

2012 Men's 110m Hurdles World Record Season

Aries Merritt (USA) - 12.80

Hurdle Touchdown Times



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Todd Henson

2012 Men's 110m Hurdles World Record Season

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Notes:

- The times listed as TV Analysis are taken from youtube.com videos and generally coming from Television broadcasts. These are not always the best angles or coverage for getting times. They are often trying to tell a story by focusing on one athlete, and sometimes while shifting camera angles an extra frame can get added or removed.
- Where times are taken from the first movement, instead of the gun, there is at least a ± 0.12 second difference/error. This will show up from the start to the first hurdle and then from hurdle 10 to the finish. The between hurdle intervals should be fairly consistent, but there is still the usual ± 0.03 second
- Data errors, missing data, spelling mistakes, anything that need correction - please let me know. As always, I try to put together the most complete and accurate report possible.
- I have done the best I could, I hope people find it useful or at least interesting.

2012 Memorial Van Damme (Brussels, BEL) (TV Analysis)

FINAL

FINAL															May (2012) - http://www.fgs.uni-halle.de				
		date	07-Sep-12	wind 0.3 m/s															
				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane / Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time			2.52	3.56	4.56	5.53	6.50	7.48	8.46	9.44	10.44	11.46		12.80	6 / 1			
	reaction time	0.145	interval	7 steps	1.04	1.00	0.97	0.97	0.98	0.98	0.98	1.00	1.02	1.34	WR		3.01	2.93	3.00
	velocity			5.44	8.79	9.14	9.42	9.42	9.33	9.33	9.33	9.14	8.96	10.46	8.59		9.11	9.36	9.14

2012 ISTAF (Berlin, GER)

FINAL

FINAL																		
date		02-Sep-12		wind		1.2 m/s												
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10	
Merritt, Aries (USA) (1985)	time												12.97	4 / 1				
reaction time	interval	No Information Available																
velocity																		

2012 AIVIA Grand Prix (Birmingham, GBR) (TV Analysis)

FINAL

FINAL														Henson (2020) - Athlete First: 2012 Aries Merritt world record season				
date		26-Aug-12										wind			-0.9 m/s			
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-in	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10	
Merritt, Aries (USA) (1985)	time	2.44	3.46	4.47	5.48	6.46	7.46	8.46	9.46	10.46	11.50		12.95	3 / 1				
	reaction time	0.146	interval	7 steps	1.02	1.01	1.01	0.98	1.00	1.00	1.04	1.45				3.04	2.98	3.04
	velocity		5.62	8.96	9.05	9.05	9.33	9.14	9.14	9.14	8.79	9.67	8.49		9.02	9.20	9.02	

2012 Athletissima (Lausanne, SUI)

FINAL

[illegible]

2012 Olympic Games (London, GBR) (TV Analysis)

FINAL

FINAL															Gaubner (2012) - http://www.fgs.uni-halle.de			
date 08-Aug-12		wind -0.3 m/s																
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10	
Merritt, Aries (USA) (1985)	time	2.54	3.55	4.55	5.54	6.53	7.52	8.53	9.53	10.55	11.57		12.92	6 / 1				
	reaction time 0.143	7 steps	1.01	1.00	0.99	0.99	0.99	1.01	1.00	1.02	1.02	1.35	PB		3.00	2.99	3.04	
	velocity	5.40	9.05	9.14	9.23	9.23	9.23	9.05	9.14	8.96	8.96	10.39	8.51		9.14	9.17	9.02	

Semi-Final 2

Semi-Final 2		date	08-Aug-12	wind	0.1 m/s										Henson (2020) - Athlete First: 2012 Aries Merritt world record season						
				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-in	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10		
Merritt, Aries (USA) (1985)	time			2.48	3.50	4.52	5.50	6.50	7.48	8.46	9.46	10.48	11.50		12.94	7 / 1					
	reaction time	0.147	interval	7 steps	1.02	1.02	0.98	1.00	0.98	0.98	1.00	1.02	1.02	1.44				3.02	2.96	3.04	
	velocity			5.53	8.96	8.96	9.33	9.14	9.33	9.33	9.14	8.96	8.96	9.74	8.50		9.08	9.26	9.02		

Heat 5

Heat 5		date	07-Aug-12	wind	0.7 m/s												Henson (2020) - Athlete First: 2012 Aries Merritt world record season						
				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10				
Merritt, Aries (USA)	(1985)	time		2.46	3.50	4.48	5.50	6.50	7.50	8.50	9.50	10.50	11.58		13.07	7 / 1							
	reaction time	0.142	interval	7 steps	1.04	0.98	1.02	1.00	1.00	1.00	1.00	1.00	1.08	1.49			3.04	3.00	3.08				
	velocity			5.58	8.79	9.33	8.96	9.14	9.14	9.14	9.14	9.14	8.46	9.41	8.42		9.02	9.14	8.90				

2012 Herculis Meeting International D'Athlétisme (Monaco, MON) (TV Analysis)

FINAL

FINAL												Henson (2020) - Athlete First: 2012 Aries Merritt world record season								
	date	20-Jul-12	wind	0.0 m/s	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time				2.38	3.40	4.44	5.42	6.40	7.38	8.38	9.38	10.42	11.46		12.93	5 / 1			
	reaction time	0.112	interval	7 steps												=PB		3.04	2.96	3.08
			velocity		5.76	8.96	8.79	9.33	9.33	9.33	9.14	9.14	8.79	8.79	9.54	8.51		9.02	9.26	8.90

2012 AVIVA London Grand Prix (London, GBR) (TV Analysis)

FINAL

2012 AVIVA London Grand Prix (London, GB) (TV Analysis)													Henson (2020) - Athlete First: 2012 Aries Merritt world record season							
FINAL	date	13-Jul-12	wind	0.6 m/s																
				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-in	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10	
Merritt, Aries (USA) (1985)	time			2.46	3.46	4.48	5.46	6.44	7.42	8.42	9.42	10.46	11.46		12.93	4 / 1				
	reaction time	0.137	interval	7 steps	1.00	1.02	0.98	0.98	0.98	1.00	1.00	1.04	1.00	1.47	=PB		3.00	2.96	3.04	
	velocity			5.58	9.14	8.96	9.33	9.33	9.33	9.14	9.14	8.79	9.14	9.54	8.51		9.14	9.26	9.02	

Heat 2

[illegible]

2012 USA Olympic Trials (Eugene, OR)

FINAL

FINAL												Henson (2020) - Athlete First: 2012 Aries Merritt world record season							
date		30-Jun-12		wind		1.2 m/s													
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10		
Merritt, Aries (USA) (1985)		time	2.37	3.40	4.40	5.39	6.37	7.36	8.34	9.34	10.36	11.37	12.93	5 / 1					
reaction time		0.138	interval	7 steps	1.03	1.00	0.99	0.98	0.99	0.98	1.00	1.02	1.01	1.56	PB		3.02	2.95	3.03
velocity			5.79	8.87	9.14	9.23	9.33	9.23	9.33	9.14	8.96	9.05	8.99	8.51		9.08	9.29	9.05	

Semi-Final 2

Semi-Final 2		date	30-Jun-12		wind	1.2 m/s												
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time													13.01	3 / 1			
reaction time	interval		No Information Available															
	velocity																	

Heat 1

[illegible]

2012 adidas Grand Prix (New York, NY)

FINAL

[illegible]

2012 Prefontaine Classic (Eugene, OR) (TV Analysis)

FINAL		date	02-Jun-12	wind	2.4 m/s											Henson (2020) - Athlete First: 2012 Aries Merritt world record season			
				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time			2.52	3.54	4.56	5.58	6.56	7.56	8.56	9.54	10.54	11.58		12.96	3 / 2			
	reaction time	0.151		7 steps	1.02	1.02	1.02	0.98	1.00	1.00	0.98	1.00	1.04	1.38			3.06	2.98	3.02
	velocity			5.44	8.96	8.96	8.96	9.33	9.14	9.14	9.33	9.14	8.79	10.16	8.49		8.96	9.20	9.08

2012 Golden Grand Prix (Shanghai, CHN)

FINAL		date	19-May-12	wind	0.4 m/s	Feng (2016) - Liu Xiang's seven-step starting: discussion on the key issues of 110m hurdles technical training													
				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time			2.34	3.38	4.42	5.46	6.50	7.54	8.58	9.62	10.66	11.70		13.26	6 / 4			
	reaction time	0.142		7 steps	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.56			3.12	3.12	3.12
	velocity			5.86	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.99	8.30		8.79	8.79	8.79

2012 Colorful Daegu Meeting (Daegu, KOR)

FINAL		date	16-May-12	wind	-0.4 m/s														
				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time														13.21	/ 1			
	reaction time																		
	interval			No Information Available															
	velocity			No Information Available															

2012 Arkansas Twilight (Fayetteville, AR)

FINAL		date	04-May-12	wind	1.0 m/s	Henson (2020) - Athlete First: 2012 Aries Merritt world record season													
				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time			2.50	3.53	4.55	5.57	6.57	7.54	8.54	9.54	10.54			13.03	5 / 1			
	reaction time			7 steps	1.03	1.02	1.02	1.00	0.97	1.00	1.00	1.00					3.07	2.97	
	velocity			5.49	8.87	8.96	8.96	9.14	9.42	9.14	9.14	9.14			8.44		8.93	9.23	

Heat 3

		date	04-May-12	wind	2.9 m/s	Henson (2020) - Athlete First: 2012 Aries Merritt world record season													
				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time			2.50	3.53	4.53	5.53	6.52	7.51	8.50	9.51	10.52	11.54		12.99	5 / 1			
	reaction time			7 steps	1.03	1.00	1.00	0.99	0.99	1.01	1.01	1.01	1.02	1.45			3.03	2.97	3.04
	velocity			5.49	8.87	9.14	9.14	9.23	9.23	9.23	9.05	9.05	8.96	9.67	8.47		9.05	9.23	9.02

2012 John McDonnell Invitational (Fayetteville, AR)

FINAL		date	21-Apr-12	wind	0.9 m/s														
				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time														13.25	/ 1			
	reaction time																		
	interval			No Information Available															
	velocity			No Information Available															

Heat 2

		date	21-Apr-12	wind	1.2 m/s														
				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time														13.25	/ 1			
	reaction time																		
	interval			No Information Available															
	velocity			No Information Available															

2012 IAAF World Indoor Championships (Istanbul, TUR) (TV Analysis)

FINAL		date		11-Mar-12		Henson (2020) - Athlete First: 2012 Aries Merritt world record season												
				H1	H2	H3	H4	H5	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10				
Merritt, Aries (USA) (1985)	time			2.48	3.48	4.50	5.50	6.50		7.44	4 / 1							
	reaction time	0.135	interval	7 steps	1.00	1.02	1.00	1.00	0.94			3.02						
			velocity	5.53	9.14	8.96	9.14	9.14	10.34	8.06		9.08						

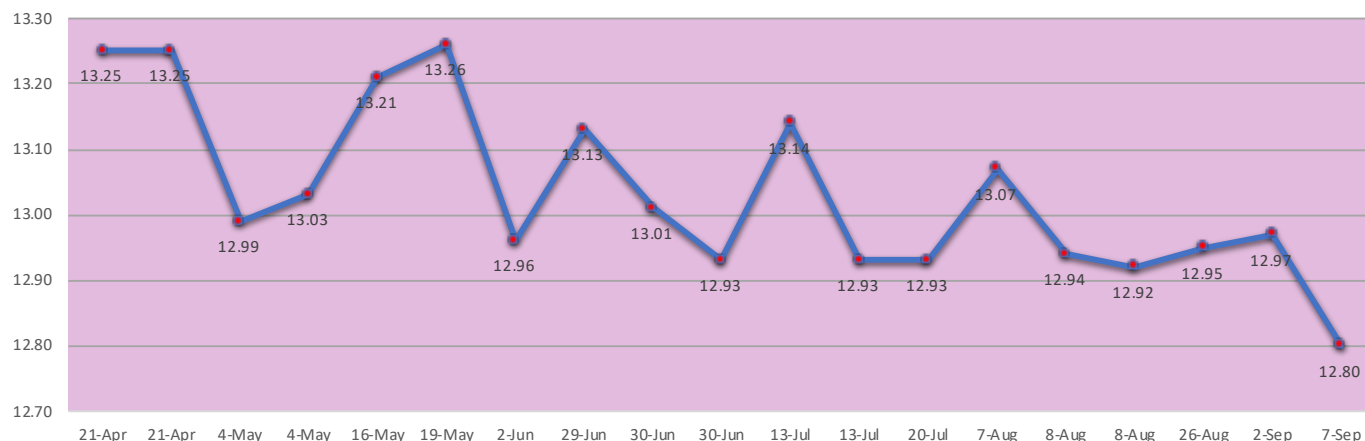
2012 USATF National Indoor Championships (Albuquerque, NM) (Altitude) (TV Analysis)

FINAL										Henson (2020) - Athlete First: 2012 Aries Merritt world record season									
		date	26-Feb-12		H1	H2	H3	H4	H5			Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10		
Merritt, Aries (USA) (1985)	time				2.50	3.52	4.56	5.54	6.54				7.43	6 / 1					
	reaction time	0.138	interval	7 steps	1.02	1.04	0.98	1.00				0.89	PB		3.04				
	velocity				5.49	8.96	8.79	9.33	9.14			10.92	8.08		9.02				

