

World Robot League Humanoid Battle

International Robotics Educational Association

Verification of Regulations

Sangbok Park
Chief Judge of IREA



1. Overview

"Humanoid Battle" is a competition that involves the diverse use of humanoid robots, emphasizing sportsmanship, respecting opponents, and sharing technical skills in a festive atmosphere. The "Humanoid Battle" event is a one-on-one tournament where participants control humanoid robots to earn points by using valid techniques to knock over or push the opponent's robot out of the arena. Participants compete in leagues based on their age and the weight class of their robots.

※ The format of the tournament may change depending on the number of participants on the competition day. After all matches are concluded, group rumbles and event matches may take place.

※ Not all weight classes are open for every competition; only select classes are open for each event. Please check the posters and announcements to confirm the weight classes for each competition.

2. Participation Categories

2-1. League Categories

Class	Junior	Pro
MINIMUMWEIGHT	7 ~ 15	X
FLYWEIGHT	7 ~ 18	X
BANTAMWEIGHT	7 ~ Adult	X
FEATHERWEIGHT	7 ~ Adult	X
LIGHTWEIGHT	7 ~ 12	7 ~ Adult
MIDDLEWEIGHT	X	7 ~ Adult
HEAVYWEIGHT	X	7 ~ Adult

2-2. Weight Class Categories

class	Weight class
Minimum	Commercial products and self-made robots under -0.7 kg
Flyweight	Commercial products and self-made robots under -1.0 kg + minimum class standard robots
Bantamweight	Commercial products and self-made robots under 1.5 kg + flyweight class standard robots
Featherweight	Commercial products and self-made robots under 1.7 kg + bantamweight class standard robots
Lightweight	Commercial products and self-made robots under 2.0 kg + featherweight class standard robots
Middleweight	Commercial products and self-made robots under 2.5 kg + lightweight class standard robots
Heavyweight	Self-made robots under 3.5 kg and middleweight robots + middleweight class standard robots

2-2-1. The robot specification allows a tolerance for weight exceeding by up to +3g.

2-2-2. Participants are allowed to compete in a weight class one level higher than their current grade, while maintaining the robot specifications of their current grade, under the condition of voluntary or overlapping participation.

3. Robot Specifications

3-1. Robot Base Platform

- Only humanoid robots that have a structure resembling a human with head, torso, arms, and legs, and comply with the 'robot specifications' regulations, are eligible to participate.

