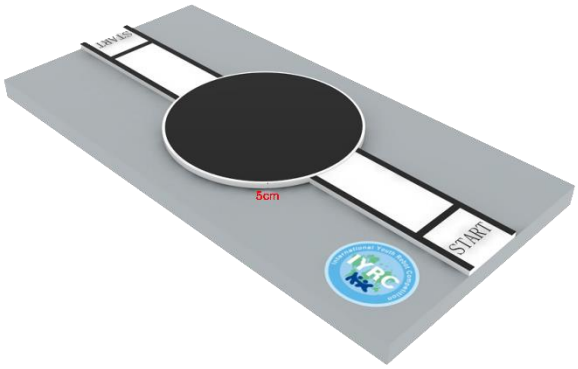
4.7 Before game start, robot has to place before the start line.

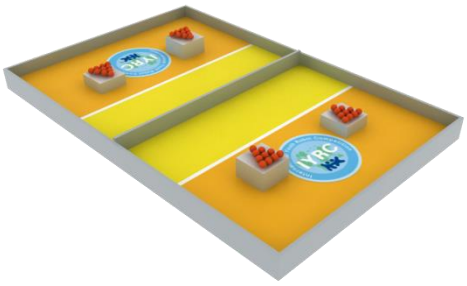
4.8 During the game, if whistle blow, robot has to be stop immediately.

4.9 Disqualify

- Touch the robot during the game
- Stop more than 5 seconds
- 2 fouls will led to game stop and opponent win

5.0 Game field



2) Volleyball Senior (Senior Skill)		
Age	13-17 years old	
Team	Team (2 vs 2)	
Robot Kits	MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot)	
Mission	Remote control robot to transfer table tennis ball into opponent's field	
Robot Building	Remote Control programmed robot	
Game Method	Tournament	

1.0 Objective

Volleyball Senior is a game that 2 robots work as a team to collect all table tennis balls from two towers from their own game field and throw or place on the opponent game field. It is essential to understand own robot fully, dynamics and physical laws about robot, sensor control techniques, and programming in order to construct and program it. This game test student ability to construct a robot with high stability and controlling skill to throw as much table tennis ball as possible to the opponent's side.

2.0 Robot Dimensions and Weight

2.1 The size of the robot at the starting box shall not exceed 25cm (H) by 25cm (W) by 25cm (L). However, robots are **n** allowed to expand to any size after the game starts.

2.2 Each robot must fully comply with the size restriction.

3.0 Restrictions on Robot design

3.1 Only MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot) are to be used to build the robot. There is no limitation to the number of blocks used to build the robot. You are allowed to cross use the parts from the above mentioned robot kits for the robots.

3.2 However, ONLY maximum **2 DC motors, 2 servo motors and 1 mainboard** are allowed to use for the competition.

3.3 Modification of electronic part is not allow. If found guilty, the participant would be IMMEDIATELY disqualified.

3.4 Robots shall not damage any part of the field or obstacles deliberately.

3.5 Robots are not allowed to have any power supply above **9V DC (Volt of Direct Current).** VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.6 Robots shall not cause any danger to the arena & surroundings in anyway whatsoever.

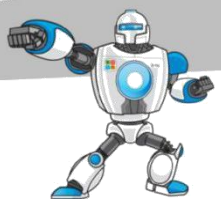
3.7 Robots will need to protect their sensors if necessary from any outside interferences.

3.8 Robots RC receivers will need to be protected from any outside interferences

4.0 Game Rules

4.1 Length of a Match

4.1.1 Each game is stipulated for 3 minutes.



4.2 Building of Robot

4.2.1 Prebuilt and programmed robot.

4.3 Starting the Robot

4.3.1 Whistle will be blown as a sign of start of the match.

4.3.2 All robots must place at the 4 corners of the game field before the referee start the game.

4.4 Competition Tasks

4.4.1 All the games will be based on "Knock out" system. All the teams will be distributed in opposing pairs by IYRC committee randomly.

4.4.2 Each team will have 2 students and each student need to control their own robot.

4.4.3 Each team will have 20 table tennis balls placed on top of two different height towers in their own field.

4.4.4 Each team can deploy any tactics or maneuvers to grab or collect the table tennis balls from the tower and transfer them into the opponents' field.

4.4.5 If the table tennis ball is thrown outside the field, the ball will be put back on the lower tower immediately by the referee.

4.4.6 No extra time shall be played in the event of a draw.

4.4.7 All teams will compete based on a 'knock-out' system with only the winning teams will proceed to the next round of competition.

4.4.8 Upon removal of a robot from the playing pitch, it can only re-enter the match upon referee's approval.

4.4.9 In case of technical problem such as robots are uncontrollable, the referee will pause the match and help participants to turn off and on the robot only. If the robots still cannot function, then the participants will be disqualified.

4.4.10 The parts which are fallen or broken from the robots cannot be fixed back onto the robots during the match.

4.4.11 While the match is in progress, at any time the referee whistles, the participant should stop the robot.

5.0 Deciding the Winner

5.1 Within 3 minutes, the team who successfully move the most number of balls into opponents' field in the match will be the WINNER.

5.2 If one of the team can transfer all of their balls into opponent's field during the match before 3 minutes of time limit, the opponent is considered "SUDDEN DEATH" and lost in the match.

5.3 In the event of a DRAW, PK Round (game filed in original state) will be played by selecting one robot from each team to compete in 30 seconds to determine the final result.

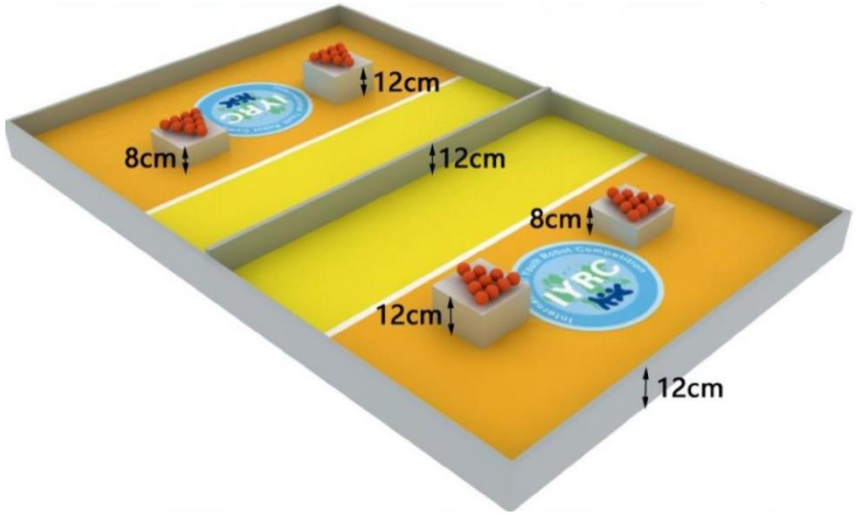
6.0 Disqualification.

