



# HuroCup Laws of the Game

## Triple Jump

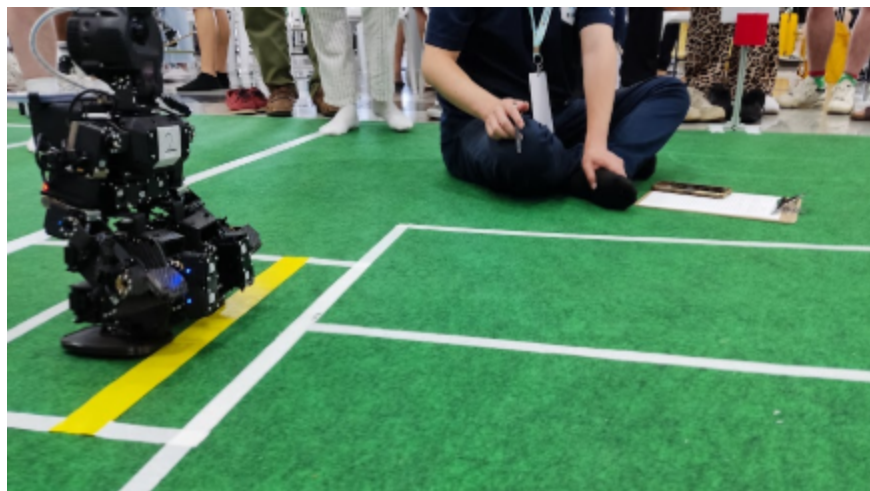
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### *Abstract*

*The following rules and regulations govern the triple jump event of HuroCup, a robotic game and robotics benchmark problem for humanoid robots.*

## Latest Version of the Rules for HuroCup

The latest official version of the rules of the game for HuroCup is always available from the [HuroCup Facebook Page](#).

## Changes to the Triple Jump rules of HuroCup

The triple jump field has been changed by removing the indicator board and the game play is updated accordingly. This year, we introduced a start zone which allows referees to select a random starting point that is centered on the runway.

## Triple Jump

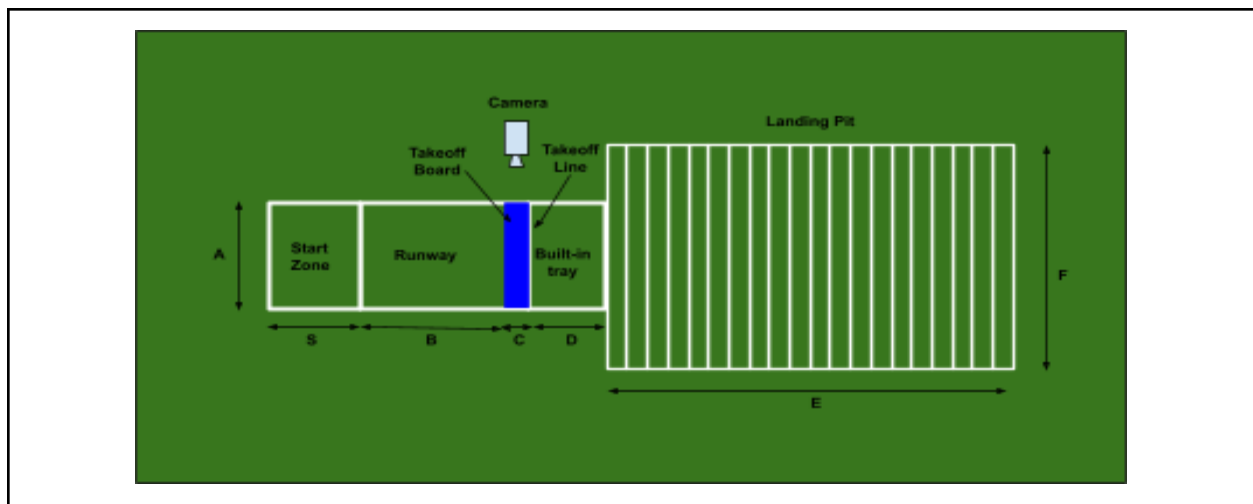
The goal of the triple jump competition is to encourage research in extremely dynamic humanoid robots able to create strong forces and compliant enough to allow for a soft landing.

## HuroCup Triple Jump - Laws of the Game

The following laws describe the specifics of the triple jump event. For general specifications relevant to all HuroCup events (e.g., robot dimensions, playing field and lighting, the responsibility of the referees) please refer to [General - HuroCup Laws of the Game](#).

### [TJ-1]: Field of Play

[TJ-1.1]: The triple jump competition is played on a field with a minimum dimension of 1.8m by 1.8m. See Figure [Triple Jump Field](#).



Dimension	Comment	Kid Size	Adult Size	U19
\$A	Width of the Runway track	50cm	50cm	50cm
\$S	Length of the Start Zone	30cm	30cm	NA: U19 can start directly with the jump.
\$B	Length of the Runway	20cm	20cm	NA: U19 can start directly with the jump.
\$C	Width of the Takeoff Board	5cm	5cm	5cm
\$D	Length of the Built-in Tray	10cm	10cm	10cm
\$E	Length of the Landing Pit	100cm	100cm	100cm
\$F	Width of Landing Pit	100cm	100cm	100cm
<i>Triple Jump Boards</i> <i>The takeoff board has a height between 1mm to 2mm.</i> <i>NA: Not Applicable</i>				

## **[TJ-2]: Number of Robots**

[TJ-2.1]: A single robot competes in a match.