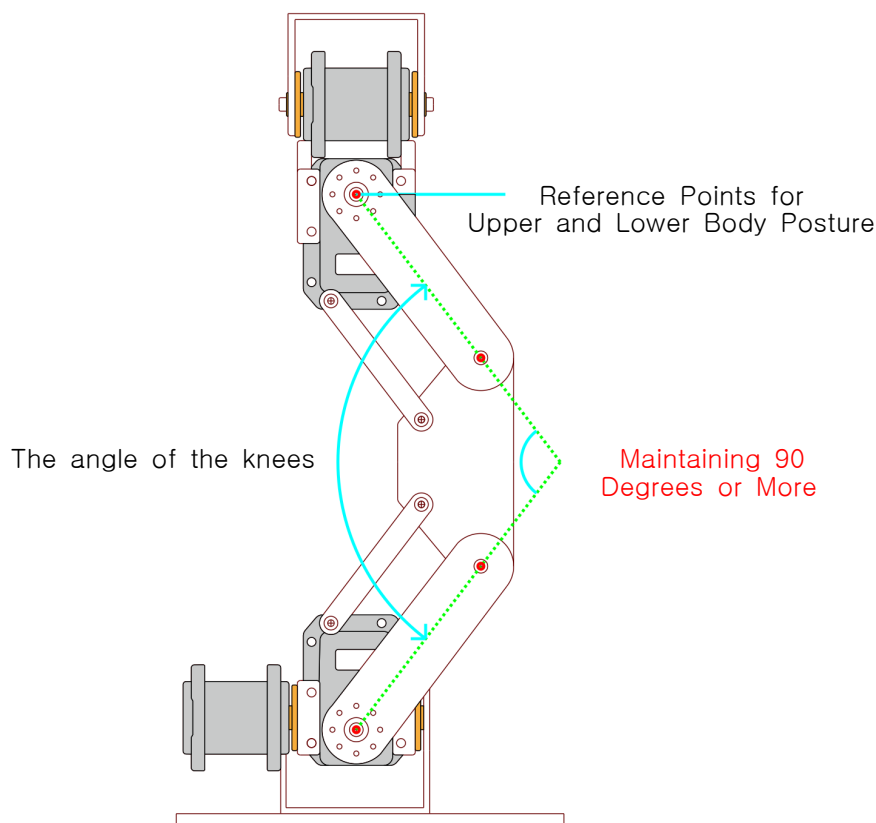
3-2. Robot Specifications

The robot specifications allow a tolerance for length exceeding by up to +1mm.

3-2-1. Basic posture of the robot : The 'specification posture height' of the robot is measured when the robot is fully extended, while the 'basic posture height' is measured when the knee angle is 90° or more. During all 'walking' and 'attacking', the robot must always maintain the height limit of the 'basic posture'.

Class	The height limit in the 'basic posture'
MINIMUMWEIGHT	at least 200mm over
FLYWEIGHT	at least 200mm over
BANTAMWEIGHT	at least 300mm over
FEATHERWEIGHT	at least 300mm over
LIGHTWEIGHT	at least 300mm over
MIDDLEWEIGHT	at least 400mm over
HEAVYWEIGHT	at least 400mm over

- ① "Basic Stance" refers to the angle of the knees and the alignment of the upper and lower body.



3-2-2. All other robot specifications must be constructed in accordance with the attached "Robot Specifications Regulations" file.

4. Rules of the game

4-1. Methods of play

- 4-1-1. Within a time limit of '3 minutes' ('1 minute' in overtime), the participant who obtains more 'downs' from the opponent wins by decision.
- 4-1-2. If '5 downs' are obtained, a 'TKO victory' is declared, and the match ends.
- 4-1-3. If a "slip down" or "down" occurs and the participant cannot return to the "basic stance" within a "10-count," a "KO loss" is declared, and the match ends.
- 4-1-4. If a "disqualification loss," "forfeit loss," or similar is declared, the match ends.

4-2. Rules regarding a "down"

- 4-2-1. The criteria and judgment regarding a "down" rest solely with the referee's absolute authority.
- 4-2-2. If an opponent's robot is knocked over by a precise strike, one point, or "down," is earned.
- 4-2-3. If a robot touches the robot that is being counted during the 'count' after a 'down' is declared, it is considered a violation of the 'down rule' and results in a 'disqualification loss.'
- 4-2-4. Each participant's 'first warning' is treated as a verbal warning, and subsequently, with each accumulation of 'one warning,' it results in a 'one down' penalty.

4-3. The rule regarding a "slip down"

- 4-3-1. Areas of the robot excluding the "sole of the foot" (including the sides of the foot) must not touch the floor of the arena during the match. Violation of this rule results

in a "slip down" declaration, and intentional slip downs may result in a warning. However, "critical attacks" are exempt from this rule.

- 4-3-2. If the attacking robot is declared a "slip down" after successfully achieving a "down," the "down" will not be recognized or counted.

4-4. The "ring out" rule

- 4-4-1. If a robot falls or goes outside the competition area, it is declared a "ring out," and the robot is penalized with a "one down."
- 4-4-2. If a participant touches a robot that is attempting to fall out of the competition area before it is declared a "ring out," it still results in a "one down" penalty.