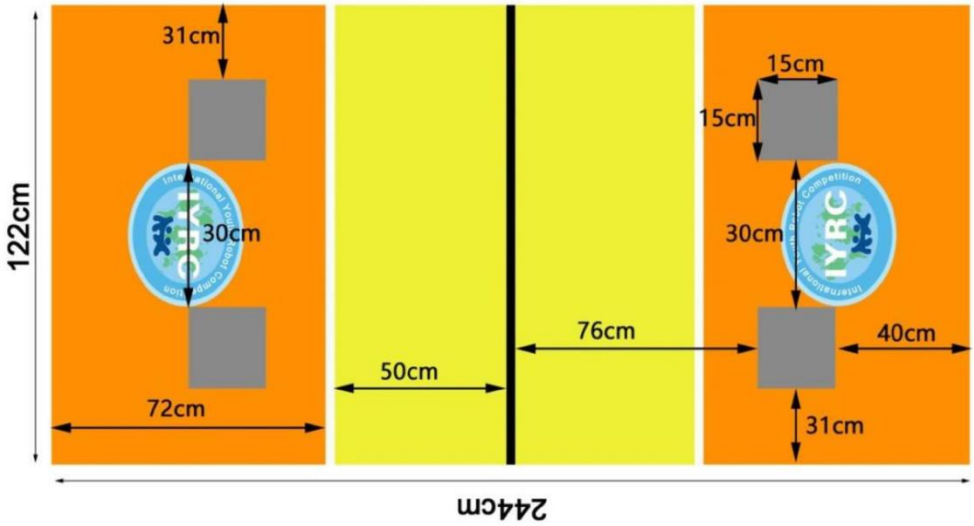
A team shall be disqualified if it commits any of the following during the match:

6.1 Touching the robot while the match is in progress.

6.2 Robot does not comply with the size restrictions.

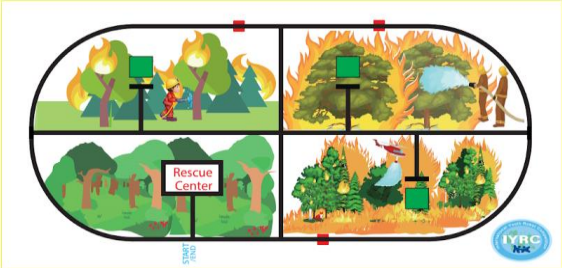
7.0 Game Field





3) SAVE THE FOREST (Senior Coding)

Age	13-17
Team	Individual
Robot Kits	MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot)
Mission	Program the line tracing robot that able to trace the line and trigger the IR sensors (put out fire), carrying items (survivors) back to rescue center.
Robot Building	Pre-build
Game Method	Mission completion and Time record



1.0 Objective

The goal of this game is to test student's ability to program the robot to save and preserve the remaining nature and also to save the survivors. This also will test the student's decision making as to save which one first the forest or the survivors.

2.0 Robot Dimension and Weight

Robot must not exceed 20cm(H), 20cm(W), 20cm(L).

Robot is **NOT allowed** to expand at any time.

3.0 Restriction on Robot Design

3.1 Only MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot). No limitation to the number of blocks used to build the robot.

3.2 May use maximum up to 4 DC motors, 2 servos, 5 IR sensors, 1 tracer sensor block and 1 mainboard only.

3.3 Robots shall not damage any part of the field or obstacles deliberately.

3.4 Robots are not allowed to have any power supply more than 9V DC. VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.5 Must not cause any danger to the arena.

4.0 Game Rules

4.1 Length of a match

4.1.1 Each game is stipulated for 3 minutes only. Each participant is allow to make two attempts and the highest score attempt will be recorded.

4.1.2 In the following cases, a match will end before 3 minutes.

- In the event of disqualification.
- When the judge sees that continuation of the match is impossible.
- Damages on the arena
- Completion of time
- Damages the forest

4.2 Building of Robot

Pre-built and programed

4.3 Starting of Robot

4.3.1 Robot should stay behind the starting line (distance from starting line to the Robot IR sensors not exceed 5cm) and facing west (R&R map position as the reference). Timer starts when the robot's IR sensors cross the starting line.

4.3.2 Whistle will be blown as a sign of start of the match.

4.3.3 Participant is allowed to start (switch on) the robot using single switch operation.

4.4 Completion Task

4.4.1 Once the match has begun, the robot must move by its own to complete the task.

4.4.2 Collect and bring the survivors to the rescue center.

4.4.3 Go to the affected area of the forest (burning area only), trigger the IR sensor to put out the fire (LED Red change to Green).

4.4.4 The parts which are fallen or broken from the robots cannot be fixed back onto the robot during match.

4.4.5 Back and stop at starting point.

4.5 Deciding the Winner

4.5.1 The winner will be the participants who able to complete the task with highest score.

4.5.2 If the score is the same for two participants, the shortest time will be the winner.

4.6 Points, Penalties and Disqualification

4.6.1 Points

• 10 points will be awarded for each survivor if properly placed in the rescue center. If physically any part of survivor body outside the rescue center box, consider as out of the box, no point.

• Put out the fire (triggered the IR sensor to turn LED Red to Green) will be awarded 10 points each.

• If LED not turn to Green, there is no point.

• Robot return and stop at starting point will be awarded 20 points.

4.6.2 Penalties

Placing the survivor at any affected area of the forest will receive a penalty which is the deduction of 15 points.

4.6.3 Disqualification

- Touching the robot or the item in the arena while the match is in progress.

- Robot does not comply with the size restriction.