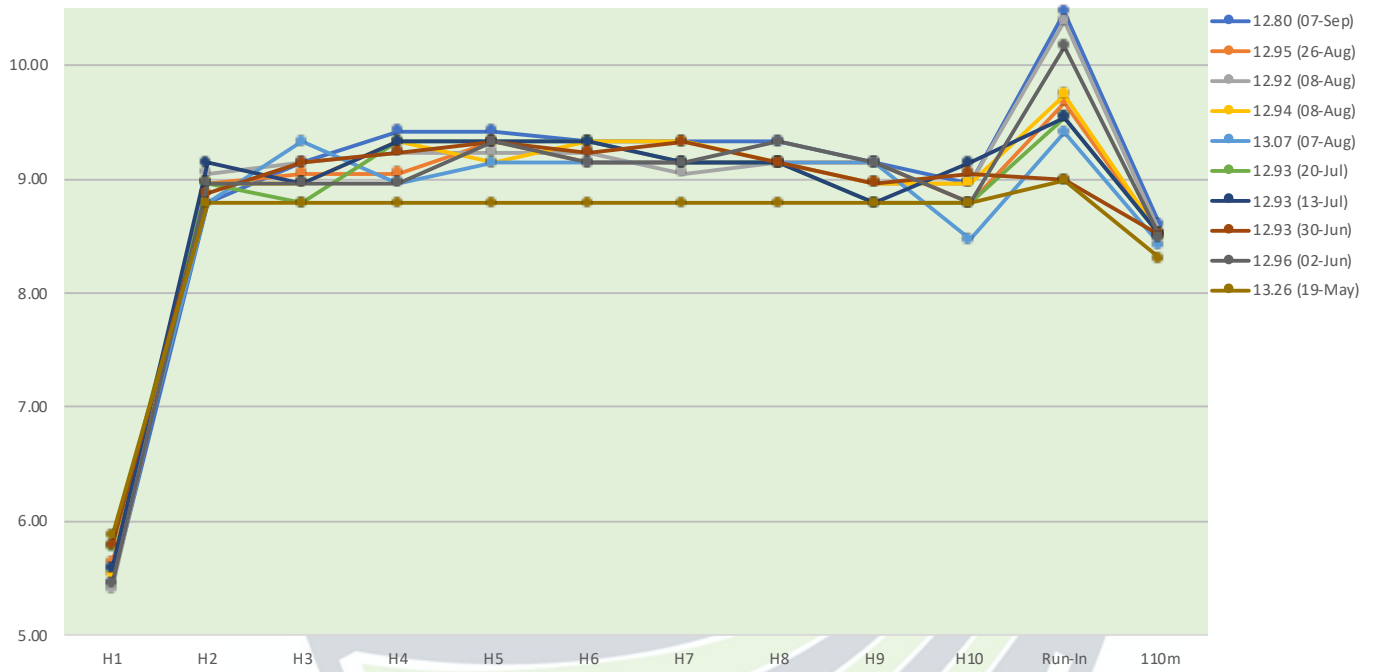
2012 Leonard Hilton Memorial Invitational (Houston, TX)

FINAL		date	13-Jan-12						Henson (2020) - Athlete First: 2012 Aries Merritt world record season						
			H1	H2	H3	H4	H5	Run-In	Official Time	Lane / Place	H1-H4	H4-H7	H7-H10		
Merritt, Aries (USA) (1985)	time		2.53	3.53	4.53	5.52	6.52		7.46	5 / 1					
	reaction time		7 steps	1.00	1.00	0.99	1.00	0.94			2.99				
	velocity		5.42	9.14	9.14	9.23	9.14	10.34	8.04		9.17				

Aries Merritt 2012

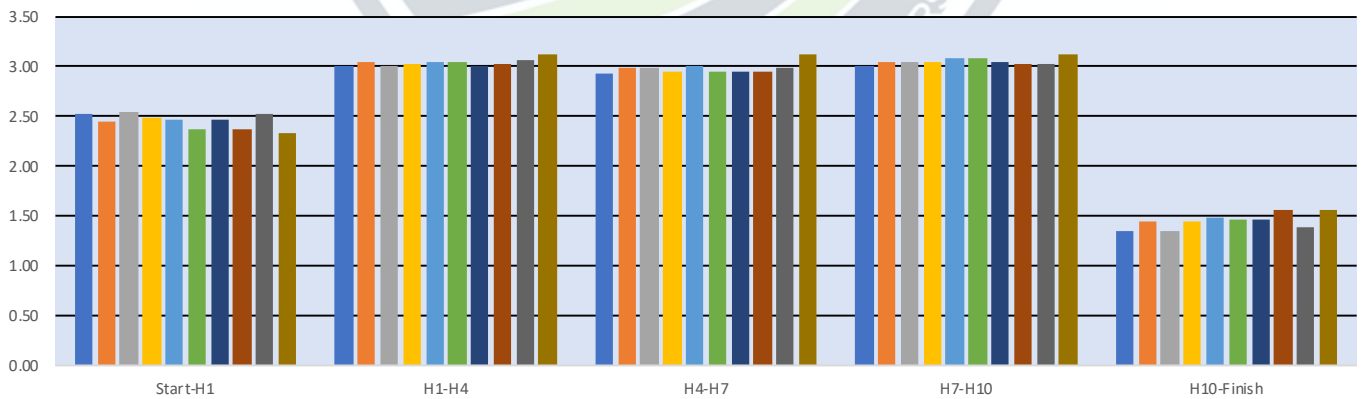


Hurdle Rhythmic Units



Time Intervals (s)

Hurdle Phases



2012 Memorial Van Damme (Brussels, BEL) (TV Analysis)

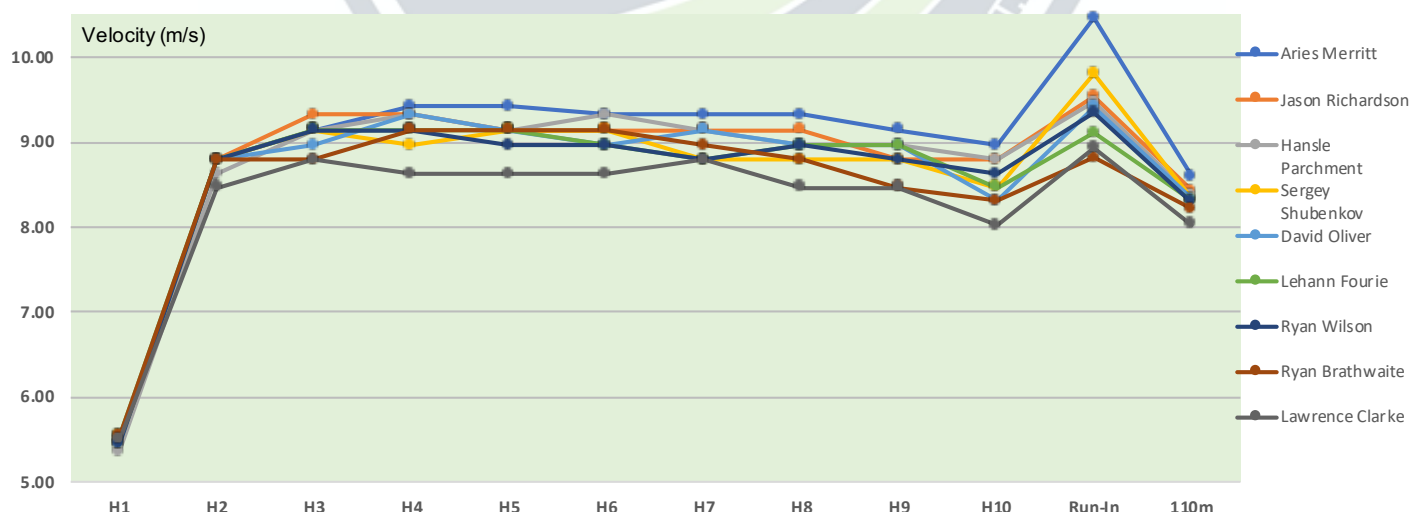
110m Hurdles

Date: 2012.09.07

Wind: 0.3 m/s

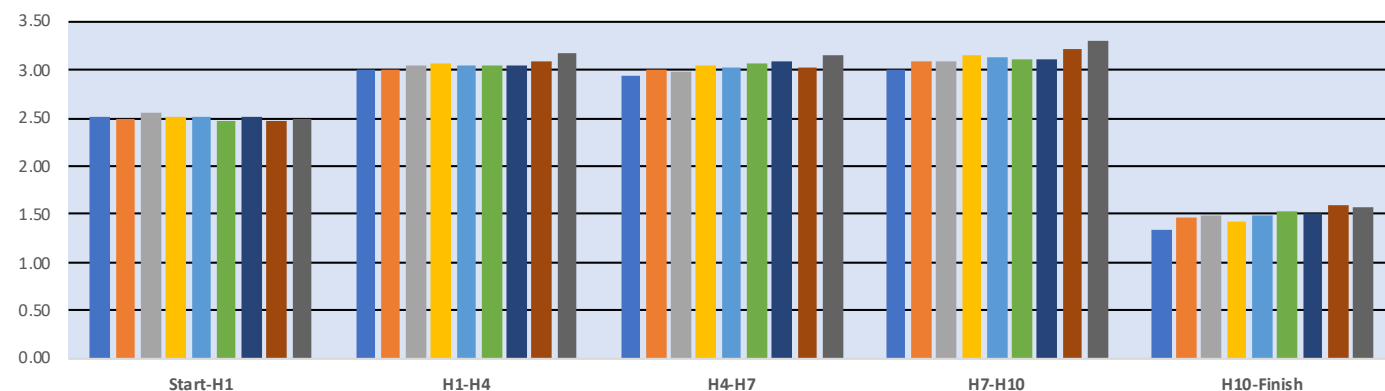
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time		2.52	3.56	4.56	5.53	6.50	7.48	8.46	9.44	10.44	11.46	12.80		6 / 1			
	reaction time	0.145														3.01	2.93	3.00
	interval		7 steps	1.04	1.00	0.97	0.97	0.98	0.98	0.98	1.00	1.02	1.34	WR		9.11	9.36	9.14
Richardson, Jason (USA) (1986)	time		2.50	3.54	4.52	5.50	6.50	7.50	8.50	9.50	10.54	11.58	13.05		5 / 2			
	reaction time	0.147														3.00	3.00	3.08
	interval		7 steps	1.04	0.98	0.98	1.00	1.00	1.00	1.00	1.04	1.04	1.47			9.14	9.14	8.90
Parchment, Hansle (JAM) (1990)	time		2.56	3.62	4.62	5.60	6.60	7.58	8.58	9.60	10.62	11.66	13.14		4 / 3			
	reaction time	0.157														3.04	2.98	3.08
	interval		7 steps	1.06	1.00	0.98	1.00	0.98	1.00	1.02	1.02	1.04	1.48			9.02	9.20	8.90
Shubenkov, Sergey (RUS) (1982)	time		2.52	3.56	4.56	5.58	6.58	7.58	8.62	9.66	10.70	11.78	13.21		1 / 4			
	reaction time	0.165														3.06	3.04	3.16
	interval			1.04	1.00	1.02	1.00	1.00	1.04	1.04	1.04	1.08	1.43			8.96	9.02	8.68
Oliver, David (USA) (1990)	time		2.52	3.56	4.58	5.56	6.56	7.58	8.58	9.60	10.62	11.72	13.21		2 / 5			
	reaction time	0.171														3.04	3.02	3.14
	interval		7 steps	1.04	1.02	0.98	1.00	1.02	1.00	1.02	1.02	1.10	1.49			9.02	9.08	8.73
Fourie, Lehann (RSA) (1987)	time		2.48	3.52	4.52	5.52	6.52	7.54	8.58	9.60	10.62	11.70	13.24		3 / 6			
	reaction time	0.133														3.04	3.06	3.12
	interval		7 steps	1.04	1.00	1.00	1.00	1.02	1.04	1.02	1.02	1.08	1.54	AR		9.02	8.96	8.79
Wilson, Ryan (USA) (1980)	time		2.52	3.56	4.56	5.56	6.58	7.60	8.64	9.66	10.70	11.76	13.26		8 / 7			
	reaction time	0.144														3.04	3.08	3.12
	interval		7 steps	1.04	1.00	1.00	1.02	1.02	1.04	1.02	1.04	1.06	1.50			9.02	8.90	8.79
Brathwaite, Ryan (BAR) (1988)	time		2.48	3.52	4.56	5.56	6.56	7.56	8.58	9.62	10.70	11.80	13.39		9 / 8			
	reaction time	0.156														3.08	3.02	3.22
	interval			1.04	1.04	1.00	1.00	1.00	1.02	1.04	1.08	1.10	1.59			8.90	9.08	8.52
Clarke, Lawrence (GBR) (1990)	time		2.50	3.58	4.62	5.68	6.74	7.80	8.84	9.92	11.00	12.14	13.71		7 / 9			
	reaction time	0.148														3.18	3.16	3.30
	interval			1.08	1.04	1.06	1.06	1.06	1.04	1.08	1.08	1.14	1.57			8.62	8.68	8.31
	velocity		5.49	8.46	8.79	8.62	8.62	8.62	8.79	8.46	8.46	8.02	8.93	8.02				



