

2017 Season Hurdles Report

Hurdle Touchdown Times

Men's 110m Hurdles
Women's 100m Hurdles
Men's 400m Hurdles
Women's 400m Hurdles

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Todd Henson

2017 Season Hurdles Report

Men's 110m Hurdles

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2017 Season Hurdles Report

Men's 400m Hurdles

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Notes:

- The times listed as TV Analysis are taken from [youtube.com](https://www.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.

Men's 110m Hurdles

McLeod, Omar (JAM) (1994)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2017 Jamaican National Championships (Kingston, JAM) (TV Analysis)													Henson (2020) - Athlete First: 2017 year end hurdle report					
date 24-Jun time			2.43	3.46	4.46	5.46	6.43	7.43	8.43	9.43	10.43	11.45			4 / 1			
reaction time				1.03	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.02	1.45	NR PB		3.03	2.97	3.02
wind 0.7 m/s velocity			5.65	8.87	9.14	9.14	9.42	9.14	9.14	9.14	9.14	8.96	9.67	8.53		9.05	9.23	9.08
McLeod, Omar (JAM) (1994)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2017 István Gyulai Memorial (Székesfehérvár, HUN) (TV Analysis)													Henson (2020) - Athlete First: 2017 year end hurdle report					
date 4-Jul time			2.48	3.50	4.50	5.50	6.50	7.50	8.48	9.52	10.54	11.56			4 / 1			
reaction time			0.138	1.02	1.00	1.00	1.00	1.00	0.98	1.04	1.02	1.02	1.40			3.02	2.98	3.08
wind 0.3 m/s velocity			5.53	8.96	9.14	9.14	9.14	9.14	9.33	8.79	8.96	8.96	10.01	8.49		9.08	9.20	8.90
McLeod, Omar (JAM) (1994)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2017 Prefontaine Classic (Eugene, OR) (TV Analysis)													Henson (2020) - Athlete First: 2017 year end hurdle report					
date 27-May time			2.48	3.52	4.52	5.52	6.52	7.54	8.52	9.52	10.54	11.58			4 / 1			
reaction time			0.150	1.04	1.00	1.00	1.00	1.02	0.98	1.00	1.02	1.04	1.43			3.04	3.00	3.06
wind 0.9 m/s velocity			5.53	8.79	9.14	9.14	9.14	8.96	9.33	9.14	8.96	8.79	9.80	8.46		9.02	9.14	8.96
Shubenkov, Sergey (ANA) (1990)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2017 István Gyulai Memorial (Székesfehérvár, HUN) (TV Analysis)													Henson (2020) - Athlete First: 2017 year end hurdle report					
date 4-Jul time			2.56	3.58	4.60	5.56	6.54	7.54	8.54	9.56	10.58	11.60			6 / 2			
reaction time			0.177	1.02	1.02	0.96	0.98	1.00	1.00	1.02	1.02	1.02	1.41			3.00	2.98	3.06
wind 0.3 m/s velocity			5.36	8.96	8.96	9.52	9.33	9.14	9.14	8.96	8.96	8.96	9.94	8.46		9.14	9.20	8.96
McLeod, Omar (JAM) (1994)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2017 Drake Relays (Des Moines, IA) (TV Analysis)													Henson (2020) - Athlete First: 2017 year end hurdle report					
date 29-Apr time			2.47	3.53	4.53	5.53	6.53	7.53	8.55	9.57	10.57	11.61			4 / 1			
reaction time				1.06	1.00	1.00	1.00	1.00	1.02	1.02	1.00	1.04	1.43			3.06	3.02	3.06
wind 1.8 m/s velocity			5.55	8.62	9.14	9.14	9.14	9.14	8.96	8.96	9.14	8.79	9.80	8.44		8.96	9.08	8.96
McLeod, Omar (JAM) (1994)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2017 IAAF World Championships (London, GBR)													Pollitt (2018) - biomechanical report for the IAAF World Champs - London 2017 - Men's 110m Hurdles					
date 7-Aug time			2.36	3.42	4.42	5.43	6.42	7.44	8.45	9.46	10.48	11.51			4 / 1			
reaction time			0.123	1.06	1.00	1.01	0.99	1.02	1.01	1.01	1.02	1.03	1.53			3.07	3.02	3.06
wind 0.0 m/s velocity			5.81	8.62	9.14	9.05	9.23	8.96	9.05	9.05	8.96	8.87	9.16	8.44		8.93	9.08	8.96
Levy, Ronald (JAM) (1992)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2017 Meeting de Paris (Paris, FRA) (TV Analysis)													Henson (2020) - Athlete First: 2017 year end hurdle report					
date 1-Jul time																		

2017 Memorial van Damme (Brussels, BEL) (TV Analysis)

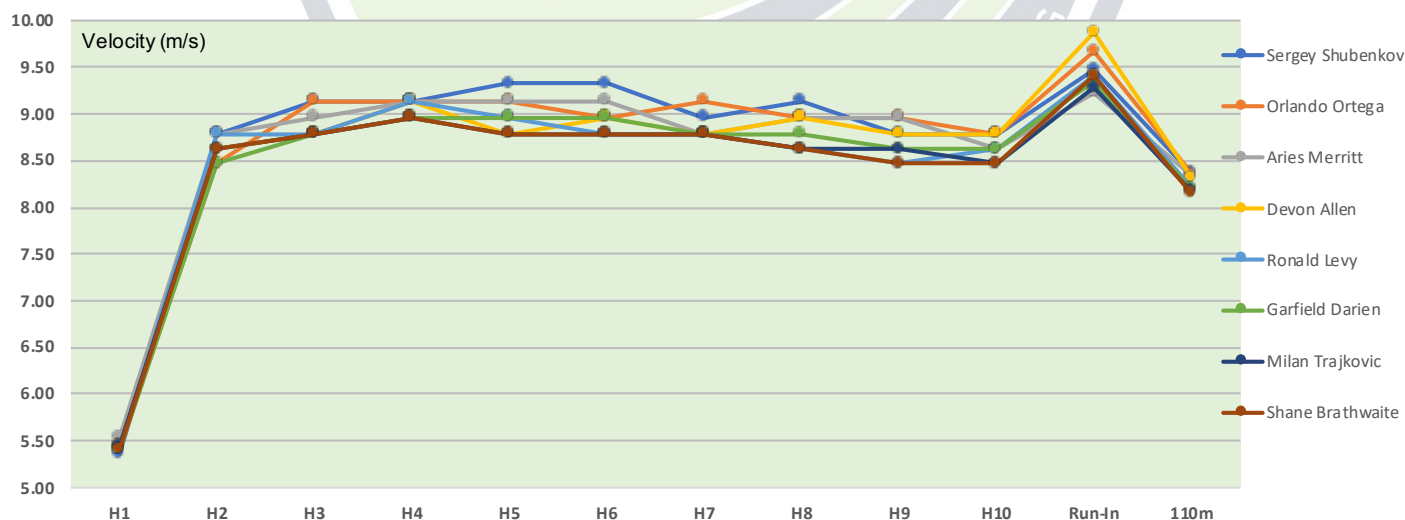
110m Hurdles

Date: 2017.09.01

Wind: 0.5 m/s

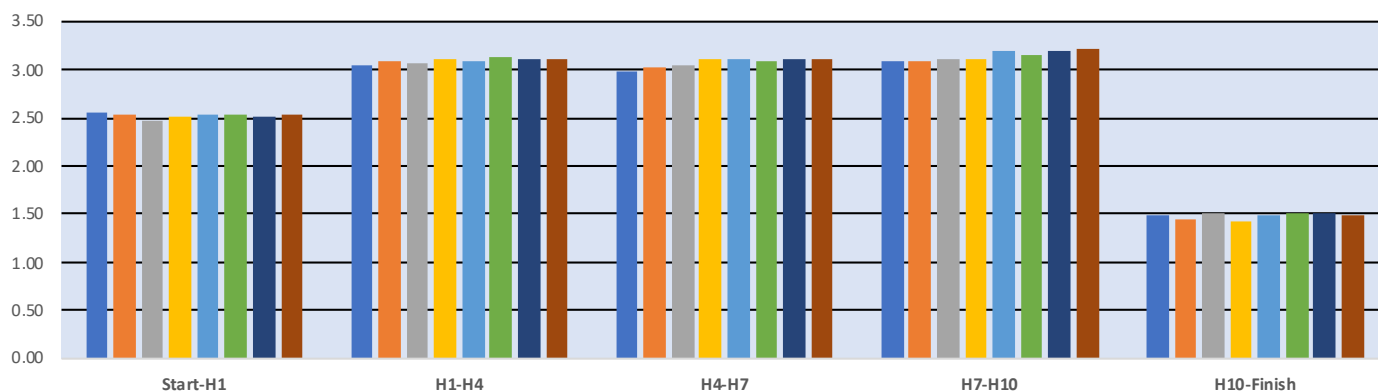
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Shubenkov, Sergey (ANA) (1990)	time		2.56	3.60	4.60	5.60	6.58	7.56	8.58	9.58	10.62	11.66		13.14	5 / 1			
	reaction time	0.146														3.04	2.98	3.08
	interval		7 steps	1.04	1.00	1.00	0.98	0.98	1.02	1.00	1.04	1.04	1.48			9.02	9.20	8.90
Ortega, Orlando (ESP) (1991)	time		2.54	3.62	4.62	5.62	6.62	7.64	8.64	9.66	10.68	11.72		13.17	7 / 2			
	reaction time	0.102														3.08	3.02	3.08
	interval		7 steps	1.08	1.00	1.00	1.00	1.02	1.00	1.02	1.02	1.04	1.45			8.90	9.08	8.90
Merritt, Aries (USA) (1985)	time		2.48	3.52	4.54	5.54	6.54	7.54	8.58	9.60	10.62	11.68		13.20	6 / 3			
	reaction time	0.133														3.06	3.04	3.10
	interval		7 steps	1.04	1.02	1.00	1.00	1.00	1.04	1.02	1.02	1.06	1.52			8.96	9.02	8.85
Allen, Devon (USA) (1994)	time		2.52	3.58	4.62	5.62	6.66	7.68	8.72	9.74	10.78	11.82		13.24	4 / 4			
	reaction time	0.122														3.10	3.10	3.10
	interval			1.06	1.04	1.00	1.04	1.02	1.04	1.02	1.04	1.04	1.42			8.85	8.85	8.85
Levy, Ronald (JAM) (1992)	time		2.54	3.58	4.62	5.62	6.64	7.68	8.72	9.78	10.86	11.92		13.41	8 / 5			
	reaction time	0.108														3.08	3.10	3.20
	interval		7 steps	1.04	1.04	1.00	1.02	1.04	1.04	1.06	1.08	1.06	1.49			8.90	8.85	8.57
Darien, Garfield (FRA) (1987)	time		2.54	3.62	4.66	5.68	6.70	7.72	8.76	9.80	10.86	11.92		13.42	9 / 6			
	reaction time	0.138														3.14	3.08	3.16
	interval		7 steps	1.08	1.04	1.02	1.02	1.02	1.04	1.04	1.06	1.06	1.50			8.73	8.90	8.68
Trajkovic, Milan (CYP) (1992)	time		2.52	3.58	4.62	5.64	6.68	7.72	8.76	9.82	10.88	11.96		13.47	2 / 7			
	reaction time	0.142														3.12	3.12	3.20
	interval		7 steps	1.06	1.04	1.02	1.04	1.04	1.04	1.06	1.06	1.08	1.51			8.79	8.79	8.57
Brathwaite, Shane (BAR) (1990)	time		2.54	3.60	4.64	5.66	6.70	7.74	8.78	9.84	10.92	12.00		13.49	3 / 8			
	reaction time	0.141														3.12	3.12	3.22
	interval		7 steps	1.06	1.04	1.02	1.04	1.04	1.04	1.06	1.08	1.08	1.49			8.79	8.79	8.52
	velocity		5.40	8.79	8.79	9.14	8.96	8.79	8.79	8.62	8.46	8.62	9.41	8.20				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=D4NI2PQk42I>

2017 Müller Grand Prix (Birmingham, GBR) (TV Analysis)

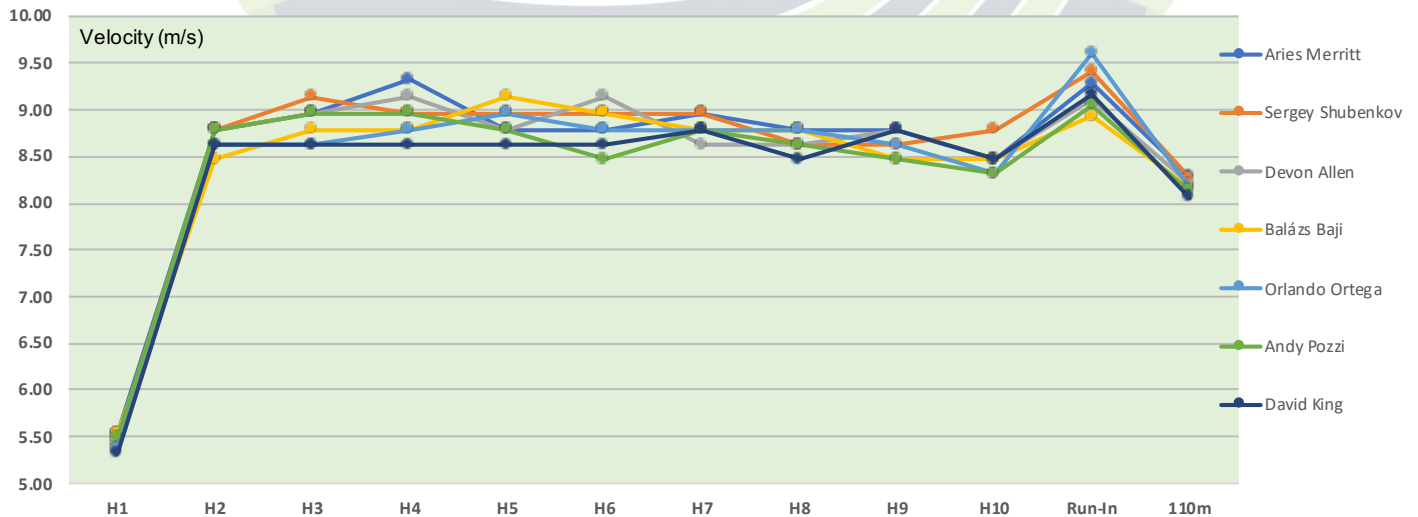
110m Hurdles

Date: 2017.08.20

Wind: -0.6 m/s

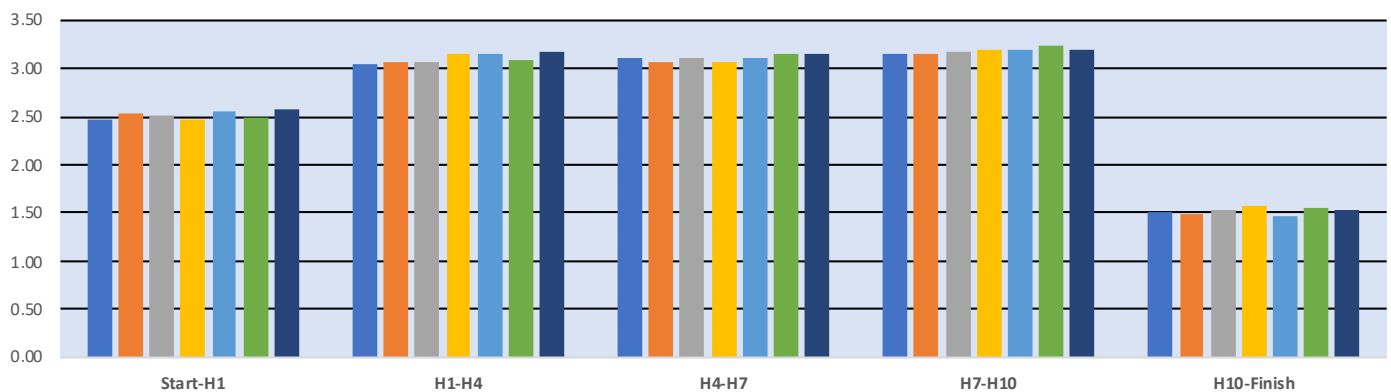
FINAL

			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		2.48	3.52	4.54	5.52	6.56	7.60	8.62	9.66	10.70	11.78		13.29	6 / 1			
	reaction time	0.127														3.04	3.10	3.16
	interval		7 steps	1.04	1.02	0.98	1.04	1.04	1.02	1.04	1.04	1.08	1.51			9.02	8.85	8.68
Shubenkov, Sergey (ANA) (1990)	time		2.54	3.58	4.58	5.60	6.62	7.64	8.66	9.72	10.78	11.82		13.31	7 / 2			
	reaction time	0.133														3.06	3.06	3.16
	interval		7 steps	1.04	1.00	1.02	1.02	1.02	1.02	1.06	1.06	1.04	1.49			8.96	8.96	8.68
Allen, Devon (USA) (1994)	time		2.52	3.56	4.58	5.58	6.62	7.62	8.68	9.74	10.78	11.86		13.40	9 / 3			
	reaction time	0.119														3.06	3.10	3.18
	interval		7 steps	1.04	1.02	1.00	1.04	1.00	1.06	1.06	1.04	1.08	1.54			8.96	8.85	8.62
Baji, Balázs (HUN) (1989)	time		2.48	3.56	4.60	5.64	6.64	7.66	8.70	9.74	10.82	11.90		13.47	8 / 4			
	reaction time	0.132														3.16	3.06	3.20
	interval		7 steps	1.08	1.04	1.04	1.00	1.02	1.04	1.04	1.08	1.08	1.57			8.68	8.96	8.57
Ortega, Orlando (ESP) (1991)	time		2.56	3.62	4.68	5.72	6.74	7.78	8.82	9.86	10.92	12.02		13.48	4 / 5			
	reaction time	0.140														3.16	3.10	3.20
	interval		7 steps	1.06	1.06	1.04	1.02	1.04	1.04	1.04	1.06	1.10	1.46			8.68	8.85	8.57
Pozzi, Andy (GBR) (1992)	time		2.50	3.54	4.56	5.58	6.62	7.70	8.74	9.80	10.88	11.98		13.53	3 / 6			
	reaction time	0.119														3.08	3.16	3.24
	interval		7 steps	1.04	1.02	1.02	1.04	1.08	1.04	1.06	1.08	1.10	1.55			8.90	8.68	8.46
King, David (GBR) (19940)	time		2.58	3.64	4.70	5.76	6.82	7.88	8.92	10.00	11.04	12.12		13.65	1 / 7			
	reaction time	0.138														3.18	3.16	3.20
	interval		7 steps	1.06	1.06	1.06	1.06	1.06	1.04	1.08	1.04	1.08	1.53			8.62	8.68	8.57
	velocity		5.53	8.79	8.96	9.33	8.79	8.79	8.96	8.79	8.79	8.46	9.28	8.28				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=PpQY4peslYk>

2017 IAAF World Championships (London, GBR)

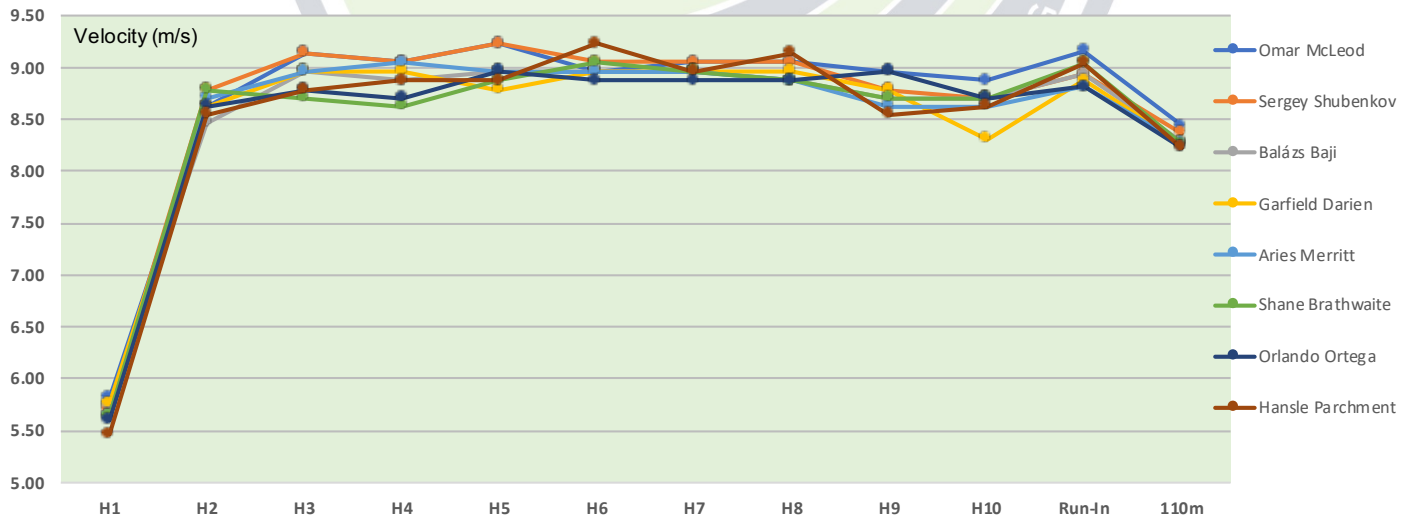
110m Hurdles

Date: 2017.08.07

Wind: 0.0 m/s

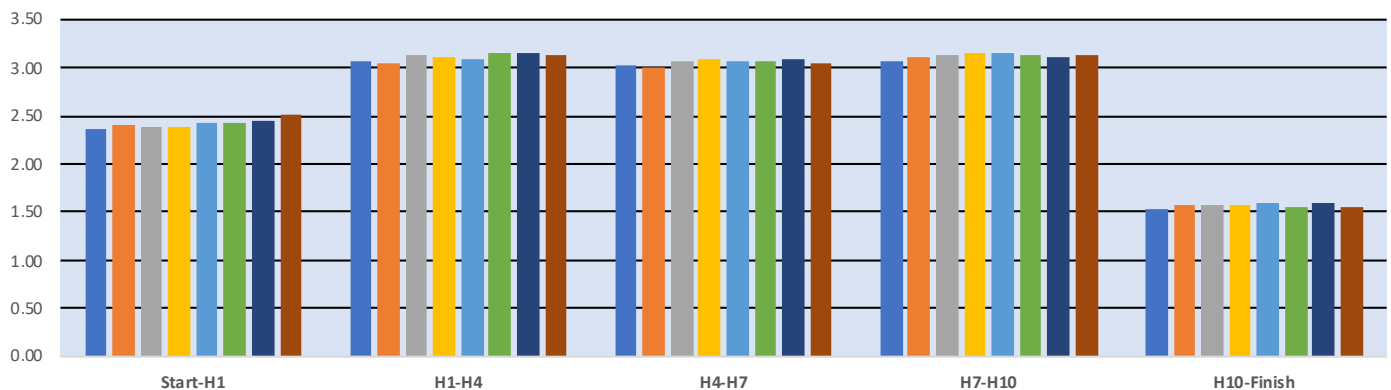
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
McLeod, Omar (JAM) (1994)	time		2.36	3.42	4.42	5.43	6.42	7.44	8.45	9.46	10.48	11.51		13.04	4 / 1			
	reaction time	0.123											1.53			3.07	3.02	3.06
	interval			1.06	1.00	1.01	0.99	1.02	1.01	1.01	1.02	1.03				8.93	9.08	8.96
Shubenkov, Sergey (ANA) (1990)	time		2.41	3.45	4.45	5.46	6.45	7.46	8.47	9.48	10.52	11.57		13.14	2 / 2			
	reaction time	0.132											1.57			3.05	3.01	3.10
	interval		7 steps	1.04	1.00	1.01	0.99	1.01	1.01	1.01	1.04	1.05				8.99	9.11	8.85
Baji, Balázs (HUN) (1989)	time		2.39	3.47	4.49	5.52	6.54	7.56	8.58	9.61	10.66	11.71		13.28	5 / 3			
	reaction time	0.122											1.57			3.13	3.06	3.13
	interval			1.08	1.02	1.03	1.02	1.02	1.02	1.03	1.05	1.05				8.76	8.96	8.76
Darien, Garfield (FRA) (1987)	time		2.38	3.44	4.46	5.48	6.52	7.54	8.56	9.58	10.62	11.72		13.30	6 / 4			
	reaction time	0.115											1.58			3.10	3.08	3.16
	interval		7 steps	1.06	1.02	1.02	1.04	1.02	1.02	1.02	1.04	1.10				8.85	8.90	8.68
Merritt, Aries (USA) (1985)	time		2.43	3.48	4.50	5.51	6.53	7.55	8.57	9.60	10.66	11.72		13.31	9 / 5			
	reaction time	0.163											1.59			3.08	3.06	3.15
	interval		7 steps	1.05	1.02	1.01	1.02	1.02	1.02	1.03	1.06	1.06				8.90	8.96	8.70
Brathwaite, Shane (BAR) (1990)	time		2.43	3.47	4.52	5.58	6.61	7.62	8.64	9.67	10.72	11.77		13.32	7 / 6			
	reaction time	0.169											1.55			3.15	3.06	3.13
	interval		7 steps	1.04	1.05	1.06	1.03	1.01	1.02	1.03	1.05	1.05				8.70	8.96	8.76
Ortega, Orlando (ESP) (1991)	time		2.45	3.51	4.55	5.60	6.62	7.65	8.68	9.71	10.73	11.78		13.37	3 / 7			
	reaction time	0.140											1.59			3.15	3.08	3.10
	interval			1.06	1.04	1.05	1.02	1.03	1.03	1.03	1.02	1.05				8.70	8.90	8.85
Parchment, Hansle (JAM) (1990)	time		2.51	3.58	4.62	5.65	6.68	7.67	8.69	9.69	10.76	11.82		13.37	8 / 8			
	reaction time	0.145											1.55			3.14	3.04	3.13
	interval		7 steps	1.07	1.04	1.03	1.03	0.99	1.02	1.00	1.07	1.06				8.73	9.02	8.76
	velocity		5.81	8.62	9.14	9.05	9.23	8.96	9.05	9.05	8.96	8.87	9.16	8.44				



Time Intervals (s)

Hurdle Phases



Source: Pollitt, L., Walker, J., Tucker, C., Bissas, A., & Merlino, S. (2018). Biomechanical report for the IAAF world championships: London 2017: Men's 110m Hurdles. Leeds Beckett University, London, GBR. p12-13.

<https://www.worldathletics.org/about-iaaf/documents/research-centre>

2017 IAAF World Championships (London, GBR)

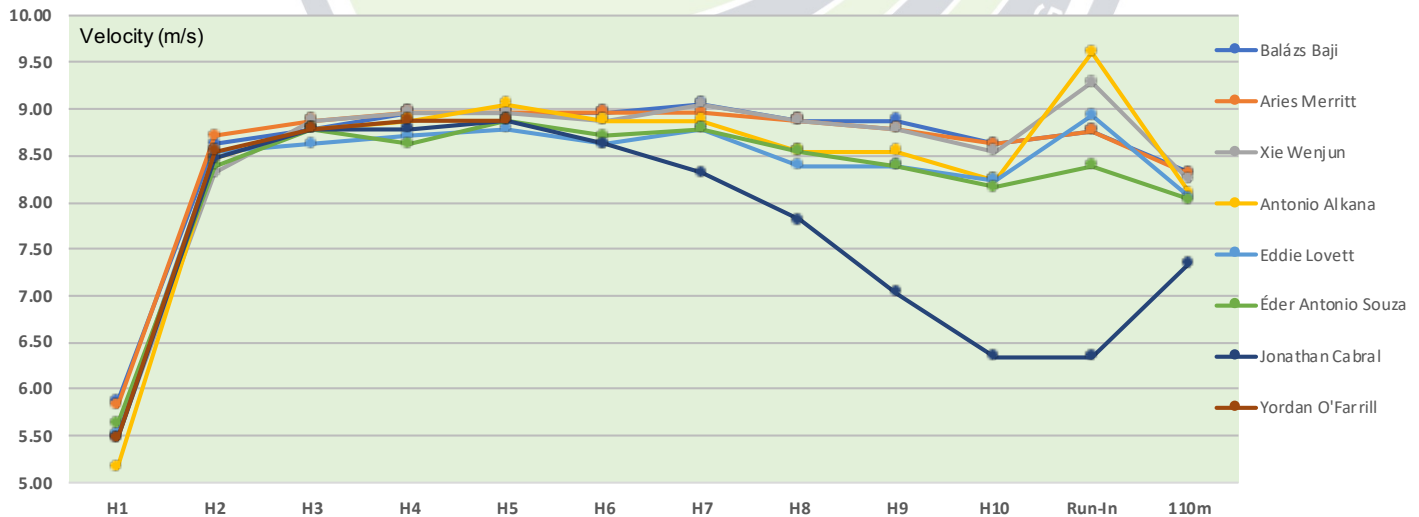
110m Hurdles

Date: 2017.08.06

Wind: 0.3 m/s

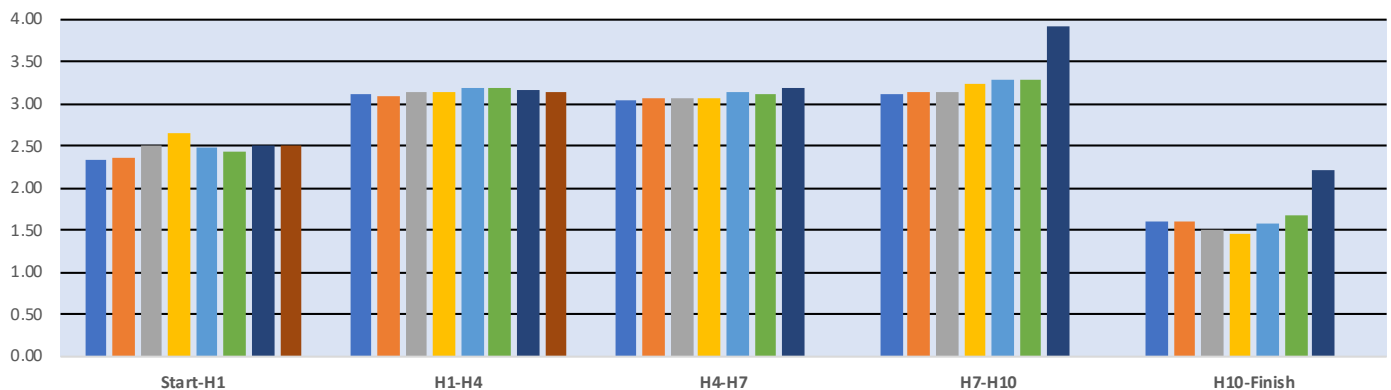
Semi-Final 3

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Baji, Balázs (HUN) (1989)	time		2.34	3.40	4.44	5.46	6.48	7.50	8.51	9.54	10.57	11.63		13.23	5 / 1			
	reaction time	0.120														3.12	3.05	3.12
	interval			1.06	1.04	1.02	1.02	1.02	1.01	1.03	1.03	1.06	1.60			8.79	8.99	8.79
	velocity		5.86	8.62	8.79	8.96	8.96	8.96	9.05	8.87	8.87	8.62	8.76	8.31				
Merritt, Aries (USA) (1985)	time		2.36	3.41	4.44	5.46	6.48	7.50	8.52	9.55	10.59	11.65		13.25	7 / 2			
	reaction time	0.117														3.10	3.06	3.13
	interval		7 steps	1.05	1.03	1.02	1.02	1.02	1.02	1.03	1.04	1.06	1.60			8.85	8.96	8.76
	velocity		5.81	8.70	8.87	8.96	8.96	8.96	8.96	8.87	8.79	8.62	8.76	8.30				
Xie Wenjun (CHN) (1990)	time		2.50	3.60	4.63	5.65	6.67	7.70	8.71	9.74	10.78	11.85		13.36	4 / 3			
	reaction time	0.171														3.15	3.06	3.14
	interval			1.10	1.03	1.02	1.02	1.03	1.01	1.03	1.04	1.07	1.51			8.70	8.96	8.73
	velocity		5.49	8.31	8.87	8.96	8.96	8.87	9.05	8.87	8.79	8.54	9.28	8.23				
Alkana, Antonio (RSA) (1990)	time		2.66	3.74	4.78	5.81	6.82	7.85	8.88	9.95	11.02	12.13		13.59	9 / 4			
	reaction time	0.230														3.15	3.07	3.25
	interval			1.08	1.04	1.03	1.01	1.03	1.03	1.07	1.11	1.11	1.46			8.70	8.93	8.44
	velocity		5.16	8.46	8.79	8.87	9.05	8.87	8.87	8.54	8.54	8.23	9.60	8.09				
Lovett, Eddie (ISV) (1992)	time		2.49	3.56	4.62	5.67	6.71	7.77	8.81	9.90	10.99	12.10		13.67	6 / 5			
	reaction time	0.180														3.18	3.14	3.29
	interval			1.07	1.06	1.05	1.04	1.06	1.04	1.09	1.09	1.11	1.57			8.62	8.73	8.33
	velocity		5.51	8.54	8.62	8.70	8.79	8.62	8.79	8.39	8.39	8.23	8.93	8.05				
Souza, Éder Antonio (BRA) (1986)	time		2.44	3.53	4.57	5.63	6.66	7.71	8.75	9.82	10.91	12.03		13.70	3 / 6			
	reaction time	0.133														3.19	3.12	3.28
	interval			1.09	1.04	1.06	1.03	1.05	1.04	1.07	1.09	1.12	1.67			8.60	8.79	8.36
	velocity		5.62	8.39	8.79	8.62	8.87	8.70	8.79	8.54	8.39	8.16	8.40	8.03				
Cabral, Johnathan (CAN) (1992)	time		2.51	3.59	4.63	5.67	6.70	7.76	8.86	10.03	11.33	12.77		14.98	8 / 7			
	reaction time	0.174														3.16	3.19	3.91
	interval			1.08	1.04	1.04	1.03	1.06	1.10	1.17	1.30	1.44	2.21			8.68	8.60	7.01
	velocity		5.47	8.46	8.79	8.79	8.87	8.62	8.31	7.81	7.03	6.35	6.34	7.34				
O'Farrill, Yordan (CUB) (1993)	time		2.51	3.58	4.62	5.65	6.68							dnf	2 / --			
	reaction time	0.147														3.14		
	interval			1.07	1.04	1.03	1.03									8.73		
	velocity		5.47	8.54	8.79	8.87	8.87											



Time Intervals (s)

Hurdle Phases



Source: Pollitt, L., Walker, J., Tucker, C., Bissas, A., & Merlino, S. (2018). Biomechanical report for the IAAF world championships: London 2017: Men's 110m Hurdles. Leeds Beckett University, London, GBR. p12-13.

<https://www.worldathletics.org/about-iaaf/documents/research-centre>

2017 IAAF World Championships (London, GBR)

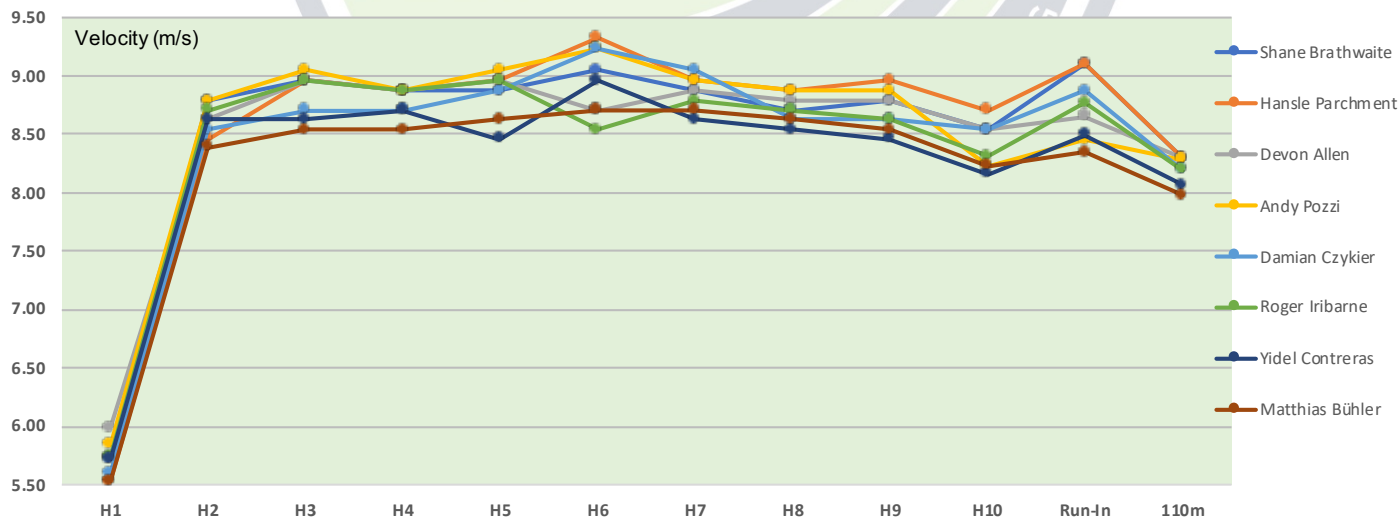
110m Hurdles

Date: 2017.08.06

Wind: 0.6 m/s

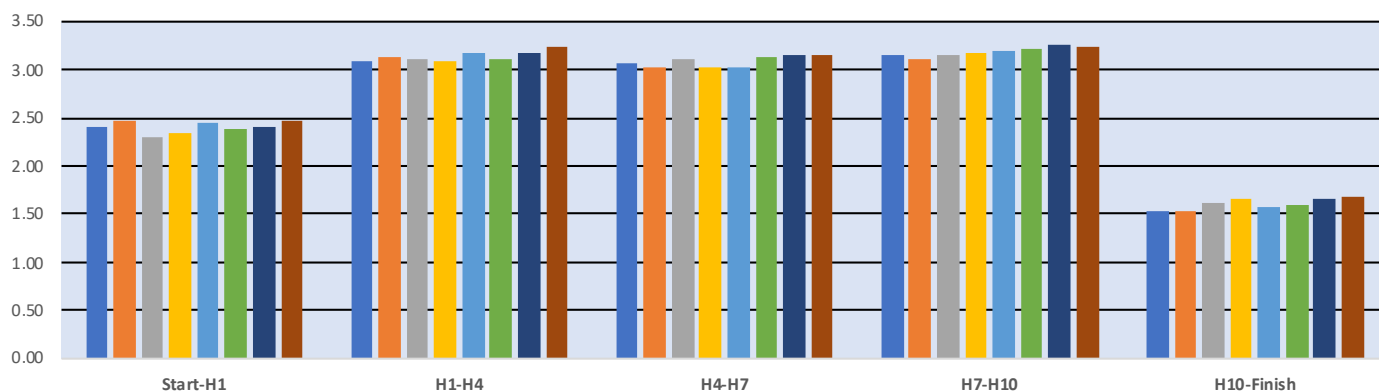
Semi-Final 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Brathwaite, Shane (BAR) (1990)	time	2.40	3.44	4.46	5.49	6.52	7.53	8.56	9.61	10.65	11.72		13.26	5 / 1			
	reaction time	0.179													3.09	3.07	3.16
	interval	7 steps	1.04	1.02	1.03	1.03	1.01	1.03	1.05	1.04	1.07	1.54			8.87	8.93	8.68
Parchment, Hansle (JAM) (1990)	time	2.48	3.56	4.58	5.61	6.63	7.61	8.63	9.66	10.68	11.73		13.27	7 / 2			
	reaction time	0.181													3.13	3.02	3.10
	interval	7 steps	1.08	1.02	1.03	1.02	0.98	1.02	1.03	1.02	1.05	1.54			8.76	9.08	8.85
Allen, Devon (USA) (1994)	time	2.29	3.35	4.37	5.40	6.42	7.47	8.50	9.54	10.58	11.65		13.27	4 / 3			
	reaction time	0.126													3.11	3.10	3.15
	interval		1.06	1.02	1.03	1.02	1.05	1.03	1.04	1.04	1.07	1.62			8.82	8.85	8.70
Pozzi, Andy (GBR) (1992)	time	2.35	3.39	4.40	5.43	6.44	7.43	8.45	9.48	10.51	11.62		13.28	6 / 4			
	reaction time	0.137													3.08	3.02	3.17
	interval	7 steps	1.04	1.01	1.03	1.01	0.99	1.02	1.03	1.03	1.11	1.66			8.90	9.08	8.65
Czykier, Damian (POL) (1992)	time	2.45	3.52	4.57	5.62	6.65	7.64	8.65	9.71	10.77	11.84		13.42	9 / 5			
	reaction time	0.183													3.17	3.03	3.19
	interval		1.07	1.05	1.05	1.03	0.99	1.01	1.06	1.06	1.07	1.58			8.65	9.05	8.60
Iribarne, Roger (CUB) (1996)	time	2.39	3.44	4.46	5.49	6.51	7.58	8.62	9.67	10.73	11.83		13.43	3 / 6			
	reaction time	0.175													3.10	3.13	3.21
	interval		1.05	1.02	1.03	1.02	1.07	1.04	1.05	1.06	1.10	1.60			8.85	8.76	8.54
Contreras, Yidiel (ESP) (1992)	time	2.40	3.46	4.52	5.57	6.65	7.67	8.73	9.80	10.88	12.00		13.65	8 / 7			
	reaction time	0.157													3.17	3.16	3.27
	interval		1.06	1.06	1.05	1.08	1.02	1.06	1.07	1.08	1.12	1.65			8.65	8.68	8.39
Bühler, Matthias (GER) (1986)	time	2.48	3.57	4.64	5.71	6.77	7.82	8.87	9.93	11.00	12.11		13.79	2 / 8			
	reaction time	0.158													3.23	3.16	3.24
	interval		1.09	1.07	1.07	1.06	1.05	1.05	1.06	1.07	1.11	1.68			8.49	8.68	8.46
	velocity	5.72	8.79	8.96	8.87	8.87	9.05	8.87	8.70	8.79	8.54	9.10	8.30				



Time Intervals (s)

Hurdle Phases



Source: Pollitt, L., Walker, J., Tucker, C., Bissas, A., & Merlino, S. (2018). Biomechanical report for the IAAF world championships: London 2017: Men's 110m Hurdles. Leeds Beckett University, London, GBR. p12-13.