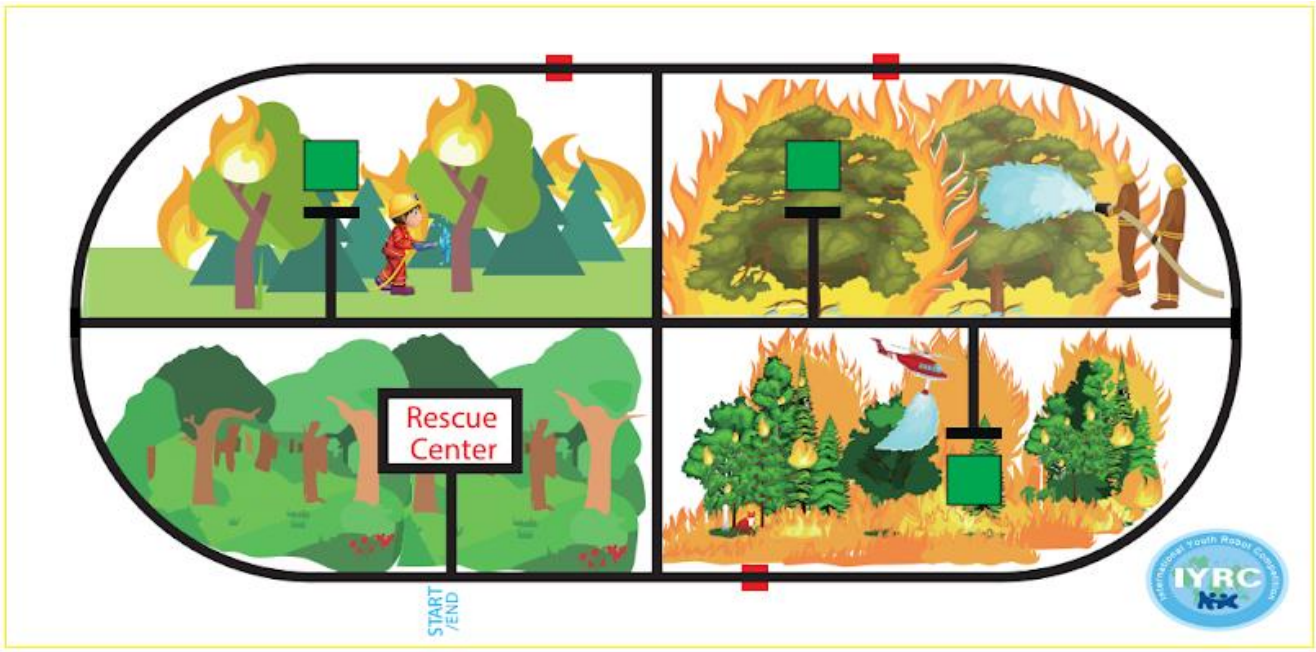
- A stalemate of more than 10s.

- The robot moves out of the line for more than 10s.

Sample score record

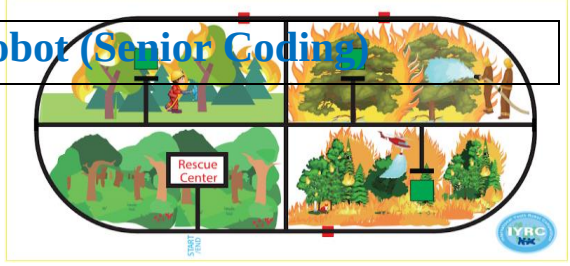
TEAM	Survivor Saved	Put out fire	Penalty	Stop at starting point	Total Points	Time Taken (s)	Ranking
A	30	30	0	20	80	180s	2
B	30	30	0	20	80	160s	1
C	20	30	-15	20	55	130s	3

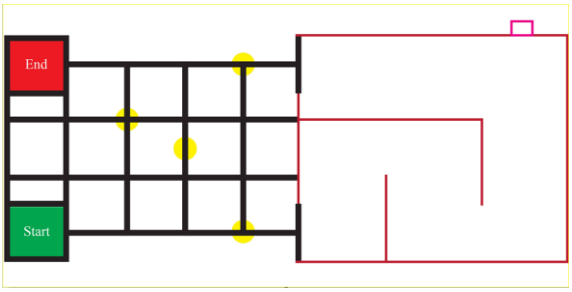
5. Game Field



Survivor 	Assembled by 4 pcs of 5*5 Blocks
Sensor to be triggered 	L : 10cm, H : 15cm , W:7cm Height of IR sensor from ground : 5.5 cm

4) Autonomous Rescue Robot (Senior Coding)



Age	13-17	
Team	Individual	
Robot Kits	MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot)	
Mission	Program the robot in Line Tracing mode and Avoider mode. Robot runs autonomously to trace the black line to complete some mission and then change to avoider mode to rescue victim in a maze.	
Robot Building	Pre-build and programmed	
Game Method	On site program robot to complete missions and Time record	

1.0 Objective

The goal of this game is to test student's ability to program the robot to run autonomously in 2 modes which are Line Tracing mode and Avoider Mode. Robot runs autonomously to trace the black line to complete some mission and then change to avoider mode to rescue victim in a maze.

2.0 Robot Dimension and Weight

Robot must not exceed 20cm(H), 20cm(W), 20cm(L).

Robot is **NOT allowed** to expand at any time.

3.0 Restriction on Robot Design

3.1 Only MRT Series, MRT-X & HUNA educational robot kit (not include My Robot Time Toy series and MRT Soccer Robot). No limitation to the number of blocks used to build the robot.

3.2 May use maximum up to 4 DC motors, 2 servos, 5 IR sensors, 1 tracer sensor block, 1 Ultrasonic sensor and 1 mainboard only.

3.3 Robots shall not damage any part of the field or obstacles deliberately.

3.4 Robots are not allowed to have any power supply more than 9V DC. VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.5 Must not cause any danger to the arena.

4.0 Game Rules

4.1 Length of a match

4.1.1 Coding & Testing will be given 3 hours. Each game is stipulated for 4 minutes only. Each participant is allow to make two attempts and the highest score attempt will be recorded.

4.1.2 In the following cases, a match will end before 4 minutes.

- In the event of disqualification.
- When the judge sees that continuation of the match is impossible.
- Damages on the arena

• Completion of time

4.2 Building of Robot

Pre-built and on site program.