Time Intervals (s)

Hurdle Phases



Source: May, J., & Graubner, R. (2012) Retrieved from <http://www.fqs.uni-halle.de> (TV Analysis) (in German)

2nd - 9th Places (TV Analysis)

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=vASaphDG7rU>

2012 AVIVA Grand Prix (Birmingham, GBR) (TV Analysis)

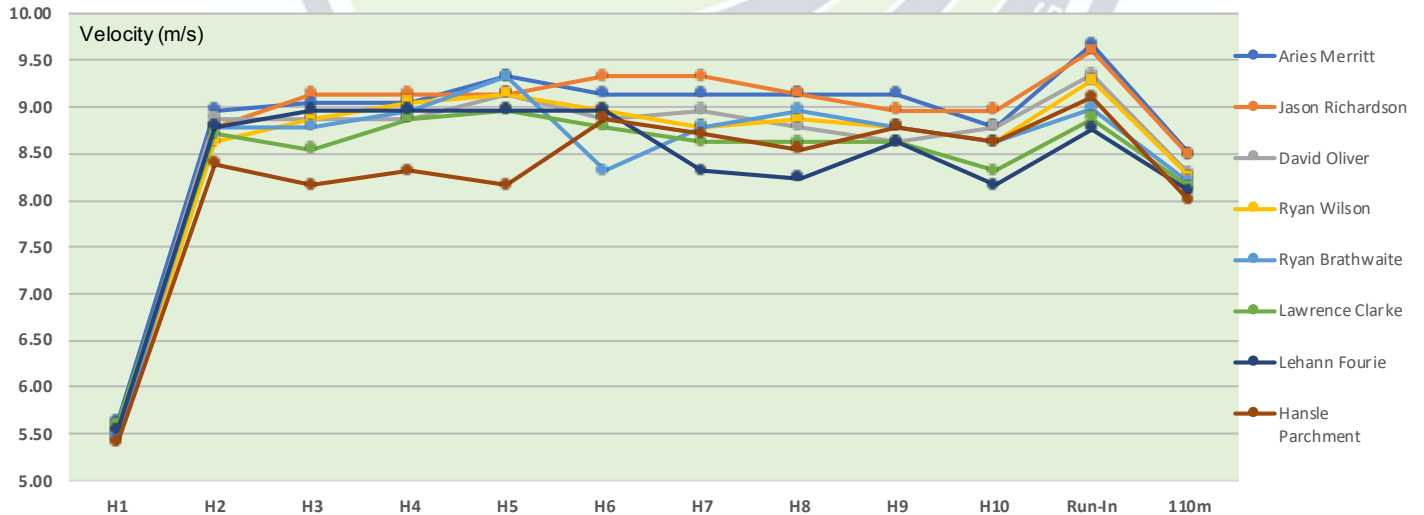
110m Hurdles

Date: 2012.08.26

Wind: -0.9 m/s

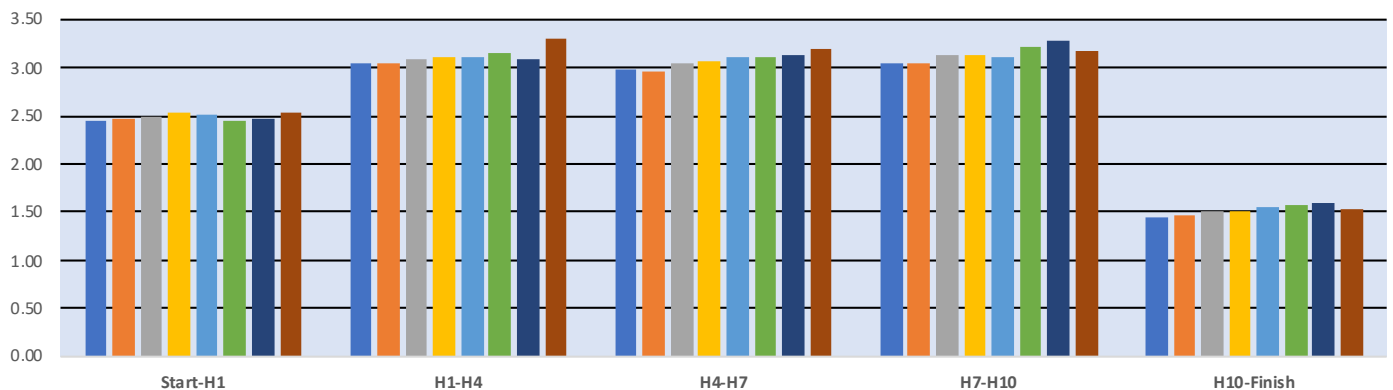
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10		
Merritt, Aries (USA) (1985)	reaction time	0.146	time	2.44	3.46	4.47	5.48	6.46	7.46	8.46	9.46	10.46	11.50		12.95	3 / 1	3.04	2.98	3.04	
			interval	7 steps	1.02	1.01	1.01	0.98	1.00	1.00	1.00	1.04	1.45							
			velocity	5.62	8.96	9.05	9.05	9.33	9.14	9.14	9.14	9.14	8.79	9.67	8.49					
Richardson, Jason (USA) (1986)	reaction time	0.165	time	2.48	3.52	4.52	5.52	6.52	7.50	8.48	9.48	10.50	11.52		12.98	2 / 2	3.04	2.96	3.04	
			interval	7 steps	1.04	1.00	1.00	1.00	0.98	0.98	1.00	1.02	1.02	1.46	=PB					
			velocity	5.53	8.79	9.14	9.14	9.14	9.33	9.33	9.14	8.96	8.96	9.60	8.47					
Oliver, David (USA) (1990)	reaction time	0.154	time	2.50	3.53	4.56	5.59	6.59	7.62	8.64	9.68	10.74	11.78		13.28	4 / 3	3.09	3.05	3.14	
			interval	7 steps	1.03	1.03	1.03	1.00	1.03	1.02	1.04	1.06	1.04	1.50						
			velocity	5.49	8.87	8.87	8.87	9.14	8.87	8.96	8.79	8.62	8.79	9.35	8.28					
Wilson, Ryan (USA) (1980)	reaction time	0.156	time	2.54	3.60	4.63	5.64	6.64	7.66	8.70	9.73	10.77	11.83		13.34	1 / 4	3.10	3.06	3.13	
			interval	7 steps	1.06	1.03	1.01	1.00	1.02	1.04	1.03	1.04	1.06	1.51						
			velocity	5.40	8.62	8.87	9.05	9.14	8.96	8.79	8.87	8.79	8.62	9.28	8.25					
Brathwaite, Ryan (BAR) (1988)	reaction time	0.160	time	2.52	3.56	4.60	5.62	6.60	7.70	8.74	9.76	10.80	11.86		13.42	7 / 5	3.10	3.12	3.12	
			interval		1.04	1.04	1.02	0.98	1.10	1.04	1.02	1.04	1.06	1.56						
			velocity	5.44	8.79	8.79	8.96	9.33	8.31	8.79	8.96	8.79	8.62	8.99	8.20					
Clarke, Lawrence (GBR) (1990)	reaction time	0.146	time	2.45	3.50	4.57	5.60	6.62	7.66	8.72	9.78	10.84	11.94		13.52	6 / 6	3.15	3.12	3.22	
			interval		1.05	1.07	1.03	1.02	1.04	1.06	1.06	1.06	1.10	1.58						
			velocity	5.60	8.70	8.54	8.87	8.96	8.79	8.62	8.62	8.62	8.31	8.87	8.14					
Fourie, Lehann (RSA) (1987)	reaction time	0.139	time	2.48	3.52	4.54	5.56	6.58	7.60	8.70	9.81	10.87	11.99		13.59	8 / 7	3.08	3.14	3.29	
			interval	7 steps	1.04	1.02	1.02	1.02	1.02	1.10	1.11	1.06	1.12	1.60						
			velocity	5.53	8.79	8.96	8.96	8.96	8.96	8.31	8.23	8.62	8.16	8.76	8.09					
Parchment, Hansle (JAM) (1990)	reaction time	0.155	time	2.54	3.63	4.75	5.85	6.97	8.00	9.05	10.12	11.16	12.22		13.76	5 / 8	3.31	3.20	3.17	
			interval	7 steps	1.09	1.12	1.10	1.12	1.03	1.05	1.07	1.04	1.06	1.54						
			velocity	5.40	8.39	8.16	8.31	8.16	8.87	8.70	8.54	8.79	8.62	9.10	7.99					



