

HUROCUP CATEGORY

SUMMARY OF RULES AND INFO

19th MALAYSIA FIRA ROBOWORLD CUP 2026

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Abstract

The following rules and regulations are general rules of HuroCup, a robotic game and robotics benchmark problem for humanoid robots. The HuroCup competition emphasizes the development of flexible, robust, and versatile robots that can perform many different tasks in different domains. HuroCup encourages research into the many areas of humanoid robotics, especially walking and balancing, complex motion planning, and human-robot interaction. In addition to the single events (e.g., archery, sprint, marathon, united soccer, penalty kick, obstacle run, rock climbing, spartan race, marathon, weightlifting, and basketball), there is an all-around competition for the single robot that performs best in overall events.

ALL RULES AND REGULATION BASED ON FIRA ROBOWORLD WEBSITE

ROBOT SPECIFICATION

DIMENSION	COMMENT	KID SIZE
$\$H$	Maximum Height	60cm
$\$HM$	Minimum Height	0cm
$\$G$	Maximum Weight	20kg
$\$D$	Maximum foot dimension	12cm
$\$AL$	Maximum arm length	Arms must not reach below the knees while standing

1. The game is played using humanoid robots. The maximum size of the robots is $\$H$. The maximum weight of the robot is $\$G$
2. There are one category of robots (kid size) depending on their height and the maximum foot dimension.
3. The *height* $\$H$ of the robot is defined as the maximum distance between any part of the robot, excluding its arms, and the ground when the robot is fully extended.
4. The *maximum foot dimension* $\$D$ is defined as the maximum distance of any two points on any foot of the robot. Some examples are shown in the Figure below :

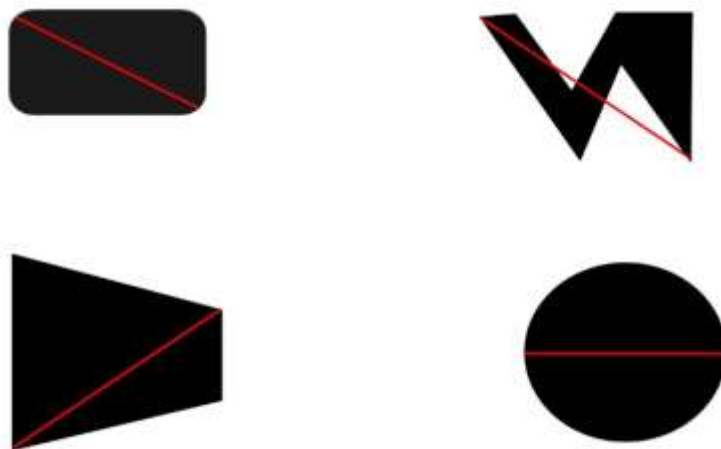


Figure Maximum Foot Dimension

5. The length of the arms must be limited such that they cannot reach below the knees when the robot is in a standing posture.
6. The robot must be limited in its kinematics to actions that are equivalent to human kinematics.
7. The sensors on the robot must be equivalent to the human senses of sight, sound, touch, hearing, taste, proprioception, balance, and acceleration.
8. All sensors must be passive, that is they are not allowed to emit signals such as infrared, ultrasound, or laser pulses.
9. The mode of locomotion of the robot must be bipedal walking or running.
10. Each robot must have the ability to fully independent locomotion, sensing, and processing. That is, all actuators, motors, power, computing, and sensing mechanisms must be incorporated into the robot.
11. Each robot must be fully autonomous, that is, it must perform its own control decisions.
12. Robots may use black and white colouring without restriction. Other colours may be used so long as they are deemed by the rules committee to be sufficiently different from reserved colours, specifically ball yellow, marker red and marker blue.
13. A robot must not have in its construction anything that is dangerous to itself, another robot, human operators, or spectators.
14. During the competition, coaches are not allowed to assist participants. Any assistance from a coach will result in the participant's disqualification.

EVENT CATEGORIES

The HuroCup competition includes a variety of events that are categorized into three (3) main groups:

Mobility Events, Manipulation Events, and Hybrid Events.

- **Mobility Events** include sprint and marathon, which test a robot's speed, endurance, and agility.
- **Manipulation Events** include archery, basketball and weightlifting, focusing on precision, control, and object handling.
- **Hybrid Events** include lift and carry, triple jump and penalty kick challenging robots with complex or hybrid tasks involving strategy, coordination, or multi-skill execution.

SCORING

1. In HuroCup events, the scoring in an event is based on the performance of the robot as well as its ranking amongst the other robots in a competition.
2. The score of a robot is between 0 (lowest performance) to 10 points (best performance).
3. All robots that are unable to meet the minimum performance criteria set for a round will automatically be awarded 0 points.
4. The robots that have surpassed the minimum performance criteria will be awarded points based on their ranking.
5. The point allocation is shown in Table Point Allocation.