4.3 Starting of Robot

4.3.1 Robot should stay inside the START Box (Green).

4.3.2 Whistle will be blown as a sign of start of the match.

4.3.3 Participant is allowed to start (switch on) the robot using single switch operation.

4.3.4 Timer starts when robot reached the Start Box black line.

4.4 Completion Task

4.4.1 The mission (knock down 3 items on the yellow spot in line tracing area) will be announced on the spot.

4.4.2 Once the match has begun, the robot must move by its own to complete the task.

4.4.3 Robot should be able to pass through the Line Tracing area then maze and stop in End Box.

4.4.4 During the game, robot will first run in Line Tracing Mode, then avoider mode and lastly Line Tracing mode again before stop in the End Box.

4.4.5 Once started, the robot has to pass through 3 fix yellow spots to knock down total 3 item before enter the maze at the correct entrance.

4.4.6 Robot pass through the maze trigger (turn LED from Red to Green) in the maze before going out of the maze at the correct exit .

4.4.7 Stop inside the End Box (Red). Any part of robot body on the black box will consider out of box.

4.5 Deciding the Winner

4.5.1 The winner will be the participant who able to complete the task with highest score and shortest time.

4.5.2 If the score is the same for two participants, the shortest time will be the winner.

4.6 Points and Disqualification

4.6.1 Points

• Each specific spots knock down item in Line Tracing area will get 10 points.

• Turn maze trigger LED turn from red to green in the maze will get 25 points.

• Able to enter into Line Tracing area from maze will get 25 points.

• Able to stop inside the End Box will get 10 points.

4.6.2 Disqualification

- Touching the robot or the item in the arena while the match is in progress.

- Robot does not comply with the size restriction.

- A stalemate of more than 10s.

- The robot moves out of the line for more than 10s.

5.0 Competition Length

5.1 Time given is 3 hours for on the spot programming and testing.

5.2 All participants are under quarantine during the programming period. Participants are allow to do testing and modify robot during this period.

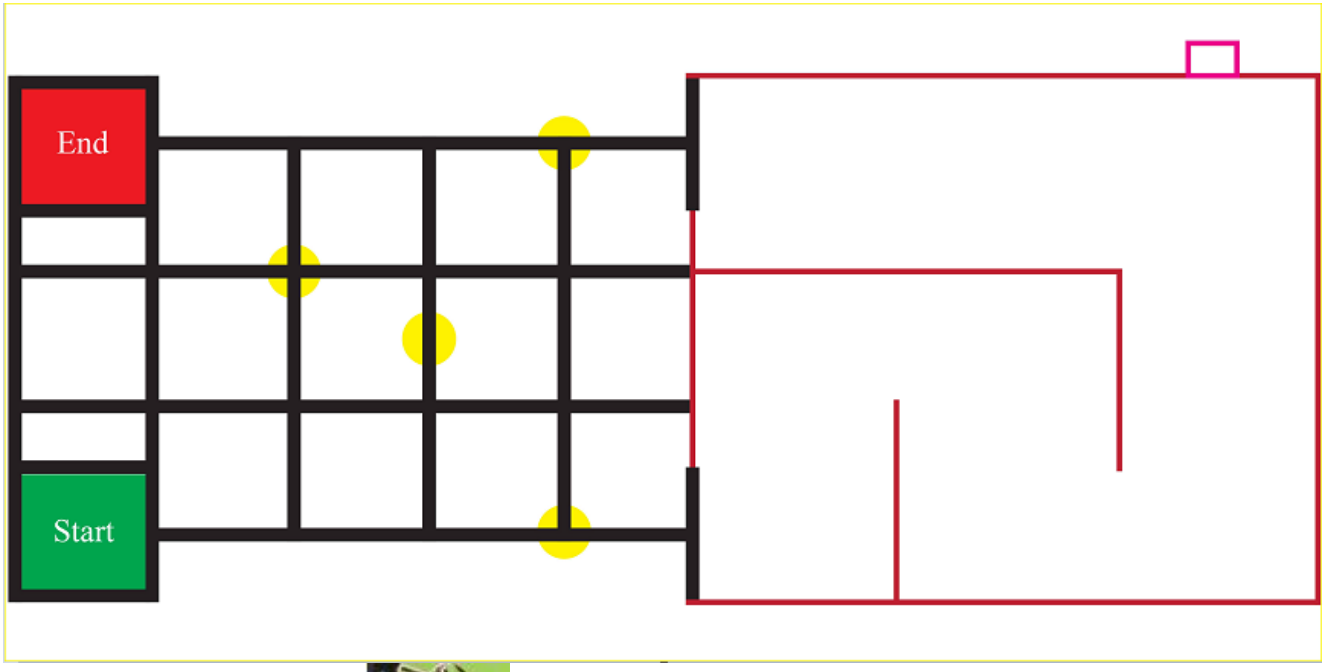
5.3 Once the participant satisfies with the robot performance, the participant may hand over their robot to referee for quarantine. No more program or structure modification is allow after this.

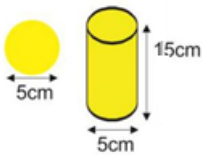
5.4 Participant will be called for competition in the following session.

Sample score record

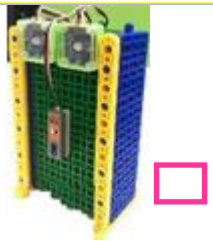
TEAM	Yellow spot	Maze mission	Enter Line Tracing area from Maze	Stop in End Box	Total Points	Time Taken (s)	Ranking
A	30	25	10	10	75	180s	2
B	30	25	10	10	75	160s	1
C	20	25	10	10	65	130s	3

6. Game Field





Line Tracing Mission



Maze trigger

wall height 12 cm

5) Senior Creative

Age	Senior : 13-17 years old	
Team	Team (3-5 students and 1 teacher)	
Robot Kits	MRT series of products	
Mission	Create a robot expressing the given theme	
Robot Building	Pre-build	
Game Method	Presentation and on/off-line evaluation by panel	

1.0 Objective

Provide a platform for student to showcase their creativity, innovative and programming skills. They are required to work together as a team to design a robot based on the given theme. Besides, they will also need to present and demonstrate their robot creation well to convince and impress the judges.

2.0 Robot Dimensions and Weight

The size and weight of the robot is not limited.

3.0 Restrictions on Robot design

3.1 Only MRT series of products are to be used to build the robot. There is no limitation to the amount of blocks used to build the robot. You are allowed to cross use the parts from the above mentioned systems for the robots.