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=57ZM5zZkhXs>

2012 Olympic Games (London, GBR)

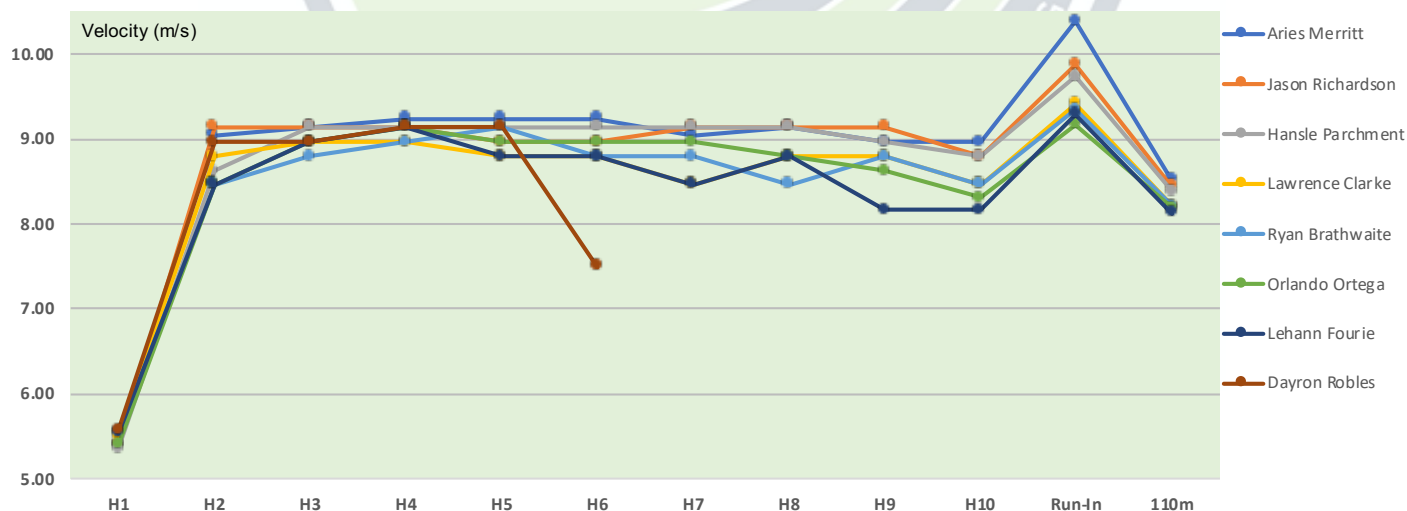
110m Hurdles

Date: 2012.08.12

Wind: -0.3 m/s

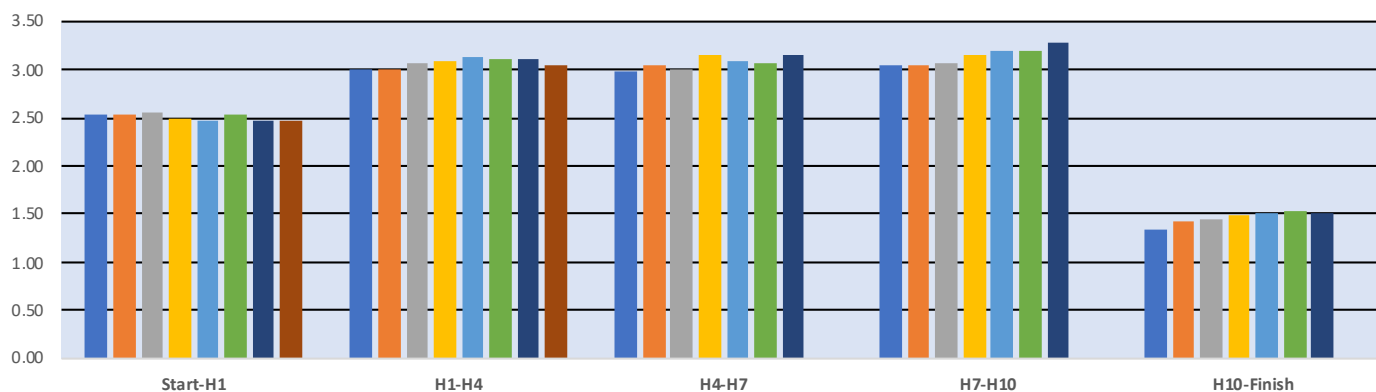
Semi-Final 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time	2.54	3.55	4.55	5.54	6.53	7.52	8.53	9.53	10.55	11.57		12.92	6 / 1	3.00	2.99	3.04
	reaction time	0.143															
	interval	7 steps	1.01	1.00	0.99	0.99	0.99	1.01	1.00	1.02	1.02	1.35	PB				
Richardson, Jason (USA) (1986)	time	2.54	3.54	4.54	5.54	6.56	7.58	8.58	9.58	10.58	11.62		13.04	4 / 2	3.00	3.04	3.04
	reaction time	0.194										1.42					
	interval	7 steps	1.00	1.00	1.00	1.02	1.02	1.00	1.00	1.04	1.04	1.42					
Parchment, Hansle (JAM) (1990)	time	2.56	3.62	4.62	5.62	6.62	7.62	8.62	9.62	10.64	11.68		13.12	7 / 3	3.06	3.00	3.06
	reaction time	0.172										1.44	NR				
	interval	7 steps	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.04	1.44					
Clarke, Lawrence (GBR) (1990)	time	2.50	3.54	4.56	5.58	6.62	7.66	8.74	9.78	10.82	11.90		13.39	2 / 4	3.08	3.16	3.16
	reaction time	0.169										1.49					
	interval	7 steps	1.04	1.02	1.02	1.04	1.04	1.08	1.04	1.04	1.08	1.49					
Brathwaite, Ryan (BAR) (1988)	time	2.48	3.56	4.60	5.62	6.62	7.66	8.70	9.78	10.82	11.90		13.40	8 / 5	3.14	3.08	3.20
	reaction time	0.163										1.50					
	interval	7 steps	1.08	1.04	1.02	1.00	1.04	1.04	1.08	1.04	1.08	1.50					
Ortega, Orlando (CUB) (1991)	time	2.54	3.62	4.64	5.64	6.66	7.68	8.70	9.74	10.80	11.90		13.43	9 / 6	3.10	3.06	3.20
	reaction time	0.135										1.53					
	interval	7 steps	1.08	1.02	1.00	1.02	1.02	1.02	1.04	1.06	1.10	1.53					
Fourie, Lehann (RSA) (1987)	time	2.48	3.56	4.58	5.58	6.62	7.66	8.74	9.78	10.90	12.02		13.53	3 / 7	3.10	3.16	3.28
	reaction time	0.136										1.51					
	interval	7 steps	1.08	1.02	1.00	1.04	1.04	1.08	1.04	1.12	1.12	1.51					
Robles, Dayron (CUB) (1986)	time	2.46	3.48	4.50	5.50	6.50	7.72						42.86	5 / --	3.04	9.02	
	reaction time	0.159											DQ				
	interval	7 steps	1.02	1.02	1.00	1.00	1.22						2.57				



Time Intervals (s)

Hurdle Phases



Aries Merritt

Source: Graubner, R. (2012) Retrieved from <http://www.fgs.uni-halle.de> (TV Analysis) (in German)

2nd - 8th Places (TV Analysis)

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=2snLA3i1Sis>

2012 Olympic Games (London, GBR)

110m Hurdles

Date: 2012.08.08

Wind: 0.1 m/s

Semi-Final 2

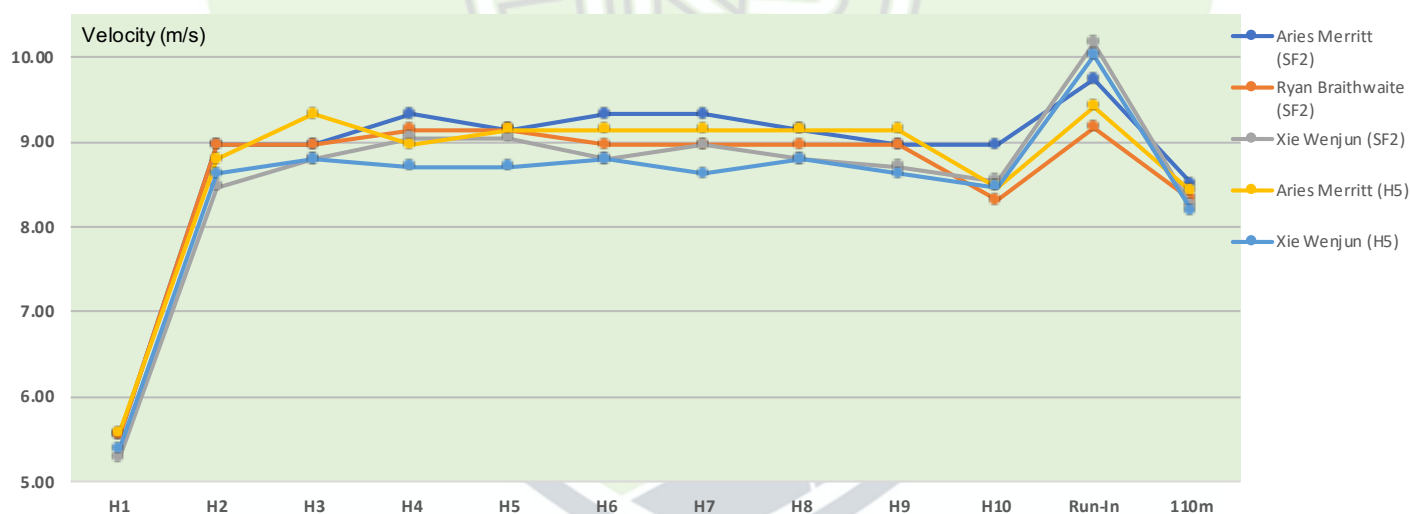
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time	2.48	3.50	4.52	5.50	6.50	7.48	8.46	9.46	10.48	11.50		12.94	7 / 1			
	reaction time	0.147													3.02	2.96	3.04
	interval	7 steps	1.02	1.02	0.98	1.00	0.98	0.98	1.00	1.02	1.02	1.44			9.08	9.26	9.02
Braithwaite, Ryan (BAR) (1988)	time	2.48	3.50	4.52	5.52	6.52	7.54	8.56	9.58	10.60	11.70		13.23	4 / 2			
	reaction time	0.159													3.04	3.04	3.14
	interval	7 steps	1.02	1.02	1.00	1.00	1.02	1.02	1.02	1.02	1.10	1.53			9.02	9.02	8.73
Xie Wenjun (CHN) (1990)	time	2.60	3.68	4.72	5.73	6.74	7.78	8.80	9.84	10.89	11.96		13.34	9 / 3			
	reaction time	0.158													3.13	3.07	3.16
	interval	7 steps	1.08	1.04	1.01	1.01	1.04	1.02	1.04	1.05	1.07	1.38	PB		8.76	8.93	8.68
	velocity	5.53	8.96	8.96	9.33	9.14	9.33	9.33	9.14	8.96	8.96	9.74	8.50				

Date: 2012.08.07

Wind: 0.7 m/s

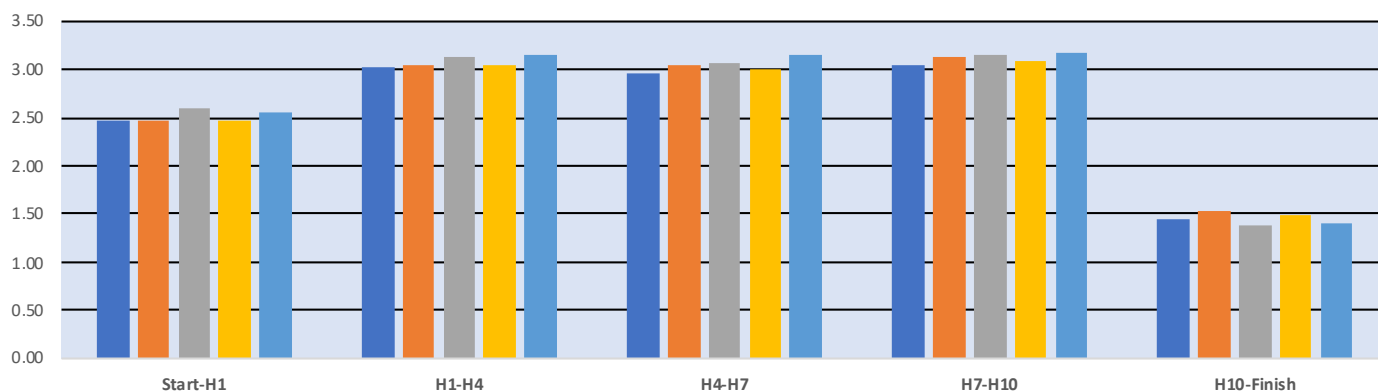
Heat 5

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time	2.46	3.50	4.48	5.50	6.50	7.50	8.50	9.50	10.50	11.58		13.07	7 / 1			
	reaction time	0.142													3.04	3.00	3.08
	interval	7 steps	1.04	0.98	1.02	1.00	1.00	1.00	1.00	1.00	1.08	1.49			9.02	9.14	8.90
Xie Wenjun (CHN) (1990)	time	2.55	3.61	4.65	5.70	6.75	7.79	8.85	9.89	10.95	12.03		13.43	2 / 3			
	reaction time	0.143													3.15	3.15	3.18
	interval	7 steps	1.06	1.04	1.05	1.05	1.04	1.06	1.04	1.06	1.08	1.40			8.70	8.70	8.62
	velocity	5.58	8.79	9.33	8.96	9.14	9.14	9.14	9.14	9.14	8.46	9.41	8.42				



Time Intervals (s)

Hurdle Phases



Semi-Final 2 (TV Analysis)

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=Zsxv1jJ51WA>

Heat 5 (TV Analysis)

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=3Q7-YmJy5ag>

Xie Wenjun - Semi-Final 2 & Heat 5

Source: Wang L., Yin J., Xu Y., Gong M., & Li R. (2016) Comparative analysis of the grey relational grade of the segment time and final results of the 110m hurdle race of Xie Wenjun and Liu Xiang. Sport Science Research, 37 (5), p. 4. (in Chinese)