<https://www.worldathletics.org/about-iaaf/documents/research-centre>

2017 IAAF World Championships (London, GBR)

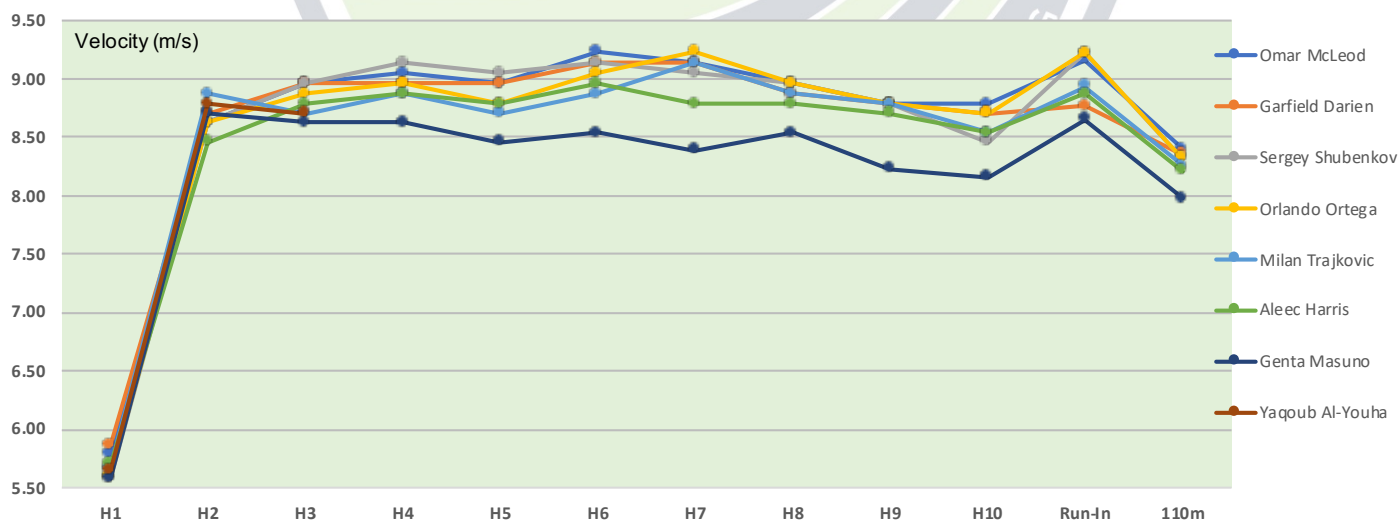
110m Hurdles

Date: 2017.08.06

Wind: 0.2 m/s

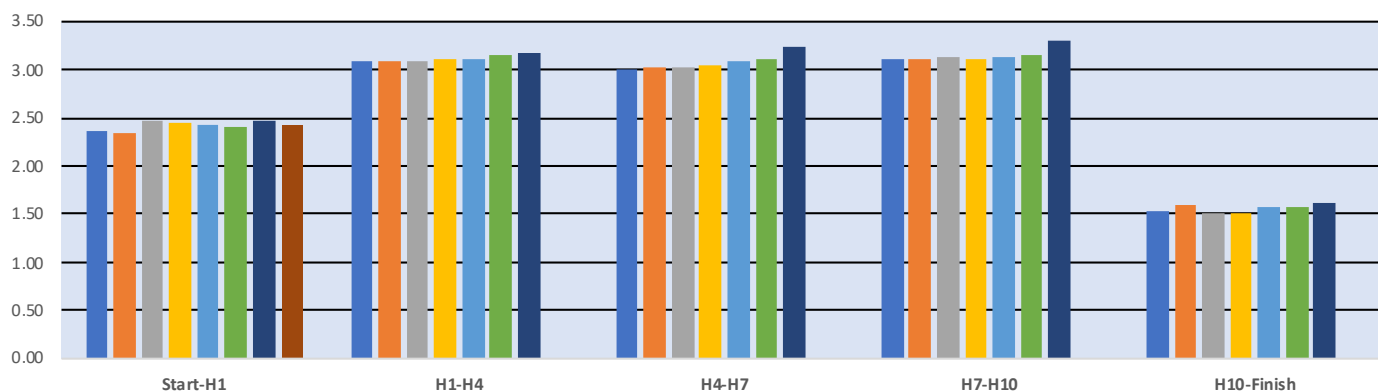
Semi-Final 1

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
McLeod, Omar (JAM) (1994)	time		2.37	3.43	4.45	5.46	6.48	7.47	8.47	9.49	10.53	11.57		13.10	7 / 1			
	reaction time	0.135														3.09	3.01	3.10
	interval			1.06	1.02	1.01	1.02	0.99	1.00	1.02	1.04	1.04	1.53			8.87	9.11	8.85
Darien, Garfield (FRA) (1987)	time		2.34	3.39	4.41	5.43	6.45	7.45	8.45	9.48	10.52	11.57		13.17	6 / 2			
	reaction time	0.125														3.09	3.02	3.12
	interval		7 steps	1.05	1.02	1.02	1.02	1.00	1.00	1.03	1.04	1.05	1.60			8.87	9.08	8.79
Shubenkov, Sergey (ANA) (1990)	time		2.46	3.52	4.54	5.54	6.55	7.55	8.56	9.58	10.62	11.70		13.22	9 / 3			
	reaction time	0.160														3.08	3.02	3.14
	interval		7 steps	1.06	1.02	1.00	1.01	1.00	1.01	1.02	1.04	1.08	1.52			8.90	9.08	8.73
Ortega, Orlando (ESP) (1991)	time		2.45	3.51	4.54	5.56	6.60	7.61	8.60	9.62	10.66	11.71		13.23	4 / 4			
	reaction time	0.148														3.11	3.04	3.11
	interval			1.06	1.03	1.02	1.04	1.01	0.99	1.02	1.04	1.05	1.52			8.82	9.02	8.82
Trajkovic, Milan (CYP) (1992)	time		2.42	3.45	4.50	5.53	6.58	7.61	8.61	9.64	10.68	11.75		13.32	5 / 5			
	reaction time	0.146														3.11	3.08	3.14
	interval		7 steps	1.03	1.05	1.03	1.05	1.03	1.00	1.03	1.04	1.07	1.57			8.82	8.90	8.73
Harris, Aleec (USA) (1990)	time		2.41	3.49	4.53	5.56	6.60	7.62	8.66	9.70	10.75	11.82		13.40	8 / 6			
	reaction time	0.140														3.15	3.10	3.16
	interval			1.08	1.04	1.03	1.04	1.02	1.04	1.04	1.05	1.07	1.58			8.70	8.85	8.68
Masuno, Genta (JPN) (1993)	time		2.46	3.51	4.57	5.63	6.71	7.78	8.87	9.94	11.05	12.17		13.79	2 / 7			
	reaction time	0.160														3.17	3.24	3.30
	interval			1.05	1.06	1.06	1.08	1.07	1.09	1.07	1.11	1.12	1.62			8.65	8.46	8.31
Al-Youha, Yaqoub (KUW) (1993)	time		2.43	3.47	4.52										dnf			
	reaction time	0.152																
	interval			1.04	1.05													
	velocity		5.65	8.79	8.70													



Time Intervals (s)

Hurdle Phases



Source: Pollitt, L., Walker, J., Tucker, C., Bissas, A., & Merlino, S. (2018). Biomechanical report for the IAAF world championships: London 2017: Men's 110m Hurdles. Leeds Beckett University, London, GBR. p12-13.

<https://www.worldathletics.org/about-iaaf/documents/research-centre>

2017 Müller's Anniversary Games (London, GBR) (TV Analysis)

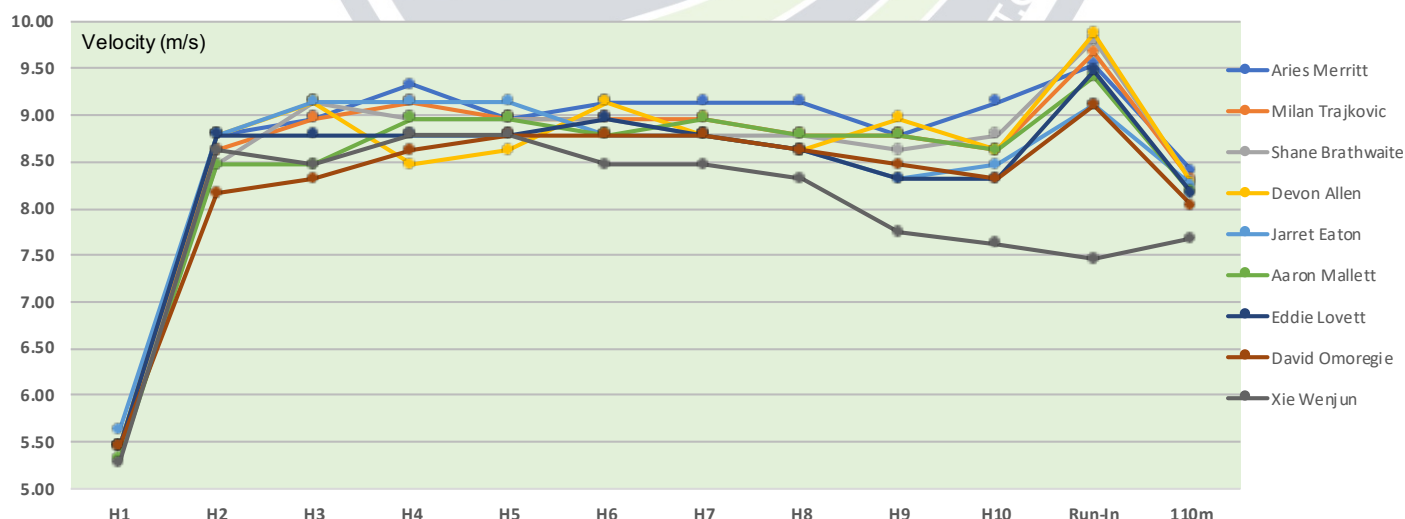
110m Hurdles

Date: 2017.07.09

Wind: 0.0 m/s

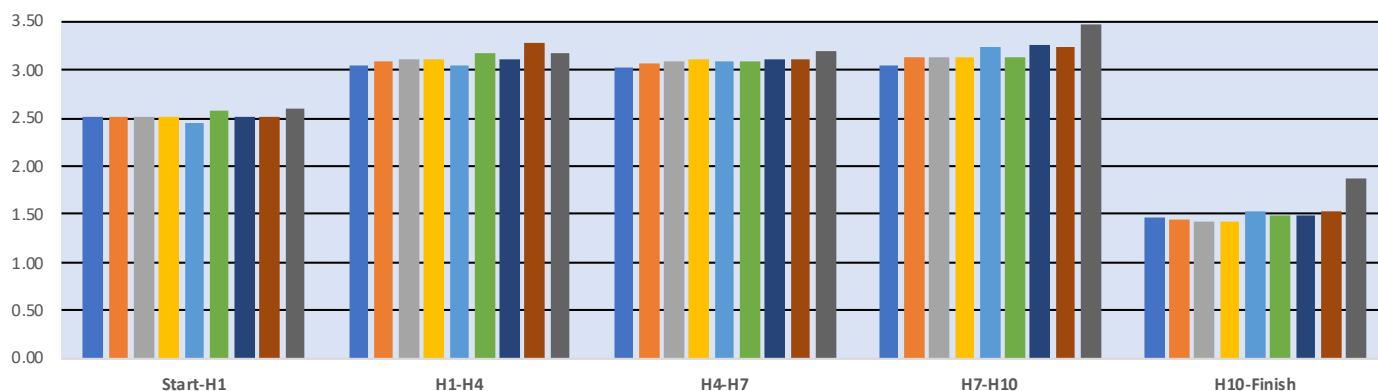
FINAL

			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		2.52	3.56	4.58	5.56	6.58	7.58	8.58	9.58	10.62	11.62		13.09	4 / 1			
	reaction time	0.134	7 steps	1.04	1.02	0.98	1.02	1.00	1.00	1.00	1.04	1.00	1.47			3.04	3.02	3.04
	interval velocity		5.44	8.79	8.96	9.33	8.96	9.14	9.14	9.14	8.79	9.14	9.54	8.40		9.02	9.08	9.02
Trajkovic, Milan (CYP) (1992)	time		2.52	3.58	4.60	5.60	6.62	7.64	8.66	9.70	10.74	11.80		13.25	5 / 2			
	reaction time	0.157	7 steps	1.06	1.02	1.00	1.02	1.02	1.02	1.04	1.04	1.06	1.45	NR PB		3.08	3.06	3.14
	interval velocity		5.44	8.62	8.96	9.14	8.96	8.96	8.96	8.79	8.79	8.62	9.67	8.30		8.90	8.96	8.73
Brathwaite, Shane (BAR) (1990)	time		2.52	3.60	4.60	5.62	6.64	7.66	8.70	9.74	10.80	11.84		13.27	8 / 3			
	reaction time	0.135	7 steps	1.08	1.00	1.02	1.02	1.02	1.04	1.04	1.06	1.04	1.43			3.10	3.08	3.14
	interval velocity		5.44	8.46	9.14	8.96	8.96	8.96	8.79	8.79	8.62	8.79	9.80	8.29		8.85	8.90	8.73
Allen, Devon (USA) (1994)	time		2.52	3.56	4.56	5.64	6.70	7.70	8.74	9.80	10.82	11.88		13.30	6 / 4			
	reaction time	0.104		1.04	1.00	1.08	1.06	1.00	1.04	1.06	1.02	1.06	1.42			3.12	3.10	3.14
	interval velocity		5.44	8.79	9.14	8.46	8.62	9.14	8.79	8.62	8.96	8.62	9.87	8.27		8.79	8.85	8.73
Eaton, Jarret (USA) (1989)	time		2.44	3.48	4.48	5.48	6.48	7.52	8.56	9.62	10.72	11.80		13.34	9 / 5			
	reaction time	0.125	7 steps	1.04	1.00	1.00	1.00	1.04	1.04	1.06	1.10	1.08	1.54			3.04	3.08	3.24
	interval velocity		5.62	8.79	9.14	9.14	9.14	8.79	8.79	8.62	8.31	8.46	9.10	8.25		9.02	8.90	8.46
Mallett, Aaron (USA) (1994)	time		2.58	3.66	4.74	5.76	6.78	7.82	8.84	9.88	10.92	11.98		13.47	1 / 6			
	reaction time	0.198	7 steps	1.08	1.08	1.02	1.02	1.04	1.02	1.04	1.04	1.06	1.49			3.18	3.08	3.14
	interval velocity		5.32	8.46	8.46	8.96	8.96	8.79	8.96	8.79	8.79	8.62	9.41	8.17		8.62	8.90	8.73
Lovett, Eddie (ISV) (1992)	time		2.52	3.56	4.60	5.64	6.68	7.70	8.74	9.80	10.90	12.00		13.48	3 / 7			
	reaction time	0.144	7 steps	1.04	1.04	1.04	1.04	1.02	1.04	1.06	1.10	1.10	1.48			3.12	3.10	3.26
	interval velocity		5.44	8.79	8.79	8.79	8.79	8.96	8.79	8.62	8.31	8.31	9.47	8.16		8.79	8.85	8.41
Omoregie, David (GBR) (1995)	time		2.52	3.64	4.74	5.80	6.84	7.88	8.92	9.98	11.06	12.16		13.70	7 / 8			
	reaction time	0.127		1.12	1.10	1.06	1.04	1.04	1.04	1.06	1.08	1.10	1.54			3.28	3.12	3.24
	interval velocity		5.44	8.16	8.31	8.62	8.79	8.79	8.79	8.62	8.46	8.31	9.10	8.03		8.36	8.79	8.46
Xie Wenjun (CHN) (1990)	time		2.60	3.66	4.74	5.78	6.82	7.90	8.98	10.08	11.26	12.46		14.34	2 / 9			
	reaction time	0.157		1.06	1.08	1.04	1.04	1.08	1.08	1.10	1.18	1.20	1.88			3.18	3.20	3.48
	interval velocity		5.28	8.62	8.46	8.79	8.79	8.46	8.46	8.31	7.75	7.62	7.46	7.67		8.62	8.57	7.88



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=1f_URX7IJYU

2017 István Gyulai Memorial (Székesfehérvár, HUN) (TV Analysis)

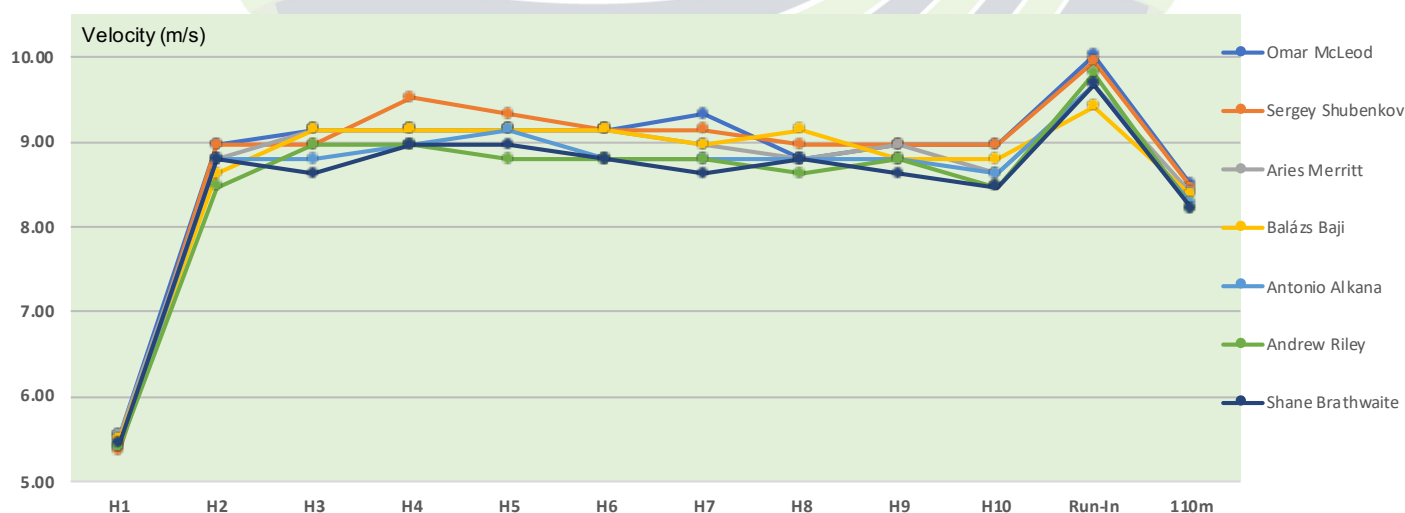
110m Hurdles

Date: 2017.07.04

Wind: 0.3 m/s

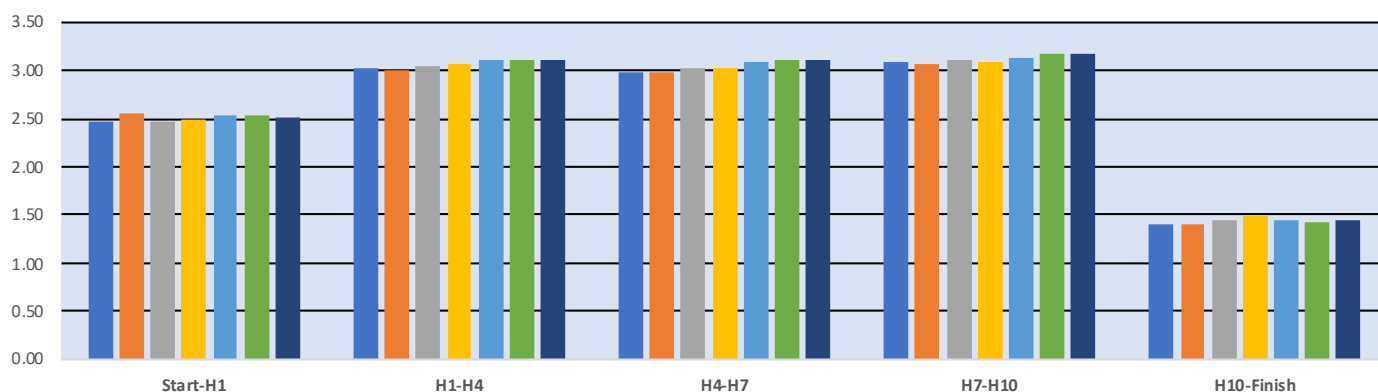
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
McLeod, Omar (JAM) (1994)	time	2.48	3.50	4.50	5.50	6.50	7.50	8.48	9.52	10.54	11.56		12.96	4 / 1			
	reaction time	0.138													3.02	2.98	3.08
	interval		1.02	1.00	1.00	1.00	1.00	0.98	1.04	1.02	1.02	1.40			9.08	9.20	8.90
	velocity	5.53	8.96	9.14	9.14	9.14	9.14	9.33	8.79	8.96	8.96	10.01	8.49				
Shubenkov, Sergey (ANA) (1990)	time	2.56	3.58	4.60	5.56	6.54	7.54	8.54	9.56	10.58	11.60		13.01	6 / 2			
	reaction time	0.177													3.00	2.98	3.06
	interval		7 steps 1.02	1.02	0.96	0.98	1.00	1.00	1.02	1.02	1.02	1.41			9.14	9.20	8.96
	velocity	5.36	8.96	8.96	9.52	9.33	9.14	9.14	8.96	8.96	8.96	9.94	8.46				
Merritt, Aries (USA) (1985)	time	2.48	3.52	4.52	5.52	6.52	7.52	8.54	9.58	10.60	11.66		13.11	3 / 3			
	reaction time	0.126													3.04	3.02	3.12
	interval		7 steps 1.04	1.00	1.00	1.00	1.00	1.02	1.04	1.02	1.06	1.45			9.02	9.08	8.79
	velocity	5.53	8.79	9.14	9.14	9.14	9.14	8.96	8.79	8.96	8.62	9.67	8.39				
Baji, Balázs (HUN) (1989)	time	2.50	3.56	4.56	5.56	6.56	7.56	8.58	9.58	10.62	11.66		13.15	2 / 4			
	reaction time	0.139													3.06	3.02	3.08
	interval		7 steps 1.06	1.00	1.00	1.00	1.00	1.02	1.00	1.04	1.04	1.49			8.96	9.08	8.90
	velocity	5.49	8.62	9.14	9.14	9.14	9.14	8.96	9.14	8.79	8.79	9.41	8.37				
Alkana, Antonio (RSA) (1990)	time	2.54	3.58	4.62	5.64	6.64	7.68	8.72	9.76	10.80	11.86		13.31	5 / 5			
	reaction time														3.10	3.08	3.14
	interval		1.04	1.04	1.02	1.00	1.04	1.04	1.04	1.04	1.06	1.45			8.85	8.90	8.73
	velocity	5.40	8.79	8.79	8.96	9.14	8.79	8.79	8.79	8.79	8.62	9.67	8.26				
Riley, Andrew (JAM) (1988)	time	2.54	3.62	4.64	5.66	6.70	7.74	8.78	9.84	10.88	11.96		13.39	1 / 6			
	reaction time	0.150													3.12	3.12	3.18
	interval		7 steps 1.08	1.02	1.02	1.04	1.04	1.04	1.06	1.04	1.08	1.43			8.79	8.79	8.62
	velocity	5.40	8.46	8.96	8.96	8.79	8.79	8.79	8.62	8.79	8.46	9.80	8.22				
Brathwaite, Shane (BAR) (1990)	time	2.52	3.56	4.62	5.64	6.66	7.70	8.76	9.80	10.86	11.94		13.39	7 / 7			
	reaction time	0.146													3.12	3.12	3.18
	interval		7 steps 1.04	1.06	1.02	1.02	1.04	1.06	1.04	1.06	1.08	1.45			8.79	8.79	8.62
	velocity	5.44	8.79	8.62	8.96	8.96	8.79	8.62	8.79	8.62	8.46	9.67	8.22				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=rwciBvykF7o>

2017 Meeting de Paris (Paris, FRA) (TV Analysis)

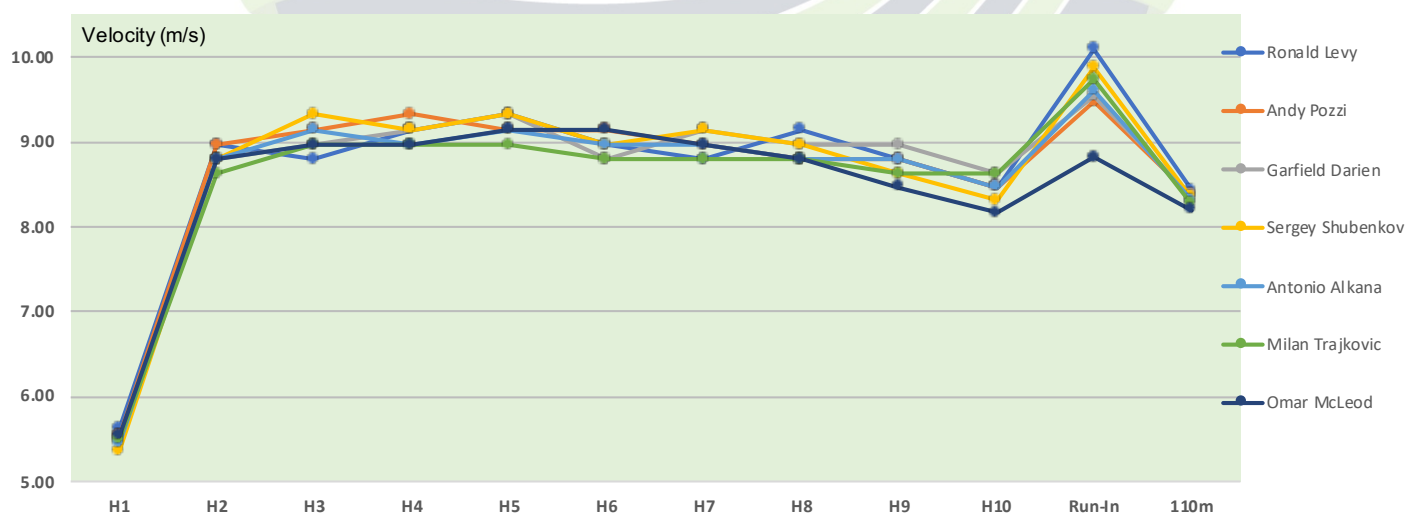
110m Hurdles

Date: 2017.07.01

Wind: -0.1 m/s

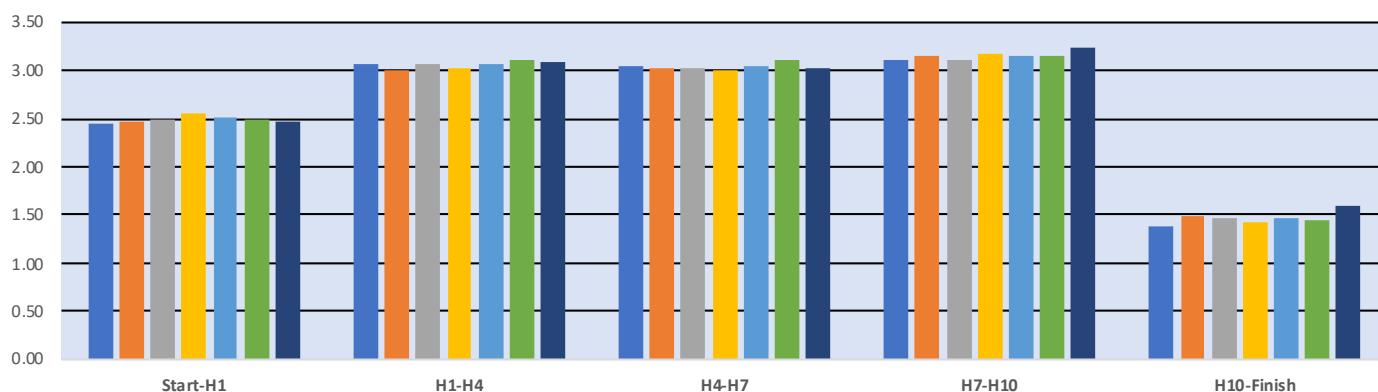
FINAL

			Final															
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Levy, Ronald (JAM) (1992)	time		2.44	3.46	4.50	5.50	6.48	7.50	8.54	9.54	10.58	11.66		13.05	8 / 1	3.06	3.04	3.12
	reaction time	0.133	7 steps	1.02	1.04	1.00	0.98	1.02	1.04	1.00	1.04	1.08	1.39	PB				
	velocity		5.62	8.96	8.79	9.14	9.33	8.96	8.79	9.14	8.79	8.46	10.09	8.43				
Pozzi, Andy (GBR) (1992)	time		2.48	3.50	4.50	5.48	6.48	7.48	8.50	9.54	10.58	11.66		13.14	3 / 2	3.00	3.02	3.16
	reaction time	0.107	7 steps	1.02	1.00	0.98	1.00	1.00	1.02	1.04	1.04	1.08	1.48	PB				
	velocity		5.53	8.96	9.14	9.33	9.14	9.14	8.96	8.79	8.79	8.46	9.47	8.37				
Darien, Garfield (FRA) (1987)	time		2.50	3.54	4.56	5.56	6.54	7.58	8.58	9.60	10.62	11.68		13.15	7 / 3	3.06	3.02	3.10
	reaction time	0.121	7 steps	1.04	1.02	1.00	0.98	1.04	1.00	1.02	1.02	1.06	1.47					
	velocity		5.49	8.79	8.96	9.14	9.33	8.79	9.14	8.96	8.96	8.62	9.54	8.37				
Shubenkov, Sergey (ANA) (1990)	time		2.56	3.60	4.58	5.58	6.56	7.58	8.58	9.60	10.66	11.76		13.18	4 / 4	3.02	3.00	3.18
	reaction time	0.125	7 steps	1.04	0.98	1.00	0.98	1.02	1.00	1.02	1.06	1.10	1.42					
	velocity		5.36	8.79	9.33	9.14	9.33	8.96	9.14	8.96	8.62	8.31	9.87	8.35				
Alkana, Antonio (RSA) (1990)	time		2.52	3.56	4.56	5.58	6.58	7.60	8.62	9.66	10.70	11.78		13.24	1 / 5	3.06	3.04	3.16
	reaction time	0.139		1.04	1.00	1.02	1.00	1.02	1.02	1.04	1.04	1.08	1.46					
	velocity		5.44	8.79	9.14	8.96	9.14	8.96	8.96	8.79	8.79	8.46	9.60	8.31				
Trajkovic, Milan (CYP) (1992)	time		2.50	3.56	4.58	5.60	6.62	7.66	8.70	9.74	10.80	11.86		13.30	2 / 6	3.10	3.10	3.16
	reaction time	0.142	7 steps	1.06	1.02	1.02	1.02	1.04	1.04	1.04	1.06	1.06	1.44					
	velocity		5.49	8.62	8.96	8.96	8.96	8.79	8.79	8.79	8.62	8.62	9.74	8.27				
McLeod, Omar (JAM) (1994)	time		2.48	3.52	4.54	5.56	6.56	7.56	8.58	9.62	10.70	11.82		13.41	5 / 7	3.08	3.02	3.24
	reaction time	0.122		1.04	1.02	1.02	1.00	1.00	1.02	1.04	1.08	1.12	1.59					
	velocity		5.53	8.79	8.96	8.96	9.14	9.14	8.96	8.79	8.46	8.16	8.82	8.20				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: https://www.youtube.com/watch?v=j7CXm15wV_A

2017 Golden Spike (Ostrava, CZE) (TV Analysis)

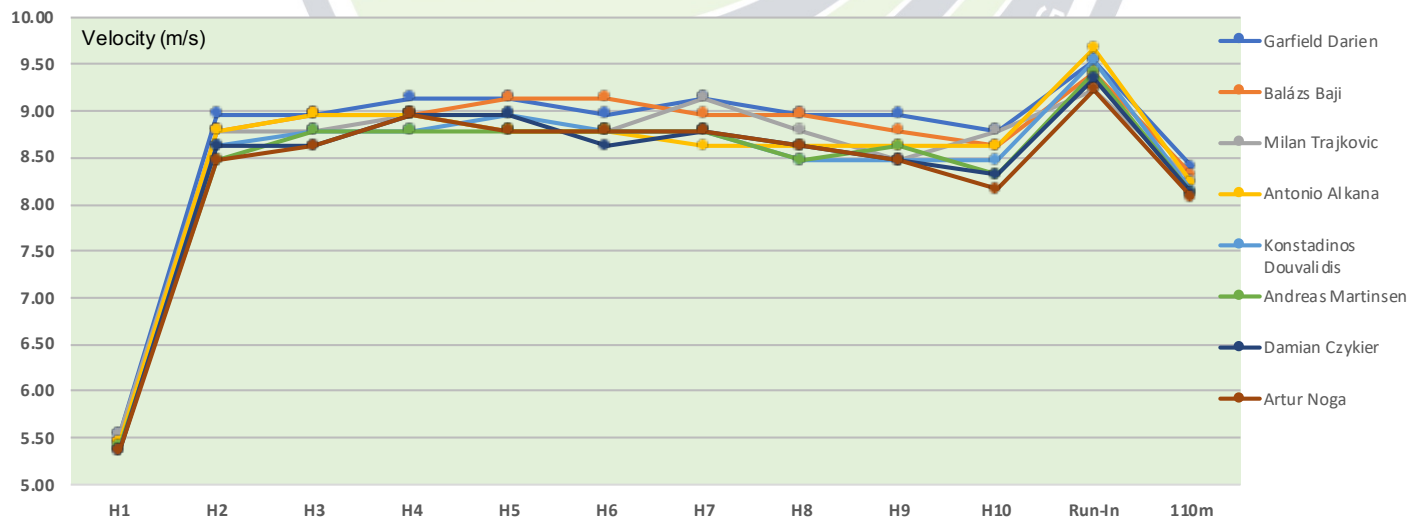
110m Hurdles

Date: 2017.06.28

Wind: 0.6 m/s

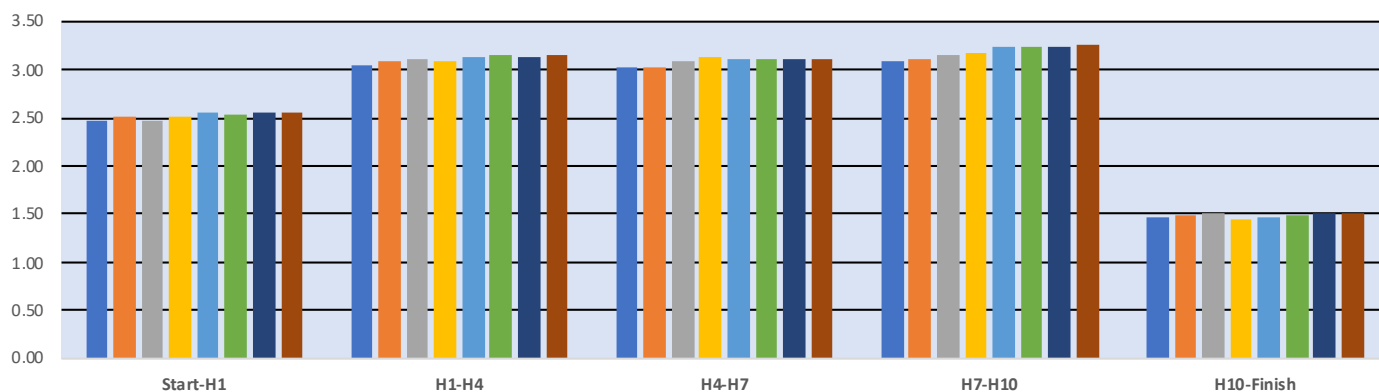
FINAL

				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Darlen, Garfield (FRA) (1987)	time			2.48	3.50	4.52	5.52	6.52	7.54	8.54	9.56	10.58	11.62		13.09	5 / 1	3.04	3.02	3.08
	reaction time	0.151		7 steps	1.02	1.02	1.00	1.00	1.02	1.00	1.02	1.02	1.04	1.47	PB				
	interval		5.53	8.96	8.96	9.14	9.14	8.96	9.14	8.96	8.96	8.79	9.54	8.40	9.02				
Baji, Balázs (HUN) (1989)	time			2.52	3.56	4.58	5.60	6.60	7.60	8.62	9.64	10.68	11.74		13.23	6 / 2	3.08	3.02	3.12
	reaction time	0.152		7 steps	1.04	1.02	1.02	1.00	1.00	1.02	1.02	1.04	1.06	1.49	NR PB				
	interval		5.44	8.79	8.96	8.96	9.14	9.14	8.96	8.96	8.79	8.62	9.41	8.31	8.90				
Trajkovic, Milan (CYP) (1992)	time			2.48	3.52	4.56	5.58	6.62	7.66	8.66	9.70	10.78	11.82		13.34	8 / 3	3.10	3.08	3.16
	reaction time	0.164		7 steps	1.04	1.04	1.02	1.04	1.04	1.00	1.04	1.08	1.04	1.52					
	interval		5.53	8.79	8.79	8.96	8.79	8.79	8.79	9.14	8.79	8.46	8.79	9.22	8.25				
Alkana, Antonio (RSA) (1990)	time			2.52	3.56	4.58	5.60	6.64	7.68	8.74	9.80	10.86	11.92		13.37	4 / 4	3.08	3.14	3.18
	reaction time	0.155		interval		1.04	1.02	1.02	1.04	1.04	1.06	1.06	1.06	1.45					
	interval		5.44	8.79	8.96	8.96	8.79	8.79	8.62	8.62	8.62	8.62	9.67	8.23	8.90				
Douvalidis, Konstadinos (GRE) (1987)	time			2.56	3.62	4.66	5.70	6.72	7.76	8.80	9.88	10.96	12.04		13.51	2 / 5	3.14	3.10	3.24
	reaction time	0.154		interval		1.06	1.04	1.04	1.02	1.04	1.04	1.08	1.08	1.47					
	interval		5.36	8.62	8.79	8.79	8.96	8.79	8.79	8.46	8.46	8.46	9.54	8.14	8.73				
Martinsen, Andreas (DEN) (1990)	time			2.54	3.62	4.66	5.70	6.74	7.78	8.82	9.90	10.96	12.06		13.55	3 / 6	3.16	3.12	3.24
	reaction time	0.149		7 steps	1.08	1.04	1.04	1.04	1.04	1.04	1.08	1.06	1.10	1.49					
	interval		5.40	8.46	8.79	8.79	8.79	8.79	8.79	8.46	8.62	8.31	9.41	8.12	8.68				
Czykier, Damian (POL) (1992)	time			2.56	3.62	4.68	5.70	6.72	7.78	8.82	9.88	10.96	12.06		13.56	7 / 7	3.14	3.12	3.24
	reaction time	0.177		7 steps	1.06	1.06	1.02	1.02	1.06	1.04	1.06	1.08	1.10	1.50					
	interval		5.36	8.62	8.62	8.96	8.96	8.62	8.79	8.62	8.46	8.31	9.35	8.11	8.73				
Noga, Artur (POL) (1988)	time			2.56	3.64	4.70	5.72	6.76	7.80	8.84	9.90	10.98	12.10		13.62	1 / 8	3.16	3.12	3.26
	reaction time	0.164		7 steps	1.08	1.06	1.02	1.04	1.04	1.04	1.06	1.08	1.12	1.52					
	interval		5.36	8.46	8.62	8.96	8.79	8.79	8.79	8.62	8.46	8.16	9.22	8.08	8.68				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=CK9rwT16RwQ>