3.2 Robots shall not damage any part of the field or obstacles deliberately.

3.3 Robots shall include LSM ((Line Core M Servo motor) or MRT products (include all MRT new products: MRT-Coconut, MRT-duino, Blacksmith-Coding Board, etc) and there is no limitation on number of sensors and motors used.

3.4 Robots allowed to move or make motion autonomously OR use remote control.

3.5 Robots can use and add other materials such as camera, sensors, paper, rings, clips, chopsticks, paper cups, and 3D Printing materials etc.

3.6 VAC (Volt of Alternating Current) power supplies are strictly prohibited for safety reasons.

3.7 Robots shall not cause any danger to the arena & surroundings in anyway whatsoever.

3.8 Robots will need to protect their sensors if necessary from any outside interference.

3.9 Robots RC receivers will need to be protected from any outside interference.

4.0 Game Rules

4.1 Method of a Match

4.1.1 Participants shall build a robot in advance.

4.1.2 Participants are given 2 hours duration to prepare their robot.

4.1.3 Each group has presentation time of 5 minutes to introduce their robots to the referee on the stage. Presentation can be done in English. If they are unable to present in English they have to prepare their own translator.

4.1.4 Robots may be displayed in/around the venue. The team members or teacher may keep the robots and explain to the public.

4.1.5 Participants should carry the printed manual (presentation). About the manual, please refer to the rule 4.3.3 & 4.3.4

4.2 Theme : UN's Sustainable Development Goals (SDGs)

4.2.1 The 5 themes are selected among 17 SDGs proposed by the United Nations. The robot can be based on one of the following field ONLY:

- Zero Hunger
- Good Health and Well-Being
- Clean Water and Sanitation
- Affordable and Clean Energy
- Sustainable Cities and Communities

You are strongly recommended to study what the themes above mean at https://www.un.org/sustainabledevelopment/sustainable-development-goals/

4.3 Robot Registration in Advance

4.3.1 Participants should submit the requirements IN ADVANCE to the official email (HQ.IYRA@gmail.com).

4.3.2 Please check the important dates;

- Deadline for sending requirements to email : **June 31 2019 (all participants)**
- Confirmation to the qualified teams : **July 15 2019 (IYRA HQ)**

4.3.3 The requirements are as below;

- More than 3 pictures containing robot, all your team member faces, and teacher together in one photo
- Video showing your robot working/moving (10 seconds to 1 min.
- Manual (Presentation file) including 1) Robot Name 2) Purpose 3) Team Member introduction and task allocation 4) Introduction of the project 5) Specification and features 6) how to program (if needed) 7) functionality of robot

4.3.4 The manual must be in English.

4.4 Deciding the Winner

4.4.1 The judges will check if the team meets the requirements or not, and evaluate teams' works online first.

4.4.2 The judges will notice the results If the participants are qualified or disqualified.

4.4.3 If the participants are qualified, then they are allowed to advance to the final round,a.k.a. 6th IYRC Korea

4.4.4 Score shall consist of :

- Relevance to theme (10 score) : online evaluation
- Creativity & Uniqueness (30 score) : online evaluation
- Robot Functionality (30 score) : on site evaluation
- Team work (10 score) : on site evaluation
- Presentation skill (20 score) : on site evaluation

5.0 What is different from Junior and Senior

5.1 Creative Design Senior rules are same as Junior except additional point system.

5.2 Creative Design Senior has additional points when;

5.2.1 Robots make motion or move autonomously. (+5 points)
5.2.2 Participants submit how to code or programming code (+5 points)
5.2.3 Participants use more than two types of main board from MRT products. (+5 points) (E.g. MRT3 Main board + MRT5 Main board + LSM + MRT Coconut + MRT Blacksmith + MRT Duino Main board)

6.0 Awards:

6.1 ALL the qualified team will be awarded.

Gold, Silver, and Bronze winners may get Trophy + Certificates, and the others may get certificates only

6.2 The teachers of the winning team will be awarded separately.

Judges will be 5-9 experts from various nations recommended by National Partners of IYRA

OPEN CATEGORIES

1) Humanoid Robot Dance		
Age	ALL (no limits)	
Team	3 persons with 3 robots	
Robot Kits	LINE Humanoid	
Mission	Creating Robot Dance to the music	
Robot Building	Pre-build，autonomous	
Game Method	Dance Performance	

1.0 Objective

To test students'skills in creating and making motion of LINE Humanoid

2.0 Robot Dimensions and Weight

2.1 Only LINE Humanoid robot parts can be used to build the robot

2.2 You are only allowed to modify the mechanical parts but not electronic parts. The participant would be IMMEDIATELY disqualified, if found guilty

2.3 Robot shall not damage any part of the field or obstacles deliberately

2.4 Robot shall not cause any danger to the arena & surroundings in anyway whatsoever

2.5 Robot will need to protect their sensors if necessary from outside interference

2.6 Robots RC receiver will need to be protected from any outside interference

3.0 Game Rules

3.1 Length of a Match

The length of song is within 2 minutes.

3.2 Building of Robot

3.2.1 Prebuilt and programmed

3.2.2 The battery specification, length of robot leg and arm should strictly adhere to the instruction manual (LINE Humanoid)

3.2.3 The appearance of the humanoid can be modified by changing color and accessories

3.2.4 The movement of the robot can be programmed freely

3.2.5 Each participant can prepare one backup LINE Humanoid

3.2.6 Organizer will provide the robot standing box (if required) to stabilize it during robot dancing.

3.3 Starting the Robot

3.3.1 Whistle will be blown as a sign of start of the match

3.3.2 Participant is allowed to start (SWITCH ON) the robot using single switch operation

3.3.3 The participant shall keep a distance from the game field during the game

3.3.4 The humanoid can be controlled using any Android phone.

3.4 Competition Tasks

3.4.1 Each team will be given 5 minutes including preparation, introduction and performance.

3.4.2 Robots should be three kits.

3.4.3 Participants shall introduce their team and performance to the referee before playing music.

3.4.4 When participants are ready, background music will be played. Any kind of music shall be allowed. Music length

should be within 2 minutes.