2012 Herculis Meeting International D'Athlétisme (Monaco, MON) (TV Analysis)

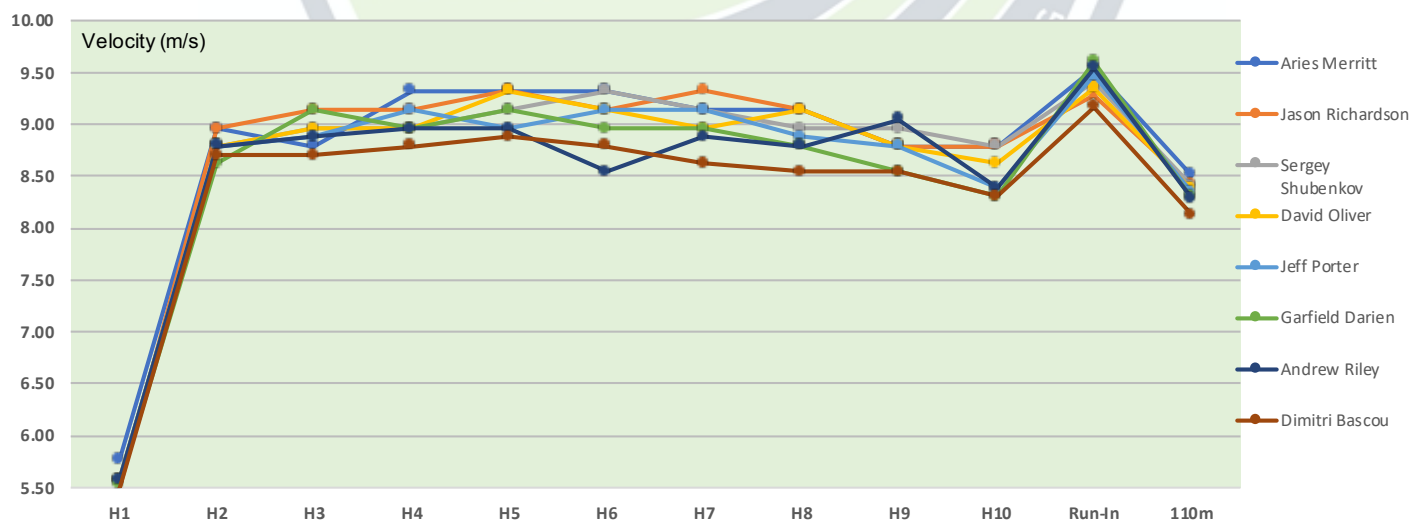
110m Hurdles

Date: 2012.07.20

Wind: 0.0 m/s

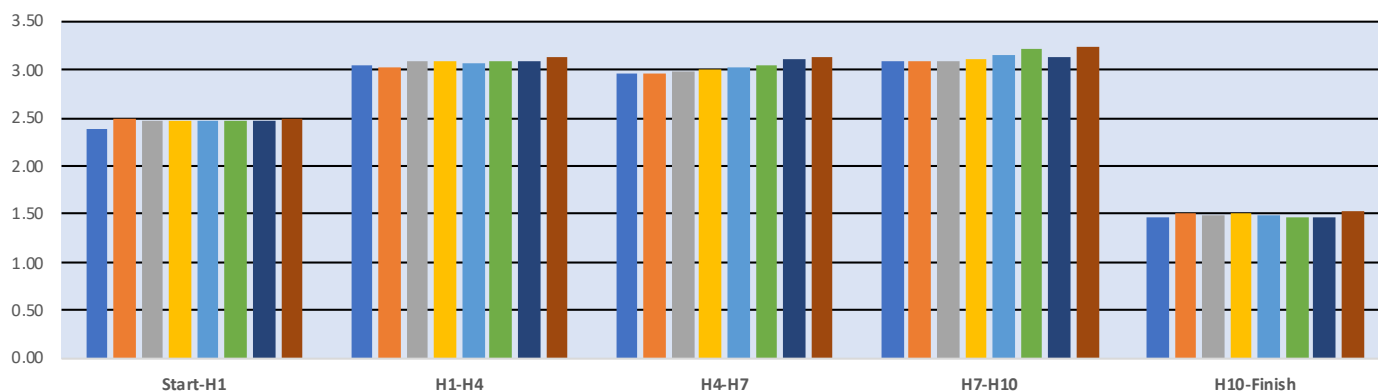
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time		2.38	3.40	4.44	5.42	6.40	7.38	8.38	9.38	10.42	11.46		12.93	5 / 1			
	reaction time	0.112	7 steps	1.02	1.04	0.98	0.98	0.98	1.00	1.00	1.04	1.04	1.47	=PB		3.04	2.96	3.08
	velocity		5.76	8.96	8.79	9.33	9.33	9.33	9.14	9.14	8.79	8.79	9.54	8.51		9.02	9.26	8.90
Richardson, Jason (USA) (1986)	time		2.50	3.52	4.52	5.52	6.50	7.50	8.48	9.48	10.52	11.56		13.07	4 / 2			
	reaction time	0.162	7 steps	1.02	1.00	1.00	0.98	1.00	0.98	1.00	1.04	1.04	1.51			3.02	2.96	3.08
	velocity		5.49	8.96	9.14	9.14	9.33	9.14	9.33	9.14	8.79	8.79	9.28	8.42		9.08	9.26	8.90
Shubenkov, Sergey (RUS) (1982)	time		2.46	3.50	4.52	5.54	6.54	7.52	8.52	9.54	10.56	11.60		13.09	7 / 3			
	reaction time	0.143		1.04	1.02	1.02	1.00	0.98	1.00	1.02	1.02	1.04	1.49	NR		3.08	2.98	3.08
	velocity		5.58	8.79	8.96	8.96	9.14	9.33	9.14	8.96	8.96	8.79	9.41	8.40		8.90	9.20	8.90
Oliver, David (USA) (1990)	time		2.46	3.50	4.52	5.54	6.52	7.52	8.54	9.54	10.58	11.64		13.14	6 / 4			
	reaction time	0.154	7 steps	1.04	1.02	1.02	0.98	1.00	1.02	1.00	1.04	1.06	1.50			3.08	3.00	3.10
	velocity		5.58	8.79	8.96	8.96	9.33	9.14	8.96	9.14	8.79	8.62	9.35	8.37		8.90	9.14	8.85
Porter, Jeff (USA) (1985)	time		2.46	3.50	4.53	5.53	6.55	7.55	8.55	9.58	10.62	11.71		13.19	3 / 5			
	reaction time	0.153		1.04	1.03	1.00	1.02	1.00	1.00	1.03	1.04	1.09	1.48			3.07	3.02	3.16
	velocity		5.58	8.79	8.87	9.14	8.96	9.14	9.14	8.87	8.79	8.39	9.47	8.34		8.93	9.08	8.68
Darien, Garfield (FRA) (1987)	time		2.48	3.54	4.54	5.56	6.56	7.58	8.60	9.64	10.71	11.81		13.27	2 / 6			
	reaction time	0.161		1.06	1.00	1.02	1.00	1.02	1.02	1.04	1.07	1.10	1.46			3.08	3.04	3.21
	velocity		5.53	8.62	9.14	8.96	9.14	8.96	8.96	8.79	8.54	8.31	9.60	8.29		8.90	9.02	8.54
Riley, Andrew (JAM) (1988)	time		2.46	3.50	4.53	5.55	6.57	7.64	8.67	9.71	10.72	11.81		13.28	8 / 7			
	reaction time	0.138		1.04	1.03	1.02	1.02	1.07	1.03	1.04	1.01	1.09	1.47			3.09	3.12	3.14
	velocity		5.58	8.79	8.87	8.96	8.96	8.54	8.87	8.79	9.05	8.39	9.54	8.28		8.87	8.79	8.73
Bascou, Dimitri (FRA) (1987)	time		2.50	3.55	4.60	5.64	6.67	7.71	8.77	9.84	10.91	12.01		13.54	1 / 8			
	reaction time	0.159	7 steps	1.05	1.05	1.04	1.03	1.04	1.06	1.07	1.07	1.10	1.53			3.14	3.13	3.24
	velocity		5.49	8.70	8.70	8.79	8.87	8.79	8.62	8.54	8.54	8.31	9.16	8.12		8.73	8.76	8.46



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=1vf64w4p0k0>

2012 AVIVA London Grand Prix (London, GBR) (TV Analysis)

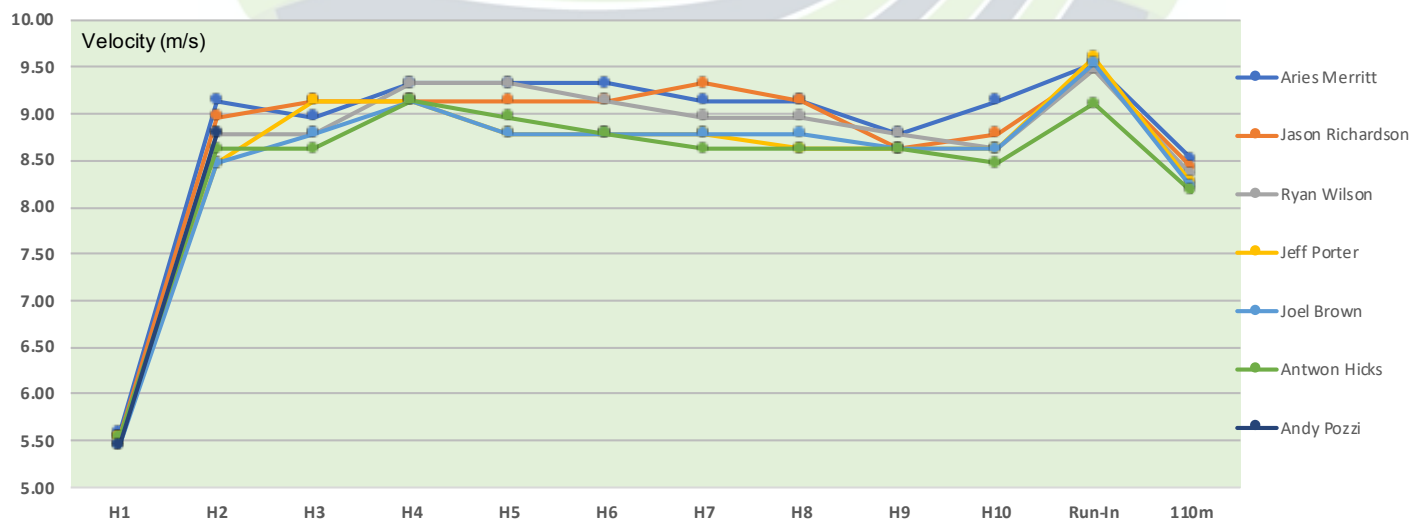
110m Hurdles

Date: 2012.07.13

Wind: 0.6 m/s

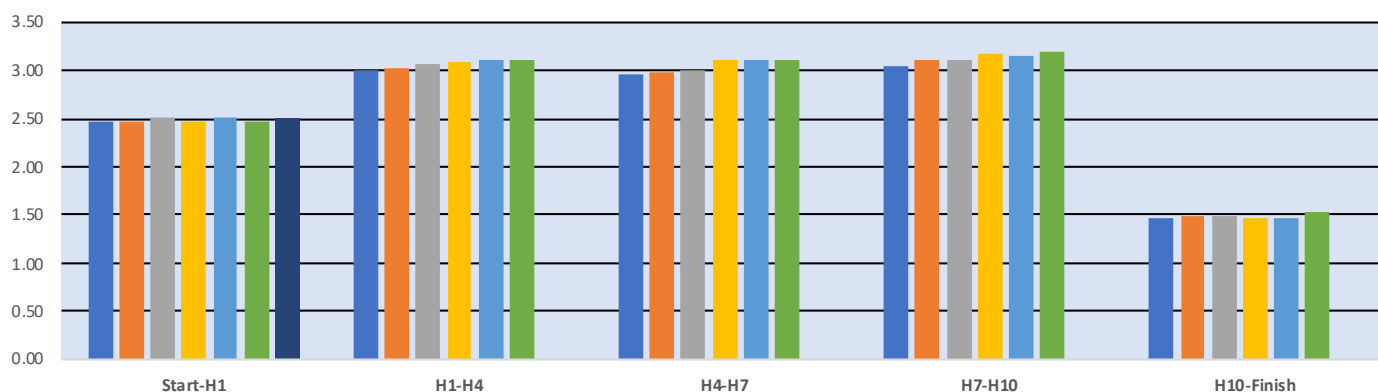
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time		2.46	3.46	4.48	5.46	6.44	7.42	8.42	9.42	10.46	11.46		12.93	4 / 1	3.00	2.96	3.04
	reaction time	0.137																
	interval		7 steps	1.00	1.02	0.98	0.98	0.98	1.00	1.00	1.04	1.00	1.47	=PB				
	velocity		5.58	9.14	8.96	9.33	9.33	9.33	9.14	9.14	8.79	9.14	9.54	8.51		9.14	9.26	9.02
Richardson, Jason (USA) (1986)	time		2.48	3.50	4.50	5.50	6.50	7.50	8.48	9.48	10.54	11.58		13.06	3 / 2	3.02	2.98	3.10
	reaction time	0.166																
	interval		7 steps	1.02	1.00	1.00	1.00	1.00	0.98	1.00	1.06	1.04	1.48					
	velocity		5.53	8.96	9.14	9.14	9.14	9.14	9.33	9.14	8.62	8.79	9.47	8.42		9.08	9.20	8.85
Wilson, Ryan (USA) (1980)	time		2.52	3.56	4.60	5.58	6.56	7.56	8.58	9.60	10.64	11.70		13.18	7 / 3	3.06	3.00	3.12
	reaction time	0.153																
	interval		7 steps	1.04	1.04	0.98	0.98	1.00	1.02	1.02	1.04	1.06	1.48					
	velocity		5.44	8.79	8.79	9.33	9.33	9.14	8.96	8.96	8.79	8.62	9.47	8.35		8.96	9.14	8.79
Porter, Jeff (USA) (1985)	time		2.48	3.56	4.56	5.56	6.60	7.64	8.68	9.74	10.80	11.86		13.32	5 / 4	3.08	3.12	3.18
	reaction time	0.154																
	interval			1.08	1.00	1.00	1.04	1.04	1.04	1.06	1.06	1.06	1.46					
	velocity		5.53	8.46	9.14	9.14	8.79	8.79	8.79	8.62	8.62	8.62	9.60	8.26		8.90	8.79	8.62
Brown, Joel (USA) (1980)	time		2.52	3.60	4.64	5.64	6.68	7.72	8.76	9.80	10.86	11.92		13.39	6 / 5	3.12	3.12	3.16
	reaction time	0.149																
	interval			1.08	1.04	1.00	1.04	1.04	1.04	1.04	1.06	1.06	1.47					
	velocity		5.44	8.46	8.79	9.14	8.79	8.79	8.79	8.79	8.62	8.62	9.54	8.22		8.79	8.79	8.68
Hicks, Antwon (USA) (1983)	time		2.48	3.54	4.60	5.60	6.62	7.66	8.72	9.78	10.84	11.92		13.46	1 / 6	3.12	3.12	3.20
	reaction time	0.165																
	interval		7 steps	1.06	1.06	1.00	1.02	1.04	1.06	1.06	1.06	1.08	1.54					
	velocity		5.53	8.62	8.62	9.14	8.96	8.79	8.62	8.62	8.62	8.46	9.10	8.17		8.79	8.79	8.57
Pozzi, Andy (GBR) (1992)	time		2.52	3.56										dnf	2 / --			
	reaction time	0.160																
	interval			1.04														
	velocity		5.44	8.79														