## **[TJ-3]: The Players**

[TJ-3.1]: Please refer to [General - HuroCup Laws of the Game](#) for detailed information about the players.

## **[TJ-4]: The Referee**

[TJ-4.1]: Please refer to [General - HuroCup Laws of the Game](#) for detailed information about the referee and his or her duties.

## **[TJ-5]: The Assistant Referee**

[TJ-5.1]: Please refer to [General - HuroCup Laws of the Game](#) for detailed information about the assistant referee and his or her duties.

## **[TJ-6]: Game Play**

[TJ-6.1]: A single robot is designated the jumper. All other robots must be outside of the playing field.

[TJ-6.2]: The only robot allowed to move during a run is the designated jumper.

[TJ-6.3]: The referee will randomly select a starting point inside the start zone centered to the Runway Track width \$A for the jumper. The jumper will be placed by the handler at the selected starting point facing the Runway Track.

[TJ-6.4]: The referee will signal the start of the competition by blowing the whistle.

[TJ-6.5]: After the referee gives the start signal, the robot must walk on the Runway \$B to reach the Takeoff Board \$C. From the Takeoff Board, the robot must use a sequence of three jumps to move forwards the Landing Pit \$E. U19 can start directly with the jump from \$C.

[TJ-6.6]: A robot must do three jumps to land in the Landing Pit \$E. If a robot remains standing after the first and second jump, then it may continue with the third jump. If a robot falls in the first or the second jump, that is, if any part of the robot other than the foot touches the ground, then the try is terminated and the try will be considered as null.

[TJ-6.7]: A robot is not allowed to leave the playing field or the Runway Track, that is at least one part of the foot must remain inside the Runway Track/Landing Pit at all time.

[TJ-6.8]: Each robot may have at most one human handler associated with it.

[TJ-6.9]: The human handlers are not allowed to interfere in any way with other robots, the referee, or other human handlers.

[TJ-6.10]: A human handler may only enter the playing field or touch his/her robot with the

permission of the referee.

[TJ-6.11]: The end of the competition is signalled by the referee by blowing the whistle a second time. The referee terminates the competition if

1. the robot has successfully landed in the Landing Pit,
2. the foot of the robot passes the Takeoff Line,
3. the robot was unable to jump within 1 minute after the referee signalled the start of the try,
4. is immobilized by a technical defect,
5. the robot leaves the playing area by completely crossing the start line or the implicit sidelines of the rectangle formed by the Runway and the Built-in Tray or lands out of the landing pit.

[TJ-6.12]: At the end of the try, another robot will be designated the jumper.

[TJ-6.13]: There are three rounds in the event. After all robots have jumped, the next round is started immediately afterwards. The order of the robots is the same as in the first round.

## **[TJ-7]: Fouls and Misconduct**

[TJ-7.1]: The robot did not have both feet in the air during at least part of each jump.

[TJ-7.2]: The robot handler touches the robot.

[TJ-7.3]: The foot of the robot crosses the Takeoff Line.

[TJ-7.4]: The robot did not touch the takeoff board.

[TJ-7.5]: Any infractions as listed by [General - HuroCup Laws of the Game](#) as far as they are applicable in this event.

[TJ-7.6]: Any team that commits one of the infractions listed in this section will be penalized by having the try declared invalid.

## **[TJ-8]: Method of Scoring**

[TJ-8.1]: The jump distance is defined as the distance measured from the Takeoff Line to the back of the foot that touches the landing pit and is nearer to the Takeoff Line.

[TJ-8.2]: As the triple jump event is a very dynamic event and requires extremely quick measurements, a camera will be mounted beside the robot in the Takeoff Line.

[TJ-8.3]: All robots that have not managed to perform the three jumps or they have not reached the landing pit are assigned 0 points.

[TJ-8.4]: Among the robots that have performed the three jumps and have reached the landing pit, the robots are ranked (i.e., 1st place, 2nd place) based on the maximum measured distance.

[TJ-8.5]: For more details about the point allocation, please refer to [Point Allocation \[Organization - HuroCup Laws of the Game\]](#).

### [TJ-1]: Tiebreaker

[TJ-8.6]: In case two or more robots have the same number of points after all rounds in the long jump event, the sum of the maximum jump distances in all rounds will be used as the tiebreaker.

[TJ-10.2]: In case two or more robots have the same number of points after all rounds and are still tied after applying the previous tiebreaker, the maximum measured distance in a single round will be used as a tiebreaker.

## Official World Records

This section contains the list of official world records for the HuroCup Robot Triple Jump competition that will be introduced in the 2018 WorldCup.

### Kid Size

Date	Event	Team	Affiliation	Distance
	World Cup 2018, Taiching, Taiwan	Malaysi a Polytek nik B		69 cm

### Adult Size

Date	Event	Team	Affiliation	Distance
	World Cup 2018, Taichung, Taiwan	Snobots		17 cm

### Junior Size

Date	Event	Team	Affiliation	Distance