3.4.5 The parts which are fallen or broken from the robot cannot fix back onto the robot during the match

3.4.6 During the robot dancing, it is not allowed to touch or control the robot additionally.

3.5 Deciding the Winner

3.5.1 Referee shall be consisted of more than three persons

3.5.2 Each performance shall be evaluated based on following method.

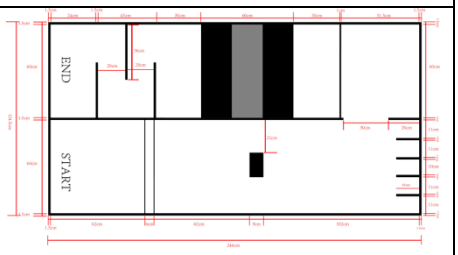
- Robot Dance Rationality, Coherent motions, Completeness [20 points]
- Robot Dance Choreography, Innovative and Creative [20 points]
- Robot dance moves in harmony with music [20 points]
- Robot motion complexity, coordination [20 points]
- Salutation before Start and after End of Dance [10 points]
- Teamwork [10 points]

Team	Rationality, Coherent motions, Completeness [20]	Choreography,Innovative, Creative [20]	Harmony with music [20]	Complexity, Coordination [20]	Salutation before and after dance [10]	Teamwork [10]	Total	Ranking

* Whenever robots fall down during the performance, the participants should get permission from the Referees in order to touch the robot.

2) Humanoid Robot Mission

Age	ALL (no limits)
Team	Individual
Robot Kits	LINE Humanoid
Mission	Using shortest time to pass through 5 missions and reach destination control by Android device
Robot Building	Pre-build，Remote control method
Game Method	Mission completion and time record



1.0 Objective

To test students' skill in constructing and controlling of high stability LINE Humanoid to complete the mission.

2.0 Robot Dimensions and Weight

2.1 Only LINE Humanoid robot parts can be used to build the robot.

2.2 You are only allowed to modify the mechanical parts but not electronic parts. The player would be IMMEDIATELY disqualified, If found guilty

2.3 Robot shall not damage any part of the field or obstacles deliberately.

2.4 Robot shall not cause any danger to the arena & surroundings in anyway whatsoever.

2.5 Robot will need to protect their sensors if necessary from outside interferences.

2.6 Robots RC receiver will need to be protected from any outside interferences.

3.0 Game Rules

3.1 Length of a Match

Each game is stipulated for 5 minutes

4.0 Building of Robot

4.1 Prebuilt and programmed

4.2 The battery specification, length of robot leg and arm should strictly adhere to the instruction manual (LINE Humanoid)

4.3 The appearance of the humanoid can be modified by changing color and accessories

4.4 The movement of the robot can be programmed freely

4.5 Each participant can prepare one backup LINE Humanoid. Not allow to use other participant robot to complete the game.

4.6 Participant should prepare their own Android device (Airplane Mode) to control the robot.

5.0 Starting the Robot

5.1 Whistle will be blown as a sign of start of the match.

5.2 Participant is allowed to start (SWITCH ON) the robot using single switch operation

5.3 The participant shall keep a distance from the game field during the game

5.4 The humanoid can be controlled using any Android phone under flight mode

6.0 Competition Tasks

6.1 Once the game stated， the robot must go through the route of the game to complete all the mission set.

6.2 Robot must STOP at the END POINT after finished all the missions for time recording purpose

6.3 Once the whistle blown, the robot can start to move from the START POINT

6.4 All robots will be collected by referees before the competition begins. Not allowed to share robot with other participants.

6.5 The parts which are fallen or broken from the robot cannot fix back onto the robot during the match.

6.6 Once robot stops at END POINT, timer will be stop.

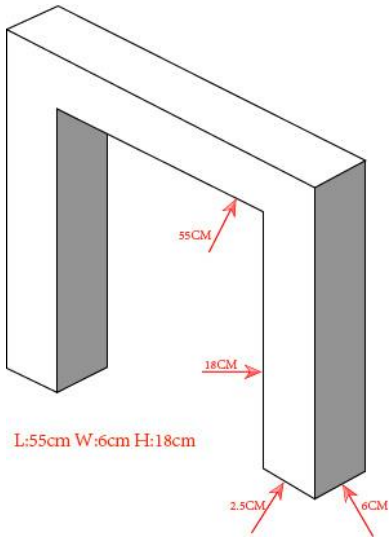
6.7 In the middle of the game if robot out of battery and not be able to control anymore, game will be terminated.

7.0 Deciding the Winner

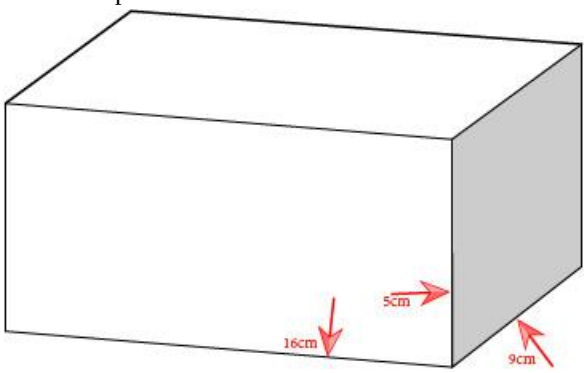
7.1 Robot reached the END POINT with highest points will win the competition. If same point, shortest time will be the winner.

7.2 Total 5 Missions

• Mission 1 ： Robot needs to crawl under obstacles placed on the passage. Successfully completed mission will be awarded 20 points.

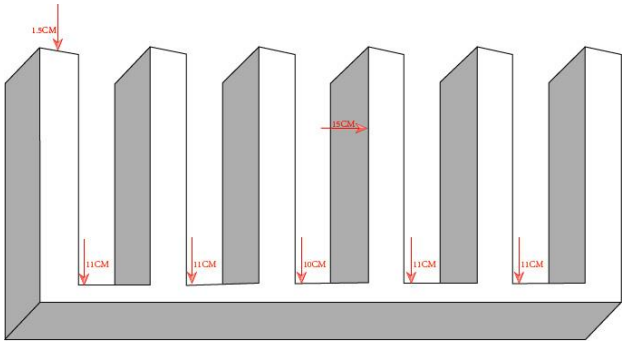


• Mission 2 ： Robot needs to use hand to carry the props (6cm soft sponge cube) and robot legs must cross the red line before dropping the props to designated area. Successfully completed mission will be awarded 20 points.