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=iQanySaHsbY>

2012 USA Olympic Trials (Eugene, OR)

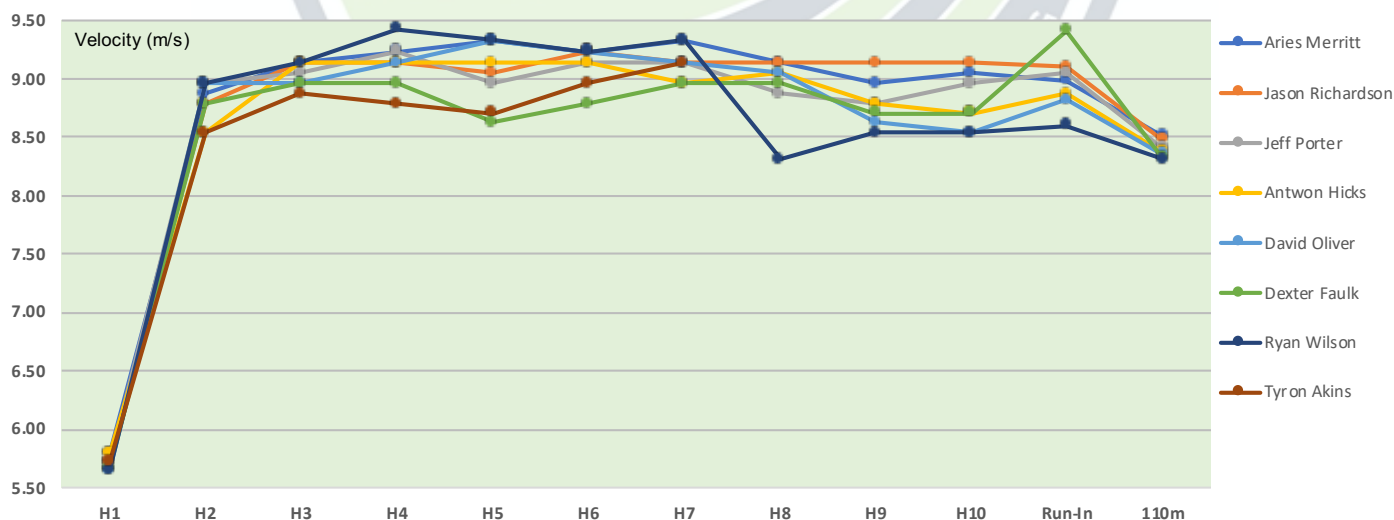
110m Hurdles

Date: 2012.06.30

Wind: 1.2 m/s

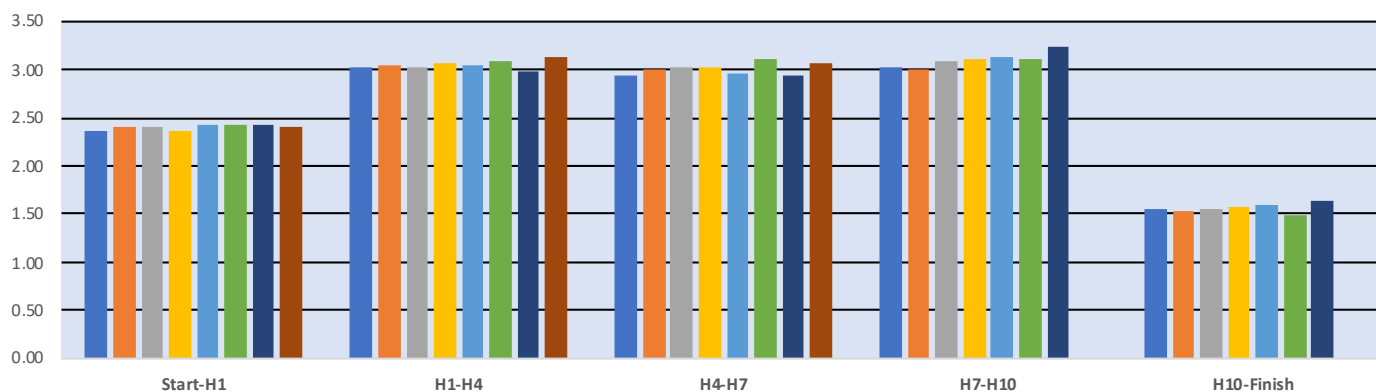
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time		2.37	3.40	4.40	5.39	6.37	7.36	8.34	9.34	10.36	11.37		12.93	5 / 1			
	reaction time	0.138																
	interval		7 steps	1.03	1.00	0.99	0.98	0.99	0.98	1.00	1.02	1.01	1.56	PB		3.02	2.95	3.03
	velocity		5.79	8.87	9.14	9.23	9.33	9.23	9.33	9.14	8.96	9.05	8.99	8.51		9.08	9.29	9.05
Richardson, Jason (USA) (1986)	time		2.40	3.44	4.44	5.44	6.45	7.44	8.44	9.44	10.44	11.44		12.98	6 / 2			
	reaction time	0.185																
	interval		7 steps	1.04	1.00	1.00	1.01	0.99	1.00	1.00	1.00	1.00	1.54	=PB		3.04	3.00	3.00
	velocity		5.72	8.79	9.14	9.14	9.05	9.23	9.14	9.14	9.14	9.14	9.10	8.47		9.02	9.14	9.14
Porter, Jeff (USA) (1985)	time		2.40	3.42	4.43	5.42	6.44	7.44	8.44	9.47	10.51	11.53		13.08	4 / 3			
	reaction time	0.157																
	interval			1.02	1.01	0.99	1.02	1.00	1.00	1.03	1.04	1.02	1.55	PB		3.02	3.02	3.09
	velocity		5.72	8.96	9.05	9.23	8.96	9.14	9.14	8.87	8.79	8.96	9.05	8.41		9.08	9.08	8.87
Hicks, Antwon (USA) (1983)	time		2.37	3.44	4.44	5.44	6.44	7.44	8.46	9.47	10.51	11.56		13.14	2 / 4			
	reaction time	0.158																
	interval		7 steps	1.07	1.00	1.00	1.00	1.00	1.02	1.01	1.04	1.05	1.58			3.07	3.02	3.10
	velocity		5.79	8.54	9.14	9.14	9.14	9.14	8.96	9.05	8.79	8.70	8.87	8.37		8.93	9.08	8.85
Oliver, David (USA) (1982)	time		2.43	3.45	4.47	5.47	6.45	7.44	8.44	9.45	10.51	11.58		13.17	3 / 5			
	reaction time	0.165																
	interval		7 steps	1.02	1.02	1.00	0.98	0.99	1.00	1.01	1.06	1.07	1.59			3.04	2.97	3.14
	velocity		5.65	8.96	8.96	9.14	9.33	9.23	9.14	9.05	8.62	8.54	8.82	8.35		9.02	9.23	8.73
Faulk, Dexter (USA) (1984)	time		2.42	3.46	4.48	5.50	6.56	7.60	8.62	9.64	10.69	11.74		13.23	8 / 6			
	reaction time	0.142																
	interval			1.04	1.02	1.02	1.06	1.04	1.02	1.02	1.05	1.05	1.49			3.08	3.12	3.12
	velocity		5.67	8.79	8.96	8.96	8.62	8.79	8.96	8.96	8.70	8.70	9.41	8.31		8.90	8.79	8.79
Wilson, Ryan (USA) (1980)	time		2.43	3.45	4.45	5.42	6.40	7.39	8.37	9.47	10.54	11.61		13.24	7 / 7			
	reaction time	0.179																
	interval		7 steps	1.02	1.00	0.97	0.98	0.99	0.98	1.10	1.07	1.07	1.63			2.99	2.95	3.24
	velocity		5.65	8.96	9.14	9.42	9.33	9.23	9.33	8.31	8.54	8.54	8.60	8.31		9.17	9.29	8.46
Akins, Tyron (USA) (1986)	time		2.40	3.47	4.50	5.54	6.59	7.61	8.61					dnf	1 / --			
	reaction time	0.179																
	interval			1.07	1.03	1.04	1.05	1.02	1.00									
	velocity		5.72	8.54	8.87	8.79	8.70	8.96	9.14									



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 30fps
 Timing From: First Movement
 Source: Athletes First (2020)

