

Application of Dartfish software in the 110 meter hurdle movement

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Abstract. Through literature, video observation, mathematical statistics, three research methods for sports technical analysis of the Rio Olympic men's 110 meter hurdles final video, collected the data of 8 players in the Olympic Games in Rio with Dartfish software. Results: winning cards starting from the first hurdle athletes in the men's 110 meter hurdles. Sprint technique, sprint technology among athletes have remarkable achievements.

Preface

This hurdle asymmetric periodic motion, the 110 meter hurdle running is composed of 9 hurdle cycle, the hurdle cycle by a hurdle step and three steps between the hurdles running a.110 hurdle race running technique can be divided into starting from the first hurdle technology, the running technique, end point sprint technology. The average speed of his mainly depends on the performance of athletes, hurdle technology and run across the binding capacity of.110 meters hurdles set 10 hurdles, the column distance is 9.14 meters, column 1.067 meters high, the starting line to the first column of the distance is 13.72 meters, the last column end point to line distance is 14.02 meters, due to the higher hurdle, column and column Running speed is very fast, so it is difficult to project the biggest hurdle.

Research objects and methods

Study subjects. In the Rio Olympic Games men's sports in the 110 column of the final 8 contestants as the research object.

Research methods. Literature. This paper Chinese general search bar enter the HowNet some journal articles of the men's 110 meter hurdles movement technology, motion analysis technology in the article reference index.

Video viewing method. By entering the Rio Olympic official website, found the men's 110 meter hurdles final video, copy the URL into the search box Shuoshu software, download the video to the computer to watch.

Mathematical statistics. By video observation, Dartfish software to get the data through the Excel software for data processing.

Research results and analysis

The athletes start to the first hurdle. From the start of the race sprint to the first hurdle step on the cross point of technology known as starting the first hurdle technology. Its task is to fast start, positive acceleration, rapid, accurate first bar ready to lay a good foundation for the speed and rhythm of the whole run. Observe and calculate the phase of athletes Sports Technology (see Table 1): this group of 6 athletes athletes starting from the first hurdle time is within 2 seconds and reached a speed increase, the demand for greater power to do the first column of the attacking column, and thus also for the full run made the save time; 2 athletes ran up to the first column of the time more than 2 seconds, compared to the former 6 athletes speed slightly Slow, but also increased the overall running time, in the starting to the first column at a disadvantage. 4 athletes below the team started to the first hurdle technical time, at all athletes in the forefront.

Table 1 :athletes starting from the first column of the time (in seconds)

Num	Name	Starting from the first hurdle time (S)
1		
2	JOHNATHAN CABRAL	2.04
3	DEVON ALLEN	2
4	PASCAL MARTINOT-LAGARDE	1.92
5	OMAR MCLEOD	1.92
6	DMTRI BASCOU	1.96
7	ORLANDO ORTEGA	2.04
8	MLAN TRAJKOVIC	1.96
9	RONNE ASH	2
average		1.98

Athletes running on the road technology. The running technique in the 110 meter hurdles by 9 cycles, the hurdle cycle by a hurdle step and three steps between the hurdles running. The hurdle step and three steps between the hurdles to run the mutual coordination and cooperation, can have more space to improve in speed, so as to shorten the running time, reduce the running the time.

Athletes hurdle technology. Provide power to great effect to the first column of the attacking column in the fast starting from the first column in can. Hurdle technology including attack bar movement, flight movement, under the bar movement, showing action of hurdle technology athletes in this process, the length of time to complete the action of hurdle technology can reflect the athletes the speed of the 9 hurdle. The time to observe and calculate the group runners in technology (see Table 2): this group of 9 athletes hurdle time is 0.47 seconds, each player in each time step hurdle has instability, only ninth athletes each hurdle the time is stable. Set, is 0.44 seconds. The sum of each athlete's hurdle time and gets the average income, the average number of the only 4 players beyond 0.47 seconds, fourth times and ninth times the 9 hurdle average time is 0.44 seconds, and the average time in the group with the least, advantage position in the entire journey.