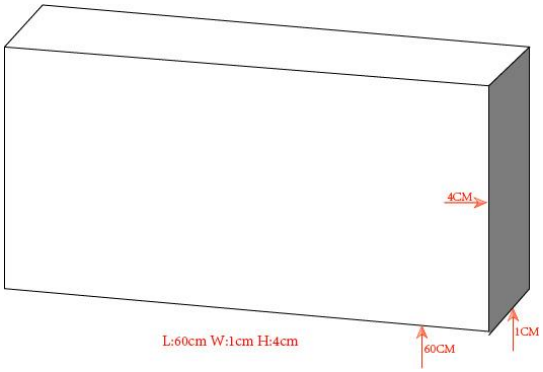


Rectangle: L:16cm W:9cm H:5cm

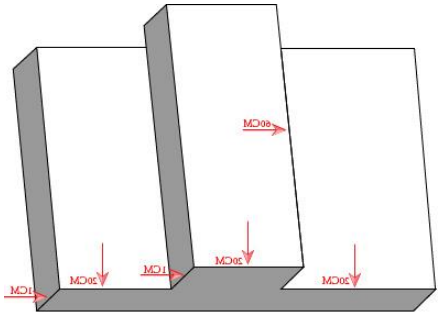
• Mission 3 : The robot needs to use a foot to kick the soccer ball(there are 2 balls) into the slot label with 16/18/20/18/16. The ball successfully enters into the highest point slot will be recorded.

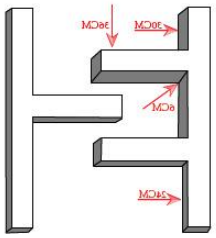


• Mission 4 : Robots need to cross above the obstacles placed in the passage. Successfully completed mission will be awarded 20 points.



• Mission 5 : Robot can only walk through the two steps staircase (walk up stairs 5 points, walk down stairs 5 points) and then walk through the Z- type route to reach the end (10 points).





• If the participant unable to complete mission 1, 2, 4, 5, allow to reattempt with referee approval. Maximum 2 attempts. Allow to give up the mission and there will be no score for this mission.

• For mission 4 & 5, robot is not allow to roll over. There will be no points if roll over.

• Robot moves out of game field, referee is responsible to put it back in the game field. Participant is not allow to touch the robot during the game. After two warning given by referee, game terminated.

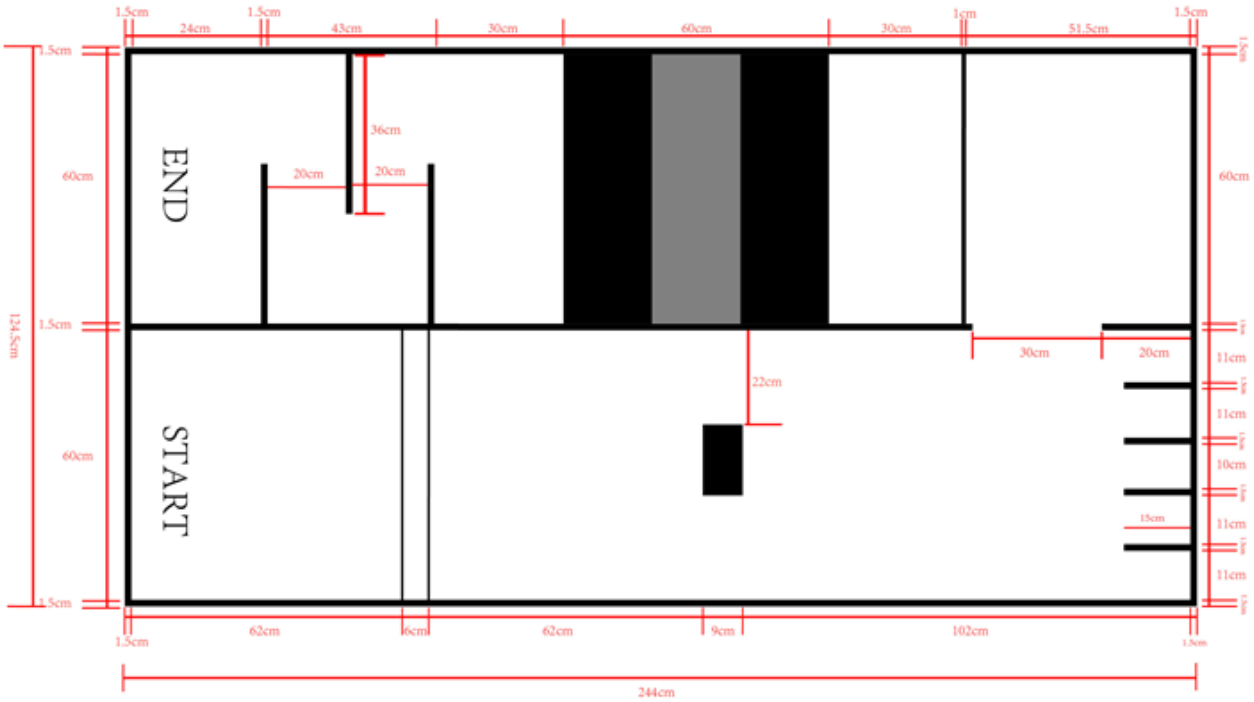
• If foul during the match, no points will be given even the robot stops at the END POINT.

• Participant can give up any mission without any points. Must get approval from referee beforehand.

Sample score Record :

Name	Mission 1	Mission 2	Mission 3	Mission4	Mission 5	Total	Time (Sec)	Rankin
A	20	20	20	20	20	100	90	2
B	20	20	20	0	15	75	92	3
C	20	20	20	20	20	100	85	1

4.0 Game Field



3) LINE Humanoid Boxing		
Age	ALL (no limits)	

Team	Individual	
Robot Kits	LINE Humanoid	
Mission	Remote control humanoid to throw punches to knock down opponents as many times as possible in three minutes	
Robot Building	Pre-build，Remote control method	
Game Method	Tournament	

1.0 Objective

To construct a humanoid robot with high stability and controlling skill to play a boxing game.

2.0 Restrictions on Robot design

2.1 Only LINE Humanoid robot parts are to be used to build the robot.

2.2 You are only allowed to modify the mechanical parts (painting/folding) but not electronic parts. If found guilty, the player would be IMMEDIATELY disqualified.

2.3 Robots shall not damage any part of the field or obstacles deliberately.

2.4 Robots are ONLY allowed to use LINE built in power supply. VAC (Voltage of Alternating Current) power supplies are strictly prohibited for safety reasons.