4-5. The "time" regulation

- 4-5-1. During the match, participants may request a "timeout" from the referee in case of rule violations or if there is a malfunction or issue with their robot. They are allotted a "repair time" of '2 minutes' and each '2-minute timeout' is counted as 'one down.'
- 4-5-2. Once a "down" is declared, which is not a "slip down," requests for a "timeout" will not be accepted, and the count and the match will continue as usual.
- 4-5-3. During the match, requests for a "timeout" due to important inquiries or objections will not result in a "one down" penalty. However, if the referee determines that the timeout request is not valid, a warning may be issued.
- 4-5-4. Timeout requests can be made up to a maximum of 2 times during the match, totaling 4 minutes. If a participant cannot return to the match after this allotted time, they will be declared the loser by KO (Knockout).

4-6. Standing Down Rule

- 4-6-1. If a robot remains inactive for '5 seconds' or more, the referee can declare a "standing down." A "standing down" results in a "one down" penalty, and if the robot fails to return within the '10-count' after the declaration, it will be declared a "KO loss."
- 4-6-2. Participants who have been declared a "standing down" can request a "timeout," during which they are allotted '2 minutes' for repairs. Additionally, they will receive an additional 'one down' penalty.

4-7. The KO (Knockout) rule

- 4-7-1. When a "standing down," "slip down," or "down" is declared, the participant must rise within a '10-count'. If unable to return to the "basic stance," a "KO loss" is declared, and the match ends.
- 4-7-2. The "10-count" does not necessarily mean one count per second. The counting speed is at the discretion of the referee based on the flow of the match and the situation at hand.

4-8. The "defensive stance" regulations

- 4-8-1. During walking and attacking, the "basic stance" should always maintain a knee angle (the angle formed between the thigh and the calf at the knee joint) of at least 90 degrees. Angles less than this are considered a "defensive stance."
- 4-8-2. If the "shoulder axis" drops below the "hip axis," it is also judged as a "defensive stance."
- 4-8-3. If maintaining a "defensive stance" for more than '3 seconds' or sitting down is not allowed. After releasing the "defensive stance," walking for '3 steps' or more is required. Failure to comply results in a warning. This rule also applies to "critical attacks."
- 4-8-4. In a "defensive stance," even if an attack is successful, it will not be recognized as a "down," and a warning will be issued. However, "critical attacks" are an exception

to this rule.

4-9. The rules regarding attacks

4-9-1. During an attack, all attacks except those considered "slip downs" or in a "defensive stance" are permissible, including attacks from all directions (360°).

4-10. Frontal attack regulations

4-10-1. If an attacking robot accurately strikes the upper body (head, chest, back) of the opponent robot with a pushing attack between the attacking robot's legs as a frontal attack, causing the opponent robot to fall down both forwards and backwards, it is recognized as a "frontal attack" and results in a "two down" penalty.

4-10-2. If the attacking robot experiences a "slip down" after a successful "frontal attack," the attack will not be recognized.

4-10-3. The authority to attempt and determine the success of a "frontal attack" rests with the referee.

4-10-4. There is no limit on the number of "frontal attacks" that can be performed.

4-11. Critical attack regulations

4-11-1. If a robot executes a significant attack or kicking technique that clearly lifts both feet of the opponent robot off the ground and causes them to fall over, it is recognized as a "critical" attack and results in a "two down" penalty.

4-11-2. A "critical attack" refers to techniques such as "charging in," "sweeps," "backdrops," "uppercuts," "flying kicks," "kicks," "tumbling," and similar maneuvers that deliver significant impact to the opponent.

The authority to attempt and determine the success of a "critical attack" rests with the referee.

4-11-3. According to the referee's judgment, if a robot successfully executes an attack that completely immobilizes the opponent robot and lifts both of its feet completely off the ground, the attack is considered a successful "critical attack" even if the attacking robot subsequently experiences a "slip down."

4-11-4. A "kick" attack can be attempted even from a "defensive stance," and if the attacking robot knocks over the opponent robot with a kick and subsequently experiences a "slip down," the attack is still recognized as a successful "critical attack."

4-11-5. A "kick" can be attempted by a robot even when one hand is touching the ground.