2017 Jamaican National Championships (Kingston, JAM) (TV Analysis)

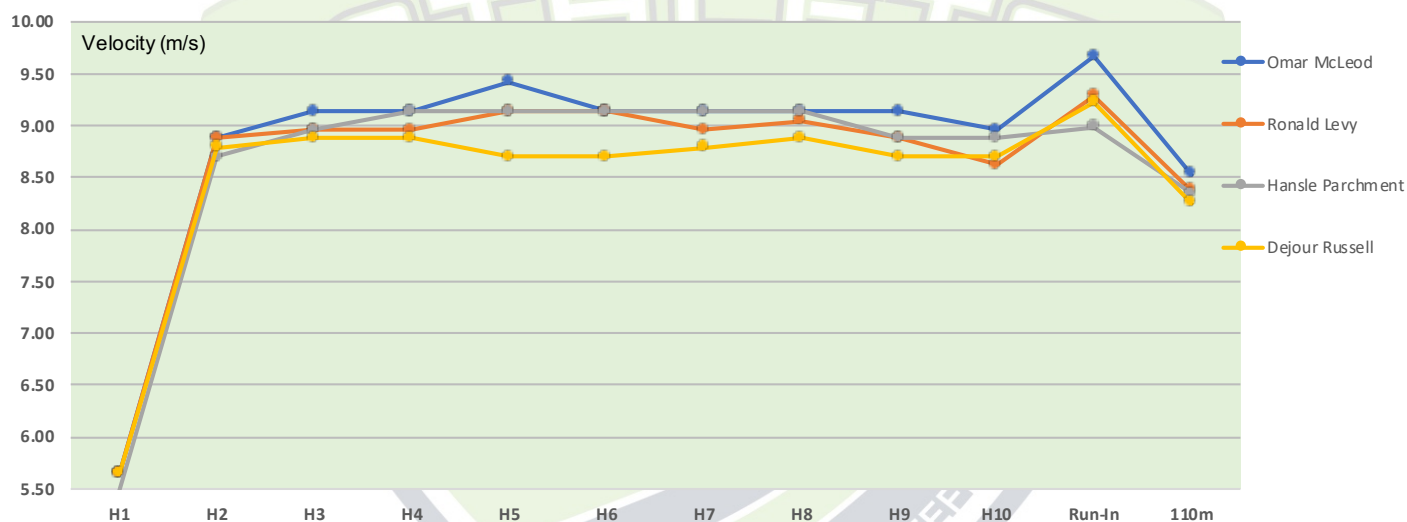
110m Hurdles

Date: 2017.06.24

Wind: 0.7 m/s

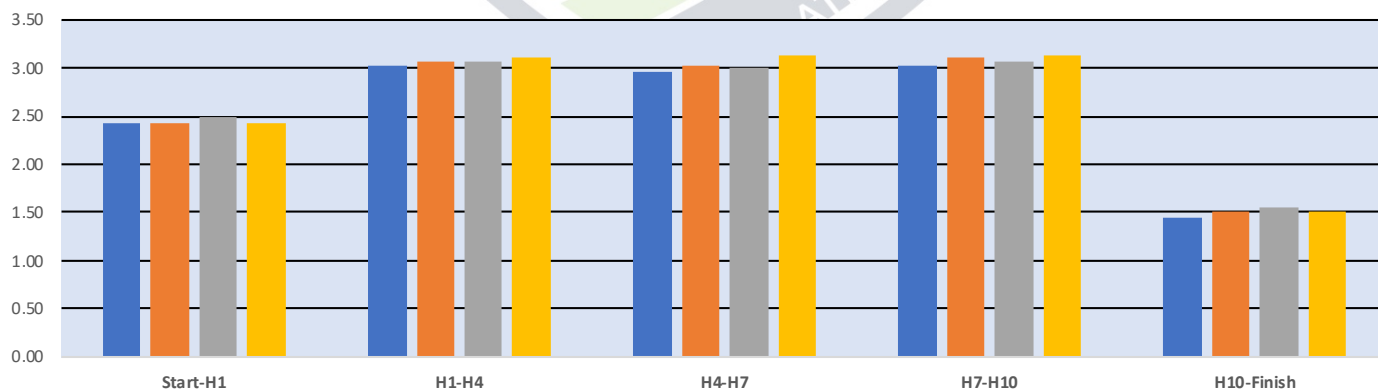
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
McLeod, Omar (JAM) (1994)	time	2.43	3.46	4.46	5.46	6.43	7.43	8.43	9.43	10.43	11.45		12.90	4 / 1			
	reaction time											1.45	NR PB		3.03	2.97	3.02
	interval		1.03	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.02				9.05	9.23	9.08
Levy, Ronald (JAM) (1992)	time	2.43	3.46	4.48	5.50	6.50	7.50	8.52	9.53	10.56	11.62		13.13	5 / 2			
	reaction time											1.51			3.07	3.02	3.10
	interval	7 steps	1.03	1.02	1.02	1.00	1.00	1.02	1.01	1.03	1.06				8.93	9.08	8.85
Parchment, Hansle (JAM) (1990)	time	2.50	3.55	4.57	5.57	6.57	7.57	8.57	9.57	10.60	11.63		13.19	8 / 3			
	reaction time											1.56			3.07	3.00	3.06
	interval	7 steps	1.05	1.02	1.00	1.00	1.00	1.00	1.00	1.03	1.03				8.93	9.14	8.96
Russell, Dejour (JAM) (2000)	time	2.43	3.47	4.50	5.53	6.58	7.63	8.67	9.70	10.75	11.80		13.32	6 / 4			
	reaction time											1.52	AJR PB		3.10	3.14	3.13
	interval		1.04	1.03	1.03	1.05	1.05	1.04	1.03	1.05	1.05				8.85	8.73	8.76
	velocity	5.65	8.87	9.14	9.14	9.42	9.14	9.14	9.14	9.14	8.96	9.67	8.53				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1728 x 1080 @ 60fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=mZABkZp-n5A>

2017 Bauhaus Athletics (Stockholm, SWE) (TV Analysis)

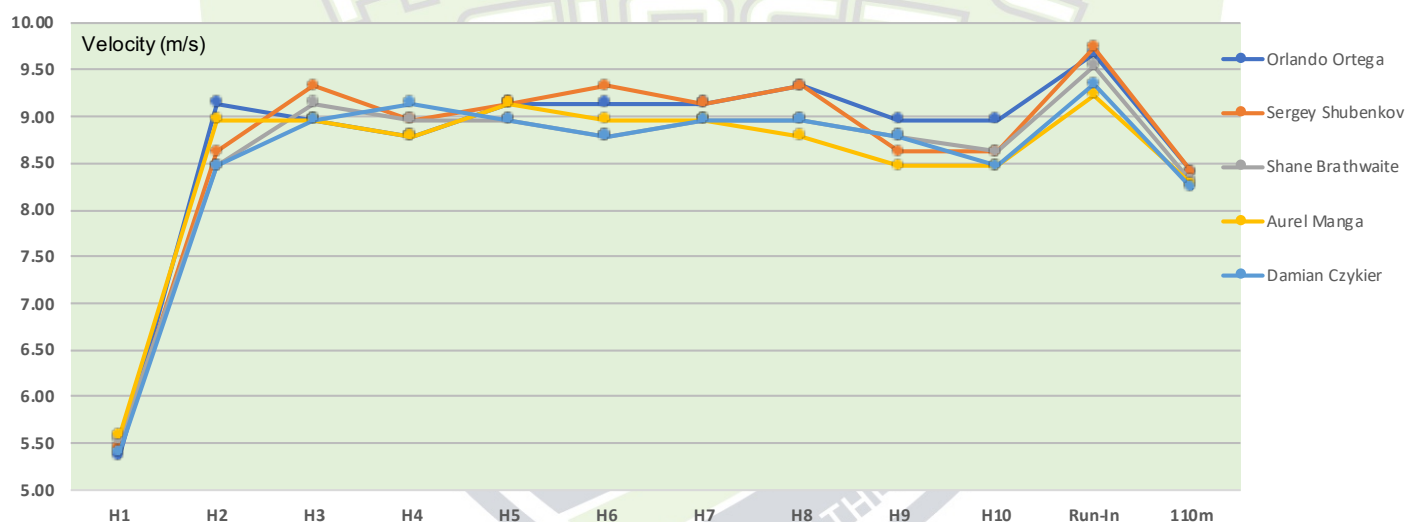
110m Hurdles

Date: 2017.06.18

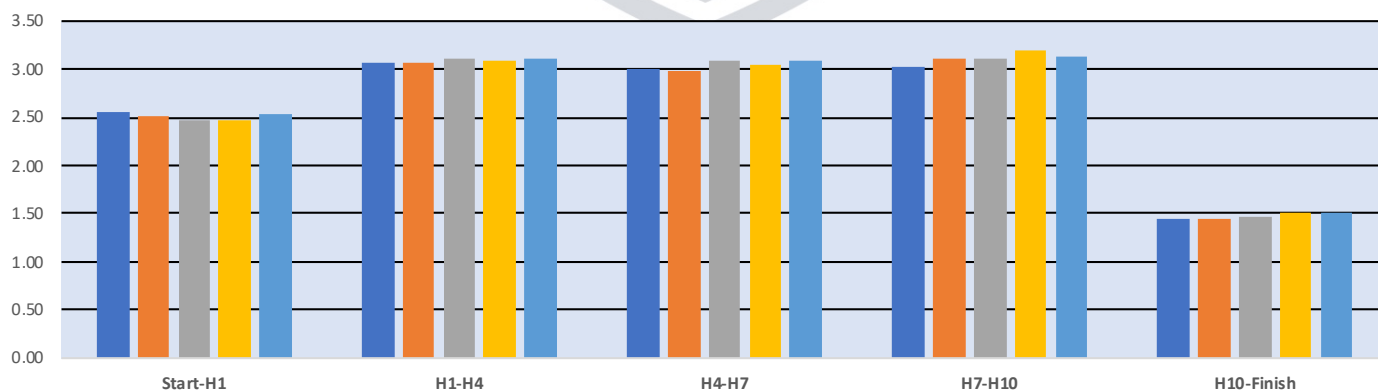
Wind: 3.5 m/s

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Ortega, Orlando (ESP) (1991)	time	2.56	3.56	4.58	5.62	6.62	7.62	8.62	9.60	10.62	11.64		13.09	4 / 1			
	reaction time	0.146													3.06	3.00	3.02
	interval		1.00	1.02	1.04	1.00	1.00	1.00	0.98	1.02	1.02	1.45			8.96	9.14	9.08
Shubenkov, Sergey (ANA) (1990)	time	2.52	3.58	4.56	5.58	6.58	7.56	8.56	9.54	10.60	11.66		13.10	5 / 2			
	reaction time	0.141													3.06	2.98	3.10
	interval	7 steps	1.06	0.98	1.02	1.00	0.98	1.00	0.98	1.06	1.06	1.44			8.96	9.20	8.85
Brathwaite, Shane (BAR) (1990)	time	2.48	3.56	4.56	5.58	6.60	7.64	8.66	9.68	10.72	11.78		13.25	1 / 3			
	reaction time	0.134													3.10	3.08	3.12
	interval	7 steps	1.08	1.00	1.02	1.02	1.04	1.02	1.02	1.04	1.06	1.47			8.85	8.90	8.79
Manga, Aurel (FRA) (1992)	time	2.46	3.48	4.50	5.54	6.54	7.56	8.58	9.62	10.70	11.78		13.30	6 / 4			
	reaction time	0.147													3.08	3.04	3.20
	interval	7 steps	1.02	1.02	1.04	1.00	1.02	1.02	1.04	1.08	1.08	1.52			8.90	9.02	8.57
Czykier, Damian (POL) (1992)	time	2.54	3.62	4.64	5.64	6.66	7.70	8.72	9.74	10.78	11.86		13.36	7 / 5			
	reaction time	0.164													3.10	3.08	3.14
	interval	7 steps	1.08	1.02	1.00	1.02	1.04	1.02	1.02	1.04	1.08	1.50			8.85	8.90	8.73
	velocity		5.44	8.96	8.79	9.14	9.14	9.14	9.33	8.96	8.96	9.67	8.40				
			5.53	8.46	9.14	8.96	8.79	8.96	8.96	8.79	8.62	9.54	8.30				
			5.58	8.96	8.96	8.79	9.14	8.96	8.79	8.46	8.46	9.22	8.27				
			5.40	8.46	8.96	9.14	8.96	8.79	8.96	8.79	8.46	9.35	8.23				



Time Intervals (s)



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: https://www.youtube.com/watch?v=i7uFJw7_vlk

2017 Golden Gala Pietro Mennea (Rome, ITA) (TV Analysis)

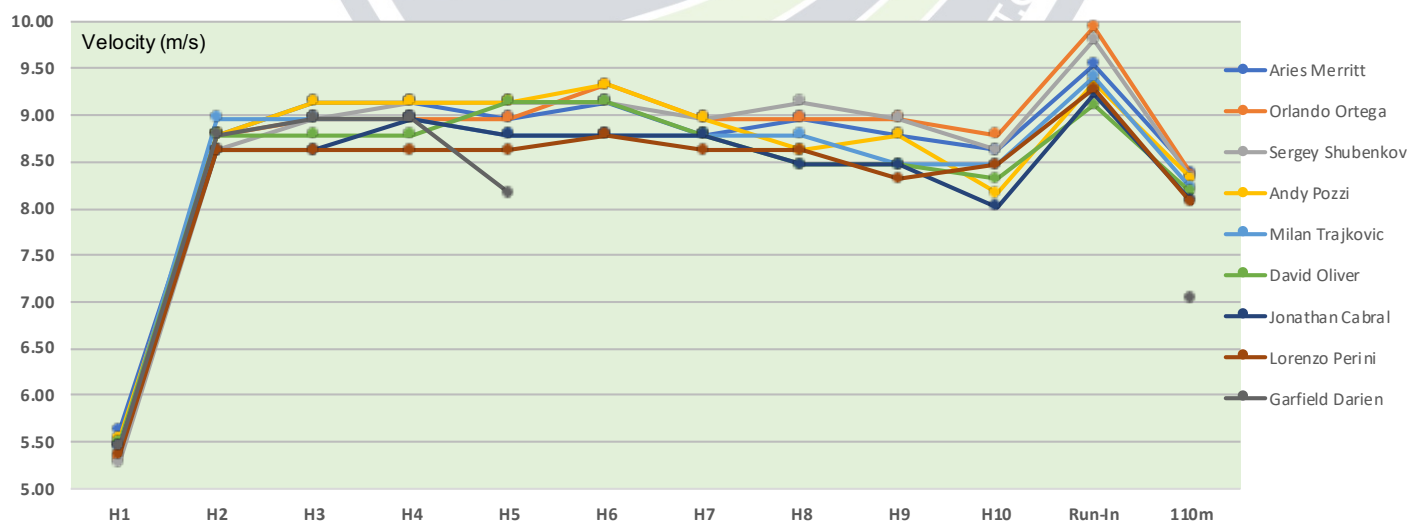
110m Hurdles

Date: 2017.06.08

Wind: -0.3 m/s

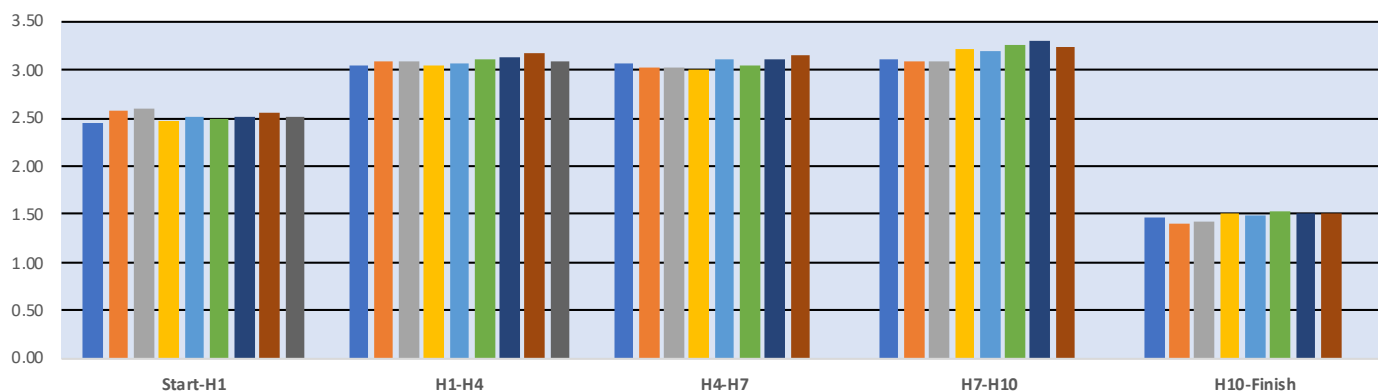
FINAL

			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		2.44	3.48	4.48	5.48	6.50	7.50	8.54	9.56	10.60	11.66		13.13	7 / 1			
	reaction time	0.132											1.47			3.04	3.06	3.12
	interval		7 steps	1.04	1.00	1.00	1.02	1.00	1.04	1.02	1.04	1.06	1.47			9.02	8.96	8.79
Ortega, Orlando (ESP) (1991)	time		2.58	3.62	4.64	5.66	6.68	7.66	8.68	9.70	10.72	11.76		13.17	6 / 2			
	reaction time	0.152											1.41			3.08	3.02	3.08
	interval		7 steps	1.04	1.02	1.02	1.02	0.98	1.02	1.02	1.02	1.04	1.41			8.90	9.08	8.90
Shubenkov, Sergey (ANA) (1990)	time		2.60	3.66	4.68	5.68	6.68	7.68	8.70	9.70	10.72	11.78		13.21	4 / 3			
	reaction time	0.154											1.43			3.08	3.02	3.08
	interval		7 steps	1.06	1.02	1.00	1.00	1.00	1.02	1.00	1.02	1.06	1.43			8.90	9.08	8.90
Pozzi, Andy (GBR) (1992)	time		2.48	3.52	4.52	5.52	6.52	7.50	8.52	9.58	10.62	11.74		13.24	5 / 4			
	reaction time	0.119											1.50			3.04	3.00	3.22
	interval		7 steps	1.04	1.00	1.00	1.00	0.98	1.02	1.06	1.04	1.12	1.50			9.02	9.14	8.52
Trajkovic, Milan (CYP) (1992)	time		2.52	3.54	4.56	5.58	6.62	7.66	8.70	9.74	10.82	11.90		13.39	9 / 5			
	reaction time	0.157											1.49			3.06	3.12	3.20
	interval		7 steps	1.02	1.02	1.02	1.04	1.04	1.04	1.04	1.08	1.08	1.49			8.96	8.79	8.57
Oliver, David (USA) (1982)	time		2.50	3.54	4.58	5.62	6.62	7.62	8.66	9.74	10.82	11.92		13.46	3 / 6			
	reaction time	0.141											1.54			3.12	3.04	3.26
	interval		7 steps	1.04	1.04	1.04	1.00	1.00	1.04	1.08	1.08	1.10	1.54			8.79	9.02	8.41
Cabral, Jonathan (CAN) (1992)	time		2.52	3.58	4.64	5.66	6.70	7.74	8.78	9.86	10.94	12.08		13.60	2 / 7			
	reaction time	0.130											1.52			3.14	3.12	3.30
	interval		7 steps	1.06	1.06	1.02	1.04	1.04	1.04	1.08	1.08	1.14	1.52			8.73	8.79	8.31
Perini, Lorenzo (ITA) (1994)	time		2.56	3.62	4.68	5.74	6.80	7.84	8.90	9.96	11.06	12.14		13.65	1 / 8			
	reaction time	0.141											1.51			3.18	3.16	3.24
	interval		7 steps	1.06	1.06	1.06	1.06	1.04	1.06	1.06	1.10	1.08	1.51			8.62	8.68	8.46
Darien, Garfield (FRA) (1987)	time		2.52	3.56	4.58	5.60	6.72							15.64	8 / 9			
	reaction time	0.148												7.03		3.08		
	interval		7 steps	1.04	1.02	1.02	1.12									8.90		



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=zJ68sVnxjKY>

2017 Prefontaine Classic (Eugene, OR) (TV Analysis)

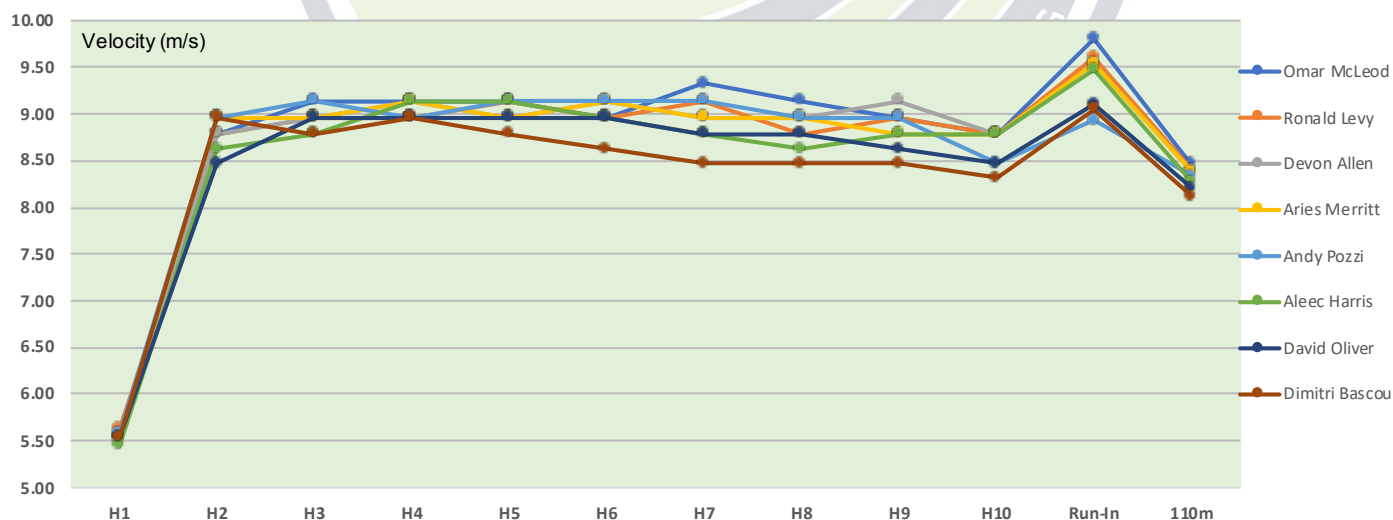
110m Hurdles

Date: 2017.05.27

Wind: 0.9 m/s

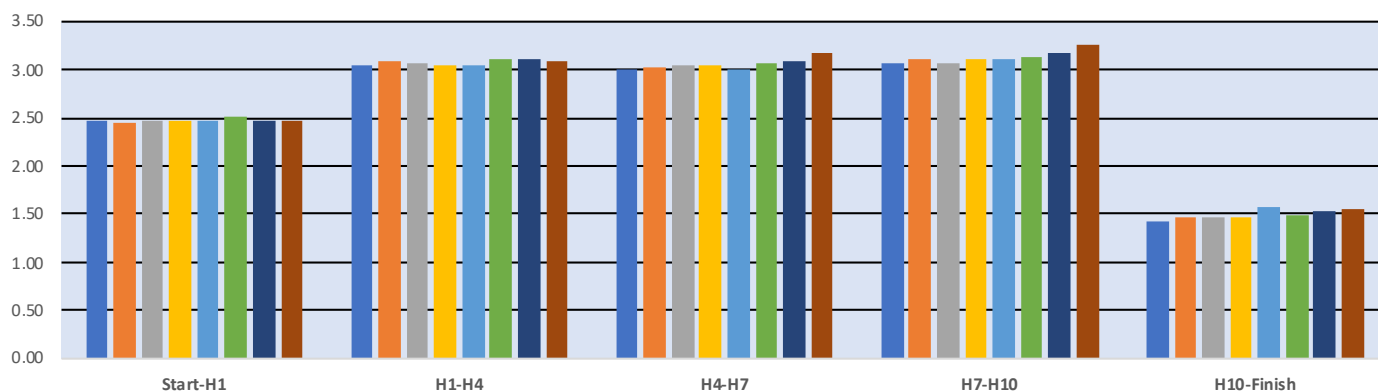
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
McLeod, Omar (JAM) (1994)	time		2.48	3.52	4.52	5.52	6.52	7.54	8.52	9.52	10.54	11.58		13.01	4 / 1			
	reaction time	0.150														3.04	3.00	3.06
	interval			1.04	1.00	1.00	1.00	1.02	0.98	1.00	1.02	1.04	1.43			9.02	9.14	8.96
Levy, Ronald (JAM) (1992)	time		2.44	3.48	4.50	5.52	6.52	7.54	8.54	9.58	10.60	11.64		13.10	1 / 2			
	reaction time	0.151														3.08	3.02	3.10
	interval		7 steps	1.04	1.02	1.02	1.00	1.02	1.00	1.04	1.02	1.04	1.46			8.90	9.08	8.85
Allen, Devon (USA) (1994)	time		2.48	3.52	4.54	5.54	6.56	7.56	8.58	9.60	10.60	11.64		13.11	5 / 3			
	reaction time	0.131														3.06	3.04	3.06
	interval			1.04	1.02	1.00	1.02	1.00	1.02	1.02	1.00	1.04	1.47			8.96	9.02	8.96
Merritt, Aries (USA) (1985)	time		2.48	3.50	4.52	5.52	6.54	7.54	8.56	9.58	10.62	11.66		13.13	6 / 4			
	reaction time	0.132														3.04	3.04	3.10
	interval		7 steps	1.02	1.02	1.00	1.02	1.00	1.02	1.02	1.04	1.04	1.47			9.02	9.02	8.85
Pozzi, Andy (GBR) (1992)	time		2.46	3.48	4.48	5.50	6.50	7.50	8.50	9.52	10.54	11.62		13.19	2 / 5			
	reaction time	0.145														3.04	3.00	3.12
	interval		7 steps	1.02	1.00	1.02	1.00	1.00	1.00	1.02	1.02	1.08	1.57			9.02	9.14	8.79
Harris, Aleec (USA) (1990)	time		2.52	3.58	4.62	5.62	6.62	7.64	8.68	9.74	10.78	11.82		13.30	8 / 6			
	reaction time	0.165														3.10	3.06	3.14
	interval			1.06	1.04	1.00	1.00	1.02	1.04	1.06	1.04	1.04	1.48			8.85	8.96	8.73
Oliver, David (USA) (1982)	time		2.48	3.56	4.58	5.60	6.62	7.64	8.68	9.72	10.78	11.86		13.40	7 / 7			
	reaction time	0.172														3.12	3.08	3.18
	interval		7 steps	1.08	1.02	1.02	1.02	1.02	1.04	1.04	1.06	1.08	1.54			8.79	8.90	8.62
Bascou, Dimitri (FRA) (1987)	time		2.48	3.50	4.54	5.56	6.60	7.66	8.74	9.82	10.90	12.00		13.55	3 / 8			
	reaction time	0.158														3.08	3.18	3.26
	interval		7 steps	1.02	1.04	1.02	1.04	1.06	1.08	1.08	1.08	1.10	1.55			8.90	8.62	8.41
	velocity		5.53	8.79	8.96	8.96	8.96	8.79	8.62	8.46	8.46	8.46	8.31	9.05	8.12			



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=qu1dNPYqesU>

2017 Shanghai Diamond League (Shanghai, CHN) (TV Analysis)

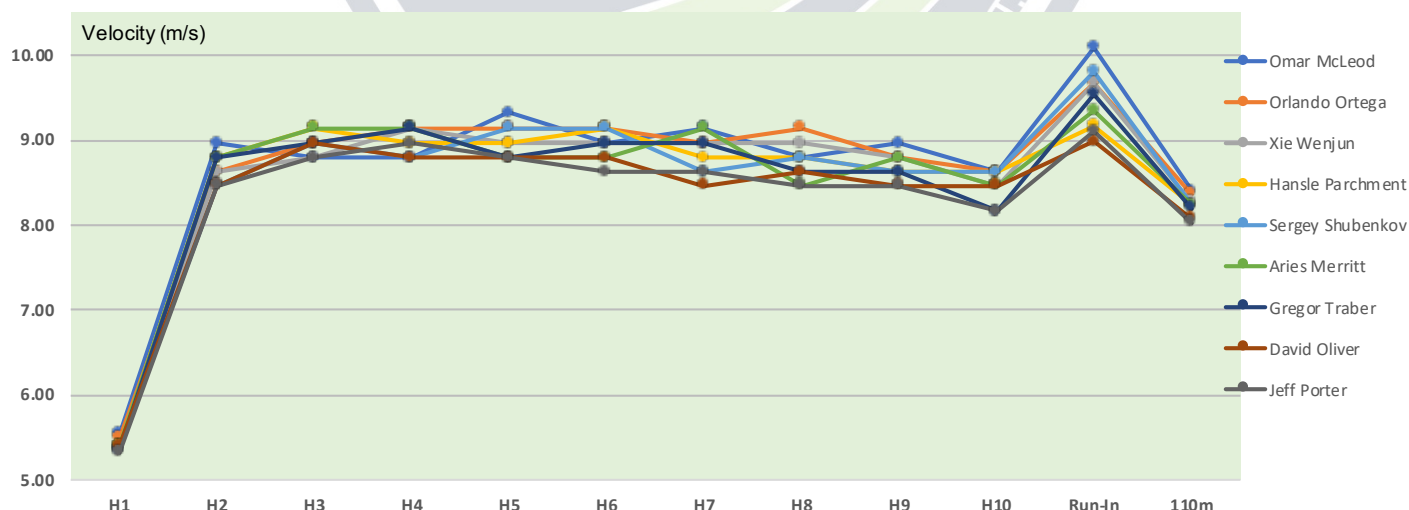
110m Hurdles

Date: 2017.05.13

Wind: 0.5 m/s

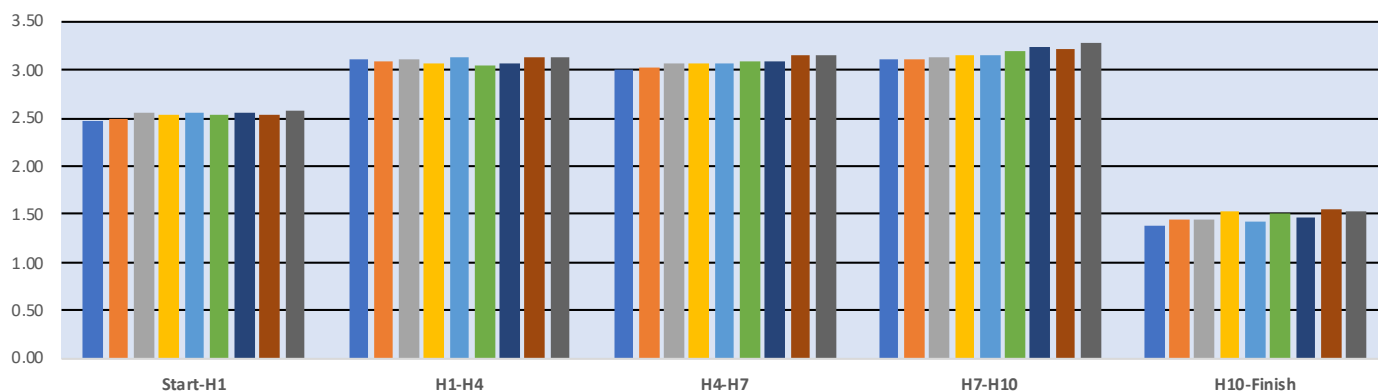
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
McLeod, Omar (JAM) (1994)	time	2.48	3.50	4.54	5.58	6.56	7.58	8.58	9.62	10.64	11.70		13.09		5 / 1			
reaction time	0.141															3.10	3.00	3.12
interval				1.02	1.04	1.04	0.98	1.02	1.00	1.04	1.02	1.06	1.39			8.85	9.14	8.79
velocity		5.53	8.96	8.79	8.79	9.33	8.96	9.14	8.79	8.96	8.62	10.09	8.40					
Ortega, Orlando (ESP) (1991)	time	2.50	3.56	4.58	5.58	6.58	7.58	8.60	9.60	10.64	11.70		13.15		6 / 2			
reaction time	0.136															3.08	3.02	3.10
interval		7 steps	1.06	1.02	1.00	1.00	1.00	1.02	1.00	1.04	1.06	1.45				8.90	9.08	8.85
velocity		5.49	8.62	8.96	9.14	9.14	9.14	8.96	9.14	8.79	8.62	9.67	8.37					
Xie Wenjun (CHN) (1990)	time	2.56	3.62	4.66	5.66	6.68	7.70	8.72	9.74	10.78	11.86		13.31		2 / 3			
reaction time	0.156															3.10	3.06	3.14
interval			1.06	1.04	1.00	1.02	1.02	1.02	1.04	1.08	1.45					8.85	8.96	8.73
velocity		5.36	8.62	8.79	9.14	8.96	8.96	8.96	8.96	8.79	8.46	9.67	8.26					
Parchment, Hansle (JAM) (1990)	time	2.54	3.58	4.58	5.60	6.62	7.62	8.66	9.70	10.76	11.82		13.35		3 / 4			
reaction time	0.143															3.06	3.06	3.16
interval		7 steps	1.04	1.00	1.02	1.02	1.00	1.04	1.04	1.06	1.06	1.53				8.96	8.96	8.68
velocity		5.40	8.79	9.14	8.96	8.96	9.14	8.79	8.79	8.62	8.62	9.16	8.24					
Shubenkov, Sergey (ANA) (1990)	time	2.56	3.64	4.66	5.70	6.70	7.70	8.76	9.80	10.86	11.92		13.35		4 / 5			
reaction time	0.153															3.14	3.06	3.16
interval		7 steps	1.08	1.02	1.04	1.00	1.00	1.06	1.04	1.06	1.06	1.43				8.73	8.96	8.68
velocity		5.36	8.46	8.96	8.79	9.14	9.14	8.62	8.79	8.62	8.62	9.80	8.24					
Merritt, Aries (USA) (1985)	time	2.54	3.58	4.58	5.58	6.62	7.66	8.66	9.74	10.78	11.86		13.36		7 / 6			
reaction time	0.136															3.04	3.08	3.20
interval		7 steps	1.04	1.00	1.00	1.04	1.04	1.00	1.08	1.04	1.08	1.50				9.02	8.90	8.57
velocity		5.40	8.79	9.14	9.14	8.79	8.79	9.14	8.46	8.79	8.46	9.35	8.23					
Traber, Gregor (GRE) (1992)	time	2.56	3.60	4.62	5.62	6.66	7.68	8.70	9.76	10.82	11.94		13.41		9 / 7			
reaction time	0.150															3.06	3.08	3.24
interval		7 steps	1.04	1.02	1.00	1.04	1.02	1.02	1.06	1.06	1.12	1.47				8.96	8.90	8.46
velocity		5.36	8.79	8.96	9.14	8.79	8.96	8.96	8.62	8.62	8.16	9.54	8.20					
Oliver, David (USA) (1982)	time	2.54	3.62	4.64	5.68	6.72	7.76	8.84	9.90	10.98	12.06		13.62		8 / 8			
reaction time	0.156															3.14	3.16	3.22
interval		7 steps	1.08	1.02	1.04	1.04	1.04	1.08	1.06	1.08	1.08	1.56				8.73	8.68	8.52
velocity		5.40	8.46	8.96	8.79	8.79	8.79	8.46	8.62	8.46	8.46	8.99	8.08					
Porter, Jeff (USA) (1985)	time	2.58	3.66	4.70	5.72	6.76	7.82	8.88	9.96	11.04	12.16		13.70		1 / 9			
reaction time	0.141															3.14	3.16	3.28
interval			1.08	1.04	1.02	1.04	1.06	1.06	1.08	1.08	1.12	1.54				8.73	8.68	8.36
velocity		5.32	8.46	8.79	8.96	8.79	8.62	8.62	8.46	8.46	8.16	9.10	8.03					



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=W1sEjLLC5m8>

2017 Drake Relays (Des Moines, IA) (TV Analysis)

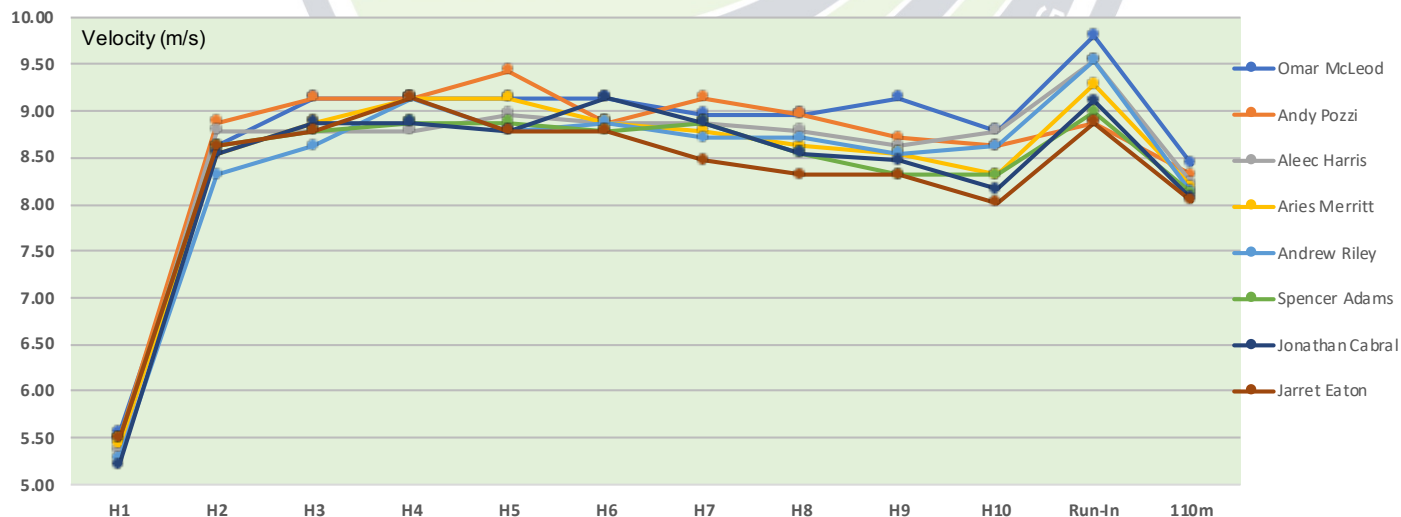
110m Hurdles

Date: 2017.04.29

Wind: 1.8 m/s

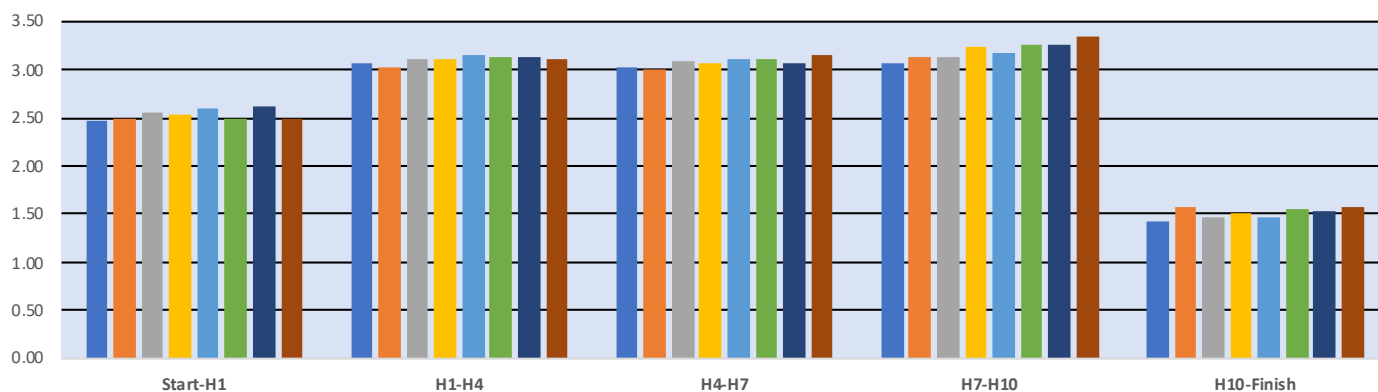
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
McLeod, Omar (JAM) (1994)	time	2.47	3.53	4.53	5.53	6.53	7.53	8.55	9.57	10.57	11.61		13.04	4 / 1			
	reaction time		1.06	1.00	1.00	1.00	1.00	1.02	1.02	1.00	1.04	1.43			3.06	3.02	3.06
	velocity	5.55	8.62	9.14	9.14	9.14	9.14	8.96	8.96	9.14	8.79	9.80	8.44		8.96	9.08	8.96
Pozzi, Andy (GBR) (1992)	time	2.50	3.53	4.53	5.53	6.50	7.53	8.53	9.55	10.60	11.66		13.24	3 / 2			
	reaction time		1.03	1.00	1.00	0.97	1.03	1.00	1.02	1.05	1.06	1.58			3.03	3.00	3.13
	velocity	5.49	8.87	9.14	9.14	9.42	8.87	9.14	8.96	8.70	8.62	8.87	8.31		9.05	9.14	8.76
Harris, Aleec (USA) (1990)	time	2.56	3.60	4.64	5.68	6.70	7.73	8.76	9.80	10.86	11.90		13.37	1 / 3			
	reaction time		1.04	1.04	1.04	1.02	1.03	1.03	1.04	1.06	1.04	1.47			3.12	3.08	3.14
	velocity	5.36	8.79	8.79	8.79	8.96	8.87	8.87	8.79	8.62	8.79	9.54	8.23		8.79	8.90	8.73
Merritt, Aries (USA) (1985)	time	2.53	3.60	4.63	5.63	6.63	7.66	8.70	9.76	10.83	11.93		13.44	5 / 4			
	reaction time		1.07	1.03	1.00	1.00	1.03	1.04	1.06	1.07	1.10	1.51			3.10	3.07	3.23
	velocity	5.42	8.54	8.87	9.14	9.14	8.87	8.79	8.62	8.54	8.31	9.28	8.18		8.85	8.93	8.49
Riley, Andrew (JAM) (1988)	time	2.60	3.70	4.76	5.76	6.80	7.83	8.88	9.93	11.00	12.06		13.53	7 / 5			
	reaction time		1.10	1.06	1.00	1.04	1.03	1.05	1.05	1.07	1.06	1.47			3.16	3.12	3.18
	velocity	5.28	8.31	8.62	9.14	8.79	8.87	8.70	8.70	8.54	8.62	9.54	8.13		8.68	8.79	8.62
Adams, Spencer (USA) (1989)	time	2.50	3.56	4.60	5.63	6.66	7.70	8.73	9.80	10.90	12.00		13.56	8 / 6			
	reaction time		1.06	1.04	1.03	1.03	1.04	1.03	1.07	1.10	1.10	1.56			3.13	3.10	3.27
	velocity	5.49	8.62	8.79	8.87	8.87	8.79	8.87	8.54	8.31	8.31	8.99	8.11		8.76	8.85	8.39
Cabral, Jonathan (CAN) (1992)	time	2.63	3.70	4.73	5.76	6.80	7.80	8.83	9.90	10.98	12.10		13.64	6 / 7			
	reaction time		1.07	1.03	1.03	1.04	1.00	1.03	1.07	1.08	1.12	1.54			3.13	3.07	3.27
	velocity	5.22	8.54	8.87	8.87	8.79	9.14	8.87	8.54	8.46	8.16	9.10	8.06		8.76	8.93	8.39
Eaton, Jarret (USA) (1989)	time	2.50	3.56	4.60	5.60	6.64	7.68	8.76	9.86	10.96	12.10		13.68	2 / 8			
	reaction time		1.06	1.04	1.00	1.04	1.04	1.08	1.10	1.10	1.14	1.58			3.10	3.16	3.34
	velocity	5.49	8.62	8.79	9.14	8.79	8.79	8.46	8.31	8.31	8.02	8.87	8.04		8.85	8.68	8.21