2012 Prefontaine Classic (Eugene, OR) (TV Analysis)

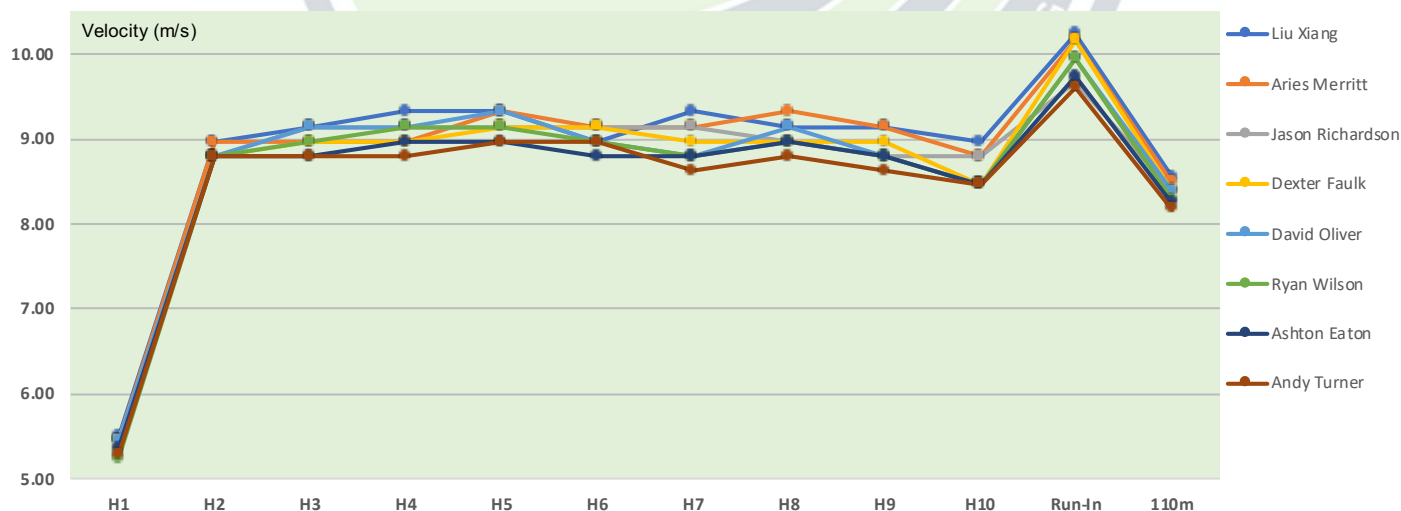
110m Hurdles

Date: 2012.06.02

Wind: 2.4 m/s

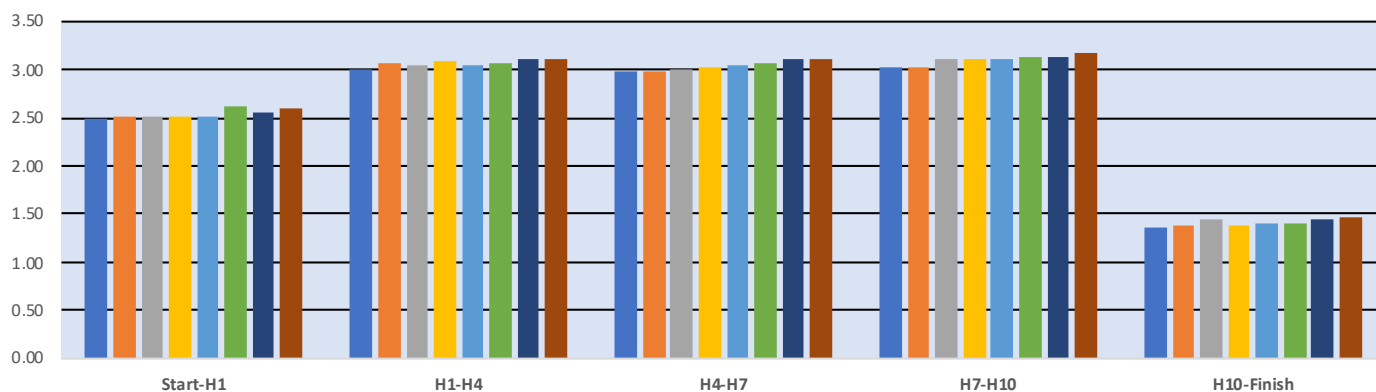
Semi-Final 3

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Liu Xiang (CHN) (1983)	time		2.50	3.52	4.52	5.50	6.48	7.50	8.48	9.48	10.48	11.50		12.87	5 / 1			
	reaction time	0.131														3.00	2.98	3.02
	interval		7 steps	1.02	1.00	0.98	0.98	1.02	0.98	1.00	1.00	1.02	1.37			9.14	9.20	9.08
	velocity		5.49	8.96	9.14	9.33	9.33	8.96	9.33	9.14	9.14	8.96	10.23	8.55				
Merritt, Aries (USA) (1985)	time		2.52	3.54	4.56	5.58	6.56	7.56	8.56	9.54	10.54	11.58		12.96	3 / 2			
	reaction time	0.151														3.06	2.98	3.02
	interval		7 steps	1.02	1.02	1.02	0.98	1.00	1.00	0.98	1.00	1.04	1.38			8.96	9.20	9.08
	velocity		5.44	8.96	8.96	8.96	9.33	9.14	9.14	9.33	9.14	8.79	10.16	8.49				
Richardson, Jason (USA) (1986)	time		2.52	3.56	4.56	5.56	6.56	7.56	8.56	9.58	10.62	11.66		13.11	4 / 3			
	reaction time	0.159														3.04	3.00	3.10
	interval		7 steps	1.04	1.00	1.00	1.00	1.00	1.00	1.02	1.04	1.04	1.45			9.02	9.14	8.85
	velocity		5.44	8.79	9.14	9.14	9.14	9.14	9.14	8.96	8.79	8.79	9.67	8.39				
Faulk, Dexter (USA) (1984)	time		2.52	3.56	4.58	5.60	6.60	7.60	8.62	9.64	10.66	11.74		13.12	7 / 4			
	reaction time	0.143														3.08	3.02	3.12
	interval		7 steps	1.04	1.02	1.02	1.00	1.00	1.02	1.02	1.02	1.08	1.38			8.90	9.08	8.79
	velocity		5.44	8.79	8.96	8.96	9.14	9.14	8.96	8.96	8.96	8.46	10.16	8.38				
Oliver, David (USA) (1982)	time		2.52	3.56	4.56	5.56	6.54	7.56	8.60	9.60	10.64	11.72		13.13	6 / 5			
	reaction time	0.171														3.04	3.04	3.12
	interval		7 steps	1.04	1.00	1.00	0.98	1.02	1.04	1.00	1.04	1.08	1.41			9.02	9.02	8.79
	velocity		5.44	8.79	9.14	9.14	9.33	8.96	8.79	9.14	8.79	8.46	9.94	8.38				
Wilson, Ryan (USA) (1980)	time		2.62	3.66	4.68	5.68	6.68	7.70	8.74	9.76	10.80	11.88		13.29	8 / 6			
	reaction time	0.194														3.06	3.06	3.14
	interval		7 steps	1.04	1.02	1.00	1.00	1.02	1.04	1.02	1.04	1.08	1.41			8.96	8.96	8.73
	velocity		5.24	8.79	8.96	9.14	9.14	8.96	8.79	8.96	8.79	8.46	9.94	8.28				
Eaton, Ashton (USA) (1988)	time		2.56	3.60	4.64	5.66	6.68	7.72	8.76	9.78	10.82	11.90		13.34	1 / 7			
	reaction time	0.168														3.10	3.10	3.14
	interval		7 steps	1.04	1.04	1.02	1.02	1.04	1.04	1.02	1.04	1.08	1.44			8.85	8.85	8.73
	velocity		5.36	8.79	8.79	8.96	8.96	8.79	8.79	8.96	8.79	8.46	9.74	8.25				
Turner, Andy (GBR) (1980)	time		2.60	3.64	4.68	5.72	6.74	7.76	8.82	9.86	10.92	12.00		13.46	2 / 8			
	reaction time	0.149														3.12	3.10	3.18
	interval		7 steps	1.04	1.04	1.04	1.02	1.02	1.06	1.04	1.06	1.08	1.46			8.79	8.85	8.62
	velocity		5.28	8.79	8.79	8.79	8.96	8.96	8.62	8.79	8.62	8.46	9.60	8.17				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

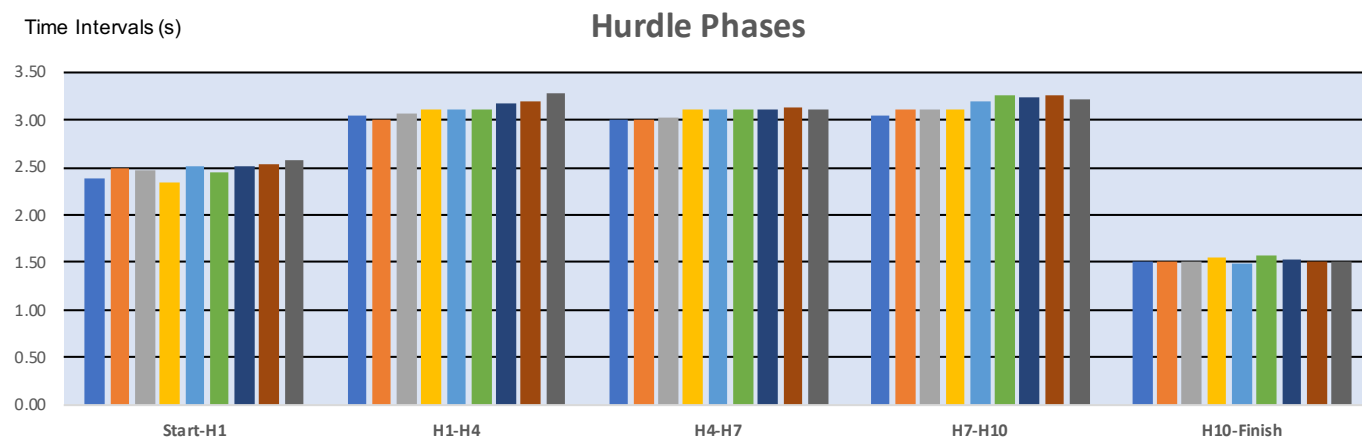
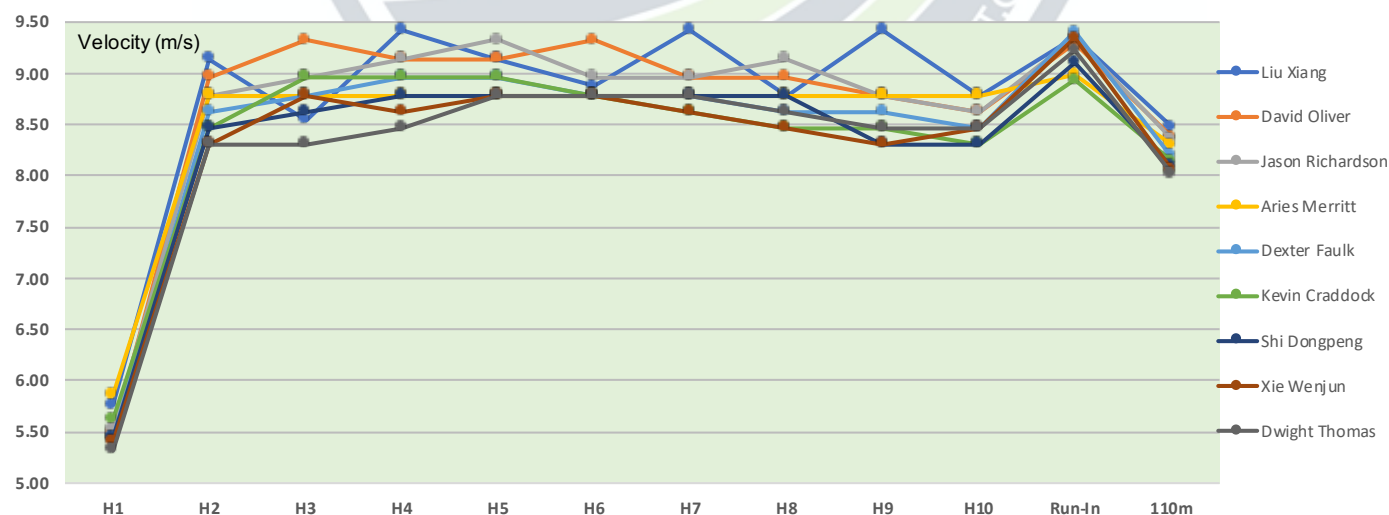
Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=vXf-iTi7Ak>

2012 Golden Grand Prix (Shanghai, CHN)

110m Hurdles			Date: 2012.05.19		Wind: 0.4 m/s										FINAL						
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10			
Liu Xiang (CHN) (1983)	time		2.38	3.38	4.45	5.42	6.42	7.45	8.42	9.46	10.43	11.47		12.97	5 / 1						
	reaction time	0.160														3.04	3.00	3.05			
	interval		1.00	1.07	0.97	1.00	1.03	0.97	1.04	0.97	1.04	0.97	1.04	1.50		9.02	9.14	8.99			
	velocity		5.76	9.14	8.54	9.42	9.14	8.87	9.42	8.79	9.42	8.79	9.35	8.48							
Oliver, David (USA) (1982)	time		2.50	3.52	4.50	5.50	6.50	7.48	8.50	9.52	10.56	11.62		13.13	7 / 2						
	reaction time	0.192														3.00	3.00	3.12			
	interval		7 steps	1.02	0.98	1.00	1.00	0.98	1.02	1.02	1.04	1.06	1.51			9.14	9.14	8.79			
	velocity		5.49	8.96	9.33	9.14	9.14	9.33	8.96	8.96	8.79	8.62	9.28	8.38							
Richardson, Jason (USA) (1986)	time		2.48	3.52	4.54	5.54	6.52	7.54	8.56	9.56	10.60	11.66		13.16	4 / 3						
	reaction time	0.168														3.06	3.02	3.10			
	interval		7 steps	1.04	1.02	1.00	0.98	1.02	1.02	1.00	1.04	1.06	1.50			8.96	9.08	8.85			
	velocity		5.53	8.79	8.96	9.14	9.33	8.96	8.96	9.14	8.79	8.62	9.35	8.36							
Merritt, Aries (USA) (1985)	time		2.34	3.38	4.42	5.46	6.50	7.54	8.58	9.62	10.66	11.70		13.26	6 / 4						
	reaction time	0.142														3.12	3.12	3.12			
	interval		7 steps	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.56			8.79	8.79	8.79			
	velocity		5.86	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.79	8.99	8.30							
Faulk, Dexter (USA) (1984)	time		2.52	3.58	4.62	5.64	6.66	7.70	8.74	9.80	10.86	11.94		13.43	2 / 5						
	reaction time	0.177														3.12	3.10	3.20			
	interval			1.06	1.04	1.02	1.02	1.04	1.04	1.06	1.06	1.08	1.49			8.79	8.85	8.57			
	velocity		5.44	8.62	8.79	8.96	8.96	8.79	8.79	8.62	8.62	8.46	9.41	8.19							
Craddock, Kevin (USA) (1987)	time		2.44	3.52	4.54	5.56	6.58	7.62	8.68	9.76	10.84	11.94		13.51	9 / 6						
	reaction time	0.167														3.12	3.12	3.26			
	interval		7 steps	1.08	1.02	1.02	1.02	1.04	1.06	1.08	1.08	1.10	1.57			8.79	8.79	8.41			
	velocity		5.62	8.46	8.96	8.96	8.96	8.79	8.62	8.46	8.46	8.31	8.93	8.14							
Shi Dongpeng (CHN) (1984)	time		2.52	3.60	4.66	5.70	6.74	7.78	8.82	9.86	10.96	12.06		13.60	1 / 7						
	reaction time	0.155														3.18	3.12	3.24			
	interval			1.08	1.06	1.04	1.04	1.04	1.04	1.04	1.10	1.10	1.54			8.62	8.79	8.46			
	velocity		5.44	8.46	8.62	8.79	8.79	8.79	8.79	8.79	8.31	8.31	9.10	8.09							
Xie Wenjun (CHN) (1990)	time		2.54	3.64	4.68	5.74	6.78	7.82	8.88	9.96	11.06	12.14		13.64	8 / 8						
	reaction time	0.179														3.20	3.14	3.26			
	interval			1.10	1.04	1.06	1.04	1.04	1.06	1.08	1.10	1.08	1.50			8.57	8.73	8.41			
	velocity		5.40	8.31	8.79	8.62	8.79	8.79	8.62	8.46	8.31	8.46	9.35	8.06							
Thomas, Dwight (JAM) (1980)	time		2.58	3.68	4.78	5.86	6.90	7.94	8.98	10.04	11.12	12.20		13.72	3 / 9						
	reaction time	0.174														3.28	3.12	3.22			
	interval		7 steps	1.10	1.10	1.08	1.04	1.04	1.04	1.06	1.08	1.08	1.52			8.36	8.79	8.52			
	velocity		5.32	8.31	8.31	8.46	8.79	8.79	8.79	8.62	8.46	8.46	9.22	8.02							



Liu Xiang & Aries Merritt

Source: Feng L. & Chen T. (2016) Liu Xiang's seven-step starting: A discussion on the key issues of 110m hurdles technical training. Journal of Ningbo Institute of Education, 18 (3). p. 66. (in Chinese)

2nd, 3rd, & 5th - 9th Places (TV Analysis)

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=wylom4zslS8>

2012 Arkansas Twilight (Fayetteville, AR)

110m Hurdles

Date: 2012.05.04

Wind: 1.0 m/s

FINAL

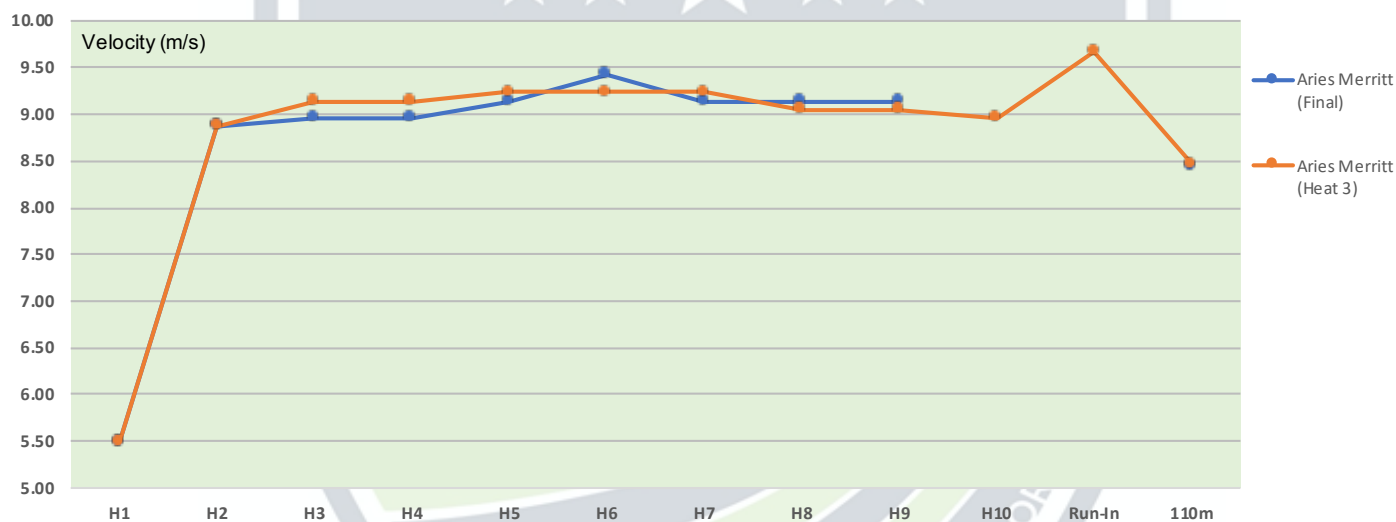
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time	2.50	3.53	4.55	5.57	6.57	7.54	8.54	9.54	10.54			13.03	5 / 1			
	reaction time														3.07	2.97	
	interval	7 steps	1.03	1.02	1.02	1.00	0.97	1.00	1.00	1.00					8.93	9.23	
	velocity	5.49	8.87	8.96	8.96	9.14	9.42	9.14	9.14	9.14			8.44				