Table 2: The 9 hurdle time runners in technology (In seconds)

Num	Name	Hurdle step time (S)									average
		1	2	3	4	5	6	7	8	9	
1											
2	JOHNATHAN CABRAL	0.52	0.44	0.56	0.56	0.52	0.52	0.56	0.52	0.48	0.52
3	DEVON ALLEN	0.44	0.48	0.44	0.48	0.48	0.56	0.44	0.48	0.48	0.48
4	PASCAL MARTINOT-LAGARDE	0.44	0.44	0.48	0.44	0.4	0.48	0.44	0.4	0.44	0.44
5	OMAR MCLEOD	0.48	0.52	0.48	0.52	0.44	0.44	0.48	0.52	0.48	0.48
6	DMTRI BASCOU	0.48	0.44	0.48	0.48	0.48	0.52	0.48	0.48	0.52	0.48
7	ORLANDO ORTEGA	0.48	0.52	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
8	MLAN TRAJKOVIC	0.52	0.4	0.44	0.44	0.52	0.48	0.48	0.48	0.48	0.47
9	RONNE ASH	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
average											0.47

Player three steps between the hurdles race technology. In the hurdle step technique followed by three steps between the hurdles race technology implementation, cross the distance between the point of attack bar vertical position from the landing to the next column is three steps between the hurdles race, hurdle technology can affect the quality of three steps between the hurdles to run, the two phase

the auxiliary phase. To observe and calculate the runners in the 9 running between hurdles with time (see Table 3): the average number of the group of 9 athletes running between hurdles is 0.57 seconds, of which 4 athletes is higher than the 9 of three steps between the hurdles running time average, with fifth and seventh times the athlete's time is minimal. Three steps between the hurdles running in a dominant position.

Table 3: Time to run 9 columns of runners in technology (in seconds)

Num	Name	Three steps between the hurdles running time (S)									average
		1	2	3	4	5	6	7	8	9	
1											
2	JOHNATHAN CABRAL	0.6	0.48	0.52	0.44	0.48	0.52	0.44	0.64	0.64	0.59
3	DEVON ALLEN	0.56	0.6	0.56	0.6	0.44	0.56	0.56	0.56	0.6	0.56
4	PASCAL MARTINOT-LAGARDE	0.6	0.56	0.44	0.6	0.56	0.56	0.64	0.68	0.6	0.58
5	OMAR MCLEOD	0.56	0.52	0.52	0.52	0.56	0.56	0.52	0.48	0.6	0.54
6	DMTRI BASCOU	0.6	0.56	0.52	0.52	0.52	0.56	0.56	0.56	0.56	0.55
7	ORLANDO ORTEGA	0.6	0.52	0.52	0.52	0.52	0.52	0.56	0.52	0.56	0.54
8	MLAN TRAJKOVIC	0.64	0.6	0.56	0.52	0.56	0.56	0.56	0.6	0.6	0.58
9	RONNE ASH	0.64	0.6	0.56	0.56	0.56	0.56	0.6	0.6	0.6	0.59
average											0.57

Sprint technology. In the finished runners starting from the first hurdle technology and the way, finally need to complete the first 10 columns after the end point to the distance; at this time, the main is to rely on the athlete's physical strength to complete this distance. To observe and calculate the athletes of sprint and final time (see table 4): the average time of the group the first 10 athletes in the bar after the sprint is 1.53 seconds, two athletes in the final sprint time higher than average, at a disadvantage. Players fifth times in the sprint time is the least, is in a dominant position.

Table4: sprint and final performance time of runners

Num	Name	Sprint time	Final score time
1			
2	JOHNATHAN CABRAL	1.48	13.4
3	DEVON ALLEN	1.55	13.31
4	PASCAL MARTINOT-LAGARDE	1.53	13.29
5	OMAR MCLEOD	1.45	13.05
6	DMTRI BASCOU	1.48	13.24
7	ORLANDO ORTEGA	1.49	13.17
8	MLAN TRAJKOVIC	1.49	13.41
9	RONNE ASH	1.77	13.45
Average		1.53	13.29

Conclusion

Athletes in the 110 meter hurdles final achievement and starting from the first hurdle technology, running technique, sprint technology has an important link, three technologies complement each other. The 110 meter hurdles athletes three key technologies of the time is lower than the average, so finally the better.

Starting from the first hurdle more time in short, the faster is the first column full power on Preparation and acceleration, the first stage of attack bar bar is very easy, just need to do technical adjustment on the line.

The way to run the hurdle step and three steps between the hurdles running stage is the most important stage in the game, the game is the main event. The hurdle step technique of time fully displays the athlete's speed and coordination ability, good to hurdle step three steps between the hurdles running speed of the upgrade technology; good three steps between the hurdles running ability can widen the gap with rivals, but also can make up for their deficiencies in other stages.

Sprint stage is the final stage of the game, in the final race of the race in particular highlights its importance, sprint time most in the 10 column after the physical level of ability of athletes, the chest hit the line before the time before the very especially highlights the characteristics of sprint.

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