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=4rnHUNdQaAM>

Women's 100m Hurdles

2017 Top 10 Times - Women's 100m Hurdles

Harrison, Kendra (USA) (1992)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2017 István Gyulai Memorial (Székesfehérvár, HUN) (TV Analysis)			<i>Henson (2020) - Athlete First: 2017 year end hurdle report</i>															
date	4-Jul	time	2.38	3.40	4.38	5.34	6.30	7.26	8.20	9.14	10.10	11.08		12.28	4 / 1			
reaction time	0.152	interval		1.02	0.98	0.96	0.96	0.96	0.94	0.94	0.96	0.98	1.20			2.96	2.86	2.88
wind	0.1 m/s	velocity	5.46	8.33	8.67	8.85	8.85	8.85	9.04	9.04	8.85	8.67	8.75	8.14		8.61	8.92	8.85
Harrison, Kendra (USA) (1992)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2017 Müller's Anniversary Games (London, GBR) (TV Analysis)			<i>Henson (2020) - Athlete First: 2017 year end hurdle report</i>															
date	9-Jul	time	2.42	3.42	4.40	5.36	6.32	7.30	8.26	9.22	10.24	11.24		12.39	5 / 1			
reaction time	0.131	interval		1.00	0.98	0.96	0.96	0.98	0.96	0.96	1.02	1.00	1.15			2.94	2.90	2.98
wind	0.2 m/s	velocity	5.37	8.50	8.67	8.85	8.85	8.67	8.85	8.85	8.33	8.50	9.13	8.07		8.67	8.79	8.56
Stowers, Jasmine (USA) (1991)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Semi-Final 1 - 2017 USATF National Championships (Sacramento, CA)			<i>Henson (2020) - Athlete First: 2017 year end hurdle report</i>															
date	24-Jun	time												12.47	/ 1			
reaction time		interval	No Information Available															
wind	0.9 m/s	velocity																
Harrison, Kendra (USA) (1992)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Heat 1 - 2017 Müller's Anniversary Games (London, GBR)			<i>Henson (2020) - Athlete First: 2017 year end hurdle report</i>															
date	9-Jul	time												12.47	5 / 1			
reaction time	0.105	interval	No Information Available															
wind	-0.1 m/s	velocity																
Pearson, Sally (USA) (1986)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2017 Müller's Anniversary Games (London, GBR) (TV Analysis)			<i>Henson (2020) - Athlete First: 2017 year end hurdle report</i>															
date	9-Jul	time	2.48	3.48	4.46	5.42	6.38	7.34	8.30	9.26	10.26	11.30		12.48	4 / 2			
reaction time	0.139	interval		1.00	0.98	0.96	0.96	0.96	0.96	0.96	1.00	1.04	1.18			2.94	2.88	3.00
wind	0.2 m/s	velocity	5.24	8.50	8.67	8.85	8.85	8.85	8.85	8.85	8.50	8.17	8.90	8.01		8.67	8.85	8.50
Harrison, Kendra (USA) (1992)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2017 Herculis Meeting International d'Athlétisme (Monaco, MON) (TV Analysis)			<i>Henson (2020) - Athlete First: 2017 year end hurdle report</i>															
date	21-Jul	time	2.52	3.56	4.54	5.50	6.46	7.44	8.40	9.38	10.38	11.40		12.51	4 / 1			
reaction time	0.161	interval		1.04	0.98	0.96	0.96	0.98	0.96	0.98	1.00	1.02	1.11			2.98	2.90	3.00
wind	-0.2 m/s	velocity	5.16	8.17	8.67	8.85	8.85	8.67	8.85	8.67	8.50	8.33	9.46	7.99		8.56	8.79	8.50
Ali, Nia (USA) (1988)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Semi-Final 1 - 2017 USATF National Championships (Sacramento, CA)			<i>Henson (2020) - Athlete First: 2017 year end hurdle report</i>															
date	24-Jun	time												12.52	/ 2			
reaction time		interval	No Information Available															
wind	0.9 m/s	velocity																
Nelvis, Sharika (USA) (1990)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2017 Herculis Meeting International d'Athlétisme (Monaco, MON) (TV Analysis)			<i>Henson (2020) - Athlete First: 2017 year end hurdle report</i>															
date	21-Jul	time	2.50	3.50	4.48	5.46	6.42	7.38	8.36	9.34	10.34	11.38		12.52	7 / 2			
reaction time	0.146	interval		1.00	0.98	0.98	0.96	0.96	0.98	0.98	1.00	1.04	1.14			2.96	2.90	3.02
wind	-0.2 m/s	velocity	5.20	8.50	8.67	8.67	8.85	8.85	8.67	8.67	8.50	8.17	9.21	7.99		8.61	8.79	8.44
Nelvis, Sharika (USA) (1990)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2017 Athletissima (Lausanne, SUI) (TV Analysis)			<i>Henson (2020) - Athlete First: 2017 year end hurdle report</i>															
date	6-Jul	time	2.46	3.46	4.44	5.41	6.37	7.33	8.30	9.30	10.30	11.30		12.53	6 / 1			
reaction time	0.129	interval	7 Steps	1.00	0.98	0.97	0.96	0.96	0.97	1.00	1.00	1.00	1.23			2.95	2.89	3.00
wind	-0.1 m/s	velocity	5.28	8.50	8.67	8.76	8.85	8.85	8.76	8.50	8.50	8.50	8.54	7.98		8.64	8.82	8.50
Pearson, Sally (AUS) (1986)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Semi-Final 1 - 2017 IAAF World Championships (London, GBR)			<i>Pollitt (2018) - biomechanical report for IAAF World Champs - London 2017 - Women's 100m Hurdles</i>															
date	11-Aug	time	2.39	3.43	4.42	5.40	6.37	7.31	8.28	9.27	10.27	11.29		12.53	6 / 1			
reaction time	0.119	interval		1.04	0.99	0.98	0.97	0.94	0.97	0.99	1.00	1.02	1.24			3.01	2.88	3.01
wind	0.5 m/s	velocity	5.44	8.17	8.59	8.67	8.76	9.04	8.76	8.59	8.50	8.33	8.47	7.98		8.47	8.85	8.47

2017 Weltklasse (Zürich, SUI) (TV Analysis)

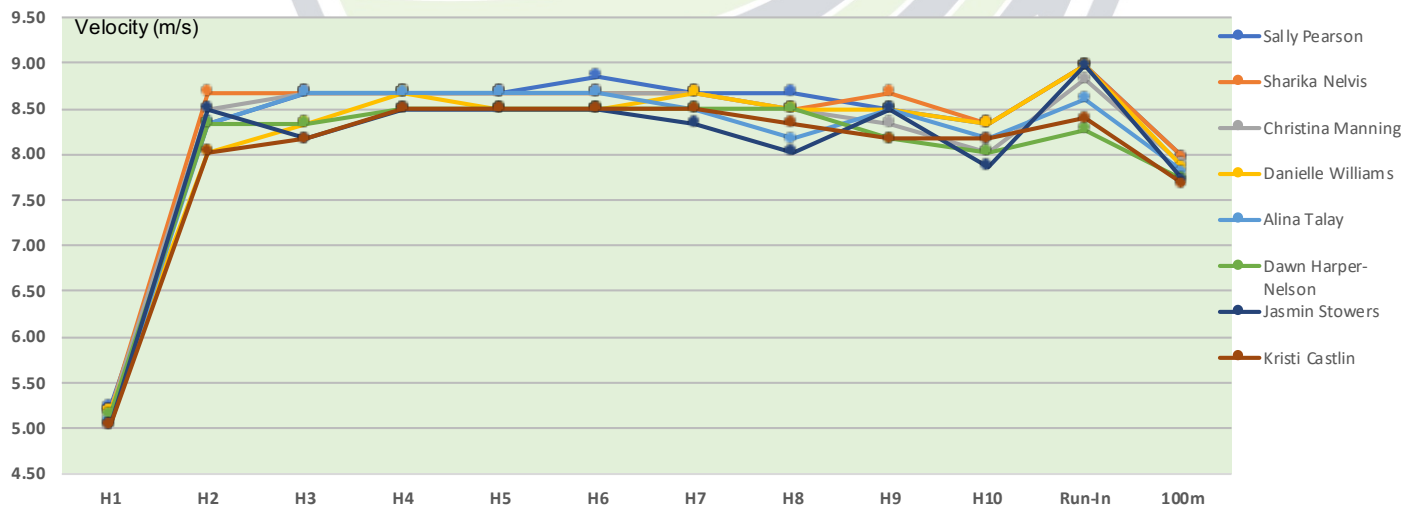
100m Hurdles

Date: 2017.08.24

Wind: -0.3 m/s

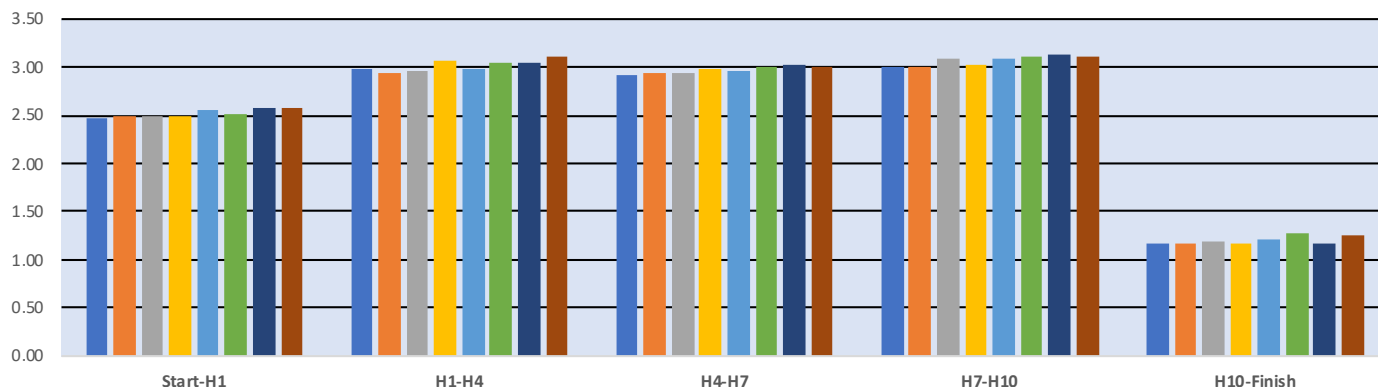
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Pearson, Sally (AUS) (1986)	time		2.48	3.50	4.48	5.46	6.44	7.40	8.38	9.36	10.36	11.38		12.55	6 / 1			
	reaction time	0.117											1.17			2.98	2.92	3.00
	interval velocity		5.24	8.33	8.67	8.67	8.67	8.85	8.67	8.67	8.50	8.33	8.97	7.97		8.56	8.73	8.50
Nelvis, Sharika (USA) (1990)	time		2.50	3.48	4.46	5.44	6.42	7.40	8.38	9.38	10.36	11.38		12.55	5 / 2			
	reaction time	0.135											1.17			2.94	2.94	3.00
	interval velocity		5.20	8.67	8.67	8.67	8.67	8.67	8.67	8.50	8.67	8.33	8.97	7.97		8.67	8.67	8.50
Manning, Christina (USA) (1990)	time		2.50	3.50	4.48	5.46	6.44	7.42	8.40	9.40	10.42	11.48		12.67	7 / 3			
	reaction time	0.117											1.19			2.96	2.94	3.08
	interval velocity		5.20	8.50	8.67	8.67	8.67	8.67	8.67	8.50	8.33	8.02	8.82	7.89		8.61	8.67	8.28
Williams, Danielle (JAM) (1992)	time		2.50	3.56	4.58	5.56	6.56	7.56	8.54	9.54	10.54	11.56		12.73	8 / 4			
	reaction time	0.116											1.17			3.06	2.98	3.02
	interval velocity		5.20	8.02	8.33	8.67	8.50	8.50	8.67	8.50	8.50	8.33	8.97	7.86		8.33	8.56	8.44
Talay, Alina (BLR) (1989)	time		2.56	3.58	4.56	5.54	6.52	7.50	8.50	9.54	10.54	11.58		12.80	2 / 5			
	reaction time	0.134											1.22			2.98	2.96	3.08
	interval velocity		5.08	8.33	8.67	8.67	8.67	8.67	8.50	8.17	8.50	8.17	8.61	7.81		8.56	8.61	8.28
Harper Nelson, Dawn (USA) (1984)	time		2.52	3.54	4.56	5.56	6.56	7.56	8.56	9.56	10.60	11.66		12.93	4 / 6			
	reaction time	0.135											1.27			3.04	3.00	3.10
	interval velocity		5.16	8.33	8.33	8.50	8.50	8.50	8.50	8.50	8.17	8.02	8.27	7.73		8.39	8.50	8.23
Stowers, Jasmin (USA) (1991)	time		2.58	3.58	4.62	5.62	6.62	7.62	8.64	9.70	10.70	11.78		12.95	3 / 7			
	reaction time	0.135											1.17			3.04	3.02	3.14
	interval velocity		5.04	8.50	8.17	8.50	8.50	8.50	8.33	8.02	8.50	7.87	8.97	7.72		8.39	8.44	8.12
Castlin, Kristi (USA) (1988)	time		2.58	3.64	4.68	5.68	6.68	7.68	8.68	9.70	10.74	11.78		13.03	9 / 8			
	reaction time	0.138											1.25			3.10	3.00	3.10
	interval velocity		5.04	8.02	8.17	8.50	8.50	8.50	8.50	8.33	8.17	8.17	8.40	7.67		8.23	8.50	8.23



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=MJx34eadB88>

2017 IAAF World Championships (London, GBR)

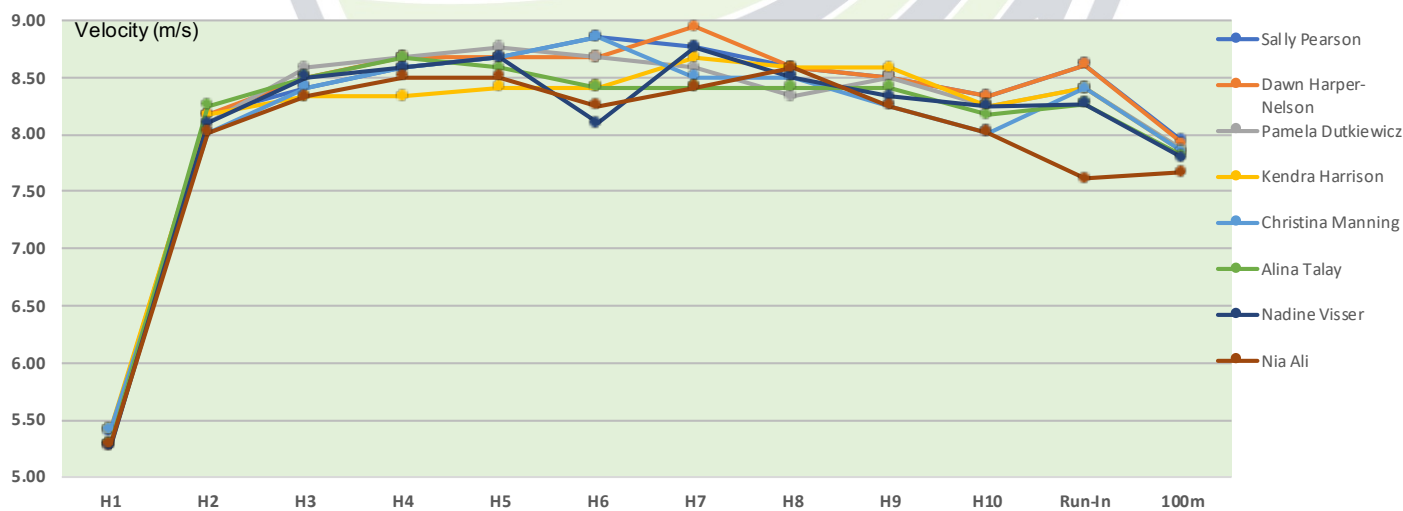
100m Hurdles

Date: 2017.08.12

Wind: 0.1 m/s

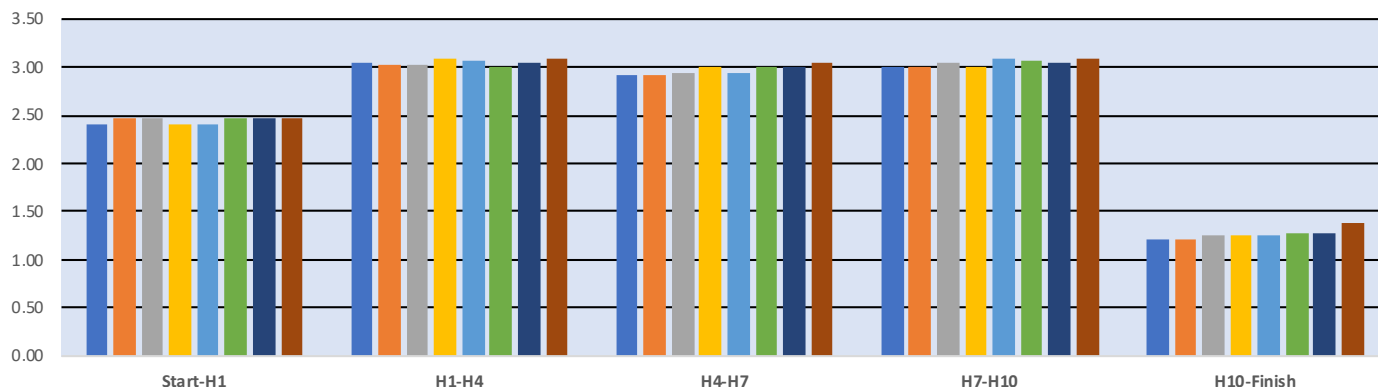
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Pearson, Sally (AUS) (1986)	time	2.41	3.45	4.46	5.45	6.43	7.39	8.36	9.35	10.35	11.37		12.59	4 / 1			
	reaction time	0.127													3.04	2.91	3.01
	interval velocity		1.04	1.01	0.99	0.98	0.96	0.97	0.99	1.00	1.02	1.22			8.39	8.76	8.47
Harper Nelson, Dawn (USA) (1984)	time	2.47	3.51	4.51	5.49	6.47	7.45	8.40	9.39	10.39	11.41		12.63	6 / 2			
	reaction time	0.167													3.02	2.91	3.01
	interval velocity		1.04	1.00	0.98	0.98	0.98	0.95	0.99	1.00	1.02	1.22			8.44	8.76	8.47
Dutkiewicz, Pamela (GER) (1991)	time	2.46	3.51	4.50	5.48	6.45	7.43	8.42	9.44	10.44	11.47		12.72	5 / 3			
	reaction time	0.143													3.02	2.94	3.05
	interval velocity		1.05	0.99	0.98	0.97	0.98	0.99	1.02	1.00	1.03	1.25			8.44	8.67	8.36
Harrison, Kendra (USA) (1992)	time	2.40	3.44	4.46	5.48	6.49	7.50	8.48	9.47	10.46	11.49		12.74	3 / 4			
	reaction time	0.146													3.08	3.00	3.01
	interval velocity		1.04	1.02	1.02	1.01	1.01	0.98	0.99	0.99	1.03	1.25			8.28	8.50	8.47
Manning, Christina (USA) (1990)	time	2.40	3.46	4.47	5.46	6.44	7.40	8.40	9.40	10.43	11.49		12.74	7 / 5			
	reaction time	0.183													3.06	2.94	3.09
	interval velocity		1.06	1.01	0.99	0.98	0.96	1.00	1.00	1.03	1.06	1.25			8.33	8.67	8.25
Talay, Alina (BLR) (1989)	time	2.46	3.49	4.49	5.47	6.46	7.47	8.48	9.49	10.50	11.54		12.81	8 / 6			
	reaction time	0.139													3.01	3.01	3.06
	interval velocity		1.03	1.00	0.98	0.99	1.01	1.01	1.01	1.01	1.04	1.27			8.47	8.47	8.33
Visser, Nadine (NED) (1995)	time	2.47	3.52	4.52	5.51	6.49	7.54	8.51	9.51	10.53	11.56		12.83	2 / 7			
	reaction time	0.154													3.04	3.00	3.05
	interval velocity		1.05	1.00	0.99	0.98	1.05	0.97	1.00	1.02	1.03	1.27			8.39	8.50	8.36
Ali, Nia (USA) (1988)	time	2.46	3.52	4.54	5.54	6.54	7.57	8.58	9.57	10.60	11.66		13.04	9 / 8			
	reaction time	0.149													3.08	3.04	3.08
	interval velocity		1.06	1.02	1.00	1.00	1.03	1.01	0.99	1.03	1.06	1.38			8.28	8.39	8.28



Time Intervals (s)

Hurdle Phases



Source: Pollitt, L., Walker, J., Bissas, A., & Merlino, S. (2018). Biomechanical report for the IAAF world championships: London 2017: Women's 100m Hurdles. Leeds Beckett University, London, GBR. p12-13.

<https://www.worldathletics.org/about-iaaf/documents/research-centre>

2017 IAAF World Championships (London, GBR)

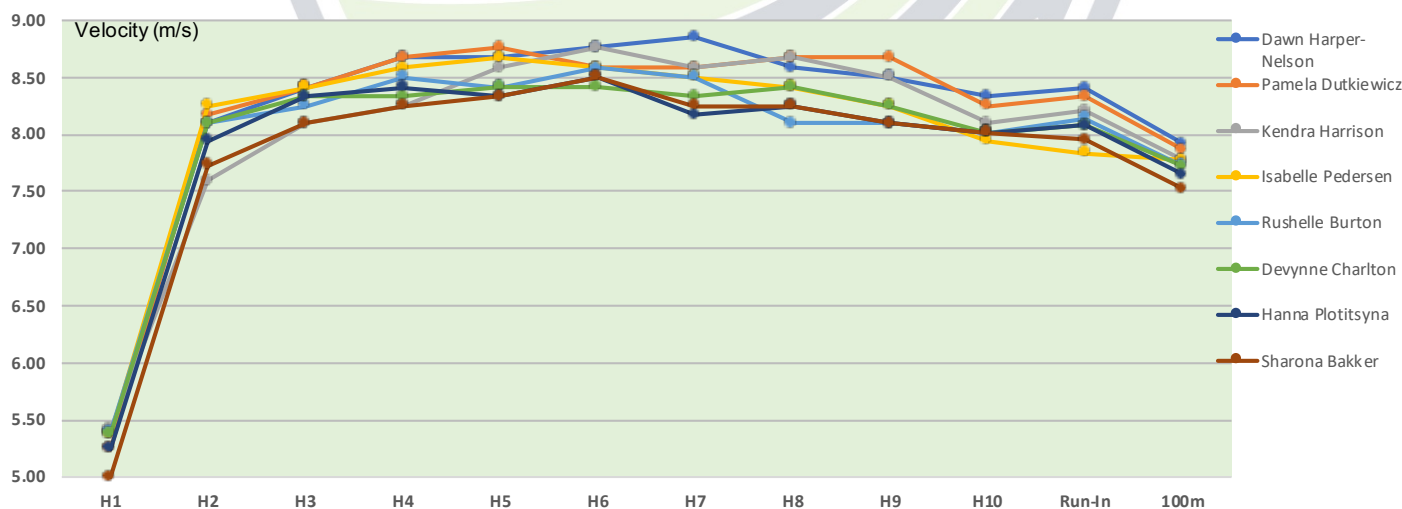
100m Hurdles

Date: 2017.08.11

Wind: 0.2 m/s

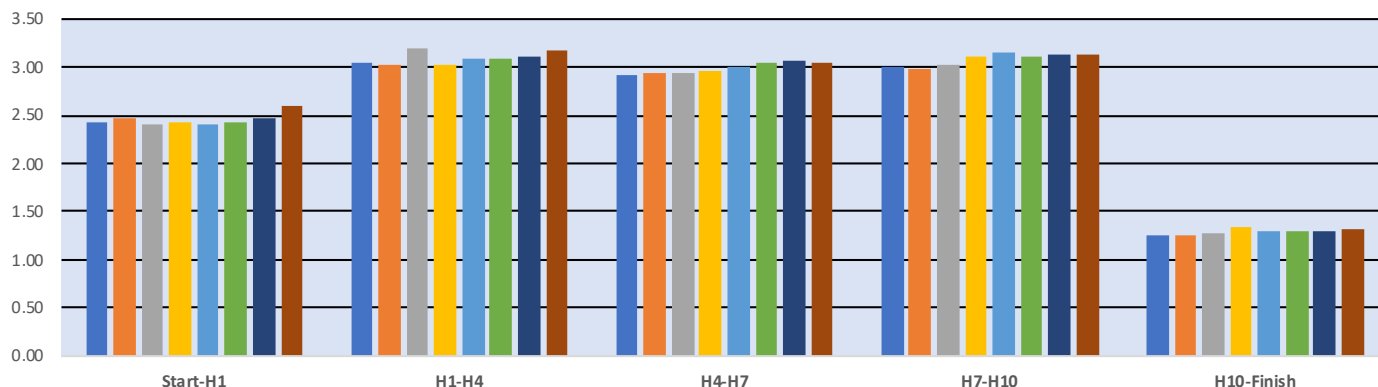
Semi-Final 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harper Nelson, Dawn (USA) (1984)	time	2.42	3.47	4.48	5.46	6.44	7.41	8.37	9.36	10.36	11.38		12.63	7 / 1			
	reaction time	0.109													3.04	2.91	3.01
	interval velocity		1.05	1.01	0.98	0.98	0.97	0.96	0.99	1.00	1.02	1.25			8.39	8.76	8.47
Dutkiewicz, Pamela (GER) (1991)	time	2.48	3.52	4.53	5.51	6.48	7.47	8.46	9.44	10.42	11.45		12.71	4 / 2			
	reaction time	0.156													3.03	2.95	2.99
	interval velocity		1.04	1.01	0.98	0.97	0.99	0.99	0.98	0.98	1.03	1.26			8.42	8.64	8.53
Harrison, Kendra (USA) (1992)	time	2.40	3.52	4.57	5.60	6.59	7.56	8.55	9.53	10.53	11.58		12.86	6 / 3			
	reaction time	0.148													3.20	2.95	3.03
	interval velocity		1.12	1.05	1.03	0.99	0.97	0.99	0.98	1.00	1.05	1.28			7.97	8.64	8.42
Pedersen, Isabelle (NOR) (1992)	time	2.42	3.45	4.46	5.45	6.43	7.42	8.42	9.43	10.46	11.53		12.87	5 / 4			
	reaction time	0.149													3.03	2.97	3.11
	interval velocity		1.03	1.01	0.99	0.98	0.99	1.00	1.01	1.03	1.07	1.34			8.42	8.59	8.20
Burton, Rushelle (JAM) (1997)	time	2.41	3.46	4.49	5.49	6.50	7.49	8.49	9.54	10.59	11.65		12.94	9 / 5			
	reaction time	0.180													3.08	3.00	3.16
	interval velocity		1.05	1.03	1.00	1.01	0.99	1.00	1.05	1.05	1.06	1.29			8.28	8.50	8.07
Charlton, Devynne (BAH) (1995)	time	2.42	3.47	4.49	5.51	6.52	7.53	8.55	9.56	10.59	11.65		12.95	2 / 6			
	reaction time	0.163													3.09	3.04	3.10
	interval velocity		1.05	1.02	1.02	1.01	1.01	1.02	1.01	1.03	1.06	1.30			8.25	8.39	8.23
Plotitsyna, Hanna (UKR) (1987)	time	2.48	3.55	4.57	5.58	6.60	7.60	8.64	9.67	10.72	11.78		13.08	8 / 7			
	reaction time	0.139													3.10	3.06	3.14
	interval velocity		1.07	1.02	1.01	1.02	1.00	1.04	1.03	1.05	1.06	1.30			8.23	8.33	8.12
Bakker, Sharona (NED) (1990)	time	2.60	3.70	4.75	5.78	6.80	7.80	8.83	9.86	10.91	11.97		13.29	3 / 8			
	reaction time	0.183													3.18	3.05	3.14
	interval velocity		1.10	1.05	1.03	1.02	1.00	1.03	1.03	1.05	1.06	1.32			8.02	8.36	8.12
	velocity		5.00	7.73	8.10	8.25	8.33	8.50	8.25	8.25	8.10	8.02	7.95				



Time Intervals (s)

Hurdle Phases



Source: Pollitt, L., Walker, J., Bissas, A., & Merlino, S. (2018). Biomechanical report for the IAAF world championships: London 2017: Women's 100m Hurdles. Leeds Beckett University, London, GBR. p12-13.

<https://www.worldathletics.org/about-iaaf/documents/research-centre>

2017 IAAF World Championships (London, GBR)

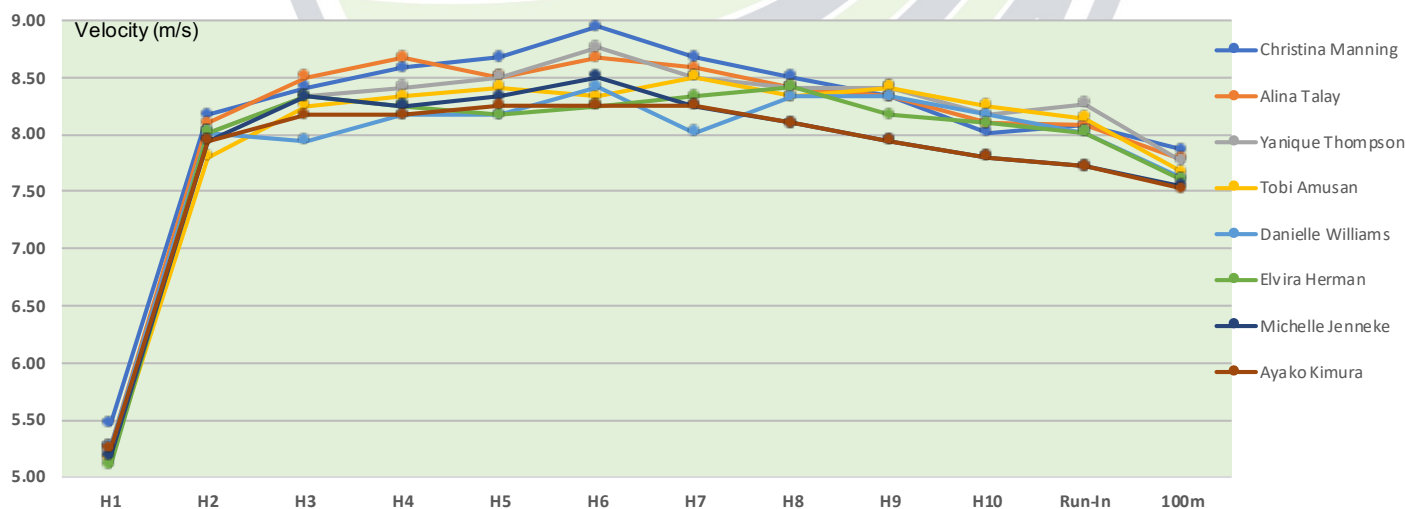
100m Hurdles

Date: 2017.08.11

Wind: 0.5 m/s

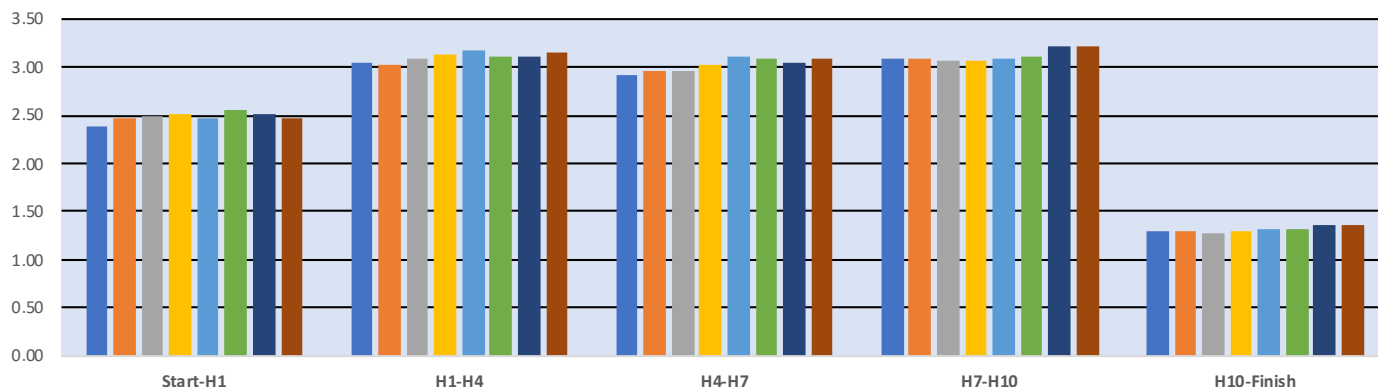
Semi-Final 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Manning, Christina (USA) (1990)	time	2.38	3.42	4.43	5.42	6.40	7.35	8.33	9.33	10.35	11.41		12.71	5 / 1			
	reaction time	0.149													3.04	2.91	3.08
	interval velocity		1.04	1.01	0.99	0.98	0.95	0.98	1.00	1.02	1.06	1.30			8.39	8.76	8.28
Talay, Alina (BLR) (1989)	time	2.47	3.52	4.52	5.50	6.50	7.48	8.47	9.48	10.50	11.55		12.85	6 / 2			
	reaction time	0.119													3.03	2.97	3.08
	interval velocity		1.05	1.00	0.98	1.00	0.98	0.99	1.01	1.02	1.05	1.30			8.42	8.59	8.28
Thompson, Yanique (JAM) (1996)	time	2.49	3.55	4.57	5.58	6.58	7.55	8.55	9.56	10.57	11.61		12.88	7 / 3			
	reaction time	0.143													3.09	2.97	3.06
	interval velocity		1.06	1.02	1.01	1.00	0.97	1.00	1.01	1.01	1.04	1.27			8.25	8.59	8.33
Amusan, Tobi (NGR) (1997)	time	2.52	3.61	4.64	5.66	6.67	7.69	8.69	9.71	10.72	11.75		13.04	9 / 4			
	reaction time	0.137													3.14	3.03	3.06
	interval velocity		1.09	1.03	1.02	1.01	1.02	1.00	1.02	1.01	1.03	1.29			8.12	8.42	8.33
Williams, Danielle (JAM) (1992)	time	2.47	3.53	4.60	5.64	6.68	7.69	8.75	9.77	10.79	11.83		13.14	4 / 5			
	reaction time	0.121													3.17	3.11	3.08
	interval velocity		1.06	1.07	1.04	1.04	1.01	1.06	1.02	1.02	1.04	1.31			8.04	8.20	8.28
Herman, Elvira (BLR) (1997)	time	2.55	3.61	4.63	5.66	6.70	7.73	8.75	9.76	10.80	11.85		13.16	8 / 6			
	reaction time	0.129													3.11	3.09	3.10
	interval velocity		1.06	1.02	1.03	1.04	1.03	1.02	1.01	1.04	1.05	1.31			8.20	8.25	8.23
Jenneke, Michelle (AUS) (1993)	time	2.51	3.58	4.60	5.63	6.65	7.65	8.68	9.73	10.80	11.89		13.25	3 / 7			
	reaction time	0.145													3.12	3.05	3.21
	interval velocity		1.07	1.02	1.03	1.02	1.00	1.03	1.05	1.07	1.09	1.36			8.17	8.36	7.94
Kimura, Ayako (JPN) (1988)	time	2.48	3.55	4.59	5.63	6.66	7.69	8.72	9.77	10.84	11.93		13.29	2 / 8			
	reaction time	0.163													3.15	3.09	3.21
	interval velocity		1.07	1.04	1.04	1.03	1.03	1.03	1.05	1.07	1.09	1.36			8.10	8.25	7.94



Time Intervals (s)

Hurdle Phases



Source: Pollitt, L., Walker, J., Bissas, A., & Merlino, S. (2018). Biomechanical report for the IAAF world championships: London 2017: Women's 100m Hurdles. Leeds Beckett University, London, GBR. p12-13.