Date: 2012.05.04

Wind: 2.9 m/s

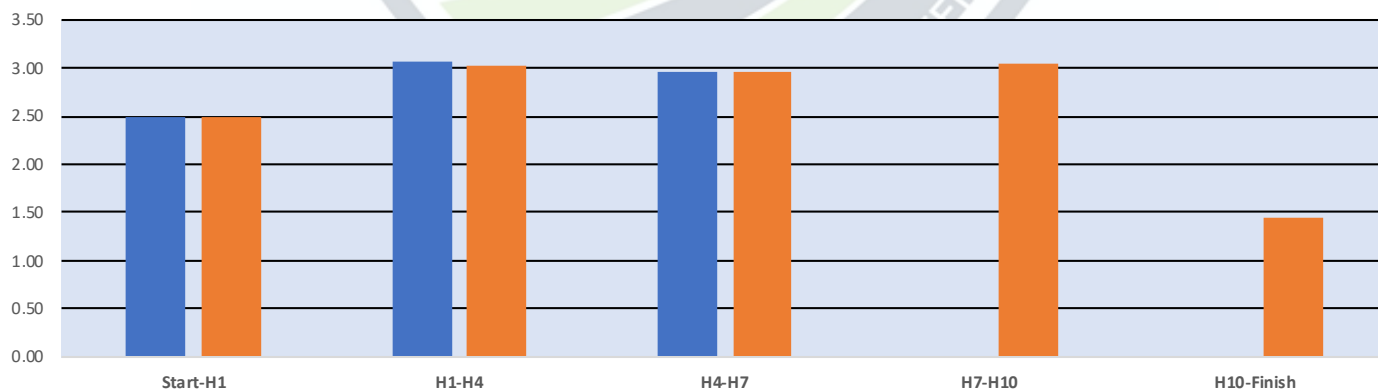
Heat 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Merritt, Aries (USA) (1985)	time	2.50	3.53	4.53	5.53	6.52	7.51	8.50	9.51	10.52	11.54		12.99	5 / 1			
	reaction time														3.03	2.97	3.04
	interval	7 steps	1.03	1.00	1.00	0.99	0.99	0.99	1.01	1.01	1.02	1.45			9.05	9.23	9.02
	velocity	5.49	8.87	9.14	9.14	9.23	9.23	9.23	9.05	9.05	8.96	9.67	8.47				



Time Intervals (s)

Hurdle Phases



Final
 Evaluated with: ObjectusVideo
 Quality & Frame Rate: 30fps
 Timing From: First Movement
 Source: Athletes First (2020)

Heat 3
 Evaluated with: ObjectusVideo
 Quality & Frame Rate: 30fps
 Timing From: First Movement
 Source: Athletes First (2020)

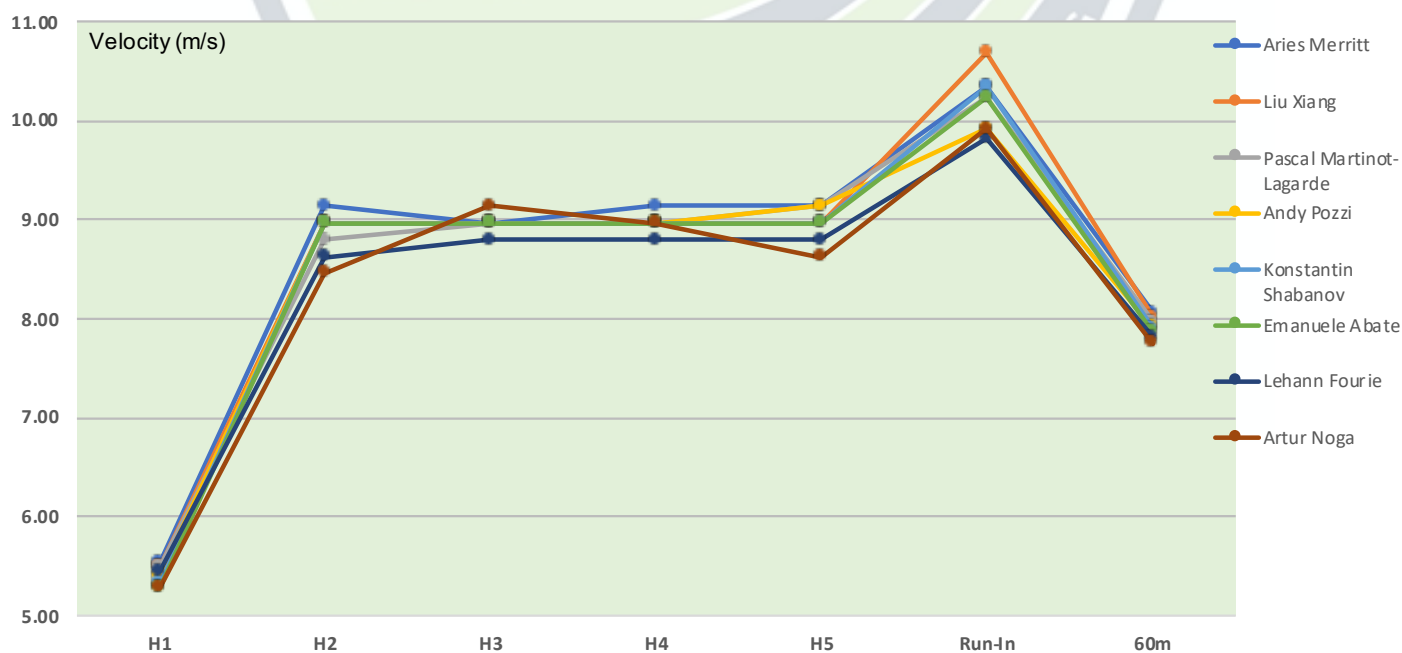
2012 IAAF World Indoor Championships (Istanbul, TUR) (TV Analysis)

60m Hurdles

Date: 2012.03.11

FINAL

			H1	H2	H3	H4	H5	Run-In	60m	Lane/Place
Merritt, Aries (USA) (1985)	time		2.48	3.48	4.50	5.50	6.50		7.44	4 / 1
	reaction time	0.135						0.94		
	interval velocity		7 steps	1.00	1.02	1.00	1.00	10.34	8.06	
Liu Xiang (CHN) (1983)	time		2.50	3.52	4.54	5.56	6.58		7.49	3 / 2
	reaction time	0.167						0.91		
	interval velocity		7 steps	1.02	1.02	1.02	1.02	10.68	8.01	
Martinot Lagarde, Pascal (FRA) (1991)	time		2.50	3.54	4.56	5.58	6.58		7.53	6 / 3
	reaction time	0.141						0.95		
	interval velocity		5.49	1.04	1.02	1.02	1.00	10.23	7.97	
Pozzi, Andy (GBR) (1992)	time		2.54	3.56	4.58	5.60	6.60		7.58	5 / 4
	reaction time	0.155						0.98		
	interval velocity		5.40	1.02	1.02	1.02	1.00	9.92	7.92	
Shabanov, Konstantin (RUS) (1989)	time		2.58	3.60	4.62	5.64	6.66		7.60	2 / 5
	reaction time	0.202						0.94		
	interval velocity		5.32	1.02	1.02	1.02	1.02	10.34	7.89	
Abate, Emanuele (ITA) (1985)	time		2.60	3.62	4.64	5.66	6.68		7.63	7 / 6
	reaction time	0.155						0.95		
	interval velocity		7 steps	1.02	1.02	1.02	1.02	10.23	7.86	
Fourie, Lehann (RSA) (1987)	time		2.52	3.58	4.62	5.66	6.70		7.69	8 / 7
	reaction time	0.147						0.99		
	interval velocity		7 steps	1.06	1.04	1.04	1.04	9.82	7.80	
Noga, Artur (POL) (1988)	time		2.60	3.68	4.68	5.70	6.76		7.74	1 / 8
	reaction time	0.157						0.98		
	interval velocity		5.28	1.08	1.00	1.02	1.06	9.92	7.75	



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=uEPQJ299tVU>

2012 USATF National Indoor Championships (Albuquerque, NM) (Altitude) (TV Analysis)**60m Hurdles**

Date: 2012.02.26

FINAL

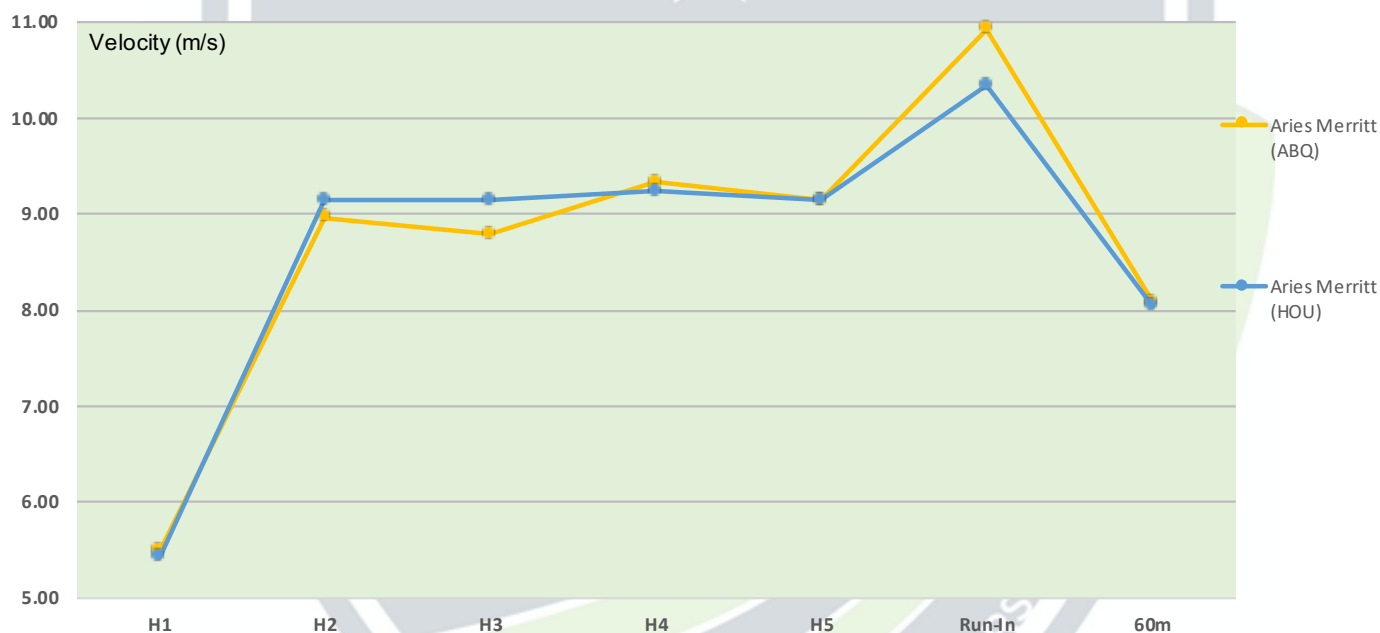
			H1	H2	H3	H4	H5	Run-In	60m	Lane/Place
Merritt, Aries (USA) (1985)			2.50	3.52	4.56	5.54	6.54		7.43	6 / 1
reaction time	0.138		7 steps	1.02	1.04	0.98	1.00	0.89	PB	
		interval								
		velocity	5.49	8.96	8.79	9.33	9.14	10.92	8.08	

2012 Leonard Hilton Memorial Invitational (Houston, TX)

Date: 2012.01.13

FINAL

			H1	H2	H3	H4	H5	Run-In	60m	Lane/Place
Merritt, Aries (USA) (1985)			2.53	3.53	4.53	5.52	6.52		7.46	5 / 1
reaction time			7 steps	1.00	1.00	0.99	1.00	0.94		
		interval								
		velocity	5.42	9.14	9.14	9.23	9.14	10.34	8.04	

**USATF National Indoor Championships**

Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 24fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=anINzbU0giQ>

Leonard Hilton Memorial

Evaluated with: ObjectusVideo
 Quality & Frame Rate: 30fps
 Timing From: First Movement
 Source: Athletes First (2020)