4-11-6. A "critical attack" is limited to a total of one per match.

However, a "kick" attack can be attempted once in addition to the "critical attack." In overtime, "critical attacks" are also limited to one attempt. Additionally, even if a "critical attack" is used in this match, it can be attempted again.

4-11-7. Unreasonable attempts of "critical attacks" without any chance of success, and attempts exceeding the allowed limit, are considered "match delays," resulting in a warning being issued.

4-12. Walking regulations

4-12-1. During walking, it is not permissible to maintain a "defensive stance." Each violation of this rule results in a warning. If it is determined that every instance of walking violates the regulation, a "2-minute" correction time is granted, and it counts as "1 down." If correction is not possible, the violation of walking regulations leads to a "disqualification loss."

4-12-2. The robot must be able to walk in at least two directions (front, back, left, right) for a minimum of 5 steps each without falling over. Referees can request verification at any time before or during the match, and a robot that fails to pass

this test will be disqualified for violating the walking regulations.

4-12-3. If any part of the robot, excluding the recognized "soles of the feet" during regulation assessment of "walking," "attack," or "defense," touches the playing field, it will be immediately processed as a "slip down" or "down."

4-12-4. During walking and direction changes, both shoulders' and both chest's axes of the robot must always maintain horizontal alignment with the playing field surface. Any walking motion that fails to maintain this horizontal alignment will be judged as a "defensive stance," and a warning will be issued for violating this regulation. The allowable tolerance for the robot's chest axis deviation from horizontal is up to ± 10 degrees.

4-13. Other regulations

4-13-1. When resuming the game after the start or a "slip down" or "down," the robots must maintain a distance of at least 50cm (approximately two spans) apart. Deliberately violating this distance will result in a warning. However, in featherweight and lighter weight classes, the minimum distance allowed is 20cm (approximately one span).

4-13-2. A robot that has fallen cannot be attacked. A "warning" will be issued if this rule is violated.

4-13-3. If a part with a side length of '3 cm' or more, or a part weighing '5 g' or more falls off during the match, or if the 'battery' becomes detached and protrudes even slightly outside the robot, the match will be immediately halted, and '2 minutes' of repair time will be given. This will count as '1 down'. If normal repairs are not possible, it will be considered a 'TKO loss'.

4-13-4. During the match, robots may not be touched without the referee's permission. Violating this rule may result in a 'warning', 'down', or 'disqualification' at the referee's discretion.

4-13-5. If a defensive strategy is employed during the match, a 'warning' may be issued at the referee's discretion.

4-13-6. If the referee signals to 'stop' during the match, the robot must immediately cease operation and halt movement. Violating this rule will result in a 'warning'.

4-13-7. If the robots become entangled, the referee may declare a 'Torque-off', and participants must immediately cut off power to the motors.

4-13-8. Due to a referee's error or decision, the match or the declaration of 'win or loss' may be overturned and the match may be resumed, even after it has concluded.

4-13-9. If a participant or their affiliate disagrees with the referee's judgment, which is the referee's exclusive authority, shows a lack of respect, or makes excessive complaints, a first 'warning' will be issued. If noncompliance and repeated protests continue, it will result in immediate 'disqualification'.

4-13-10. During the match or when the match is paused, when the referee provides explanations regarding decisions or rules, participants should signify their understanding by saying 'Yes' and giving a simple nod.

4-14. Terminology Regulations

4-14-1. 경기 중 '레디:Ready', '파이트:Fight', '다운:Down', '노카운트:No-Count', '스탠딩다운:Standing-down', '링 아웃:Ring-out', '토크오프:Torque-Off', '떨어져:Tteol-eo-jyeo(Distance)', '경고:Yellow-Card', '타임:Time', '스톱(중지):Stop', '그만:Geu-man(Game-Over)', '승:Seung(Win)', '차렷:Cha-lyeos(Attention)', 인사:In-sa(Bow)', '디스퀄리피(실격):Disqualify',

‘득점:Point’, ‘정면공격:Frontal Attack or Front Attack’ 등의 용어가 사용된다. 상황에 따른 용어를 미리 숙지하도록 한다.