<https://www.worldathletics.org/about-iaaf/documents/research-centre>

2017 IAAF World Championships (London, GBR)

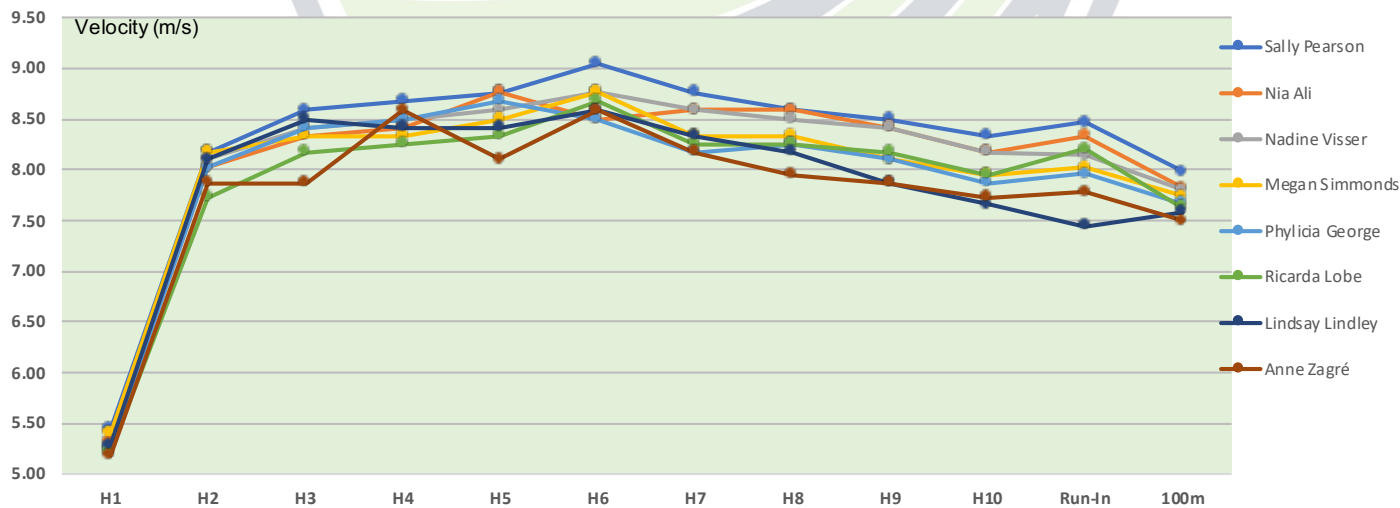
100m Hurdles

Date: 2017.08.11

Wind: 0.5 m/s

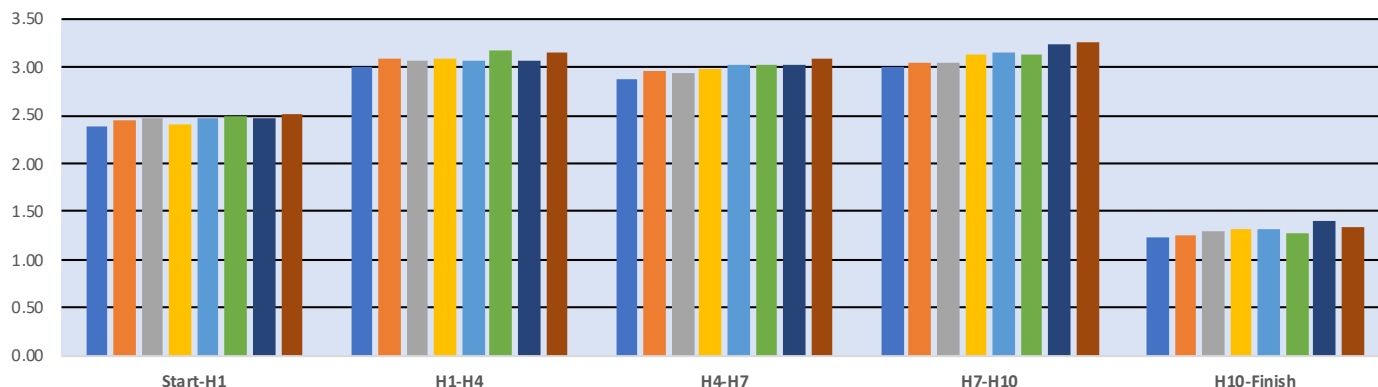
Semi-Final 1

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Pearson, Sally (AUS) (1986)	time		2.39	3.43	4.42	5.40	6.37	7.31	8.28	9.27	10.27	11.29		12.53	6 / 1			
	reaction time	0.119														3.01	2.88	3.01
	interval			1.04	0.99	0.98	0.97	0.94	0.97	0.99	1.00	1.02	1.24			8.47	8.85	8.47
Ali, Nia (USA) (1988)	time		2.44	3.50	4.52	5.53	6.50	7.50	8.49	9.48	10.49	11.53		12.79	4 / 2			
	reaction time	0.158														3.09	2.96	3.04
	interval			1.06	1.02	1.01	0.97	1.00	0.99	0.99	1.01	1.04	1.26			8.25	8.61	8.39
Visser, Nadine (NED) (1995)	time		2.48	3.53	4.54	5.54	6.53	7.50	8.49	9.49	10.50	11.54		12.83	7 / 3			
	reaction time	0.175														3.06	2.95	3.05
	interval			1.05	1.01	1.00	0.99	0.97	0.99	1.00	1.01	1.04	1.29			8.33	8.64	8.36
Simmonds, Megan (JAM) (1994)	time		2.41	3.45	4.47	5.49	6.49	7.46	8.48	9.50	10.55	11.62		12.93	5 / 4			
	reaction time	0.148														3.08	2.99	3.14
	interval			1.04	1.02	1.02	1.00	0.97	1.02	1.02	1.05	1.07	1.31			8.28	8.53	8.12
George, Phylisia (CAN) (1987)	time		2.47	3.53	4.54	5.54	6.52	7.52	8.56	9.59	10.64	11.72		13.04	8 / 5			
	reaction time	0.117														3.07	3.02	3.16
	interval			1.06	1.01	1.00	0.98	1.00	1.04	1.03	1.05	1.08	1.32			8.31	8.44	8.07
Lobe, Ricarda (GER) (1994)	time		2.49	3.59	4.63	5.66	6.68	7.66	8.69	9.72	10.76	11.83		13.11	3 / 6			
	reaction time	0.147														3.17	3.03	3.14
	interval			1.10	1.04	1.03	1.02	0.98	1.03	1.03	1.04	1.07	1.28			8.04	8.42	8.12
Lindley, Lindsay (NGR) (1989)	time		2.46	3.51	4.51	5.52	6.53	7.52	8.54	9.58	10.66	11.77		13.18	2 / 7			
	reaction time	0.163														3.06	3.02	3.23
	interval			1.05	1.00	1.01	1.01	0.99	1.02	1.04	1.08	1.11	1.41			8.33	8.44	7.89
Zagr�, Anne (BEL) (1990)	time		2.51	3.59	4.67	5.66	6.71	7.70	8.74	9.81	10.89	11.99		13.34	9 / 8			
	reaction time	0.139														3.15	3.08	3.25
	interval			1.08	1.08	0.99	1.05	0.99	1.04	1.07	1.08	1.10	1.35			8.10	8.28	7.85
	velocity																	
			5.44	8.17	8.59	8.67	8.76	9.04	8.76	8.59	8.50	8.33	8.47	7.98				



Time Intervals (s)

Hurdle Phases



Source: Pollitt, L., Walker, J., Bissas, A., & Merlino, S. (2018). Biomechanical report for the IAAF world championships: London 2017: Women's 100m Hurdles. Leeds Beckett University, London, GBR. p12-13.

<https://www.worldathletics.org/about-iaaf/documents/research-centre>

2017 Herculis Meeting International d'Athletisme (Monaco, MON) (TV Analysis)

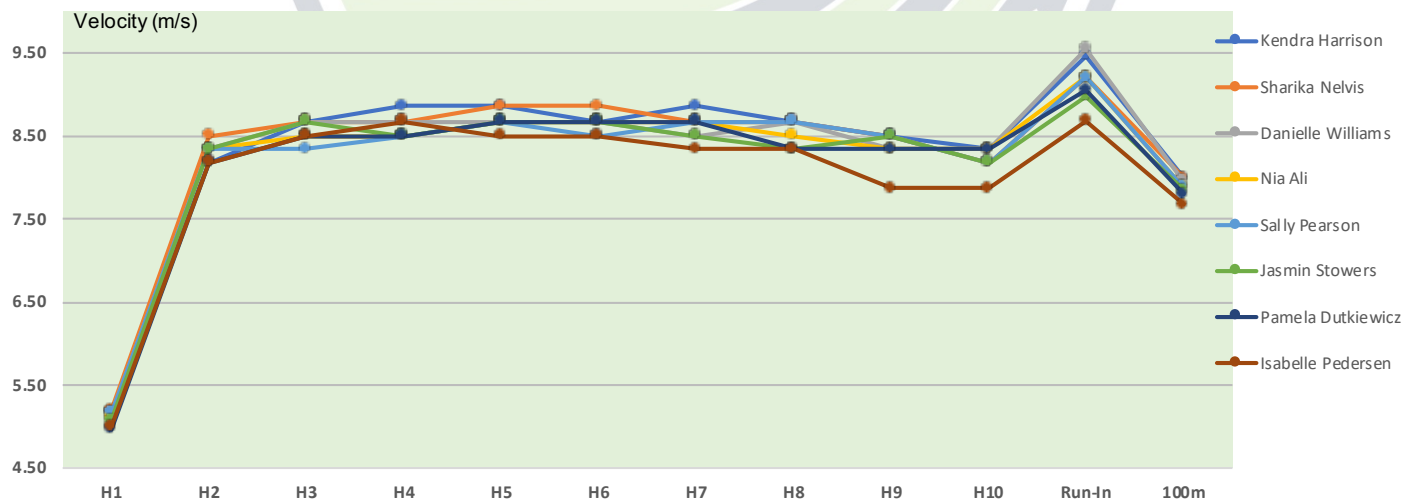
100m Hurdles

Date: 2017.07.21

Wind: -0.2 m/s

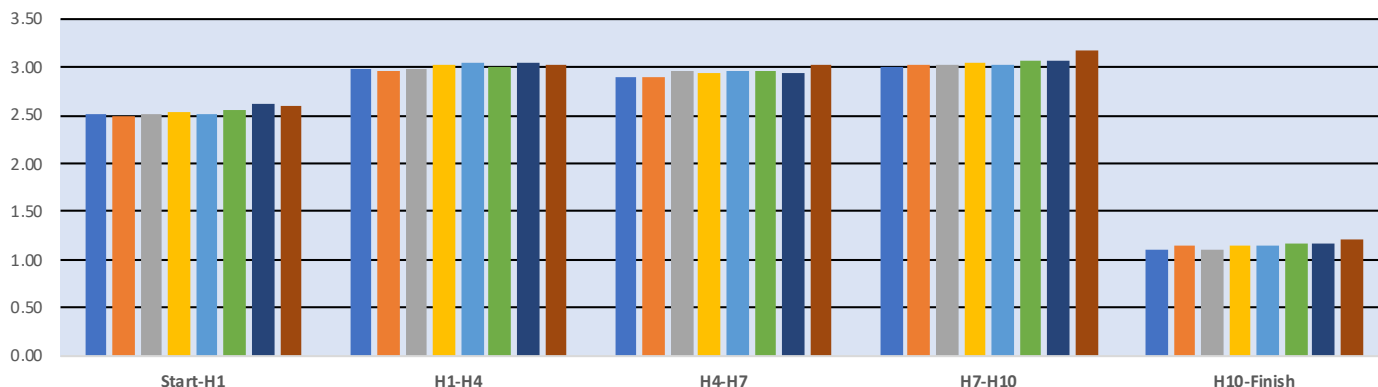
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.52	3.56	4.54	5.50	6.46	7.44	8.40	9.38	10.38	11.40		12.51	4 / 1			
	reaction time	0.161													2.98	2.90	3.00
	interval		1.04	0.98	0.96	0.96	0.98	0.96	0.98	1.00	1.02	1.11			8.56	8.79	8.50
Nelvis, Sharika (USA) (1990)	time	2.50	3.50	4.48	5.46	6.42	7.38	8.36	9.34	10.34	11.38		12.52	7 / 2			
	reaction time	0.146													2.96	2.90	3.02
	interval		1.00	0.98	0.98	0.96	0.96	0.98	0.98	1.00	1.04	1.14			8.61	8.79	8.44
Williams, Danielle (JAM) (1992)	time	2.52	3.54	4.52	5.50	6.48	7.46	8.46	9.44	10.46	11.48		12.58	2 / 3			
	reaction time	0.127													2.98	2.96	3.02
	interval		1.02	0.98	0.98	0.98	0.98	1.00	0.98	1.02	1.02	1.10			8.56	8.61	8.44
Ali, Nia (USA) (1988)	time	2.54	3.56	4.56	5.56	6.54	7.52	8.50	9.50	10.52	11.54		12.68	6 / 4			
	reaction time	0.136													3.02	2.94	3.04
	interval		1.02	1.00	1.00	0.98	0.98	0.98	1.00	1.02	1.02	1.14			8.44	8.67	8.39
Pearson, Sally (AUS) (1986)	time	2.52	3.54	4.56	5.56	6.54	7.54	8.52	9.50	10.50	11.54		12.68	5 / 5			
	reaction time	0.134													3.04	2.96	3.02
	interval		1.02	1.02	1.00	0.98	1.00	0.98	0.98	1.00	1.04	1.14			8.39	8.61	8.44
Stowers, Jasmin (USA) (1991)	time	2.56	3.58	4.56	5.56	6.54	7.52	8.52	9.54	10.54	11.58		12.75	3 / 6			
	reaction time	0.134													3.00	2.96	3.06
	interval		1.02	0.98	1.00	0.98	0.98	1.00	1.02	1.00	1.04	1.17			8.50	8.61	8.33
Dutkiewicz, Pamela (GER) (1991)	time	2.62	3.66	4.66	5.66	6.64	7.62	8.60	9.62	10.64	11.66		12.82	8 / 7			
	reaction time	0.149													3.04	2.94	3.06
	interval		1.04	1.00	1.00	0.98	0.98	0.98	1.02	1.02	1.02	1.16			8.39	8.67	8.33
Pedersen, Isabelle (NOR) (1992)	time	2.60	3.64	4.64	5.62	6.62	7.62	8.64	9.66	10.74	11.82		13.03	1 / 8			
	reaction time	0.187													3.02	3.02	3.18
	interval		1.04	1.00	0.98	1.00	1.00	1.02	1.02	1.08	1.08	1.21			8.44	8.44	8.02
	velocity		5.00	8.17	8.50	8.67	8.50	8.50	8.33	8.33	7.87	7.87	8.68				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: Gun Flash

Source: https://www.youtube.com/watch?v=s_0EMvhr42o

2017 Müller's Anniversary Games (London, GBR) (TV Analysis)

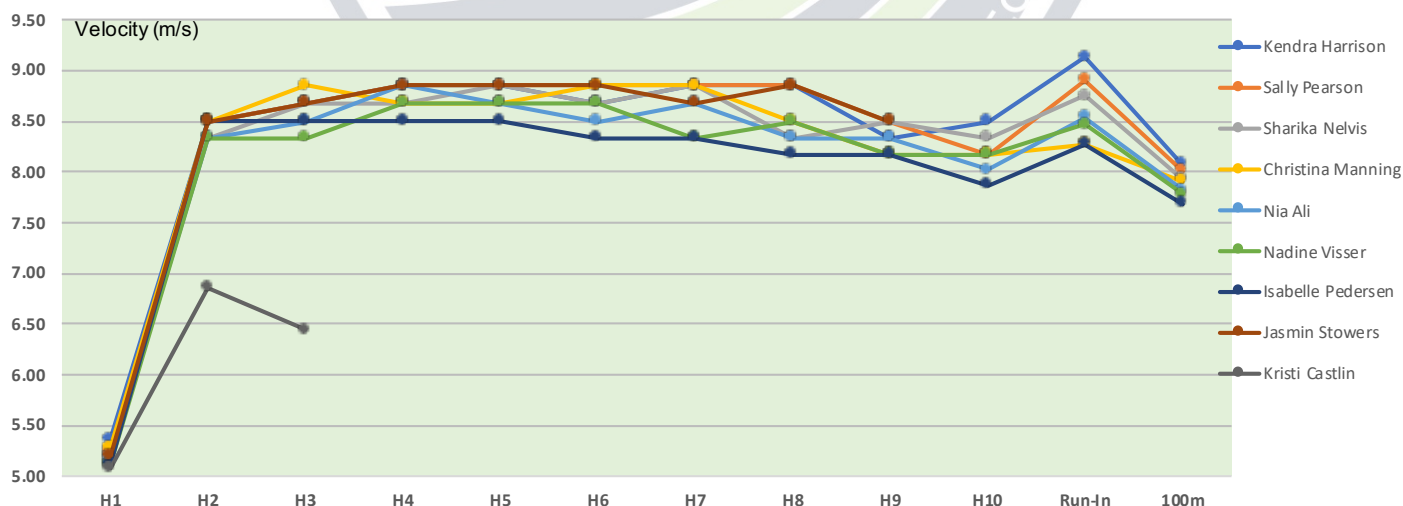
100m Hurdles

Date: 2018.07.17

Wind: 0.2 m/s

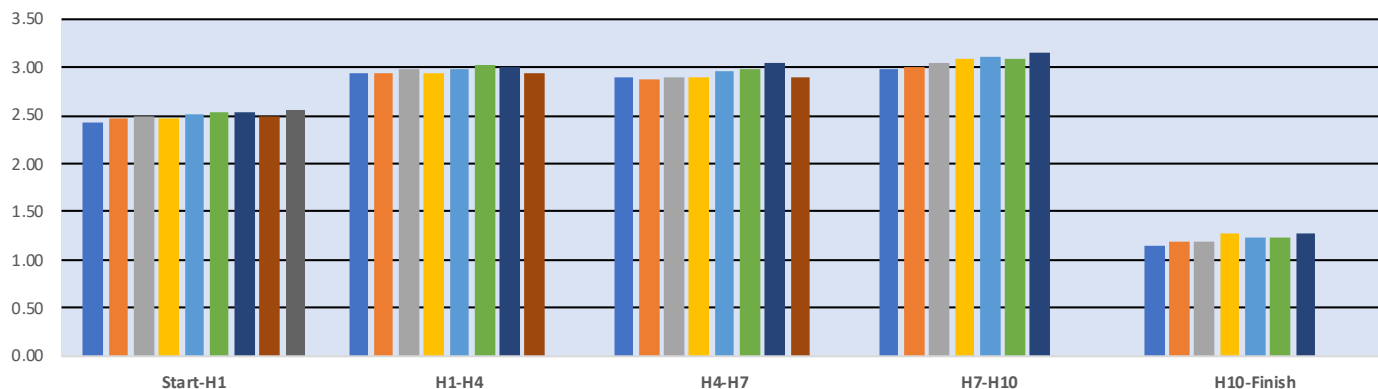
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time		2.42	3.42	4.40	5.36	6.32	7.30	8.26	9.22	10.24	11.24		12.39	5 / 1			
	reaction time	0.131											1.15			2.94	2.90	2.98
	interval			1.00	0.98	0.96	0.96	0.98	0.96	0.96	1.02	1.00	1.15			8.67	8.79	8.56
Pearson, Sally (USA) (1986)	time		2.48	3.48	4.46	5.42	6.38	7.34	8.30	9.26	10.26	11.30		12.48	4 / 2			
	reaction time	0.139											1.18			2.94	2.88	3.00
	interval			1.00	0.98	0.96	0.96	0.96	0.96	0.96	1.00	1.04	1.18			8.67	8.85	8.50
Nelvis, Sharika (USA) (1990)	time		2.50	3.52	4.50	5.48	6.44	7.42	8.38	9.40	10.40	11.42		12.62	8 / 3			
	reaction time	0.144											1.20			2.98	2.90	3.04
	interval			1.02	0.98	0.98	0.96	0.98	0.96	1.02	1.00	1.02	1.20			8.56	8.79	8.39
Manning, Christina (USA) (1990)	time		2.46	3.46	4.42	5.40	6.38	7.34	8.30	9.30	10.34	11.38		12.65	7 / 4			
	reaction time	0.146											1.27			2.94	2.90	3.08
	interval			1.00	0.96	0.98	0.98	0.96	0.96	1.00	1.04	1.04	1.27			8.67	8.79	8.28
Ali, Nia (USA) (1988)	time		2.52	3.54	4.54	5.50	6.48	7.48	8.46	9.48	10.50	11.56		12.79	3 / 5			
	reaction time	0.148											1.23			2.98	2.96	3.10
	interval			1.02	1.00	0.96	0.98	1.00	0.98	1.02	1.02	1.06	1.23			8.56	8.61	8.23
Visser, Nadine (NED) (1995)	time		2.54	3.56	4.58	5.56	6.54	7.52	8.54	9.54	10.58	11.62		12.86	9 / 6			
	reaction time	0.146											1.24			3.02	2.98	3.08
	interval			1.02	1.02	0.98	0.98	0.98	1.02	1.00	1.04	1.04	1.24			8.44	8.56	8.28
Pedersen, Isabelle (NOR) (1992)	time		2.54	3.54	4.54	5.54	6.54	7.56	8.58	9.62	10.66	11.74		13.01	1 / 7			
	reaction time	0.157											1.27			3.00	3.04	3.16
	interval			1.00	1.00	1.00	1.00	1.02	1.02	1.04	1.04	1.08	1.27			8.50	8.39	8.07
Stowers, Jasmin (USA) (1991)	time		2.50	3.50	4.48	5.44	6.40	7.36	8.34	9.30	10.30			dnf	6 / --			
	reaction time	0.124														2.94	2.90	
	interval			1.00	0.98	0.96	0.96	0.96	0.98	0.96	1.00					8.67	8.79	
Castlin, Kristi (USA) (1988)	time		2.56	3.80	5.12									dnf	2 / --			
	reaction time	0.128																
	interval			1.24	1.32													
	velocity		5.08	6.85	6.44													



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: https://www.youtube.com/watch?v=_UG_aU5JkIQ

2017 Athletissima (Lausanne, SUI) (TV Analysis)

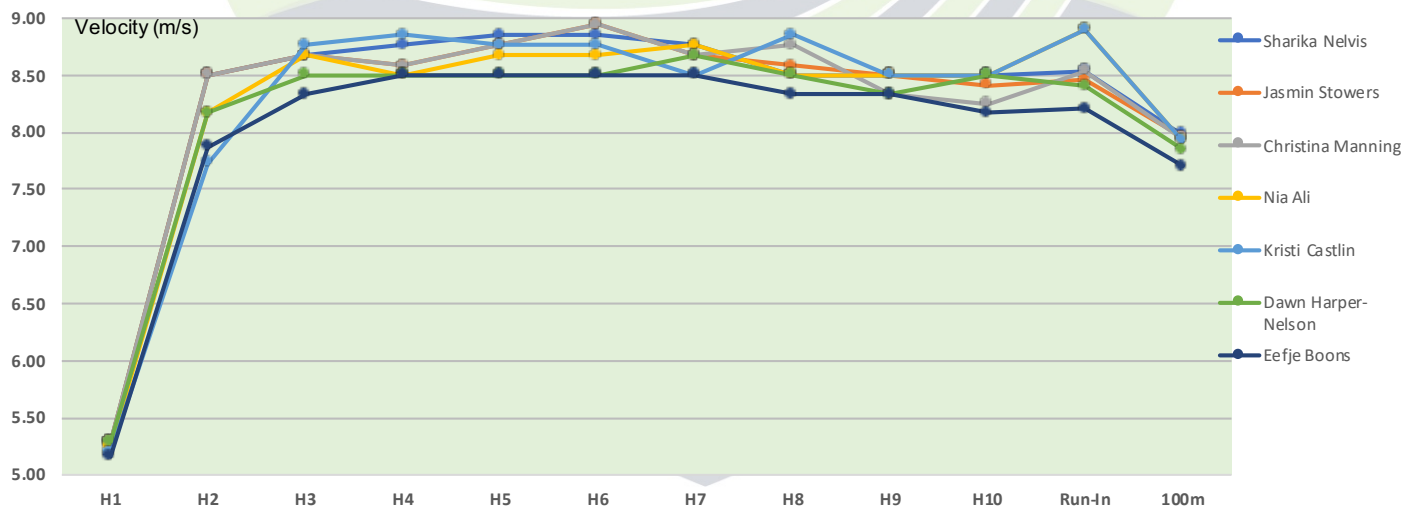
100m Hurdles

Date: 2017.07.06

Wind: -0.1 m/s

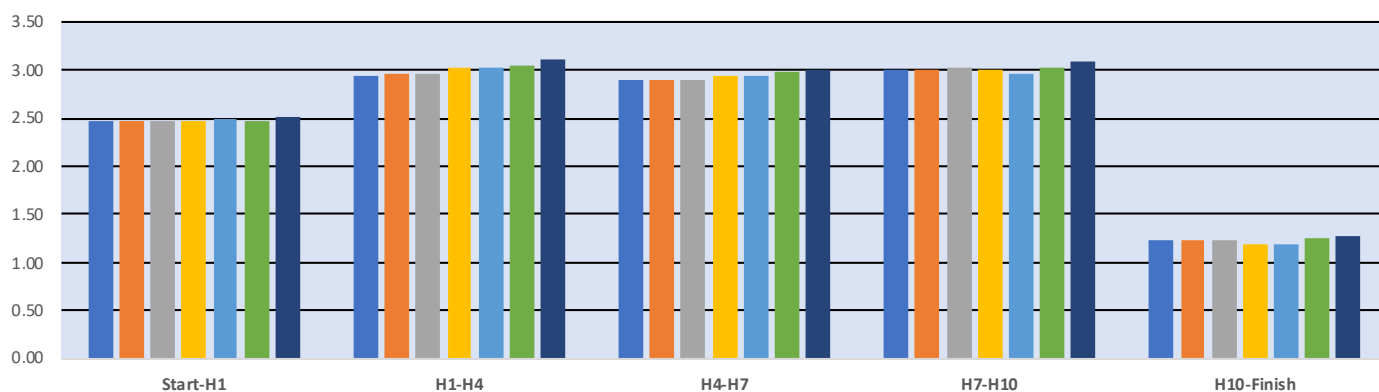
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Nelvis, Sharika (USA) (1990)	time		2.46	3.46	4.44	5.41	6.37	7.33	8.30	9.30	10.30	11.30		12.53	6 / 1			
	reaction time	0.129														2.95	2.89	3.00
	interval velocity		7 Steps	1.00	0.98	0.97	0.96	0.96	0.97	1.00	1.00	1.00	1.23			8.64	8.82	8.50
Stowers, Jasmin (USA) (1991)	time		2.46	3.46	4.44	5.43	6.40	7.35	8.33	9.32	10.32	11.33		12.57	5 / 2			
	reaction time	0.119														2.97	2.90	3.00
	interval velocity		5.28	8.50	8.67	8.59	8.76	8.95	8.67	8.59	8.50	8.42	8.47	7.96		8.59	8.79	8.50
Manning, Christina (USA) (1990)	time		2.46	3.46	4.44	5.43	6.40	7.35	8.33	9.30	10.32	11.35		12.58	2 / 3			
	reaction time	0.132														2.97	2.90	3.02
	interval velocity		5.28	8.50	8.67	8.59	8.76	8.95	8.67	8.76	8.33	8.25	8.54	7.95		8.59	8.79	8.44
Ali, Nia (USA) (1988)	time		2.48	3.52	4.50	5.50	6.48	7.46	8.43	9.43	10.43	11.43		12.61	4 / 4			
	reaction time	0.135														3.02	2.93	3.00
	interval velocity		5.24	1.04	0.98	1.00	0.98	0.98	0.97	1.00	1.00	1.00	1.18			8.44	8.70	8.50
Castlin, Kristi (USA) (1988)	time		2.50	3.60	4.57	5.53	6.50	7.47	8.47	9.43	10.43	11.43		12.61	7 / 5			
	reaction time	0.133														3.03	2.94	2.96
	interval velocity		5.20	7.73	8.76	8.85	8.76	8.76	8.50	8.85	8.50	8.50	8.90	7.93		8.42	8.67	8.61
Harper Nelson, Dawn (USA) (1984)	time		2.46	3.50	4.50	5.50	6.50	7.50	8.48	9.48	10.50	11.50		12.75	1 / 6			
	reaction time	0.116														3.04	2.98	3.02
	interval velocity		5.28	8.17	8.50	8.50	8.50	8.50	8.67	8.50	8.33	8.50	8.40	7.84		8.39	8.56	8.44
Boons Eefje (NED) (1994)	time		2.52	3.60	4.62	5.62	6.62	7.62	8.62	9.64	10.66	11.70		12.98	3 / 7			
	reaction time	0.128														3.10	3.00	3.08
	interval velocity		5.16	7.87	8.33	8.50	8.50	8.50	8.50	8.33	8.33	8.17	8.20	7.70		8.23	8.50	8.28



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=Zezf-faKIAE>

2017 István Gyulai Memorial (Székesfehérvár, HUN) (TV Analysis)

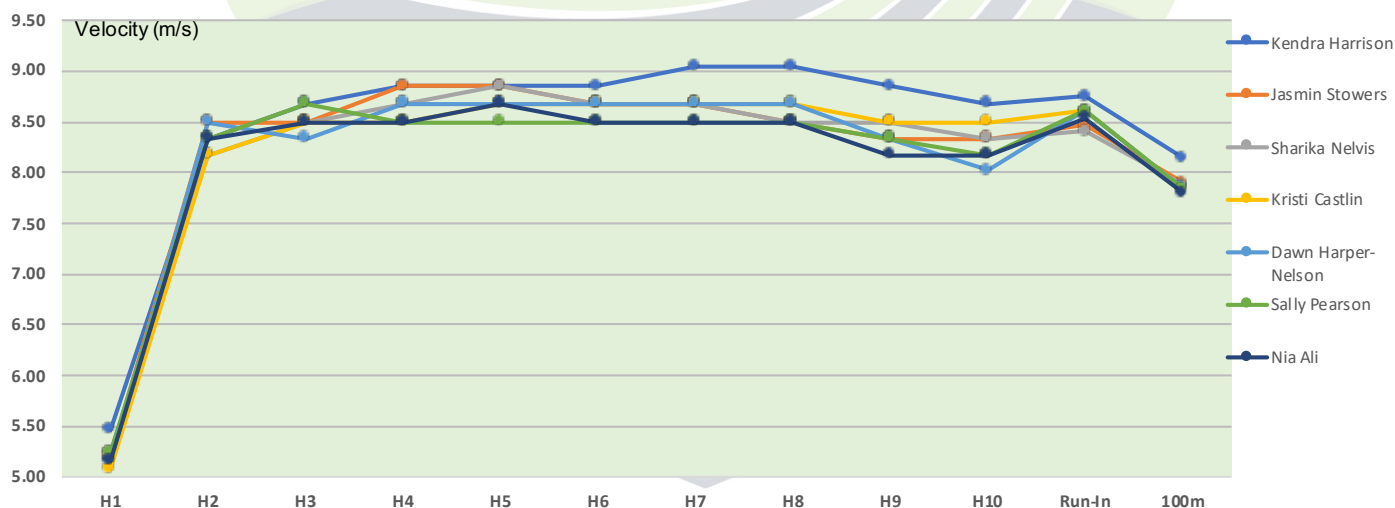
100m Hurdles

Date: 2017.07.04

Wind: 0.1 m/s

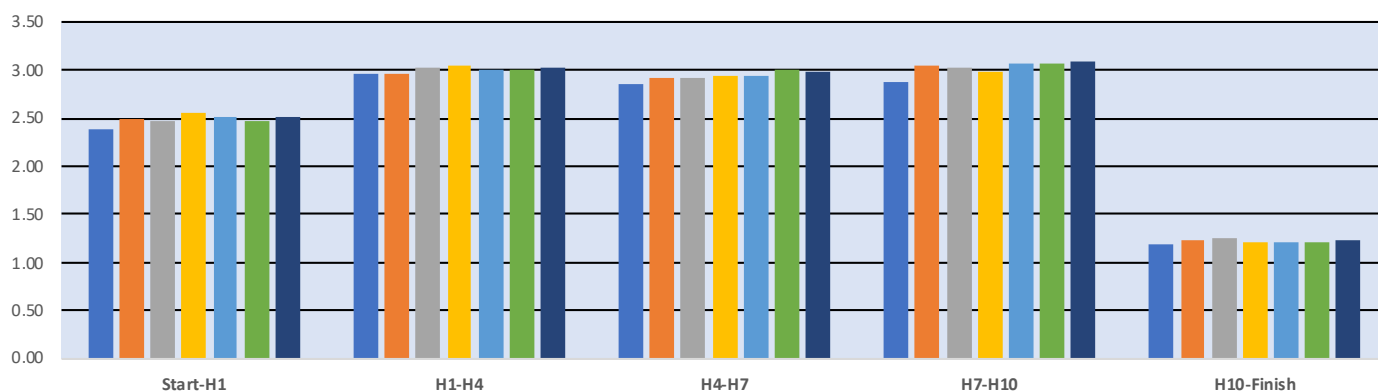
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.38	3.40	4.38	5.34	6.30	7.26	8.20	9.14	10.10	11.08		12.28	4 / 1			
	reaction time	0.152													2.96	2.86	2.88
	interval		1.02	0.98	0.96	0.96	0.96	0.94	0.94	0.96	0.98	1.20			8.61	8.92	8.85
Stowers, Jasmin (USA) (1991)	time	2.50	3.50	4.50	5.46	6.42	7.40	8.38	9.38	10.40	11.42		12.66	6 / 2			
	reaction time	0.148													2.96	2.92	3.04
	interval		1.00	1.00	0.96	0.96	0.98	0.98	1.00	1.02	1.02	1.24			8.61	8.73	8.39
Nelvis, Sharika (USA) (1990)	time	2.48	3.52	4.52	5.50	6.46	7.44	8.42	9.42	10.42	11.44		12.69	1 / 3			
	reaction time	0.160													3.02	2.92	3.02
	interval		1.04	1.00	0.98	0.96	0.98	0.98	1.00	1.00	1.02	1.25			8.44	8.73	8.44
Castlin, Kristi (USA) (1988)	time	2.56	3.60	4.60	5.60	6.58	7.56	8.54	9.52	10.52	11.52		12.74	3 / 4			
	reaction time	0.165													3.04	2.94	2.98
	interval		1.04	1.00	1.00	0.98	0.98	0.98	0.98	1.00	1.00	1.22			8.39	8.67	8.56
Harper Nelson, Dawn (USA) (1984)	time	2.52	3.52	4.54	5.52	6.50	7.48	8.46	9.44	10.46	11.52		12.74	2 / 5			
	reaction time	0.161													3.00	2.94	3.06
	interval		1.00	1.02	0.98	0.98	0.98	0.98	0.98	1.02	1.06	1.22			8.50	8.67	8.33
Pearson, Sally (AUS) (1986)	time	2.48	3.50	4.48	5.48	6.48	7.48	8.48	9.48	10.50	11.54		12.76	7 / 6			
	reaction time	0.135													3.00	3.00	3.06
	interval		1.02	0.98	1.00	1.00	1.00	1.00	1.00	1.02	1.04	1.22			8.50	8.50	8.33
Ali, Nia (USA) (1988)	time	2.52	3.54	4.54	5.54	6.52	7.52	8.52	9.52	10.56	11.60		12.83	5 / 7			
	reaction time	0.159													3.02	2.98	3.08
	interval		1.02	1.00	1.00	0.98	1.00	1.00	1.00	1.04	1.04	1.23			8.44	8.56	8.28
	velocity		5.46	8.33	8.67	8.85	8.85	9.04	9.04	8.85	8.67	8.75	8.14				
	velocity		5.20	8.50	8.50	8.85	8.85	8.67	8.67	8.50	8.33	8.47	7.90				
	velocity		5.24	8.17	8.50	8.67	8.85	8.67	8.67	8.50	8.33	8.40	7.88				
	velocity		5.08	8.17	8.50	8.50	8.67	8.67	8.67	8.50	8.50	8.61	7.85				
	velocity		5.16	8.50	8.33	8.67	8.67	8.67	8.67	8.33	8.02	8.61	7.85				
	velocity		5.24	8.33	8.67	8.50	8.50	8.50	8.50	8.33	8.17	8.61	7.84				
	velocity		5.16	8.33	8.50	8.50	8.67	8.50	8.50	8.17	8.17	8.54	7.79				



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=fpF_xeeBMAY

2017 Bislett Games (Oslo, NOR) (TV Analysis)

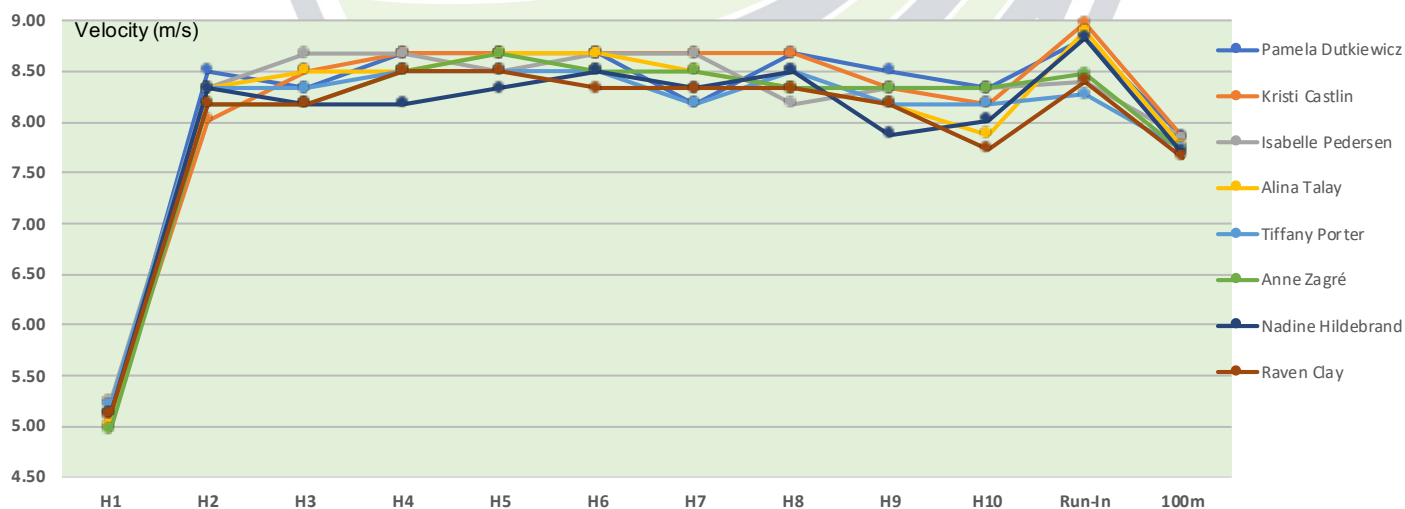
100m Hurdles

Date: 2017.06.15

Wind: 0.8 m/s

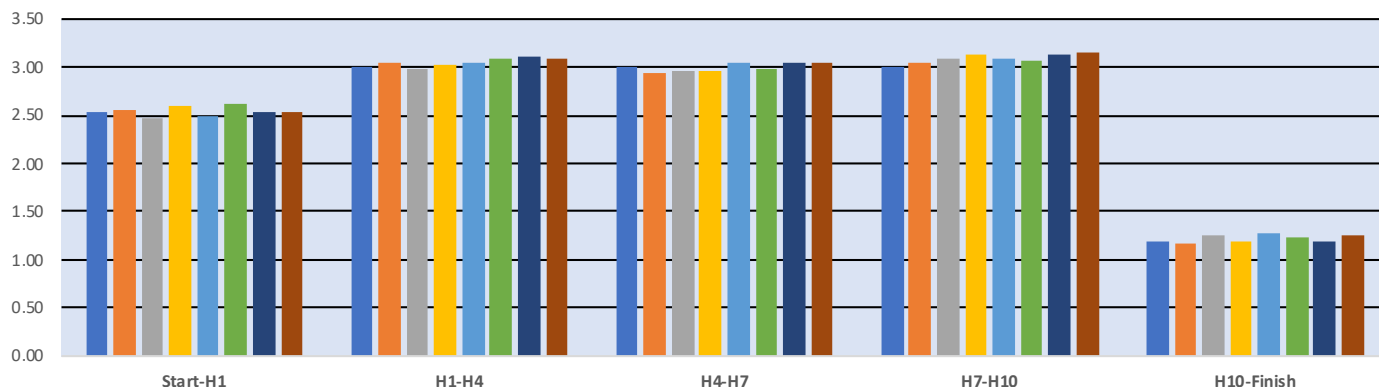
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Dutkiewicz, Pamela (GER) (1991)	time	2.54	3.54	4.56	5.54	6.52	7.50	8.54	9.52	10.52	11.54		12.73	4 / 1			
	reaction time	0.127													3.00	3.00	3.00
	interval		1.00	1.02	0.98	0.98	0.98	1.04	0.98	1.00	1.02	1.19			8.50	8.50	8.50
Castlin, Kristi (USA) (1988)	time	2.56	3.62	4.62	5.60	6.58	7.56	8.54	9.52	10.54	11.58		12.75	6 / 2			
	reaction time	0.140													3.04	2.94	3.04
	interval		1.06	1.00	0.98	0.98	0.98	0.98	1.02	1.04	1.17				8.39	8.67	8.39
Pedersen, Isabelle (NOR) (1992)	time	2.48	3.50	4.48	5.46	6.46	7.44	8.42	9.46	10.48	11.50		12.75	5 / 3			
	reaction time	0.122													2.98	2.96	3.08
	interval		1.02	0.98	0.98	1.00	0.98	1.04	1.02	1.02	1.25	PB			8.56	8.61	8.28
Talay, Alina (BLR) (1989)	time	2.60	3.62	4.62	5.62	6.60	7.58	8.58	9.60	10.64	11.72		12.90	7 / 4			
	reaction time	0.141													3.02	2.96	3.14
	interval		1.02	1.00	1.00	0.98	0.98	1.00	1.02	1.04	1.08	1.18			8.44	8.61	8.12
Porter, Tiffany (GBR) (1987)	time	2.50	3.52	4.54	5.54	6.54	7.54	8.58	9.58	10.62	11.66		12.93	3 / 5			
	reaction time	0.124													3.04	3.04	3.08
	interval		1.02	1.02	1.00	1.00	1.00	1.04	1.00	1.04	1.04	1.27			8.39	8.39	8.28
Zagré, Anne (BEL) (1990)	time	2.62	3.66	4.70	5.70	6.68	7.68	8.68	9.70	10.72	11.74		12.98	8 / 6			
	reaction time	0.154													3.08	2.98	3.06
	interval		1.04	1.04	1.00	0.98	1.00	1.00	1.02	1.02	1.02	1.24			8.28	8.56	8.33
Hildebrand, Nadine (GER) (1987)	time	2.54	3.56	4.60	5.64	6.66	7.66	8.68	9.68	10.76	11.82		13.01	2 / 7			
	reaction time	0.140													3.10	3.04	3.14
	interval		1.02	1.04	1.04	1.02	1.00	1.02	1.00	1.08	1.06	1.19			8.23	8.39	8.12
Clay, Raven (USA) (1990)	time	2.54	3.58	4.62	5.62	6.62	7.64	8.66	9.68	10.72	11.82		13.07	1 / 8			
	reaction time	0.144													3.08	3.04	3.16
	interval		1.04	1.04	1.00	1.00	1.02	1.02	1.02	1.04	1.10	1.25			8.28	8.39	8.07
	time	2.54	3.58	4.62	5.62	6.62	7.64	8.66	9.68	10.72	11.82		13.07				
	interval		1.04	1.04	1.00	1.00	1.02	1.02	1.02	1.04	1.10	1.25					
	velocity	5.12	8.17	8.17	8.50	8.50	8.33	8.33	8.33	8.17	7.73	8.40	7.65				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=K5ieW1-zni8>