2.5 Robots shall not cause any danger to the arena and surroundings in anyway whatsoever.

2.6 Robots will need to protect their sensors if necessary from any outside interferences.

2.7 Robots RC receivers will need to be protected from any outside interferences.

3.0 Games Rules

3.1 Length of a Match

3.1.1 Each game is stipulated for 3 minutes.

4.0 Building of Robot

4.1 Prebuilt and programmed

4.2 The battery specification, length of robot leg and arm should strictly adhere to the instruction manual (LINE Humanoid)

4.3 The appearance of the humanoid can be modified by changing color and accessories

4.4 The movement of the robot can be programmed freely

4.5 Each participant can prepare one backup LINE Humanoid. Not allow to use other participant robot to complete the game.

4.6 Participant should prepare their own Android device (Airplane Mode) to control the robot.

5.0 Starting the Robot

5.1 Whistle will be blown as a sign to start the match.

5.2 Participant is allowed to start (SWITCH ON) the robot using single switch operation.

5.3 The participant who remote controls the robot shall keep distance with the game field area without touching or disturbing the game field.

5.4 The humanoid can be control using android phone under flight mode.

6.0 Competition Tasks

6.1 The games will be based on **"knock out"** system. All the participants will be distributed in opposing pairs by committee randomly.

6.2 The humanoid can used its hand, leg or body to knock opponent down.

6.3 Once the humanoid fall down after pushing by opponent or fall down by itself, 1 mark will be awarded to opponent.

6.4 Except the humanoid's feet, if any other body parts of the humanoid(hand, knee, chest, back) touch on the ground of the stage, 1 marks will be awarded to the opponent.

6.5 There will be no rest time during the competition. (For example, the humanoid fall down and cannot get up by itself or the humanoid lost control) the competition will carry on.

6.6 Each time when the opponent's humanoid being knock down, participants should obey judge instruction to move back to certain distance and wait for opponent's humanoid to get up.

6.7 Judges will countdown for 10 seconds when one's humanoid fall down or lost control, if the humanoid cannot back to its normal operation within this 10 seconds, judges will declare that the participants lost the competition.

6.8 Both robots must attempt to cross over and engage the opponent robot as soon as the match starts. The robot can deploy any tactics or maneuvers, as long as it does not constitutes a foul.

6.9 If the humanoid is stop moving to attack the opponent for more than 10 seconds a yellow card will be issued to the offender. Upon receiving 2 yellow card, 1 mark will also be awarded to opponent.

7.0 Deciding the Winner

7.1 Within 3 minutes, the participants with highest scores will be the winner.

7.2 The 'knock-out' stage shall not consist of any points and the winner of the game shall proceed to the next round.

7.3 Extra time shall be played in an event of a DRAW.

7.4 The time limit for extra time shall be 1 minute.

7.5 'Sudden death' penalties shall decide the match in the event both participants are still tied for score. The participants that fall down first losses the game.

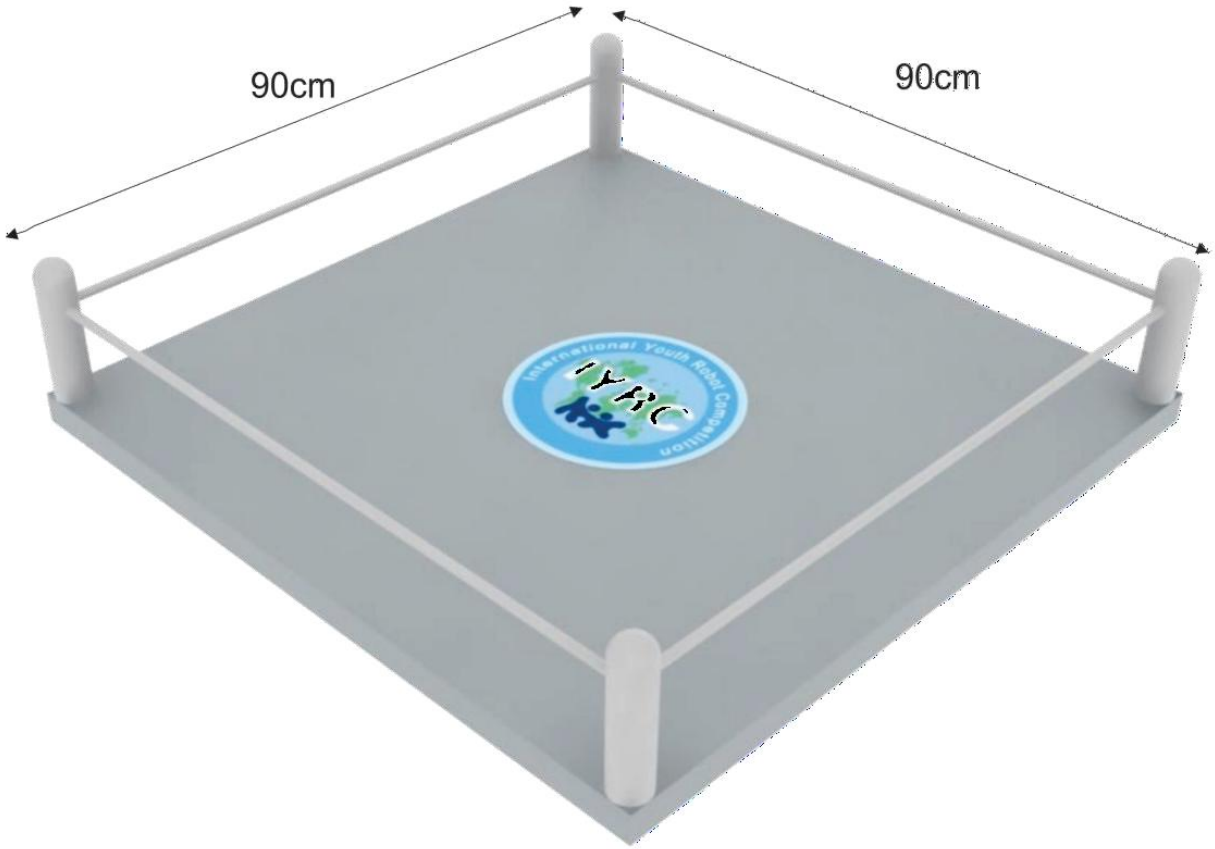
8.0 Disqualification

A team shall be disqualified if it commits any of the following during the match:

8.1 Touching the robots while the match is in progress.

8.2 Robot does not comply with the restrictions.

9.0 Game Field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