4-14-2. Any matters not otherwise specified shall be determined according to the decision of the judging committee on the day of the event.

5. Robot Modifications

5-1-1. After completing the 'specification inspection', if modifications are necessary for the robot due to abnormalities or other reasons, participants must obtain permission from the referees before making any changes. (During the match, this counts as '1 down'). If participants make changes to the robot without permission, it will result in 'disqualification'.

6. Evaluation Methods

6-1. Basic Evaluation

6-1-1. Participants who adhere to the established regulations and obtain outcomes such as 'KO', 'TKO', 'decision win', 'disqualification', or 'forfeit' against their opponent within the allotted time will achieve victory.

6-1-2. Depending on the situation, multiple robots can engage in a group competition known as a 'Rumble' match to determine rankings. In a 'Rumble' match, even fallen robots can be attacked. Participants who are 'ringed out' or 'down' immediately lose, and the robot remaining on the arena floor or removing 'mission objects' ultimately wins.

6-2. Evaluation of a Draw

6-2-1. In the event of a tie, teams immediately enter a '1-minute' extension period without additional time for battery replacement or repairs. The team that scores the first '1 point' wins by 'Golden Down'. Any remaining 'warnings' that are not counted as scoring infractions are carried over into the extension period.

6-2-2. If the match remains undecided after the extension period, the evaluation priority is as follows: The team with fewer warnings > The team with fewer slip downs during the extension > If priority is still unclear, another extension period may be conducted > The team with the lighter robot weight.
These criteria determine the outcome if the match is still tied after overtime.

6-3. Disqualification Regulations

6-3-1. Participating in a match using another participant's robot

6-3-2. Refusal to comply with the referee's instructions or decisions

6-3-3. Violation of robot specifications during the match

6-3-4. Leaving the arena or designated waiting area without referee permission

6-3-5. Using profanity or engaging in violent behavior

6-3-6. Engaging in any unsportsmanlike conduct or misconduct that disrupts the course of the match

6-3-7. If a participant is unable to compete after all other matches have concluded

6-3-8. If a participant is disqualified, the record of that match is not recognized.

6-3-9. In the case of disqualification or intentional actions that compromise fairness by a participating team or individual, the IREA may permanently revoke their eligibility to

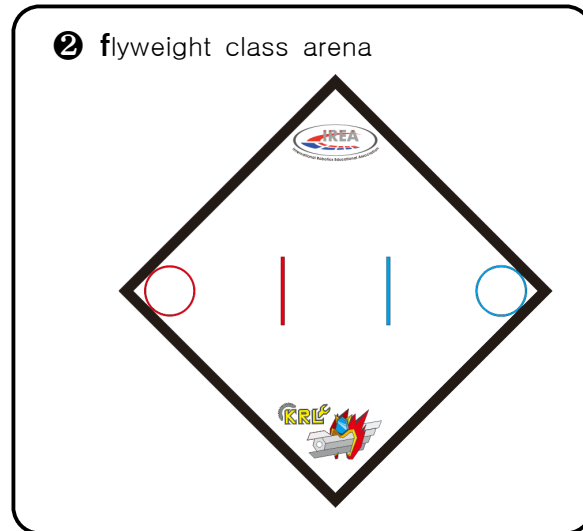
participate in IREA-sanctioned competitions through a deliberation council meeting