2017 Prefontaine Classic (Eugene, OR) (TV Analysis)

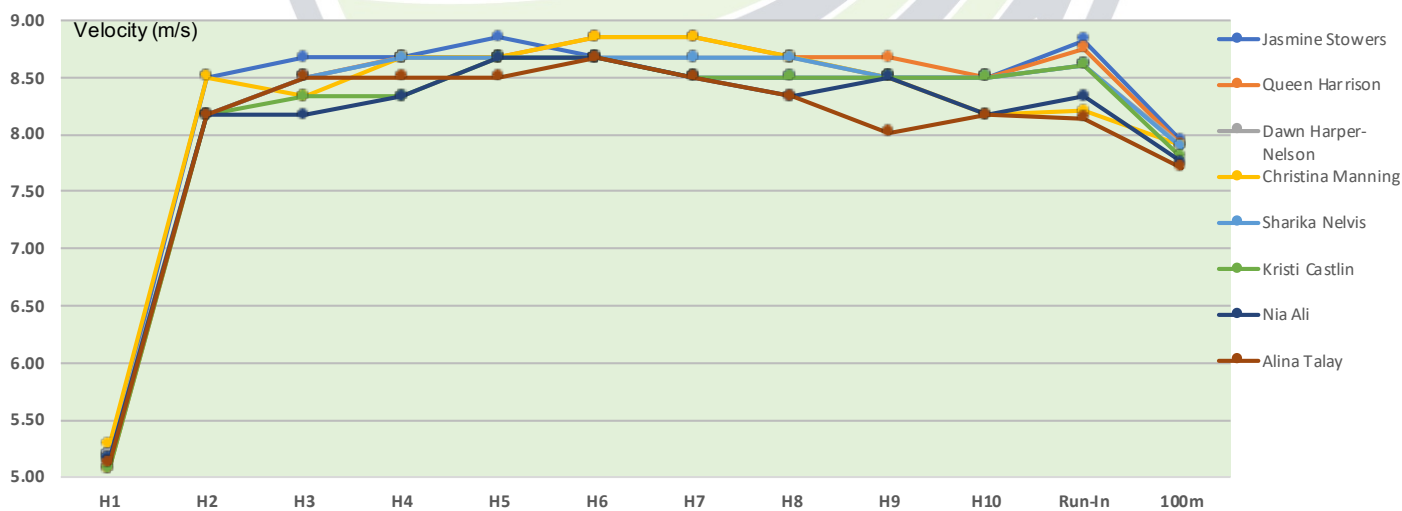
100m Hurdles

Date: 2017.05.27

Wind: 0.8 m/s

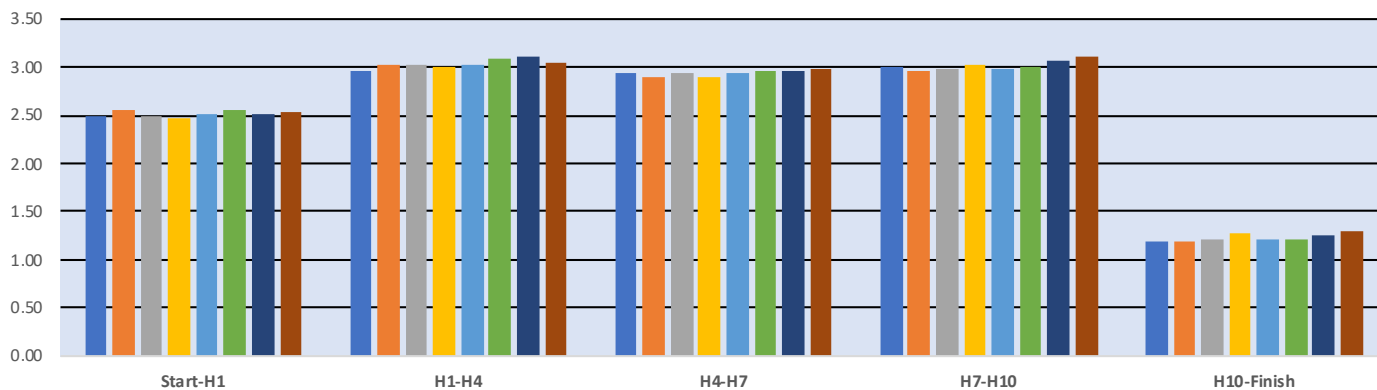
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Stowers, Jasmine (USA) (1991)	time	2.50	3.50	4.48	5.46	6.42	7.40	8.40	9.40	10.40	11.40		12.59	2 / 1			
reaction time	0.154														2.96	2.94	3.00
interval			1.00	0.98	0.98	0.96	0.98	1.00	1.00	1.00	1.00	1.19			8.61	8.67	8.50
velocity		5.20	8.50	8.67	8.67	8.85	8.67	8.50	8.50	8.50	8.50	8.82	7.94				
Harrison, Queen (USA) (1988)	time	2.56	3.60	4.60	5.58	6.56	7.52	8.48	9.46	10.44	11.44		12.64	8 / 2			
reaction time	0.172														3.02	2.90	2.96
interval			1.04	1.00	0.98	0.98	0.96	0.96	0.98	0.98	1.00	1.20			8.44	8.79	8.61
velocity		5.08	8.17	8.50	8.67	8.67	8.85	8.85	8.67	8.67	8.50	8.75	7.91				
Harper Nelson, Dawn (USA) (1984)	time	2.50	3.54	4.54	5.52	6.50	7.48	8.46	9.44	10.44	11.44		12.66	3 / 3			
reaction time	0.154														3.02	2.94	2.98
interval			1.04	1.00	0.98	0.98	0.98	0.98	0.98	1.00	1.00	1.22			8.44	8.67	8.56
velocity		5.20	8.17	8.50	8.67	8.67	8.67	8.67	8.67	8.50	8.50	8.61	7.90				
Manning, Christina (USA) (1990)	time	2.46	3.46	4.48	5.46	6.44	7.40	8.36	9.34	10.34	11.38		12.66	7 / 4			
reaction time	0.157														3.00	2.90	3.02
interval			1.00	1.02	0.98	0.98	0.96	0.96	0.98	1.00	1.04	1.28			8.50	8.79	8.44
velocity		5.28	8.50	8.33	8.67	8.67	8.85	8.85	8.67	8.50	8.17	8.20	7.90				
Nelvis, Sharika (USA) (1990)	time	2.52	3.56	4.56	5.54	6.52	7.50	8.48	9.46	10.46	11.46		12.68	4 / 5			
reaction time	0.187														3.02	2.94	2.98
interval			1.04	1.00	0.98	0.98	0.98	0.98	0.98	1.00	1.00	1.22			8.44	8.67	8.56
velocity		5.16	8.17	8.50	8.67	8.67	8.67	8.67	8.67	8.50	8.50	8.61	7.89				
Castlin, Kristi (USA) (1988)	time	2.56	3.60	4.62	5.64	6.62	7.60	8.60	9.60	10.60	11.60		12.82	6 / 6			
reaction time	0.163														3.08	2.96	3.00
interval			1.04	1.02	1.02	0.98	0.98	1.00	1.00	1.00	1.00	1.22			8.28	8.61	8.50
velocity		5.08	8.17	8.33	8.33	8.67	8.67	8.50	8.50	8.50	8.50	8.61	7.80				
Ali, Nia (USA) (1988)	time	2.52	3.56	4.60	5.62	6.60	7.58	8.58	9.60	10.60	11.64		12.90	5 / 7			
reaction time	0.178														3.10	2.96	3.06
interval			1.04	1.04	1.02	0.98	0.98	1.00	1.02	1.00	1.04	1.26			8.23	8.61	8.33
velocity		5.16	8.17	8.17	8.33	8.67	8.67	8.50	8.33	8.50	8.17	8.33	7.75				
Talay, Alina (BLR) (1989)	time	2.54	3.58	4.58	5.58	6.58	7.56	8.56	9.58	10.64	11.68		12.97	1 / 8			
reaction time	0.159														3.04	2.98	3.12
interval			1.04	1.00	1.00	1.00	0.98	1.00	1.02	1.06	1.04	1.29			8.39	8.56	8.17
velocity		5.12	8.17	8.50	8.50	8.50	8.67	8.50	8.33	8.02	8.17	8.14	7.71				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=Tb0jZpV1X4M>

2017 Doha Diamond League (Doha, QAT) (TV Analysis)

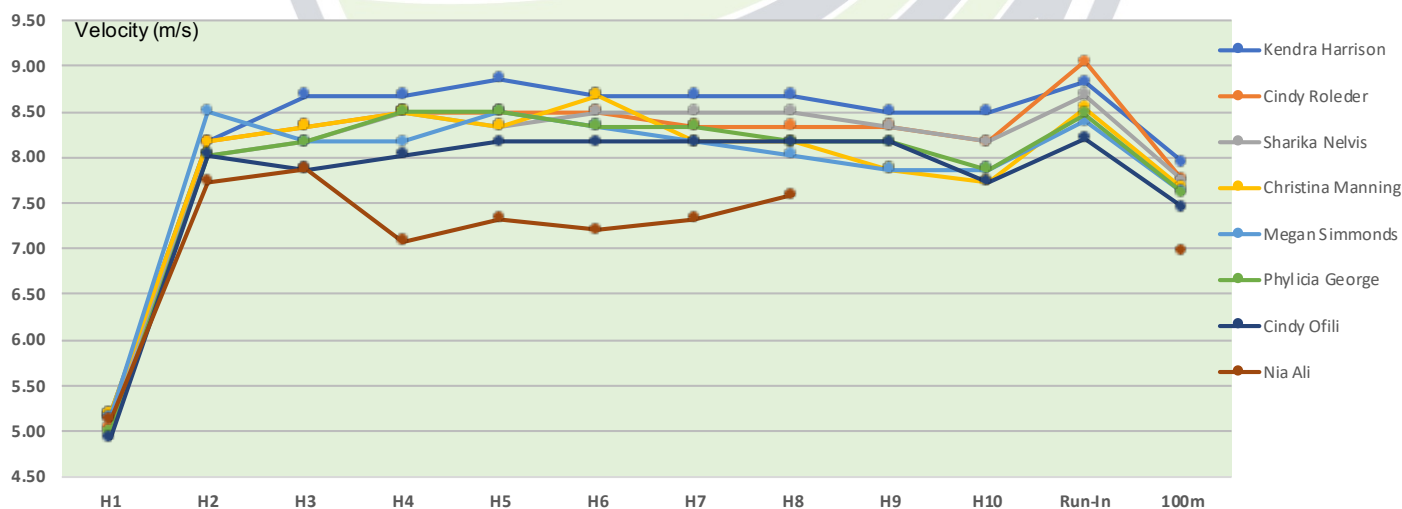
100m Hurdles

Date: 2017.05.05

Wind: -2.3 m/s

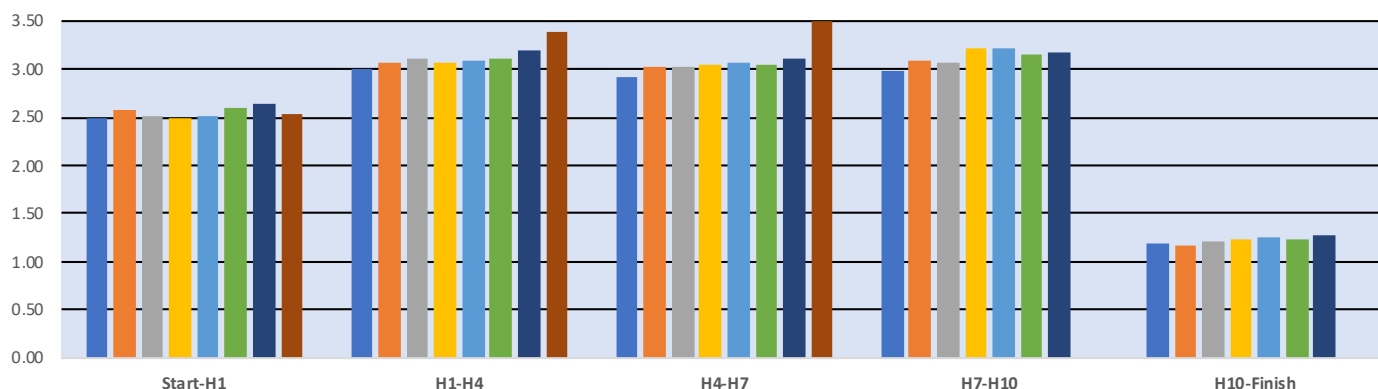
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.50	3.54	4.52	5.50	6.46	7.44	8.42	9.40	10.40	11.40		12.59	5 / 1			
	reaction time	0.128										1.19			3.00	2.92	2.98
	interval velocity		1.04	0.98	0.98	0.96	0.98	0.98	0.98	1.00	1.00	8.82	7.94		8.50	8.73	8.56
Roleder, Cindy (GER) (1989)	time	2.58	3.62	4.64	5.64	6.64	7.64	8.66	9.68	10.70	11.74		12.90	3 / 2			
	reaction time	0.138										1.16			3.06	3.02	3.08
	interval velocity		1.04	1.02	1.00	1.00	1.00	1.02	1.02	1.02	1.04	9.05	7.75		8.33	8.44	8.28
Nelvis, Sharika (USA) (1990)	time	2.52	3.58	4.62	5.62	6.64	7.64	8.64	9.64	10.66	11.70		12.91	2 / 3			
	reaction time	0.142										1.21			3.10	3.02	3.06
	interval velocity		1.06	1.04	1.00	1.02	1.00	1.00	1.00	1.02	1.04	8.68	7.75		8.23	8.44	8.33
Manning, Christina (USA) (1990)	time	2.50	3.54	4.56	5.56	6.58	7.56	8.60	9.64	10.72	11.82		13.05	6 / 4			
	reaction time	0.148										1.23			3.06	3.04	3.22
	interval velocity		1.04	1.02	1.00	1.02	0.98	1.04	1.04	1.08	1.10	8.54	7.66		8.33	8.39	7.92
Simmonds, Megan (JAM) (1994)	time	2.52	3.52	4.56	5.60	6.60	7.62	8.66	9.72	10.80	11.88		13.13	8 / 5			
	reaction time	0.185										1.25			3.08	3.06	3.22
	interval velocity		1.00	1.04	1.04	1.00	1.02	1.04	1.06	1.08	1.08	8.40	7.62		8.28	8.33	7.92
George, Phylcia (CAN) (1987)	time	2.60	3.66	4.70	5.70	6.70	7.72	8.74	9.78	10.82	11.90		13.14	1 / 6			
	reaction time	0.162										1.24			3.10	3.04	3.16
	interval velocity		1.06	1.04	1.00	1.00	1.02	1.02	1.04	1.04	1.08	8.47	7.61		8.23	8.39	8.07
Ofili, Cindy (GBR) (1994)	time	2.64	3.70	4.78	5.84	6.88	7.92	8.96	10.00	11.04	12.14		13.42	7 / 7			
	reaction time	0.158										1.28			3.20	3.12	3.18
	interval velocity		1.06	1.08	1.06	1.04	1.04	1.04	1.04	1.04	1.10	8.20	7.45		7.97	8.17	8.02
Ali, Nia (USA) (1988)	time	2.54	3.64	4.72	5.92	7.08	8.26	9.42	10.54				14.34	4 / 8			
	reaction time	0.143													3.38	3.50	
	interval velocity		1.10	1.08	1.20	1.16	1.18	1.16	1.12				6.97		7.54	7.29	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=xIP0562aaVM>

2017 Drake Relays (Des Moines, IA) (TV Analysis)

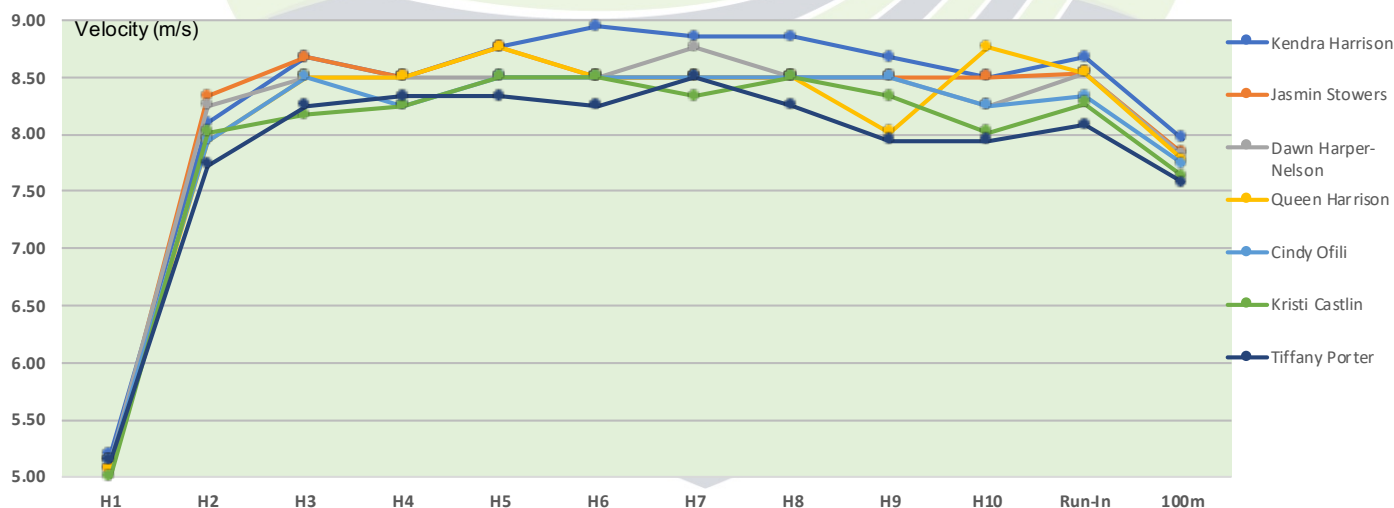
100m Hurdles

Date: 2017.04.29

Wind: 1.0 m/s

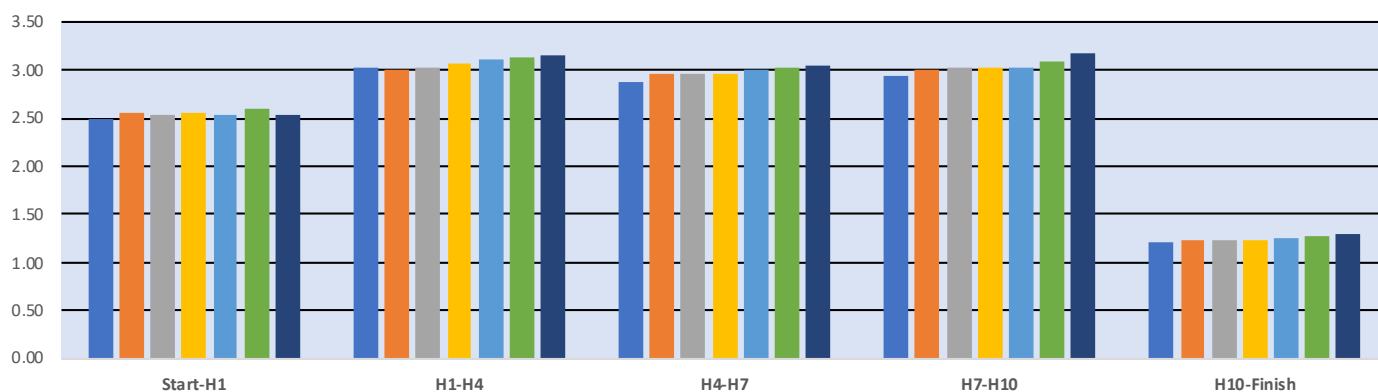
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.50	3.55	4.53	5.53	6.50	7.45	8.41	9.37	10.35	11.35		12.56	4 / 1			
	reaction time											1.21			3.03	2.88	2.94
	interval velocity	5.20	8.10	8.67	8.50	8.76	8.95	8.85	8.85	8.67	8.50	8.68	7.96		8.42	8.85	8.67
Stowers, Jasmin (USA) (1991)	time	2.56	3.58	4.56	5.56	6.53	7.53	8.53	9.53	10.53	11.53		12.76	2 / 2			
	reaction time											1.23			3.00	2.97	3.00
	interval velocity	5.08	8.33	8.67	8.50	8.76	8.50	8.50	8.50	8.50	8.50	8.54	7.84		8.50	8.59	8.50
Harper Nelson, Dawn (USA) (1984)	time	2.53	3.56	4.56	5.56	6.56	7.56	8.53	9.53	10.53	11.56		12.79	3 / 3			
	reaction time											1.23			3.03	2.97	3.03
	interval velocity	5.14	8.25	8.50	8.50	8.50	8.50	8.76	8.50	8.50	8.25	8.54	7.82		8.42	8.59	8.42
Harrison, Queen (USA) (1988)	time	2.56	3.63	4.63	5.63	6.60	7.60	8.60	9.60	10.66	11.63		12.86	7 / 4			
	reaction time											1.23			3.07	2.97	3.03
	interval velocity	5.08	7.94	8.50	8.50	8.76	8.50	8.50	8.50	8.02	8.76	8.54	7.78		8.31	8.59	8.42
Ofili, Cindy (GBR) (1994)	time	2.53	3.60	4.60	5.63	6.63	7.63	8.63	9.63	10.63	11.66		12.92	6 / 6			
	reaction time											1.26			3.10	3.00	3.03
	interval velocity	5.14	7.94	8.50	8.25	8.50	8.50	8.50	8.50	8.50	8.25	8.33	7.74		8.23	8.50	8.42
Castlin, Kristi (USA) (1988)	time	2.60	3.66	4.70	5.73	6.73	7.73	8.75	9.75	10.77	11.83		13.10	5 / 7			
	reaction time											1.27			3.13	3.02	3.08
	interval velocity	5.00	8.02	8.17	8.25	8.50	8.50	8.33	8.50	8.33	8.02	8.27	7.63		8.15	8.44	8.28
Porter, Tiffany (GBR) (1987)	time	2.53	3.63	4.66	5.68	6.70	7.73	8.73	9.76	10.83	11.90		13.20	1 / 8			
	reaction time											1.30			3.15	3.05	3.17
	interval velocity	5.14	7.73	8.25	8.33	8.33	8.25	8.50	8.25	7.94	7.94	8.08	7.58		8.10	8.36	8.04



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=1gDJiIimjIA>

Men's 400m Hurdles

2017 Top 10 Times - Men's 400m Hurdles

McMaster, Kyron (IVB) (1997)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10		
FINAL - 2017 Jamaica International Invitational (Kingston, JAM) (TV Analysis)			Henson (2020) - Athlete First: 2017 year end hurdle report																	
date	20-May	time		9.51	13.28	17.08	21.02	24.99	29.13	33.43	37.90				5 / 1					
reaction time		interval			3.77	3.80	3.94	3.97	4.14	4.30	4.47			NR PB				12.05		
		velocity		8.41	9.28	9.21	8.88	8.82	8.45	8.14	7.83			8.37				8.71		
H1 lead leg	R	strides			13	13	13	13	13	14	14		14	107						
Clement, Kerron (USA) (1985)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10		
FINAL - 2017 Müller's Anniversary Games (London, GBR) (TV Analysis)			Henson (2020) - Athlete First: 2017 year end hurdle report																	
date	9-Jul	time		6.00	9.72	13.44	17.24	21.24	25.48	29.80	34.16	38.60	43.08			7 / 1				
reaction time	0.157	interval			3.72	3.72	3.80	4.00	4.24	4.32	4.36	4.44	4.48	4.94			11.24	12.56		
		velocity		7.50	9.41	9.41	9.21	8.75	8.25	8.10	8.03	7.88	7.81	8.10	8.33		9.34	8.36		
H1 lead leg	R	strides		20	13	13	13	13	13	13	13	13	13	16	153			7.91		
McMaster, Kyron (IVB) (1997)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10		
FINAL - 2017 Weltklasse (Zürich, SUI) (TV Analysis)			Henson (2020) - Athlete First: 2017 year end hurdle report																	
date	24-Aug	time		5.72	9.42	13.16		21.00	25.08	29.32	33.76	38.24	42.88			4 / 1				
reaction time	0.153	interval			3.70	3.74		7.84	4.08	4.24	4.44	4.48	4.64	5.19				13.56		
		velocity		7.87	9.46	9.36		8.93	8.58	8.25	7.88	7.81	7.54	7.71	8.32			7.74		
H1 lead leg	R	strides		20	13	13		13	13	13	14	14	14	17.2	131.2					
McMaster, Kyron (IVB) (1997)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10		
FINAL - 2017 Müller's Anniversary Games (London, GBR) (TV Analysis)			Henson (2020) - Athlete First: 2017 year end hurdle report																	
date	9-Jul	time		5.76	9.32	13.04	16.72	20.60	24.68	28.96	33.36	37.92	42.76			6 / 2				
reaction time	0.164	interval			3.56	3.72	3.68	3.88	4.08	4.28	4.40	4.56	4.84	5.36			10.96	12.24		
		velocity		7.81	9.83	9.41	9.51	9.02	8.58	8.18	7.95	7.68	7.23	7.46	8.31		9.58	8.58		
H1 lead leg	R	strides		20	13	13	13	13	13	14	14	14	15	18	160			7.61		
Downing, Quincy (USA) (1993)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10		
FINAL - 2017 Racers Grand Prix (Kingston, JAM)			Henson (2020) - Athlete First: 2017 year end hurdle report																	
date	10-Jun	time												48.13		/ 1				
reaction time		interval		No Information Available													PB			
		velocity																		
H1 lead leg		strides																		
Futch, Eric (USA) (1993)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10		
FINAL - 2017 USATF Championships (Sacramento, CA) (TV Analysis)			Henson (2020) - Athlete First: 2017 year end hurdle report																	
date	25-Jun	time		5.96	9.79	13.65	17.58	21.65	25.65	29.82	34.03	38.34	42.79			4 / 1				
reaction time		interval			3.83	3.86	3.93	4.07	4.00	4.17	4.21	4.31	4.45	5.39			11.62	12.24		
		velocity		7.55	9.14	9.07	8.91	8.60	8.75	8.39	8.31	8.12	7.87	7.42	8.30		9.04	8.58		
H1 lead leg	R	strides		22	14	14	13	13		14	15	15	15	18	153			8.10		
Warholm, Karsten (NOR) (1996)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10		
FINAL - 2017 Weltklasse (Zürich, SUI) (TV Analysis)			Henson (2020) - Athlete First: 2017 year end hurdle report																	
date	24-Aug	time		5.76	9.32	13.00	16.80	20.76	24.84	29.08	33.52	38.28	43.00			6 / 2				
reaction time	0.164	interval			3.56	3.68	3.80	3.96	4.08	4.24	4.44	4.76	4.72	5.22			11.04	12.28		
		velocity		7.81	9.83	9.51	9.21	8.84	8.58	8.25	7.88	7.35	7.42	7.66	8.30		9.51	8.55		
H1 lead leg	L	strides		20	13	13	13	13	13	13	15	15	15	17.7	145.7			7.54		
Copello, Yasmani (TUR) (1987)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10		
FINAL - 2017 Müller's Anniversary Games (London, GBR) (TV Analysis)			Henson (2020) - Athlete First: 2017 year end hurdle report																	
date	9-Jul	time		6.00	9.68	13.52	17.40	21.40	25.52	29.88	34.32	38.76	43.16			8 / 3				
reaction time	0.187	interval			3.68	3.84	3.88	4.00	4.12	4.36	4.44	4.44	4.40	5.08			11.40	12.48		
		velocity		7.50	9.51	9.11	9.02	8.75	8.50	8.03	7.88	7.88	7.95	7.87	8.29		9.21	8.41		
H1 lead leg	R	strides		20	13	13	13	13	13	14	14	14	14	17.2	158.2			7.91		
Warholm, Karsten (NOR) (1996)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10		
FINAL - 2017 Bislett Games (Oslo, NOR) (TV Analysis)			Henson (2020) - Athlete First: 2017 year end hurdle report																	
date	15-Jun	time		5.86	9.46	13.06	16.93	20.86	25.00	29.30	33.56	38.20	42.90			7 / 1				
reaction time	0.149	interval			3.60	3.60	3.87	3.93	4.14	4.30	4.26	4.64	4.70	5.35			11.07	12.37		
		velocity		7.68	9.72	9.72	9.04	8.91	8.45	8.14	8.22	7.54	7.45	7.48	8.29		9.49	8.49		
H1 lead leg	L	strides		20	13	13	13	13	13	13	13	15	15	17.5	158.5			7.72		
Stigler, Michael (USA) (1992)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10		
FINAL - 2017 USATF Championships (Sacramento, CA) (TV Analysis)			Henson (2020) - Athlete First: 2017 year end hurdle report																	
date	25-Jun	time		6.10	9.79	13.58	17.38	21.31		29.89	34.20	38.55	43.07			8 / 2				
reaction time		interval			3.69	3.79	3.80	3.93		8.58	4.31	4.35	4.52	5.19			11.28	12.51		
		velocity		7.38	9.49	9.23	9.21	8.91		8.16	8.12	8.05	7.74	7.71	8.29		9.31	8.39		
H1 lead leg	R	strides		22	13	13	13	13			15	15	15	18.2	137.2			7.97		
Samba, Abderrahmane (QAT) (1995)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10		
FINAL - 2017 North-West University Pukke Invitational (Sasolburg, RSA) (TV Analysis)			Henson (2020) - Athlete First: 2017 year end hurdle report																	
date	28-Mar	time		5.92	9.60	13.32	17.12	21.00	25.08	29.40	33.84	38.44	43.00			5 / 1				
reaction time		interval			3.68	3.72	3.80	3.88	4.08	4.32	4.44	4.60	4.56	5.31			11.20	12.28		
		velocity		7.60	9.51	9.41	9.21	9.02	8.58	8.10	7.88	7.61	7.68	7.53	8.28		9.38	8.55		
H1 lead leg	R	strides			13	13	13	13	13	13	14	14	14	17.5	137.5			7.72		

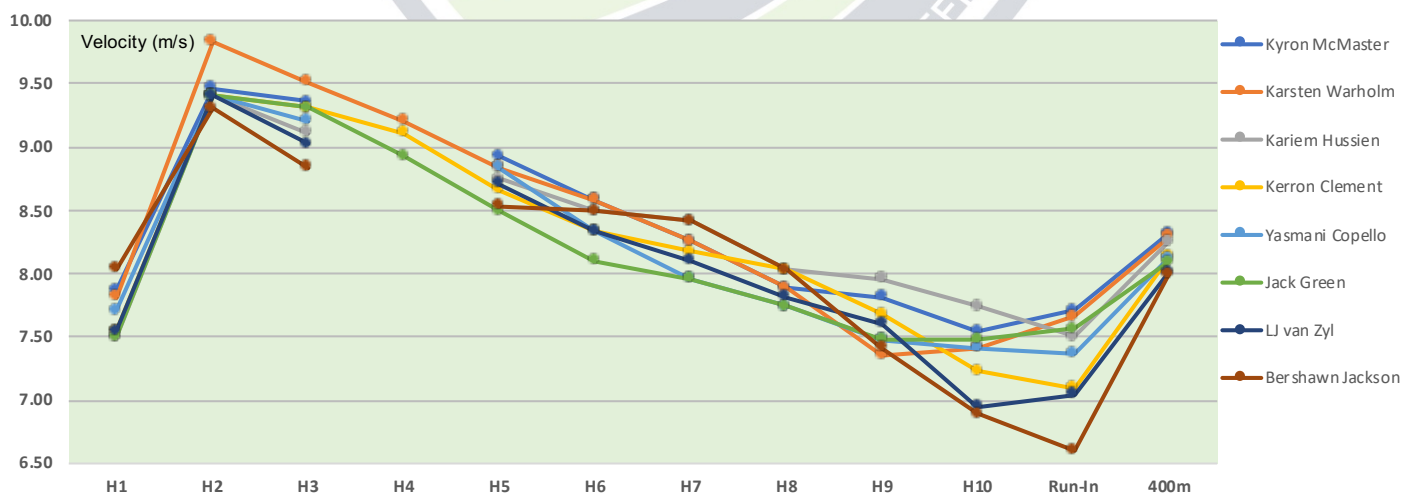
2017 Weltklasse (Zürich, SUI) (TV Analysis)

Men's 400m Hurdles

Date 2017.08.24

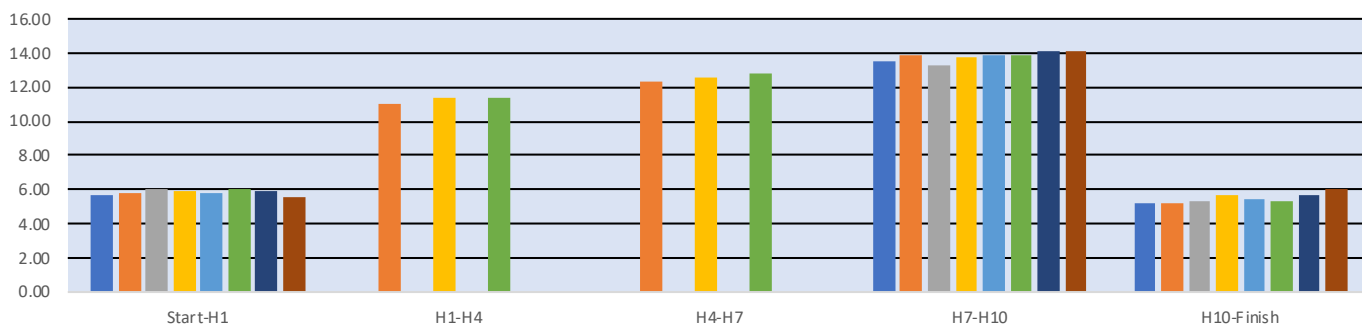
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McMaster, Kyron (IVB) (1997)	time		5.72	9.42	13.16		21.00	25.08	29.32	33.76	38.24	42.88		48.07	4 / 1			
	reaction time	0.153																
	interval																	
	velocity		7.87	9.40	9.74		7.84	4.08	4.24	4.44	4.48	4.64	5.19					13.56
Warholm, Karsten (NOR) (1996)	time		5.76	9.32	13.00	16.80	20.76	24.84	29.08	33.52	38.28	43.00		48.22	6 / 2	11.04	12.28	13.92
	reaction time	0.164																
	interval																	
	velocity		7.81	9.83	9.51	9.21	8.84	8.58	8.25	7.88	7.81	7.54	7.71	8.32		9.51	8.55	7.54
Hussein, Kariem (SUI) (1989)	time		6.00	9.72	13.56		21.56	25.68	29.84	34.20	38.60	43.12		48.45	3 / 3			
	reaction time	0.148																
	interval																	
	velocity		7.50	9.41	9.11		8.75	8.50	8.41	8.03	7.95	7.74	7.50	8.26				13.28
Clement, Kerron (USA) (1985)	time		5.96	9.68	13.44	17.28	21.32	25.52	29.80	34.16	38.72	43.56		49.20	7 / 4	11.32	12.52	13.76
	reaction time	0.167																
	interval																	
	velocity		7.55	9.41	9.31	9.11	8.66	8.33	8.18	8.03	7.68	7.23	7.09	8.13		9.28	8.39	7.63
Copello, Yasmani (TUR) (1987)	time		5.84	9.56	13.36		21.28	25.48	29.88	34.40	39.08	43.80		49.23	5 / 5			
	reaction time	0.181																
	interval																	
	velocity		7.71	9.41	9.21		8.84	8.33	7.95	7.74	7.48	7.42	7.37	8.13				13.92
Green, Jack (GBR) (1991)	time		6.00	9.72	13.48	17.40	21.52	25.84	30.24	34.76	39.44	44.12		49.41	8 / 6	11.40	12.84	13.88
	reaction time	0.218																
	interval																	
	velocity		7.50	9.41	9.31	8.93	8.50	8.10	7.95	7.74	7.48	7.48	7.56	8.10		9.21	8.18	7.56
van Zyl, LJ (RSA) (1985)	time		5.96	9.68	13.56		21.60	25.80	30.12	34.60	39.20	44.24		49.92	1 / 7			
	reaction time	0.188																
	interval																	
	velocity		7.55	9.41	9.02		8.71	8.33	8.10	7.81	7.61	6.94	7.04	8.01				14.12
Jackson, Bershawn (USA) (1983)	time		5.60	9.36	13.32		21.52	25.64	29.80	34.16	38.88	43.96		50.02	2 / 8			
	reaction time	0.127																
	interval																	
	velocity		8.04	9.31	8.84		8.54	8.50	8.41	8.03	7.42	6.89	6.60	8.00				14.16
H1 lead leg	time																	
	interval																	
	velocity																	
	strides		20	13	13			13	13	14	14	14	17.2	131.2				7.74



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=3onrMWhCRm8>

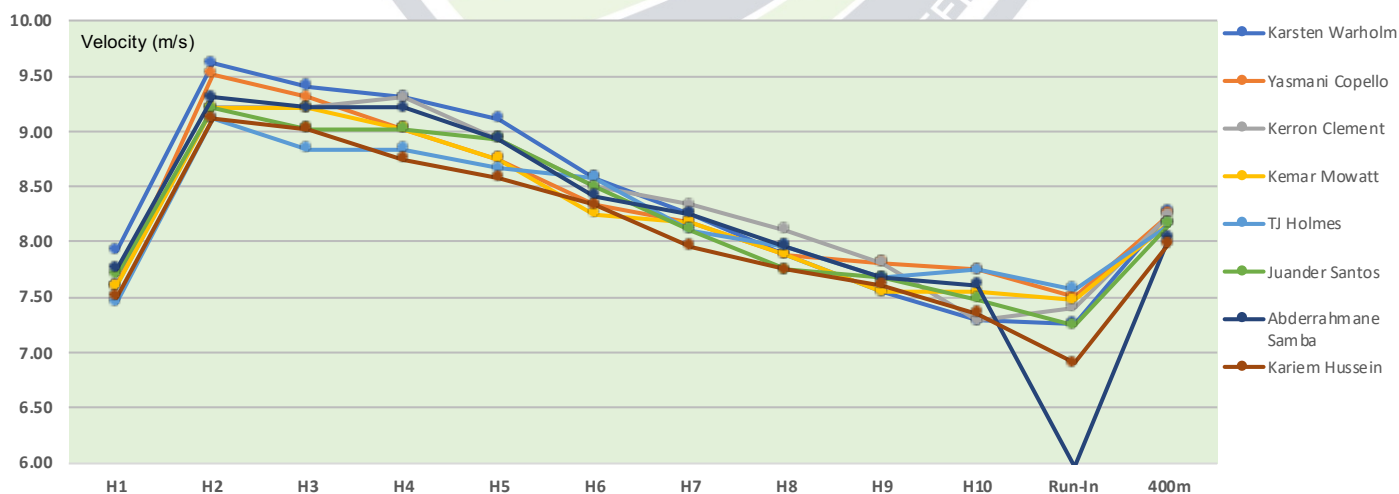
2017 IAAF World Championships (London, GBR) (TV Analysis)