PLACE	POINTS SCORED
1st	10
2nd	8
3rd	6
4th	4
5th	3
6th	2
7th	1
8th, 9th, 10th, ...	0

METHOD OF SCORING

1. All robots that have not scored at least one point in any event are automatically awarded no 0 rank.
2. The robot with the maximum number of points over all HuroCup events is declared the winner and the other ranks are determined according to the sum of their scores over all events.

PRIZES AND AWARDS

1. Overall category awards will be presented for each event categories. A robot's score in each category will be the sum of its final scores in all events within that category. The robot with the highest total score in each category will receive the first-place award (Gold medal), second place (Silver medal) and third place (Bronze medal) for that category.
2. In case of multiple robots with the same sum of scores for event categories the tie breaker shall be determined based on the robot's result/achievements as follows:
 - Mobility – Marathon
 - Manipulation - Archery
 - Hybrid - Lift and Carry
3. The **Master HuroCup champion** will be determined by the **highest total point for 3 main groups categories**. If the tie persists, the final tiebreaker will be determined using the event order under Allround - HuroCup Laws of the Game - [AR-8.4] in FIRA RoboWorld Cup Rules.
[AR-8.4] The order of events is marathon, spartan race, triple jump, archery, obstacle run, basketball, weightlifting, penalty kick, and sprint.

THE HUROCUP COMPETITION INCLUDES THE FOLLOWING EVENTS:

A. MOBILITY

1.0 SPRINT



GOAL	The goal is for the robots to move as quickly as possible from a start line to the finish line (forward and reverse) for a series of segments.
GAMEPLAY	Robot run forward until cross the finish line, and reverse until cross the start line
ROUND	3 rounds (best time recorded), 1 Grand Final Sprint round.
DURATION	3 minutes (can retry if fall or step on lines within the time limit)
WINNER	Winner based on the shortest time.
TIEBREAKER	Refer to distance, forward time, and reverse time
For more detail information, please refer to our official website. Any changes to the rules of the game are subject to the discretion of the referee according to the suitability of the competition.	

2.0 MARATHON



GOAL	HuroCup marathon aims to test the robustness and endurance of humanoid robots.
GAMEPLAY	Robot runs forward navigate the Marathon course as quickly as possible by following visual markers that indicate forward motion and turns. The event no longer relies on any visible ground track or colored lines.
ROUND	1 round (1 hour).
DISTANCE	421 meters
WINNER	Winner based on quickest time and distance.
PENALTY	The robot handler is not allowed to touch the robot. However, in case of a failure or malfunction of the robot, the robot's handler may, after having been penalized for this infraction, request permission from the referee to fix his robot. After having received permission from the referee, the helper may fix the robot. Please refer to for special laws regarding the batteries of the robot. Robot handler is not allowed to change the batteries during the competition. Changing the batteries will lead to immediate disqualification of the team. Robot handler is not allowed to connect a power cable to the robot or any other device that can be used to charge batteries. If the robot falls and the handler touches it, consider 1 time penalty. But, if the robot falls and stands up itself, it's not considered as a penalty.
TIEBREAKER	Refer to distance and time
For more detail information, please refer to our official website. Any changes to the rules of the game are subject to the discretion of the referee according to the suitability of the competition.	

B. MANIPULATION

1.0 ARCHERY



GOAL	The goal of the archery competition is to encourage research into humanoid robots that can do compliant control precisely and track moving targets (must use vision system).
GAMEPLAY	After the referee blows the first whistle, a robot must pull the bowstring. The tension in the bowstring will propel the arrow to the target board. The score will be counted when the arrow stuck to the target board
ROBOT LOCATION	Starting location will be determined by the referee
TARGET BOARD LOCATION	Rotation target board (360 degrees), placed at the centre - with different speeds for each round
ROUND	2 rounds (3 shoots each round)
DURATION	2 minutes for each trial
WINNER	The arrow stuck to the target board after being shot by the shooter. Highest point of shooting (overall)
PENALTY	If the robot does not have a vision system, the participant will be disqualified
TIEBREAKER	If more than one robot has scored the same number of points, the robots will be ranked based on: 1. highest marks for the total red target (bull eyes) for all round 2. fastest-time robot shoots an arrow to the target board (pick from any 10 shoot)
For more detail information, please refer to our official website.	
Any changes to the rules of the game are subject to the discretion of the referee according to the suitability of the competition.	

2.0 BASKETBALL



GOAL	The goal of the basketball competition is to encourage research into humanoid robots that can dexterously manipulate small objects.
GAMEPLAY	Robot must be placed in the middle of the field. Then the robot must walk toward the ball to pick up the ball that was randomly placed by the referee or based on a draw by the players.
ROUND	5
DURATION	2 minutes
WINNER	Winner based on accumulation of ball points (2 points, 3 points, 5 points)
BALL COLOUR & TYPE	Orange colour table tennis ball
PENALTY	If the robot does not have a vision system, the participant will be disqualified
TIEBREAKER	The shortest duration taken for the highest score trial
For more detail information, please refer to our official website. Any changes to the rules of the game are subject to the discretion of the referee according to the suitability of the competition.	