7. Arena Specifications

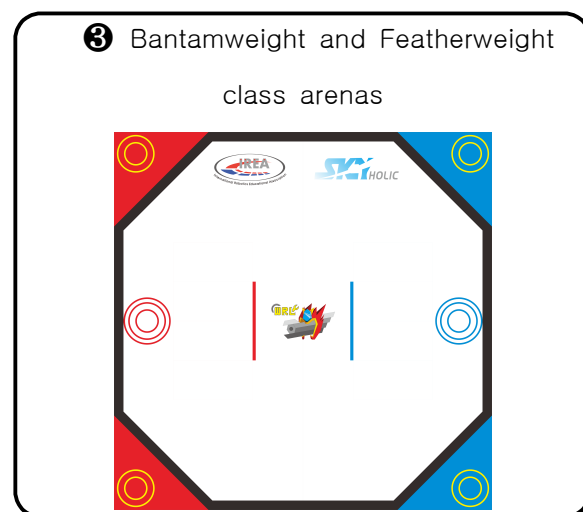
7-1. Arena Structure - Below is an example of the arena layout, subject to change based on the conditions on the day of the match.

7-1-1. The size of the arena

- The specifications for the Miniweight and Antweight arenas are 90 x 90 x 10 cm (width x length x height), with a tolerance range of $\pm 5\%$. The floor material of the arena is PET.



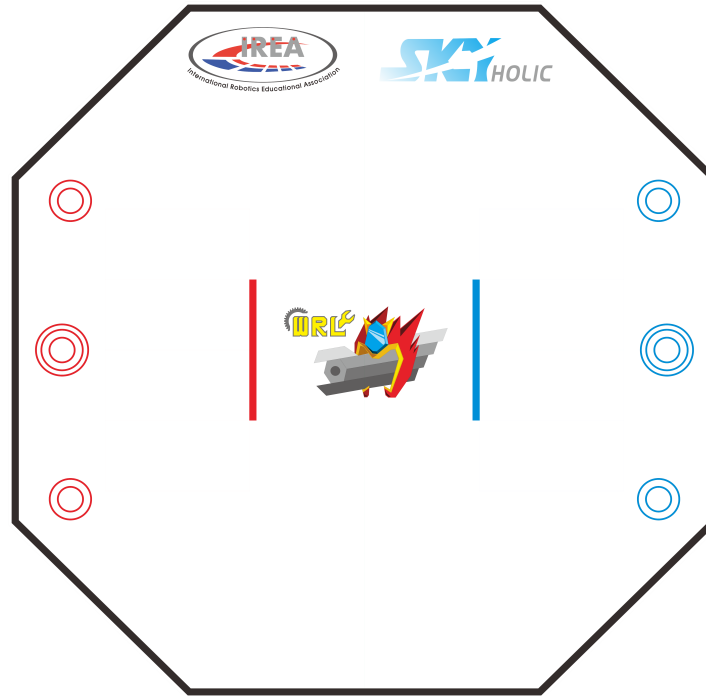
- The specifications for the Beetleweight and Featherweight class arenas are as follows: Dimensions: 120 x 120 x 10-30 cm (width x length x height), with a tolerance range of $\pm 5\%$. Floor Material: PET or Flex. These arenas provide the required dimensions and floor material options for the specified weight classes in robot competitions.



- The size and structure of the arenas for the Lightweight (라이트급), Middleweight (미들급), Heavyweight (헤비급), and Pair (페어) classes are as follows: Dimensions: Approximately 198 x 198 x 30 cm (width x length x height), with a tolerance range of $\pm 5\%$. Structure: Consists of 5 square coated plywood panels measuring 70 x 70 cm, 22T, and 4 triangular coated plywood panels measuring 70 x 70 cm, 22T. Floor Material: Flex or PET.

These specifications provide the dimensions and panel composition for the specified weight classes' arenas in robot competitions.

④ Middleweight and Heavyweight class arenas



* The rules of this game may be modified in the future. Please check frequently.

국제로봇교육협의회장



President, International Robotics Educational Association

Association Secretariat Confirmation

Secretary General

Junhyeok Jang

A handwritten signature in black ink, likely belonging to Junhyeok Jang, the Secretary General.

Please send your inquiries to this email address: robot-league@naver.com
Or contact the association representative, Daewon LEE, on WhatsApp at +82 1026043782.
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