Men's 400m Hurdles

Date 2017.08.09

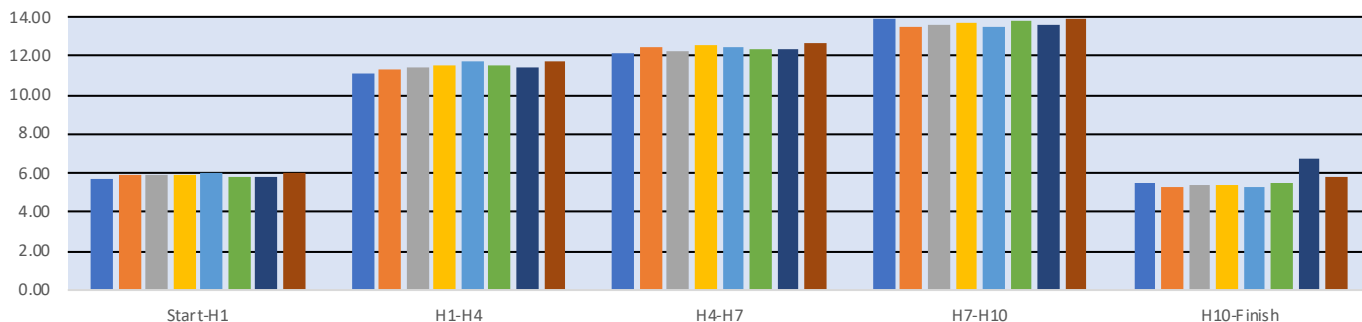
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Warholm, Karsten (NOR) (1996)	time		5.68	9.32	13.04	16.80	20.64	24.72	28.96	33.40	38.04	42.84		48.35	5 / 1			
	reaction time	0.175																
	interval			3.64	3.72	3.76	3.84	4.08	4.24	4.44	4.64	4.80	5.51			11.12	12.16	13.88
	velocity		7.92	9.62	9.41	9.31	9.11	8.58	8.25	7.88	7.54	7.29	7.26	8.27		9.44	8.63	7.56
Copello, Yasmani (TUR) (1987)	time		5.92	9.60	13.36	17.24	21.24	25.44	29.72	34.16	38.64	43.16		48.49	8 / 2			
	reaction time	0.211																
	interval			3.68	3.76	3.88	4.00	4.20	4.28	4.44	4.48	4.52	5.33			11.32	12.48	13.44
	velocity		7.60	9.51	9.31	9.02	8.75	8.33	8.18	7.88	7.81	7.74	7.50	8.25		9.28	8.41	7.81
Clement, Kerron (USA) (1985)	time		5.92	9.72	13.52	17.28	21.20	25.32	29.52	33.84	38.32	43.12		48.52	4 / 3			
	reaction time	0.153																
	interval			3.80	3.80	3.76	3.92	4.12	4.20	4.32	4.48	4.80	5.40			11.36	12.24	13.60
	velocity		7.60	9.21	9.21	9.31	8.93	8.50	8.33	8.10	7.81	7.29	7.41	8.24		9.24	8.58	7.72
Mowatt, Kemar (JAM) (1995)	time		5.92	9.72	13.52	17.40	21.40	25.64	29.92	34.36	39.00	43.64		48.99	3 / 4			
	reaction time	0.189																
	interval			3.80	3.80	3.88	4.00	4.24	4.28	4.44	4.64	4.64	5.35			11.48	12.52	13.72
	velocity		7.60	9.21	9.21	9.02	8.75	8.25	8.18	7.88	7.54	7.54	7.48	8.16		9.15	8.39	7.65
Holmes, TJ (USA) (1995)	time		6.04	9.88	13.84	17.80	21.84	25.92	30.24	34.64	39.20	43.72		49.00	7 / 5			
	reaction time	0.210																
	interval			3.84	3.96	3.96	4.04	4.08	4.32	4.40	4.56	4.52	5.28			11.76	12.44	13.48
	velocity		7.45	9.11	8.84	8.84	8.66	8.58	8.10	7.95	7.68	7.74	7.58	8.16		8.93	8.44	7.79
Santos, Juander (DOM) (1995)	time		5.84	9.64	13.52	17.40	21.32	25.44	29.76	34.28	38.84	43.52		49.04	2 / 6			
	reaction time	0.158																
	interval			3.80	3.88	3.88	3.92	4.12	4.32	4.52	4.56	4.68	5.52			11.56	12.36	13.76
	velocity		7.71	9.21	9.02	9.02	8.93	8.50	8.10	7.74	7.68	7.48	7.25	8.16		9.08	8.50	7.63
Samba, Abderrahmane (QAT) (1995)	time		5.80	9.56	13.36	17.16	21.08	25.24	29.48	33.88	38.44	43.04		49.74	6 / 7			
	reaction time	0.206																
	interval			3.76	3.80	3.80	3.92	4.16	4.24	4.40	4.56	4.60	6.70			11.36	12.32	13.56
	velocity		7.76	9.31	9.21	9.21	8.93	8.41	8.25	7.95	7.68	7.61	5.97	8.04		9.24	8.52	7.74
Hussein, Kariem (SUI) (1989)	time		6.00	9.84	13.72	17.72	21.80	26.00	30.40	34.92	39.52	44.28		50.07	9 / 8			
	reaction time	0.163																
	interval			3.84	3.88	4.00	4.08	4.20	4.40	4.52	4.60	4.76	5.79			11.72	12.68	13.88
	velocity		7.50	9.11	9.02	8.75	8.58	8.33	7.95	7.74	7.61	7.35	6.91	7.99		8.96	8.28	7.56



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=KYA3Z5Xqv40>

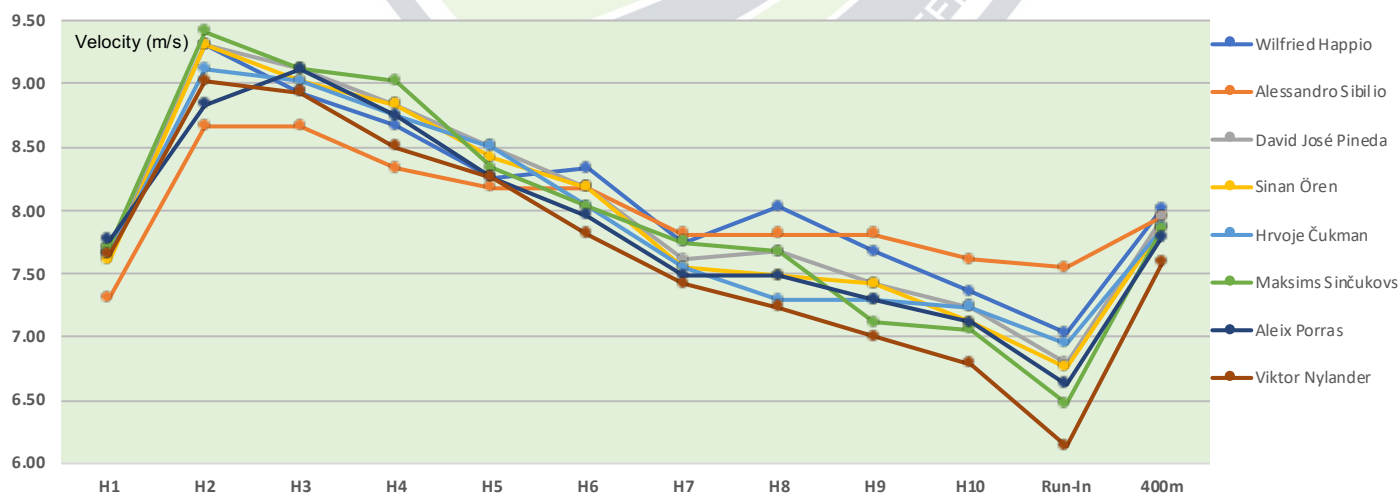
2017 European U20 Championships (Grosseto, ITA) (TV Analysis)

Men's 400m Hurdles

Date 2017.07.23

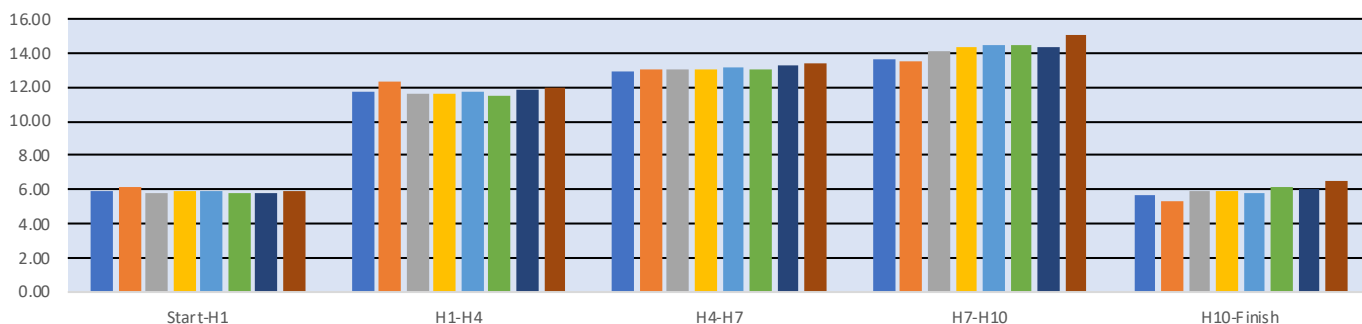
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Happio, Wilfried (FRA) (1998)	time		5.88	9.64	13.56	17.60	21.84	26.04	30.56	34.92	39.48	44.24		49.93	6 / 1			
	reaction time	0.234																
	interval		7.65	3.76	3.92	4.04	4.24	4.20	4.52	4.36	4.56	4.76	5.69	NJR PB		11.72	12.96	13.68
	velocity															8.96	8.10	7.68
Sibilio, Alessandro (ITA) (1999)	time		6.16	10.20	14.24	18.44	22.72	27.00	31.48	35.96	40.44	45.04		50.34	5 / 2			
	reaction time	0.191																
	interval		7.31	4.04	4.04	4.20	4.28	4.28	4.48	4.48	4.48	4.60	5.30	PB		12.28	13.04	13.56
	velocity															8.55	8.05	7.74
Pineda, David José (ESP) (1998)	time		5.84	9.60	13.44	17.40	21.52	25.80	30.40	34.96	39.68	44.52		50.41	3 / 3			
	reaction time	0.283																
	interval		7.71	3.76	3.84	3.96	4.12	4.28	4.60	4.56	4.72	4.84	5.89	NJR PB		11.56	13.00	14.12
	velocity															9.08	8.08	7.44
Ören, Sinan (TUR) (1998)	time		5.92	9.68	13.56	17.52	21.68	25.96	30.60	35.28	40.00	44.92		50.84	7 / 4			
	reaction time	0.258																
	interval		7.60	3.76	3.88	3.96	4.16	4.28	4.64	4.68	4.72	4.92	5.92	NJR PB		11.60	13.08	14.32
	velocity															9.05	8.03	7.33
Čukman, Hrvoje (CRO) (1998)	time		5.88	9.72	13.60	17.60	21.72	26.08	30.72	35.52	40.32	45.16		50.92	1 / 5			
	reaction time	0.226																
	interval		7.65	3.84	3.88	4.00	4.12	4.36	4.64	4.80	4.80	4.84	5.76	PB		11.72	13.12	14.44
	velocity															8.96	8.00	7.27
Sinčukovs, Maksims (LAT) (1998)	time		5.84	9.56	13.40	17.28	21.48	25.84	30.36	34.92	39.84	44.80		50.98	4 / 6			
	reaction time	0.178																
	interval		7.71	3.72	3.84	3.88	4.20	4.36	4.64	4.56	4.92	4.96	6.18	NJR PB		11.44	13.08	14.44
	velocity															9.18	8.03	7.27
Porras, Aleix (ESP) (1999)	time		5.80	9.76	13.60	17.60	21.84	26.24	30.92	35.60	40.40	45.32		51.36	8 / 7			
	reaction time	0.231																
	interval		7.76	3.96	3.84	4.00	4.24	4.40	4.68	4.68	4.80	4.92	6.04			11.80	13.32	14.40
	velocity															8.90	7.88	7.29
Nylander, Viktor (SWE) (1998)	time		5.88	9.76	13.68	17.80	22.04	26.52	31.24	36.08	41.08	46.24		52.76	2 / 8			
	reaction time	0.187																
	interval		7.65	3.88	3.92	4.12	4.24	4.48	4.72	4.84	5.00	5.16	6.52			11.92	13.44	15.00
	velocity															8.81	7.81	7.00



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=tvwCgPjxi2U>

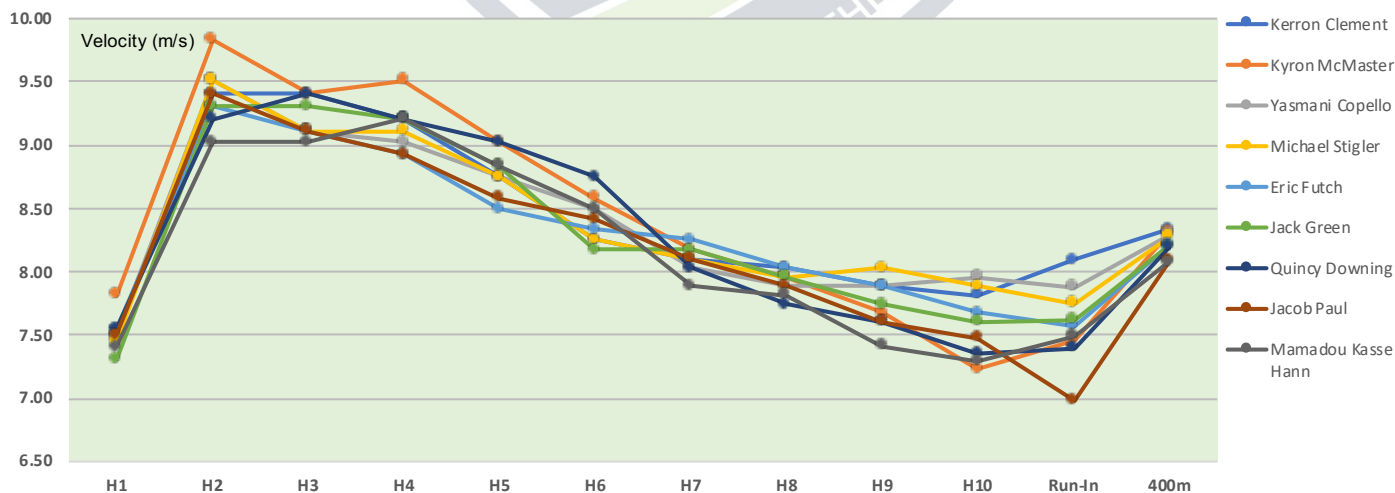
2017 Müller's Anniversary Games (London, GBR) (TV Analysis)

Men's 400m Hurdles

Date 2017.07.09

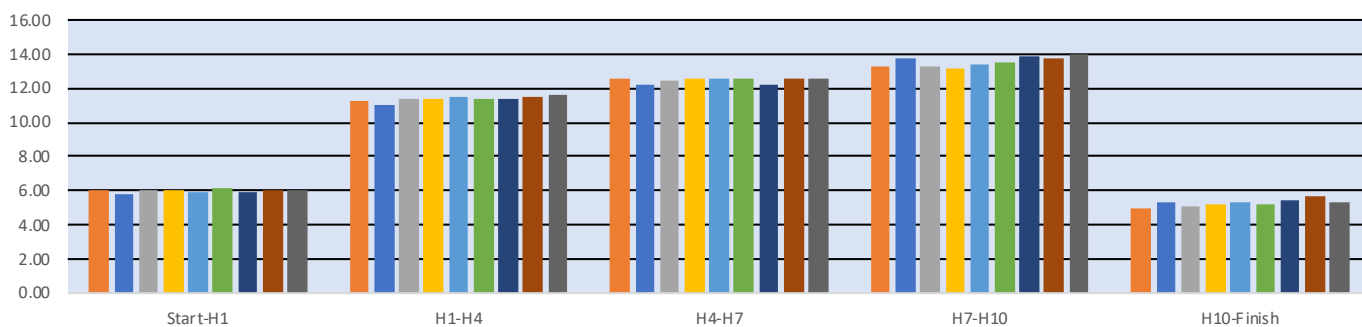
FINAL

				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Clement, Kerron (USA) (1985)	time			6.00	9.72	13.44	17.24	21.24	25.48	29.80	34.16	38.60	43.08		48.02	7 / 1			
	reaction time	0.157	interval		3.72	3.72	3.80	4.00	4.24	4.32	4.36	4.44	4.48	4.94			11.24	12.56	13.28
	velocity			7.50	9.41	9.41	9.21	8.75	8.25	8.10	8.03	7.88	7.81	8.10	8.33		9.34	8.36	7.91
	H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	13	16	153				
McMaster, Kyron (IVB) (1997)	time			5.76	9.32	13.04	16.72	20.60	24.68	28.96	33.36	37.92	42.76		48.12	6 / 2			
	reaction time	0.164	interval		3.56	3.72	3.68	3.88	4.08	4.28	4.40	4.56	4.84	5.36			10.96	12.24	13.80
	velocity			7.81	9.83	9.41	9.51	9.02	8.58	8.18	7.95	7.68	7.23	7.46	8.31		9.58	8.58	7.61
	H1 lead leg	R	strides	20	13	13	13	13	13	14	14	14	15	18	160				
Copello, Yasmani (TUR) (1987)	time			6.00	9.68	13.52	17.40	21.40	25.52	29.88	34.32	38.76	43.16		48.24	8 / 3			
	reaction time	0.187	interval		3.68	3.84	3.88	4.00	4.12	4.36	4.44	4.44	4.40	5.08			11.40	12.48	13.28
	velocity			7.50	9.51	9.11	9.02	8.75	8.50	8.03	7.88	7.88	7.95	7.87	8.29		9.21	8.41	7.91
	H1 lead leg	R	strides	20	13	13	13	13	13	14	14	14	14	17.2	158.2				
Stigler, Michael (USA) (1992)	time			6.04	9.72	13.56	17.40	21.40	25.64	29.96	34.36	38.72	43.16		48.32	4 / 4			
	reaction time	0.199	interval		3.68	3.84	3.84	4.00	4.24	4.32	4.40	4.36	4.44	5.16			11.36	12.56	13.20
	velocity			7.45	9.51	9.11	9.11	8.75	8.25	8.10	7.95	8.03	7.88	7.75	8.28		9.24	8.36	7.95
	H1 lead leg	R	strides	22	13	13	13	13	13	15	15	15	15	18	165				
Futch, Eric (USA) (1993)	time			5.96	9.72	13.56	17.48	21.60	25.80	30.04	34.40	38.84	43.40		48.68	5 / 5			
	reaction time	0.189	interval		3.76	3.84	3.92	4.12	4.20	4.24	4.36	4.44	4.56	5.28			11.52	12.56	13.36
	velocity			7.55	9.31	9.11	8.93	8.50	8.33	8.25	8.03	7.88	7.68	7.58	8.22		9.11	8.36	7.86
	H1 lead leg	R	strides	22	14	14	13	14	15	14	15	15	15	18	169				
Green, Jack (GBR) (1991)	time			6.16	9.92	13.68	17.48	21.44	25.72	30.00	34.40	38.92	43.52		48.77	9 / 6			
	reaction time	0.213	interval		3.76	3.76	3.80	3.96	4.28	4.28	4.40	4.52	4.60	5.25			11.32	12.52	13.52
	velocity			7.31	9.31	9.31	9.21	8.84	8.18	8.18	7.95	7.74	7.61	7.62	8.20		9.28	8.39	7.77
	H1 lead leg	R	strides	22	14	13	13	13	14	14	15	15	15	18.7	166.7				
Downing, Quincy (USA) (1993)	time			5.96	9.76	13.48	17.28	21.16	25.16	29.52	34.04	38.64	43.40		48.81	2 / 7			
	reaction time	0.144	interval		3.80	3.72	3.80	3.88	4.00	4.36	4.52	4.60	4.76	5.41			11.32	12.24	13.88
	velocity			7.55	9.21	9.41	9.21	9.02	8.75	8.03	7.74	7.61	7.35	7.39	8.20		9.28	8.58	7.56
	H1 lead leg	R	strides	21	13	13	13	13	13	14	14	14	15	17.5	160.5				
Paul, Jacob (GBR) (1995)	time			6.00	9.72	13.56	17.48	21.56	25.72	30.04	34.48	39.08	43.76		49.49	1 / 8			
	reaction time	0.156	interval		3.72	3.84	3.92	4.08	4.16	4.32	4.44	4.60	4.68	5.73	PB		11.48	12.56	13.72
	velocity			7.50	9.41	9.11	8.93	8.58	8.41	8.10	7.88	7.61	7.48	6.98	8.08		9.15	8.36	7.65
	H1 lead leg	L	strides	21	14	14	14	14	14	14	15	15	15	150					
Hann, Mamadou Kasse (FRA) (1986)	time			6.08	9.96	13.84	17.64	21.60	25.72	30.16	34.64	39.36	44.16		49.50	3 / 9			
	reaction time	0.151	interval		3.88	3.88	3.80	3.96	4.12	4.44	4.48	4.72	4.80	5.34			11.56	12.52	14.00
	velocity			7.40	9.02	9.02	9.21	8.84	8.50	7.88	7.81	7.42	7.29	7.49	8.08		9.08	8.39	7.50
	H1 lead leg	L	strides	21	14	14	13	13	13	14	14	15	14	145					



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=oKAabcv6i-w>

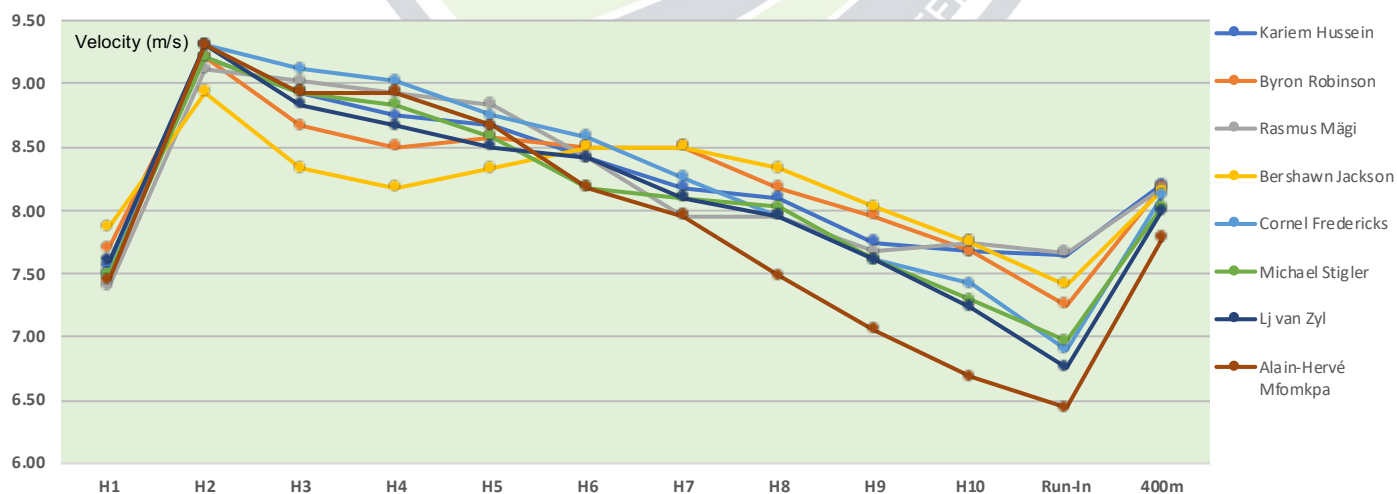
2017 Athletissima (Lausanne, SUI) (TV Analysis)

Men's 400m Hurdles

Date 2017.07.06

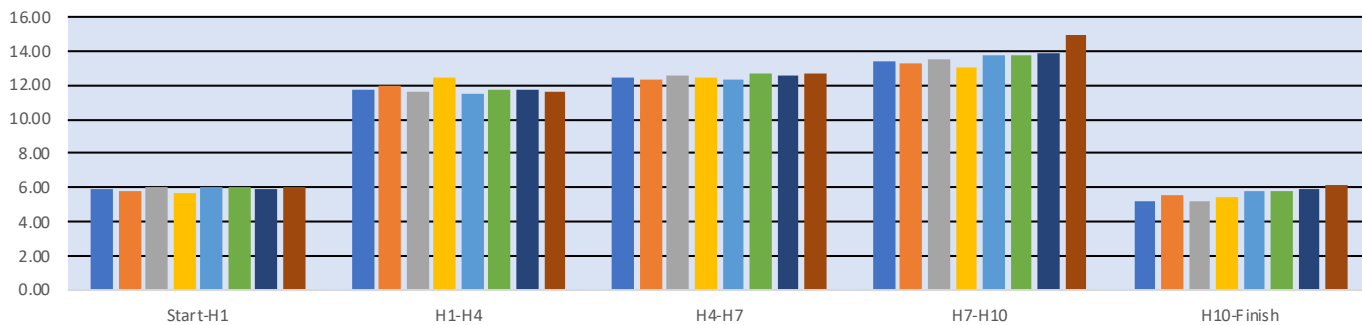
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Hussein, Kariem (SUI) (1989)	time		5.96	9.76	13.68	17.68	21.72	25.88	30.16	34.48	39.00	43.56		48.79	5 / 1			
	reaction time	0.170																
	interval		7.55	3.80	3.92	4.00	4.04	4.16	4.28	4.32	4.52	4.56	5.23			11.72	12.48	13.40
	velocity		9.21	8.93	8.93	8.75	8.66	8.41	8.18	8.10	7.74	7.68	7.65	8.20		8.96	8.41	7.84
Robinson, Byron (USA) (1995)	time		5.84	9.64	13.68	17.80	21.88	26.00	30.12	34.40	38.80	43.36		48.88	4 / 2			
	reaction time	0.151																
	interval		7.71	3.80	4.04	4.12	4.08	4.12	4.28	4.40	4.56	5.52				11.96	12.32	13.24
	velocity		9.21	8.66	8.50	8.58	8.50	8.50	8.18	7.95	7.68	7.25	8.18			8.78	8.52	7.93
Mägi, Rasmus (EST) (1992)	time		6.08	9.92	13.80	17.72	21.68	25.84	30.24	34.64	39.20	43.72		48.94	7 / 3			
	reaction time	0.127																
	interval		7.40	3.84	3.88	3.92	3.96	4.16	4.40	4.40	4.56	5.22				11.64	12.52	13.48
	velocity		9.11	9.02	8.84	8.84	8.41	7.95	7.95	7.68	7.74	7.66	8.17			9.02	8.39	7.79
Jackson, Bershawn (USA) (1983)	time		5.72	9.64	13.84	18.12	22.32	26.44	30.56	34.76	39.12	43.64		49.04	3 / 4			
	reaction time	0.140																
	interval		7.87	3.92	4.20	4.28	4.20	4.12	4.28	4.36	4.52	5.40				12.40	12.44	13.08
	velocity		8.93	8.33	8.33	8.18	8.33	8.50	8.50	8.33	8.03	7.74	7.41	8.16		8.47	8.44	8.03
Fredericks, Cornel (RSA) (1990)	time		6.00	9.76	13.60	17.48	21.48	25.56	29.80	34.20	38.80	43.52		49.32	8 / 5			
	reaction time	0.137																
	interval		7.50	3.76	3.84	3.88	4.00	4.08	4.24	4.36	4.60	4.72	5.80			11.48	12.32	13.72
	velocity		9.31	9.11	9.02	8.75	8.58	8.25	7.95	7.61	7.42	6.90	8.11			9.15	8.52	7.65
Stigler, Michael (USA) (1992)	time		6.00	9.80	13.72	17.68	21.76	26.04	30.36	34.72	39.32	44.12		49.86	6 / 6			
	reaction time	0.224																
	interval		7.50	3.80	3.92	3.96	4.08	4.28	4.32	4.36	4.60	4.80	5.74			11.68	12.68	13.76
	velocity		9.21	8.93	8.84	8.58	8.18	8.10	8.03	7.61	7.29	6.97	8.02			8.99	8.28	7.63
van Zyl, LJ (RSA) (1985)	time		5.92	9.68	13.64	17.68	21.80	25.96	30.28	34.68	39.28	44.12		50.04	2 / 7			
	reaction time	0.152																
	interval		7.60	3.76	3.96	4.04	4.12	4.16	4.32	4.40	4.60	4.84	5.92			11.76	12.60	13.84
	velocity		9.31	8.84	8.66	8.50	8.41	8.10	7.95	7.61	7.23	6.76	7.99			8.93	8.33	7.59
Mfomkpa, Alain-Hervé (SUI) (1996)	time		6.04	9.80	13.72	17.64	21.68	25.96	30.36	35.04	40.00	45.24		51.45	1 / 8			
	reaction time	0.156																
	interval		7.45	3.76	3.92	3.92	4.04	4.28	4.40	4.68	4.96	5.24	6.21			11.60	12.72	14.88
	velocity		9.31	8.93	8.93	8.66	8.18	7.95	7.48	7.06	6.68	6.44	7.77			9.05	8.25	7.06



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: https://www.youtube.com/watch?v=IcVcm_ChsR0

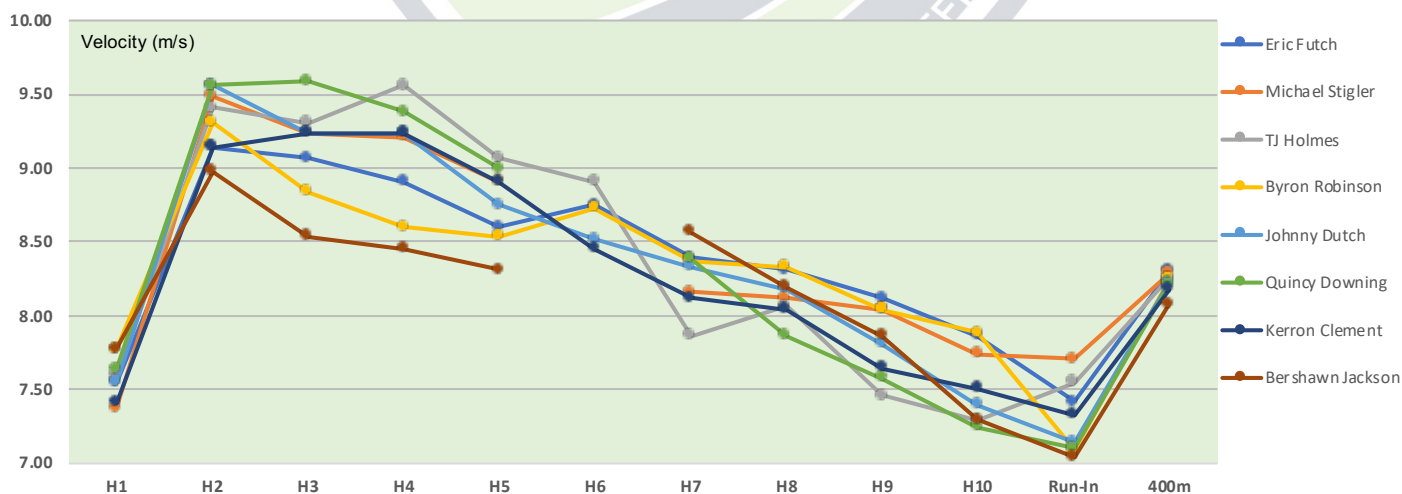
2017 USATF Championships (Sacramento, CA) (TV Analysis)

Men's 400m Hurdles

Date 2017.06.25

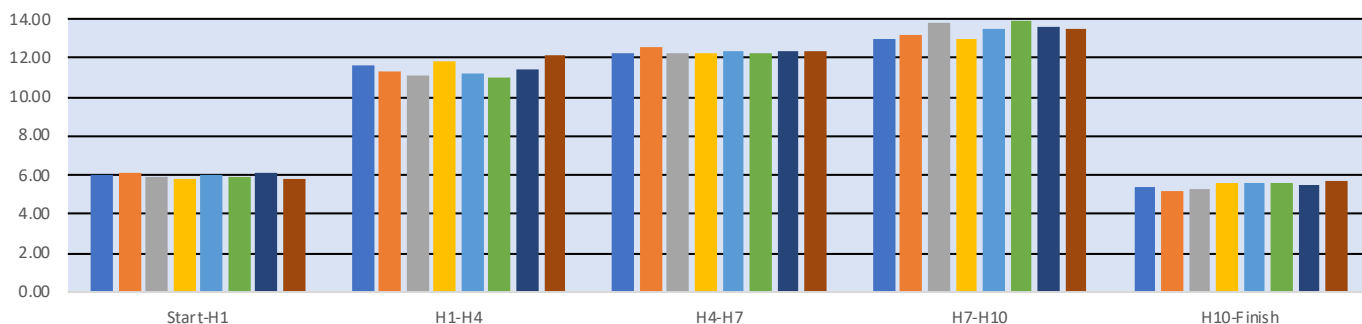
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Futch, Eric (USA) (1993)	time		5.96	9.79	13.65	17.58	21.65	25.65	29.82	34.03	38.34	42.79		48.18	4 / 1			
	reaction time																	
	interval			3.83	3.86	3.93	4.07	4.00	4.17	4.21	4.31	4.45	5.39	PB		11.62	12.24	12.97
	velocity		7.55	9.14	9.07	8.91	8.60	8.75	8.39	8.31	8.12	7.87	7.42	8.30		9.04	8.58	8.10
Stigler, Michael (USA) (1992)	H1 lead leg	R	22	14	14	13	13		14	15	15	15	18	153				
	time		6.10	9.79	13.58	17.38	21.31		29.89	34.20	38.55	43.07		48.26	8 / 2			
	reaction time																	
	interval			3.69	3.79	3.80	3.93		8.58	4.31	4.35	4.52	5.19	PB		11.28	12.51	13.18
Holmes, TJ (USA) (1995)	velocity		7.38	9.49	9.23	9.21	8.91		8.16	8.12	8.05	7.74	7.71	8.29		9.31	8.39	7.97
	H1 lead leg	R	22	13	13	13	13			15	15	15	15	137.2				
	time		5.93	9.65	13.41	17.07	20.93	24.86	29.31	33.65	38.34	43.14		48.44	2 / 3			
	reaction time																	
Robinson, Byron (USA) (1995)	interval			3.72	3.76	3.66	3.86	3.93	4.45	4.34	4.69	4.80	5.30	PB		11.14	12.24	13.83
	velocity		7.59	9.41	9.31	9.56	9.07	8.91	7.87	8.06	7.46	7.29	7.55	8.26		9.43	8.58	7.59
	H1 lead leg	L	20	13	13	13	13	13	14	14	15	15	18	161				
	time		5.79	9.55	13.51	17.58	21.68	25.69	29.87	34.07	38.42	42.86		48.50	6 / 4			
Dutch, Johnny (USA) (1989)	reaction time																	
	interval			3.76	3.96	4.07	4.10	4.01	4.18	4.20	4.35	4.44	5.64	PB		11.79	12.29	12.99
	velocity		7.77	9.31	8.84	8.60	8.54	8.73	8.37	8.33	8.05	7.88	7.09	8.25		8.91	8.54	8.08
	H1 lead leg	L	22	15	15	15	15	15	15	15	15	15	19.5	176.5				
Downing, Quincy (USA) (1993)	time		5.96	9.62	13.41	17.20	21.20	25.31	29.51	33.79	38.27	43.00		48.60	3 / 5			
	reaction time																	
	interval			3.66	3.79	3.79	4.00	4.11	4.20	4.28	4.48	4.73	5.60			11.24	12.31	13.49
	velocity		7.55	9.56	9.23	9.23	8.75	8.52	8.33	8.18	7.81	7.40	7.14	8.23		9.34	8.53	7.78
Clement, Kerron (USA) (1985)	H1 lead leg	R	22	13	13	13	13	14	14	15	15	15	19	166				
	time		5.89	9.55	13.20	16.93	20.82		29.17	33.62	38.24	43.07		48.70	7 / 6			
	reaction time																	
	interval			3.66	3.65	3.73	3.89		8.35	4.45	4.62	4.83	5.63			11.04	12.24	13.90
Jackson, Bershawn (USA) (1983)	velocity		7.64	9.56	9.59	9.38	9.00		8.38	7.87	7.58	7.25	7.10	8.21		9.51	8.58	7.55
	H1 lead leg	R	21	13	13	13	13			14	14	15	17.7	133.7				
	time		6.07	9.90	13.69	17.48	21.41	25.55	29.86	34.21	38.79	43.45		48.91	5 / 7			
	reaction time																	
Stigler, Michael (USA) (1992)	interval			3.83	3.79	3.79	3.93	4.14	4.31	4.35	4.58	4.66	5.46			11.41	12.38	13.59
	velocity		7.41	9.14	9.23	9.23	8.91	8.45	8.12	8.05	7.64	7.51	7.33	8.18		9.20	8.48	7.73
	H1 lead leg	R	20	13	13	13	13	13	13	13	13	13	16.5	153.5				
	time		5.79	9.69	13.79	17.93	22.14		30.31	34.58	39.03	43.83		49.51	1 / 8			
	reaction time																	
	interval			3.90	4.10	4.14	4.21		8.17	4.27	4.45	4.80	5.68			12.14	12.38	13.52
	velocity		7.77	8.97	8.54	8.45	8.31		8.57	8.20	7.87	7.29	7.04	8.08		8.65	8.48	7.77
	H1 lead leg	L	22	15		15	15			15	15	17	19.2	133.2				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 29fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=X93P6fCXRI4>

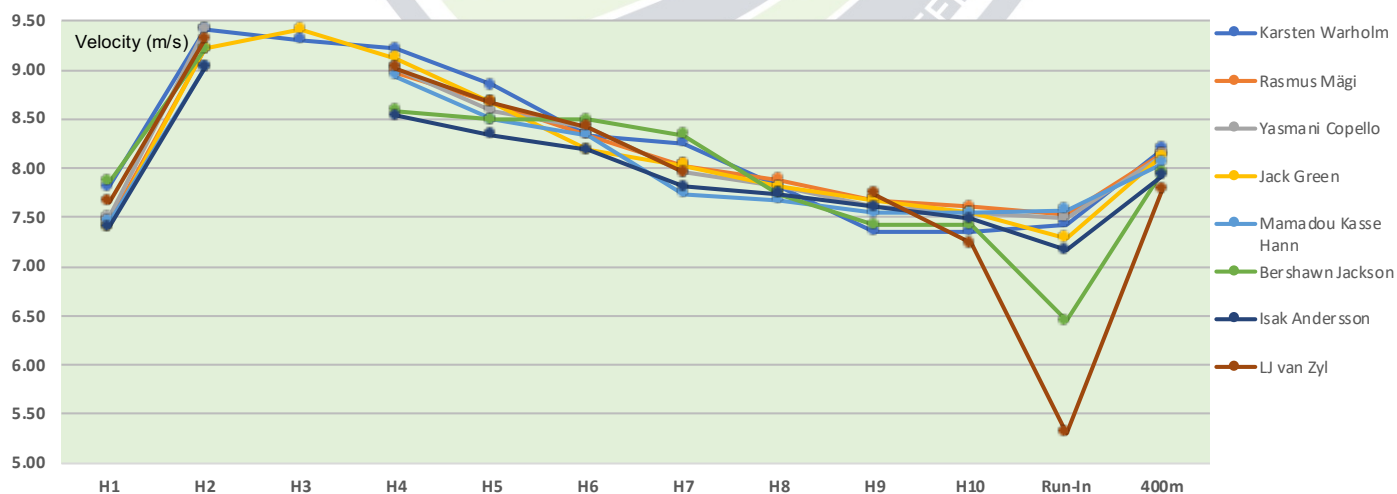
2017 Bauhaus Athletics (Stockholm, SWE) (TV Analysis)