3.0 WEICHLIFTING



GOAL	The goal of the weightlifting competition is to encourage research in actively balancing robots and robots that can walk under a heavy load and are able to compensate for varying centers of gravity.
GAMEPLAY	After the referee gives the start signal, the robot must pick up the lifting bar positioned at the pick-up line. The robot must walk towards the lifting line while continuously carrying the weight below head height until a foot touches the lifting line. While at least one foot is touching the lifting line, the robot must lift the lifting bar above its head. The height difference between the low and high position must be at least 15 cm. The robot must proceed to the finish line with the weight up and then, while at least one foot is touching the finish line, the robot must stop and drop the weight to the ground.
ROUND	5
DURATION	2 minutes
WINNER	Based on the highest number of discs lifted successfully in a trial.
FIRST ROUND DISC QUANTITY	Depends on the desired quantity of each team. However, the team cannot reduce the requested quantity of discs if failed to lift. The robot is only allowed to increase the number of discs if the robot successfully finishes its current attempt.
TIEBREAKER	1) Total number of discs successfully lifted in 3 rounds. 2) Number of successful trials if the same total number of discs
For more detail information, please refer to our official website. Any changes to the rules of the game are subject to the discretion of the referee according to the suitability of the competition.	

C. HYBRID

1.0 LIFT AND CARRY



GOAL	The goal of this competition is to provide an event for the research of enhancing the mobility of humanoid robots. Thus, the design of playing field is aimed at the humanoid robots to use active balancing, push recovery, complex motion planning, coordination, and execution to increase the range of usable motions.
GAMEPLAY	Robot must reach the highest spot of the platform with both feet and leave the uneven terrain until both feet touch the ground outside of the uneven terrain.
ROBOT LOCATION	Starting location will be determined by the referee
ROUND	3
DURATION	5 minutes for each robot to complete task (climb up and down). If there is no progress for more than one minute, the round will be terminated.
WINNER	Shortest time taken to reach the highest spot and leave the uneven terrain.
TIEBREAKER	Shortest time and platform level
For more detail information, please refer to our official website. Any changes to the rules of the game are subject to the discretion of the referee according to the suitability of the competition.	

2.0 TRIPLE JUMP



GOAL	The goal of the triple jump competition is to encourage research in extremely dynamic humanoid robots able to create strong forces and compliant enough to allow for a soft landing.
GAMEPLAY	Robot must walk on the runway to reach the take-off board. From the take-off board, a robot must use a sequence of three jumps to move forward the Landing Pit.
ROBOT LOCATION	Starting location will be determined by the referee.
ROUND	3
DURATION	Should jump within 60 seconds after the referee signalled to start
WINNER	Winner is the longest jump. For all robots that have not managed to jump for more than 5mm, the jump is not counted.
TIEBREAKER	In case two or more robots have the same number maximum jumping distance after all rounds in the long jump event, the sum of successful long jump distances in all rounds will be counted, and if the sum is the same, then the number of successful attempts will be used to determine the winner.
For more detail information, please refer to our official website. Any changes to the rules of the game are subject to the discretion of the referee according to the suitability of the competition.	

3.0 PENALTY KICK



GOAL	The goal of the penalty kick competition is to encourage research in robot precision in aiming and kicking, ability to control speed and direction of the ball and decision-making in choosing a target.
GAMEPLAY	At the beginning of the event, the robot is placed behind the ball (will place the ball away from the goal line centered along the goal line) which is a fixed start point. The robot must move the ball from the start point into the shooting zone without touching any of the obstacles (robot only). Once the ball is completely inside the shooting zone, the robot must kick the ball into the goal defended by a goal keeper (random positioned and part of the robot touches the goal line at the start of the game). The robot is not allowed to leave the playing field or to enter the goal area. A robot has entered the goal area if any part of the robot's foot touches the goal area line or the goal area itself.
OBSTACLE LOCATION	Three wall obstacles will be placed outside the shooting zone. One obstacle is centered along the goal line and the other two obstacles are placed between centered obstacle with certain distance.
OBSTACLE	• 3 walls (blue colour) • A wall obstacle is an obstacle that is placed on the floor and has a height of approximately 30cm. It has a minimum length of 40cm.
ROUND	1 round (5 tries)
BALL COLOUR & TYPE	Tennis ball (Green colour)
DURATION	2 minutes for each try
WINNER	Number of goal score.
TIEBREAKER	Shortest time taken to complete the task.
For more detail information, please refer to our official website. Any changes to the rules of the game are subject to the discretion of the referee according to the suitability of the competition.	