Men's 400m Hurdles

Date 2017.06.18

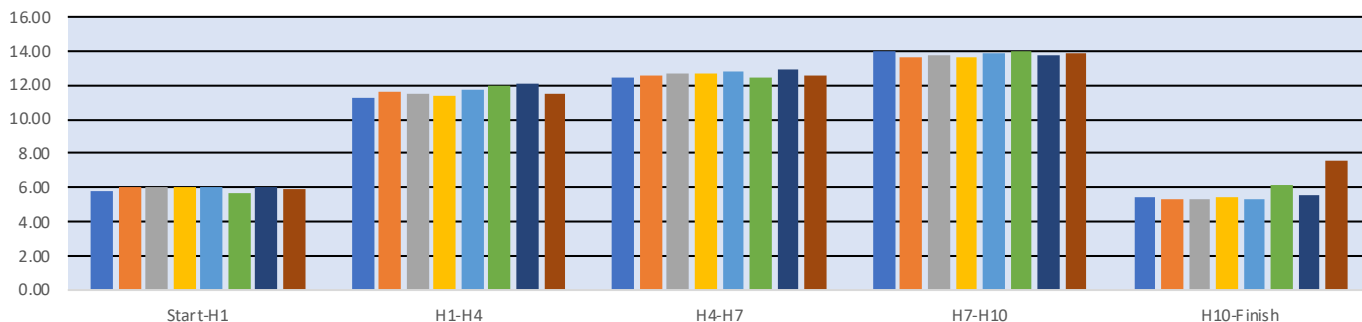
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Warholm, Karsten (NOR) (1996)	time		5.76	9.48	13.24	17.04	21.00	25.20	29.44	33.92	38.68	43.44		48.82	7 / 1			
	reaction time	0.139																
	interval																	
	velocity		7.81	9.41	9.31	9.21	8.84	8.33	8.25	7.81	7.35	7.35	7.43	8.19		11.28	12.40	14.00
Mägi, Rasmus (EST) (1992)	time		6.04	9.84		17.64	21.68	25.88	30.24	34.68	39.24	43.84		49.16	3 / 2			
	reaction time	0.142																
	interval																	
	velocity		7.45	9.21		8.97	8.66	8.33	8.03	7.88	7.68	7.61	7.52	8.14		11.60	12.60	13.60
Copello, Yasmani (TUR) (1987)	time		6.00	9.72		17.48	21.56	25.72	30.12	34.60	39.20	43.84		49.18	6 / 3			
	reaction time	0.178																
	interval																	
	velocity		7.50	9.41		9.02	8.58	8.41	7.95	7.81	7.61	7.54	7.49	8.13		11.48	12.64	13.72
Green, Jack (GBR) (1991)	time		6.08	9.88	13.60	17.44	21.48	25.76	30.12	34.60	39.16	43.80		49.29	8 / 4			
	reaction time	0.203																
	interval																	
	velocity		7.40	9.21	9.41	9.11	8.66	8.18	8.03	7.81	7.68	7.54	7.29	8.12		11.36	12.68	13.68
Hann, Mamadou Kasse (FRA) (1986)	time		6.04	9.92		17.76	21.88	26.08	30.60	35.16	39.80	44.44		49.72	5 / 5			
	reaction time	0.158																
	interval																	
	velocity		7.45	9.02		8.93	8.50	8.33	7.74	7.68	7.54	7.54	7.58	8.05		11.72	12.84	13.84
Jackson, Bershawn (USA) (1983)	time		5.72	9.52		17.68	21.80	25.92	30.12	34.64	39.36	44.08		50.28	4 / 6			
	reaction time	0.135																
	interval																	
	velocity		7.87	9.21		8.58	8.50	8.50	8.33	7.74	7.42	7.42	6.45	7.96		11.96	12.44	13.96
Andersson, Isak (SWE) (1996)	time		6.08	9.96		18.16	22.36	26.64	31.12	35.64	40.24	44.92		50.50	1 / 7			
	reaction time	0.202																
	interval																	
	velocity		7.40	9.02		8.54	8.33	8.18	7.81	7.74	7.61	7.48	7.17	7.92		12.08	12.96	13.80
van Zyl, LJ (RSA) (1985)	time		5.88	9.64		17.40	21.44	25.60	30.00		39.04	43.88		51.42	2 / 8			
	reaction time	0.143																
	interval																	
	velocity		7.65	9.31		7.76	4.04	4.16	4.40		9.04	4.84	7.54	7.78		11.52	12.60	13.88
H1 lead leg	time																	
	interval																	
	velocity																	
	strides		20	13	13	13	13	13	13	13	15	15	17.7	158.7		9.31	8.47	7.50



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=iB7foMNsGgQ>

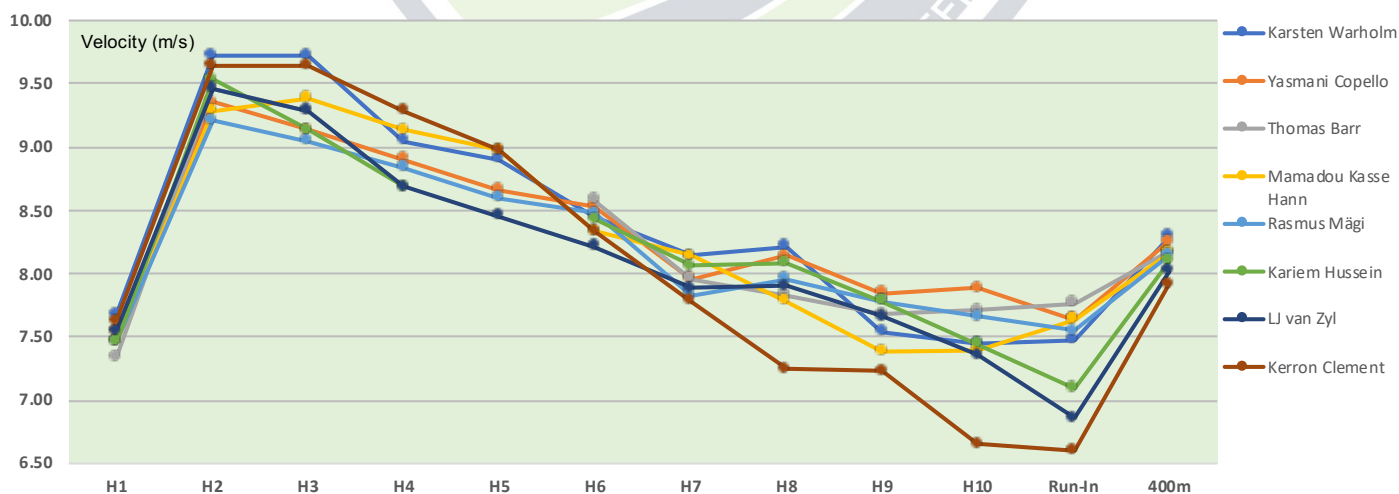
2017 Bislett Games (Oslo, NOR) (TV Analysis)

Men's 400m Hurdles

Date 2017.06.15

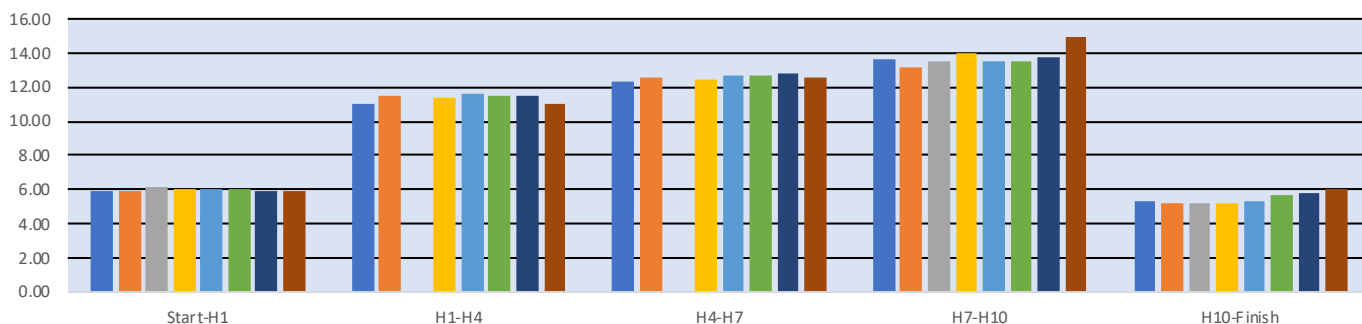
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Warholm, Karsten (NOR) (1996)	time		5.86	9.46	13.06	16.93	20.86	25.00	29.30	33.56	38.20	42.90		48.25	7 / 1			
	reaction time	0.149												NR PB		11.07	12.37	13.60
	interval		7.68	3.60	3.60	3.87	3.93	4.14	4.30	4.26	4.64	4.70	5.35	7.48		9.49	8.49	7.72
	velocity																	
Copello, Yasmani (TUR) (1987)	time		5.96	9.70	13.53	17.46	21.50	25.60	30.00	34.30	38.76	43.20		48.44	4 / 2			
	reaction time	0.188														11.50	12.54	13.20
	interval		7.55	3.74	3.83	3.93	4.04	4.10	4.40	4.30	4.46	4.44	5.24	7.63		9.13	8.37	7.95
	velocity																	
Barr, Thomas (IRL) (1992)	time		6.13	9.83	13.60			25.83	30.23	34.70	39.26	43.80		48.95	1 / 3			
	reaction time	0.193																13.57
	interval		7.34	3.70	3.77			12.23	4.40	4.47	4.56	4.54	5.15	7.77				7.74
	velocity																	
Hann, Mamadou Kasse (FRA) (1986)	time		6.03	9.80	13.53	17.36	21.26	25.46	29.76	34.26	39.00	43.73		48.97	5 / 4			
	reaction time	0.176														11.33	12.40	13.97
	interval		7.46	3.77	3.73	3.83	3.90	4.20	4.30	4.50	4.74	4.73	5.24	7.63		9.27	8.47	7.52
	velocity																	
Mägi, Rasmus (EST) (1992)	time		6.03	9.83	13.70	17.66	21.73	25.86	30.33	34.73	39.23	43.80		49.10	3 / 5			
	reaction time	0.147														11.63	12.67	13.47
	interval		7.46	3.80	3.87	3.96	4.07	4.13	4.47	4.40	4.50	4.57	5.30	7.55		9.03	8.29	7.80
	velocity																	
Hussein, Kariem (SUI) (1989)	time		6.03	9.70	13.53	17.56		25.86	30.20	34.53	39.03	43.73		49.37	2 / 6			
	reaction time	0.162														11.53	12.64	13.53
	interval		7.46	3.67	3.83	4.03		8.30	4.34	4.33	4.50	4.70	5.64	7.09		9.11	8.31	7.76
	velocity																	
van Zyl, LJ (RSA) (1985)	time		5.96	9.66	13.43	17.46	21.60	25.86	30.30	34.73	39.30	44.06		49.89	8 / 7			
	reaction time	0.158														11.50	12.84	13.76
	interval		7.55	3.70	3.77	4.03	4.14	4.26	4.44	4.43	4.57	4.76	5.83	6.86		9.13	8.18	7.63
	velocity																	
Clement, Kerron (USA) (1985)	time		5.90	9.53	13.16	16.93	20.83	25.03	29.53	34.36	39.20	44.46		50.52	6 / 8			
	reaction time	0.164														11.03	12.60	14.93
	interval		7.63	3.63	3.63	3.77	3.90	4.20	4.50	4.83	4.84	5.26	6.06	7.92		9.52	8.33	7.03
	velocity																	
	time																	
	reaction time																	
	interval																	
	velocity																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1072 @ 30fps

Timing From: First Movement

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

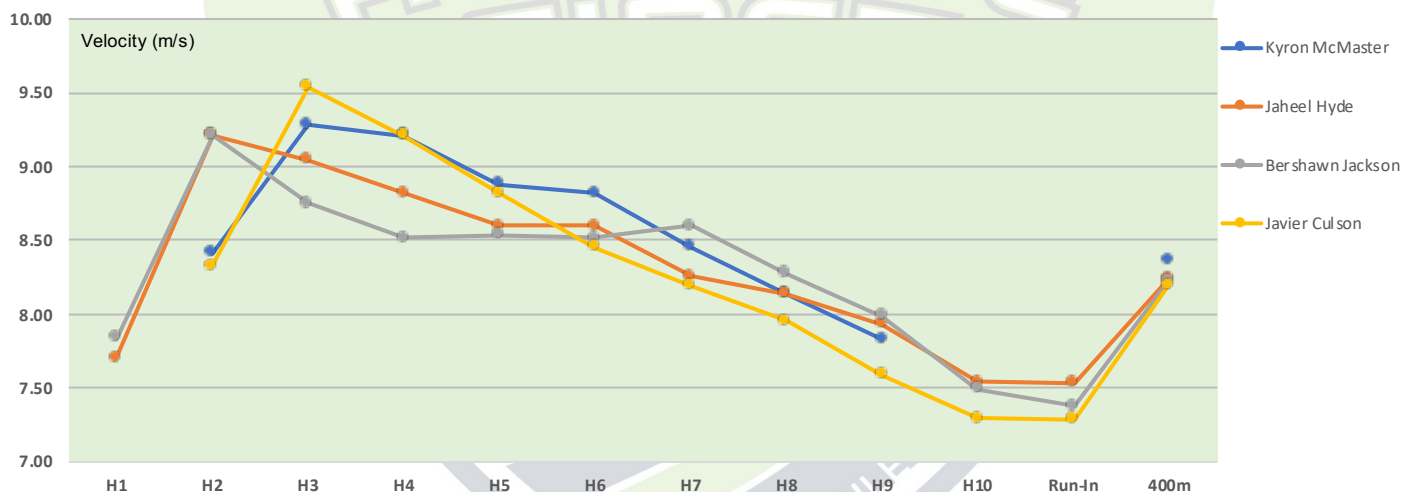
2017 Jamaica International Invitational (Kingston, JAM) (TV Analysis)

Men's 400m Hurdles

Date 2017.05.20

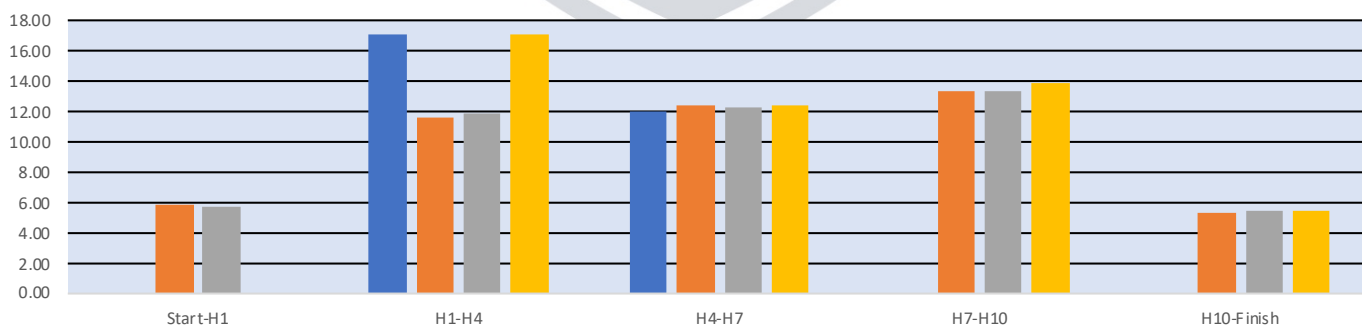
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McMaster, Kyron (IVB) (1997)	time		9.51	13.28	17.08	21.02	24.99	29.13	33.43	37.90			47.80	5 / 1			
	reaction time												NR PB		17.08	12.05	
	interval														6.15	8.71	
	velocity		8.41	9.28	9.21	8.88	8.82	8.45	8.14	7.83							
	H1 lead leg	R			13	13	13	13	14	14	14		107				
Hyde, Jaheel (JAM) (1997)	time	5.84	9.64	13.51	17.48	21.55	25.62	29.86	34.16	38.57	43.21		48.52	3 / 2			
	reaction time												PB		11.64	12.38	13.35
	interval														9.02	8.48	7.87
	velocity	7.71	9.21	9.04	8.82	8.60	8.60	8.25	8.14	7.94	7.54	7.53	8.24				
	H1 lead leg	L	22	14	14	13	14	14	14	15	15	15	18.5				
	strides												153.5				
Jackson, Bershawn (USA) (1983)	time	5.74	9.54	13.54	17.65	21.75	25.86	29.93	34.16	38.54	43.21		48.63	4 / 3			
	reaction time														11.91	12.28	13.28
	interval														8.82	8.55	7.91
	velocity	7.84	9.21	8.75	8.52	8.54	8.52	8.60	8.27	7.99	7.49	7.38	8.23				
	H1 lead leg	L	22	15	15	15	15	15	15	15	15	19	161				
	strides																
Culson, Javier (PUR) (1983)	time		9.61	13.28	17.08	21.05	25.19	29.46	33.86	38.47	43.27		48.76	6 / 4			
	reaction time														17.08	12.38	13.81
	interval														6.15	8.48	7.60
	velocity		8.32	9.54	9.21	8.82	8.45	8.20	7.95	7.59	7.29	7.29	8.20				
	H1 lead leg				13	13	13	13	13	14	14	17.2	123.2				
	strides																



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=cYP4LIYq8UE>

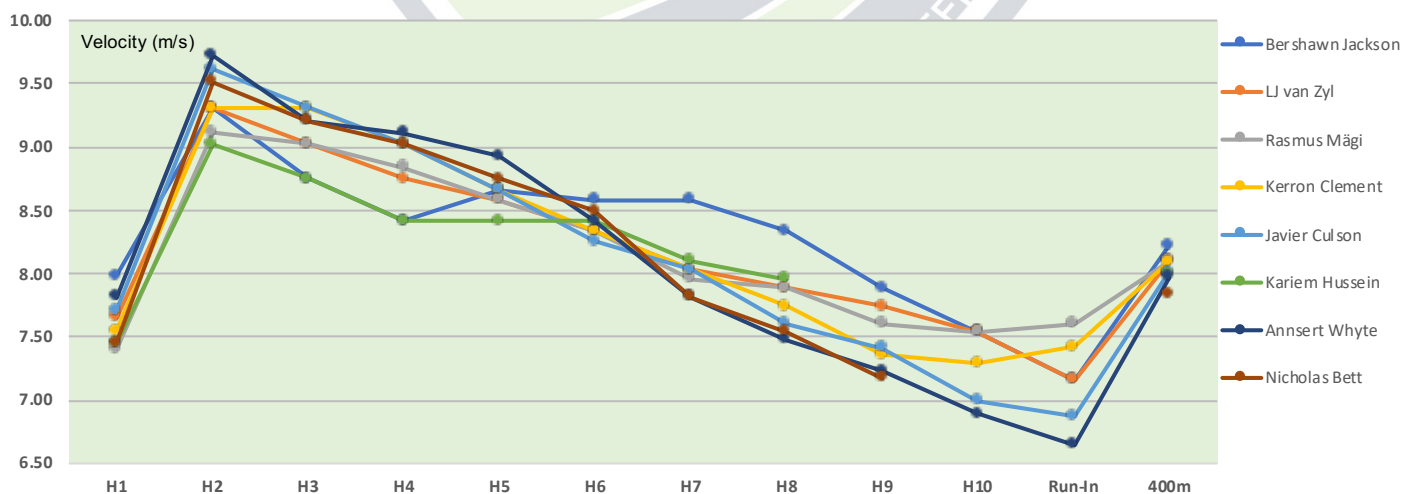
2017 Shanghai Diamond League (Shanghai, CHN) (TV Analysis)

Men's 400m Hurdles

Date 2017.05.13

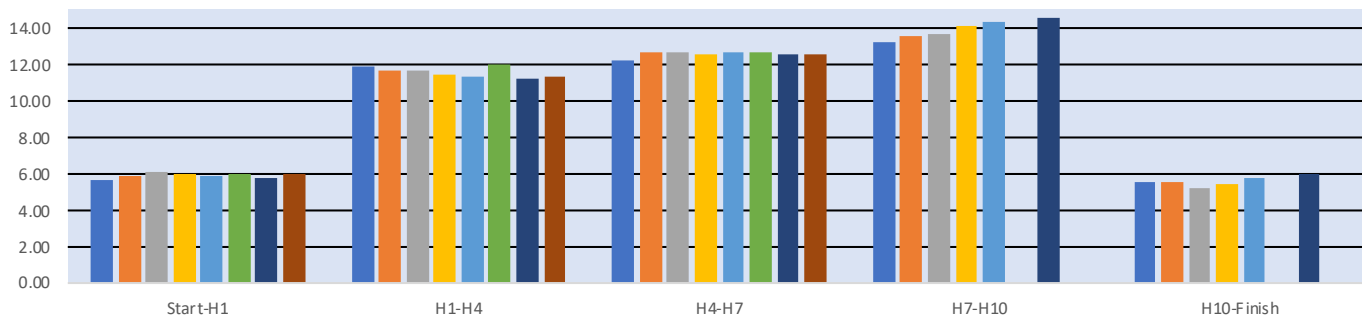
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Jackson, Bershawn (USA) (1983)	time		5.64	9.40	13.40	17.56	21.60	25.68	29.76	33.96	38.40	43.04		48.63	4 / 1			
	reaction time	0.127																
	interval			3.76	4.00	4.16	4.04	4.08	4.20	4.44	4.64	5.59				11.92	12.20	13.28
	velocity		7.98	9.31	8.75	8.41	8.66	8.58	8.33	7.88	7.54	7.16	8.23			8.81	8.61	7.91
van Zyl, LJ (RSA) (1985)	time		5.88	9.64	13.52	17.52	21.60	25.80	30.16	34.60	39.12	43.76		49.35	7 / 2			
	reaction time	0.155																
	interval			3.76	3.88	4.00	4.08	4.20	4.36	4.44	4.52	4.64	5.59			11.64	12.64	13.60
	velocity		7.65	9.31	9.02	8.75	8.58	8.33	8.03	7.88	7.74	7.54	7.16	8.11		9.02	8.31	7.72
Mägi, Rasmus (EST) (1992)	time		6.08	9.92	13.80	17.76	21.84	26.04	30.44	34.88	39.48	44.12		49.38	8 / 3			
	reaction time	0.138																
	interval			3.84	3.88	3.96	4.08	4.20	4.40	4.44	4.60	4.64	5.26			11.68	12.68	13.68
	velocity		7.40	9.11	9.02	8.84	8.58	8.33	7.95	7.88	7.61	7.54	7.60	8.10		8.99	8.28	7.68
Clement, Kerron (USA) (1985)	time		5.96	9.72	13.48	17.36	21.40	25.60	29.96	34.48	39.24	44.04		49.43	6 / 4			
	reaction time	0.155																
	interval			3.76	3.76	3.88	4.04	4.20	4.36	4.52	4.76	4.80	5.39			11.40	12.60	14.08
	velocity		7.55	9.31	9.31	9.02	8.66	8.33	8.03	7.74	7.35	7.29	7.42	8.09		9.21	8.33	7.46
Culson, Javier (PUR) (1984)	time		5.84	9.48	13.24	17.12	21.16	25.40	29.76	34.36	39.08	44.08		49.90	2 / 5			
	reaction time	0.194																
	interval			3.64	3.76	3.88	4.04	4.24	4.36	4.60	4.72	5.00	5.82			11.28	12.64	14.32
	velocity		7.71	9.62	9.31	9.02	8.66	8.25	8.03	7.61	7.42	7.00	6.87	8.02		9.31	8.31	7.33
Hussein, Kariem (SUI) (1989)	time		6.04	9.92	13.92	18.08	22.24	26.40	30.72	35.12				50.02	9 / 6			
	reaction time	0.177																
	interval			3.88	4.00	4.16	4.16	4.16	4.32	4.40						12.04	12.64	
	velocity		7.45	9.02	8.75	8.41	8.41	8.41	8.10	7.95				8.00		8.72	8.31	
Whyte, Annsert (JAM) (1987)	time		5.76	9.36	13.16	17.00	20.92	25.08	29.56	34.24	39.08	44.16		50.18	3 / 7			
	reaction time	0.154																
	interval			3.60	3.80	3.84	3.92	4.16	4.48	4.68	4.84	5.08	6.02			11.24	12.56	14.60
	velocity		7.81	9.72	9.21	9.11	8.93	8.41	7.81	7.48	7.23	6.89	6.64	7.97		9.34	8.36	7.19
Bett, Nicholas (KEN) (1990)	time		6.04	9.72	13.52	17.40	21.40	25.52	30.00	34.64	39.52			51.09	5 / 8			
	reaction time	0.189																
	interval			3.68	3.80	3.88	4.00	4.12	4.48	4.64	4.88					11.36	12.60	
	velocity		7.45	9.51	9.21	9.02	8.75	8.50	7.81	7.54	7.17			7.83		9.24	8.33	
	H1 lead leg													142				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 10800 @ 25fps

Timing From: First Movement

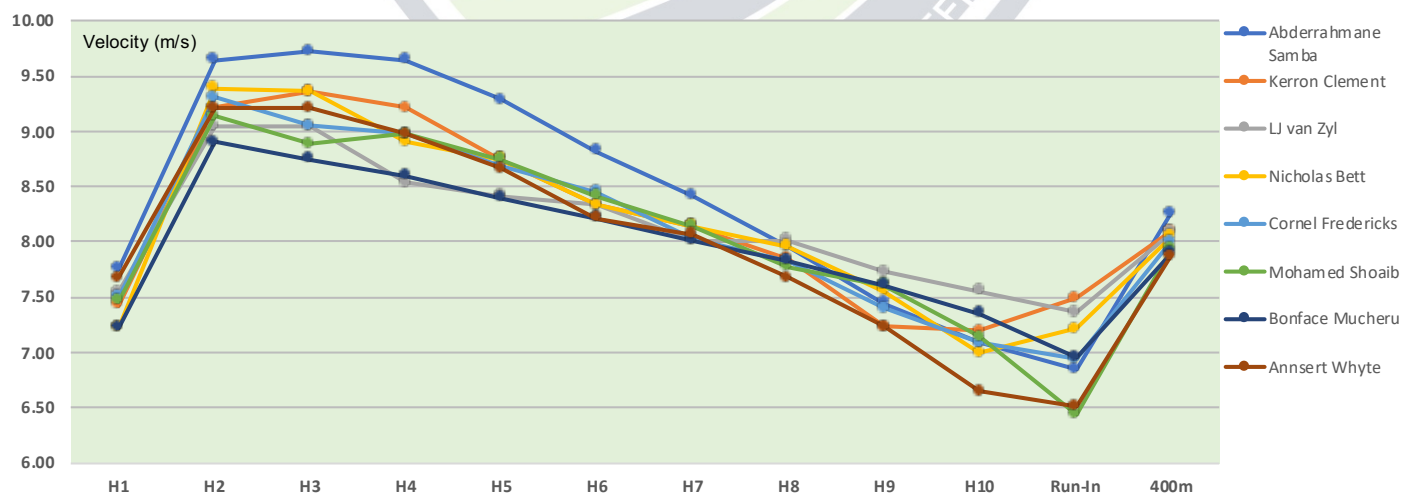
Source: <https://www.youtube.com/watch?v=v7f2lf6eAzs>

Men's 400m Hurdles

Date 2017.05.05

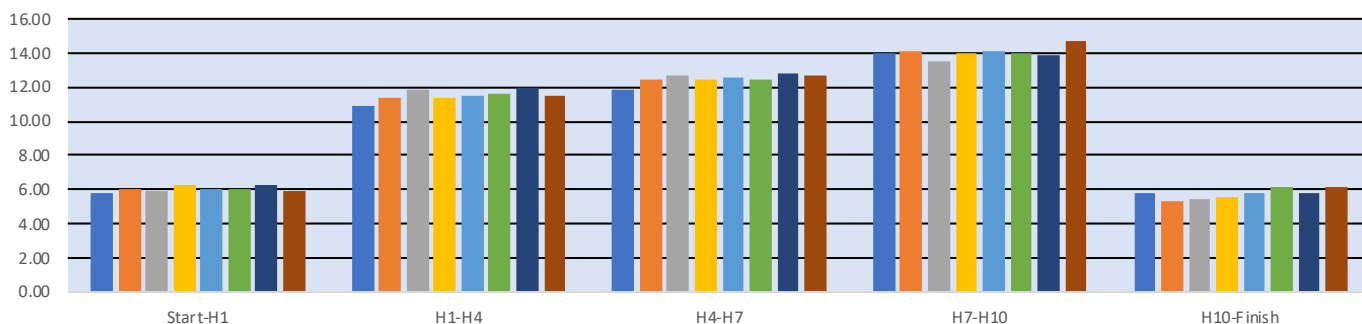
FINAL

Samba, Abderrahmane (QAT) (1995)				time	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-in	400m	Lane / Place	H1-H4	H4-H7	H7-H10	
reaction time				0.185	5.80	9.43	13.03	16.66	20.43	24.40	28.56	32.96	37.66	42.60		48.44	4 / 1		10.86	11.90	14.04
					interval	3.63	3.60	3.63	3.77	3.97	4.16	4.40	4.70	4.94	5.84				9.67	8.82	7.48
					velocity	7.76	9.64	9.72	9.64	9.28	8.82	8.41	7.95	7.45	7.09	6.85	8.26		9.67	8.82	7.48
H1 lead leg				R	strides	20	13	13	13	13	13	14	14	15	18	159					
Cle ment, Kerron (USA) (1985)				time	6.06	9.86	13.60	17.40	21.40	25.60	29.90	34.36	39.20	44.06		49.40	6 / 2		11.34	12.50	14.16
reaction time				0.176		3.80	3.74	3.80	4.00	4.20	4.30	4.46	4.84	4.86	5.34				9.26	8.40	7.42
					interval	7.43	9.21	9.36	9.21	8.75	8.33	8.14	7.85	7.23	7.20	7.49	8.10		9.26	8.40	7.42
					velocity	7.43	9.21	9.36	9.21	8.75	8.33	8.14	7.85	7.23	7.20	7.49	8.10		9.26	8.40	7.42
H1 lead leg				R	strides	20	13	13	13	13	13	13	14	14	16	155					
van Zyl, LJ (RSA) (1985)				time	5.96	9.83	13.70	17.80	21.96	26.16	30.53	34.90	39.43	44.06		49.49	8 / 3		11.84	12.73	13.53
reaction time				0.156		3.87	3.87	4.10	4.16	4.20	4.37	4.37	4.53	4.63	5.43				8.87	8.25	7.76
					interval	7.55	9.04	9.04	8.54	8.41	8.33	8.01	7.73	7.56	7.37	8.08			8.87	8.25	7.76
					velocity	7.55	9.04	9.04	8.54	8.41	8.33	8.01	7.73	7.56	7.37	8.08			8.87	8.25	7.76
H1 lead leg				L	strides	22	14	14	14	14	14	15	15	15	18.7	170.7					
Bett, Nicholas (KEN) (1990)				time	6.23	9.96	13.70	17.63	21.63	25.83	30.13	34.53	39.16	44.16		49.70	5 / 4		11.40	12.50	14.03
reaction time				0.168		3.73	3.74	3.93	4.00	4.20	4.30	4.40	4.63	5.00	5.54				9.21	8.40	7.48
					interval	7.22	9.38	9.36	8.91	8.75	8.33	8.14	7.95	7.56	7.00	7.22	8.05		9.21	8.40	7.48
					velocity	7.22	9.38	9.36	8.91	8.75	8.33	8.14	7.95	7.56	7.00	7.22	8.05		9.21	8.40	7.48
H1 lead leg				R	strides	21	13	13	13	13	13	13	13	13	15	17	157				
Fredericks, Cornel (RSA) (1990)				time	6.00	9.76	13.63	17.53	21.56	25.70	30.06	34.53	39.26	44.20		49.96	1 / 5		11.53	12.53	14.14
reaction time				0.147		3.76	3.87	3.90	4.03	4.14	4.36	4.47	4.73	4.94	5.76				9.11	8.38	7.43
					interval	7.50	9.31	9.04	8.97	8.68	8.45	8.03	7.83	7.40	7.09	6.94	8.01		9.11	8.38	7.43
					velocity	7.50	9.31	9.04	8.97	8.68	8.45	8.03	7.83	7.40	7.09	6.94	8.01		9.11	8.38	7.43
H1 lead leg				R	strides	22	14	14	14	14	14	15	15	15	16	19.5	172.5				
Shoaib, Mohamed (SUD) (1998)				time	6.03	9.86	13.80	17.70	21.70	25.86	30.16	34.66	39.26	44.16		50.37	2 / 6		11.67	12.46	14.00
reaction time				0.206		3.83	3.94	3.90	4.00	4.16	4.30	4.50	4.60	4.90	6.21				9.00	8.43	7.50
					interval	7.46	9.14	8.88	8.97	8.75	8.41	8.14	7.78	7.61	7.14	6.44	7.94		9.00	8.43	7.50
					velocity	7.46	9.14	8.88	8.97	8.75	8.41	8.14	7.78	7.61	7.14	6.44	7.94		9.00	8.43	7.50
H1 lead leg				R	strides	21	13	13	13	13	13	13	13	14	14	18	158				
Mucheru, Bonface (KEN) (1992)				time	6.23	10.16	14.16	18.23	22.40	26.66	31.03	35.50	40.10	44.86		50.61	3 / 7		12.00	12.80	13.83
reaction time				0.155		3.93	4.00	4.07	4.17	4.26	4.37	4.47	4.60	4.76	5.75				8.75	8.20	7.59
					interval	7.22	8.91	8.75	8.60	8.39	8.22	8.01	7.83	7.61	7.35	6.96	7.90		8.75	8.20	7.59
					velocity	7.22	8.91	8.75	8.60	8.39	8.22	8.01	7.83	7.61	7.35	6.96	7.90		8.75	8.20	7.59
H1 lead leg				R	strides	22	15	15	15	15	15	15	15	15	15	18.5	175.5				
Whyte, Annsert (JAM) (1987)				time	5.86	9.66	13.46	17.36	21.40	25.66	30.00	34.56	39.40	44.66		50.80	7 / 8		11.50	12.64	14.66
reaction time				0.154		3.80	3.80	3.90	4.04	4.26	4.34	4.56	4.84	5.26	6.14				9.13	8.31	7.16
					interval	7.68	9.21	9.21	8.97	8.66	8.22	8.06	7.68	7.23	6.65	6.51	7.87		9.13	8.31	7.16
					velocity	7.68	9.21	9.21	8.97	8.66	8.22	8.06	7.68	7.23	6.65	6.51	7.87		9.13	8.31	7.16
H1 lead leg				L	strides	21	14	14	14	14	14	14	15	15	16	151					



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=strD8mCPQH4>

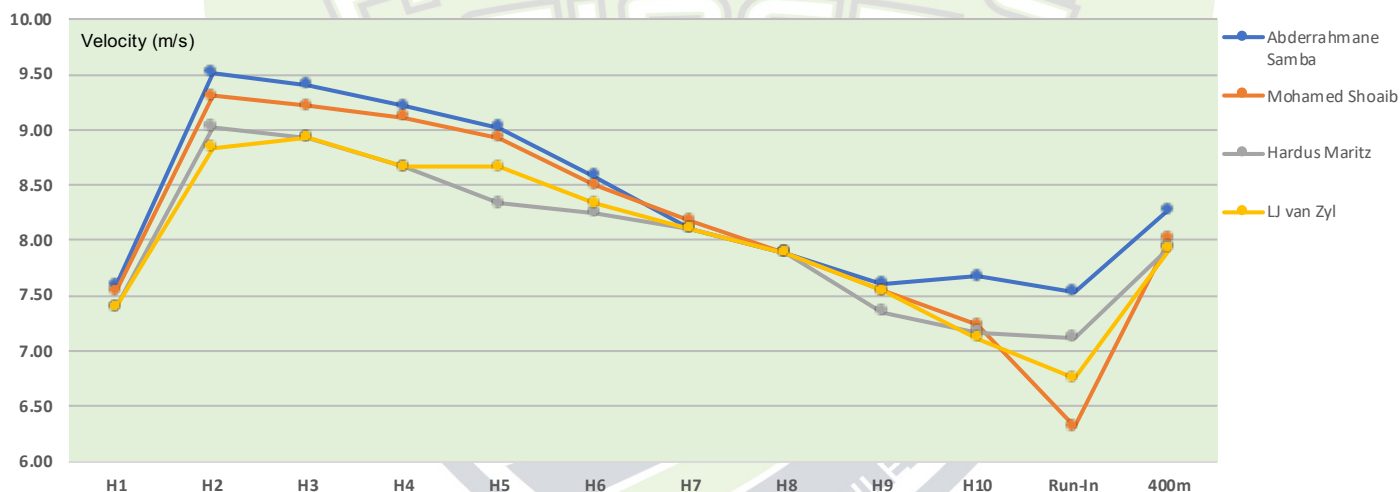
2017 North-West University Pukke Invitational (Sasolburg, RSA) (TV Analysis)

Men's 400m Hurdles

Date 2017.03.28

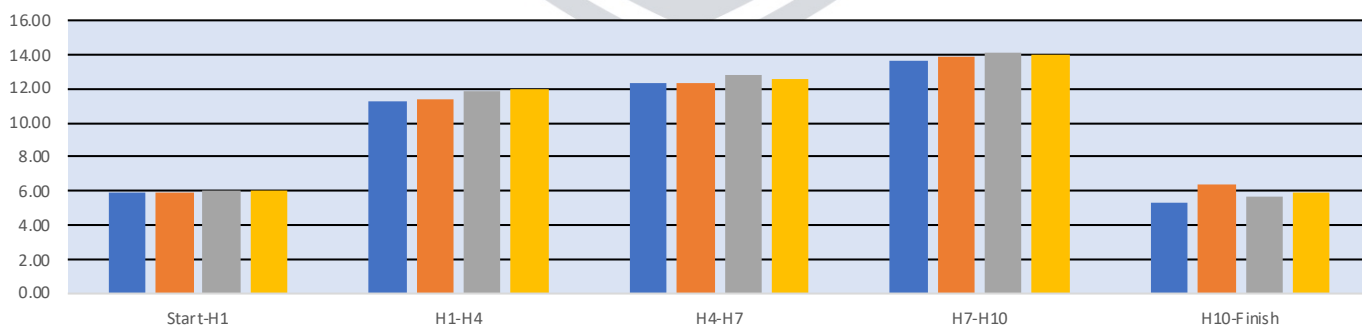
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Samba, Abderrahmane (QAT) (1995)	time		5.92	9.60	13.32	17.12	21.00	25.08	29.40	33.84	38.44	43.00		48.31	5 / 1			
	reaction time			3.68	3.72	3.80	3.88	4.08	4.32	4.44	4.60	4.56	5.31	PB		11.20	12.28	13.60
	interval		7.60	9.51	9.41	9.21	9.02	8.58	8.10	7.88	7.61	7.68	7.53	8.28		9.38	8.55	7.72
	velocity																	
Shoaib, Mohamed (SUD) (1998)	time		5.96	9.72	13.52	17.36	21.28	25.40	29.68	34.12	38.76	43.60		49.93	1 / 2			
	reaction time			3.76	3.80	3.84	3.92	4.12	4.28	4.44	4.64	4.84	6.33	NR NJR PB		11.40	12.32	13.92
	interval		7.55	9.31	9.21	9.11	8.93	8.50	8.18	7.88	7.54	7.23	6.32	8.01		9.21	8.52	7.54
	velocity																	
Maritz, Hardus (NAM) (1990)	time		6.08	9.96	13.88	17.92	22.12	26.36	30.68	35.12	39.88	44.76		50.38	3 / 3			
	reaction time			3.88	3.92	4.04	4.20	4.24	4.32	4.44	4.76	4.88	5.62			11.84	12.76	14.08
	interval		7.40	9.02	8.93	8.66	8.33	8.25	8.10	7.88	7.35	7.17	7.12	7.94		8.87	8.23	7.46
	velocity																	
van Zyl, LJ (RSA) (1985)	time		6.08	10.04	13.96	18.00	22.04	26.24	30.56	35.00	39.64	44.56		50.48	4 / 4			
	reaction time			3.96	3.92	4.04	4.04	4.20	4.32	4.44	4.64	4.92	5.92			11.92	12.56	14.00
	interval		7.40	8.84	8.93	8.66	8.66	8.33	8.10	7.88	7.54	7.11	6.76	7.92		8.81	8.36	7.50
	velocity																	
	H1 lead leg	R																
	H1 lead leg	L																



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=QP2GubrnDfw>

Women's 400m Hurdles

Muhammad, Dalilah (USA) (1990)				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
FINAL - 2017 USATF National Championships (Sacramento, CA)																				
	date	25-Jun	time	6.04	10.01	14.18	18.48	22.69	26.99	31.50	36.27	41.27	46.44		52.64	5 / 1				
	reaction time	0.186	interval		3.97	4.17	4.30	4.21	4.30	4.51	4.77	5.00	5.17	6.20	PB		12.44	13.02	14.94	
			velocity	7.45	8.82	8.39	8.14	8.31	8.14	7.76	7.34	7.00	6.77	6.45	7.60		8.44	8.06	7.03	
	H1 lead leg	R	strides	23	15	15	15	15	15	15	16	16	16	20	181					
Little, Shamier (USA) (1995)				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
FINAL - 2017 USATF National Championships (Sacramento, CA)																				
	date	25-Jun	time	6.34		14.51			27.36	31.96	36.77	41.84	46.94		52.75	4 / 2				
	reaction time	0.217	interval			8.17			12.85	4.60	4.81	5.07	5.10	5.81	PB				14.98	
			velocity	7.10		8.57			8.17	7.61	7.28	6.90	6.86	6.88	7.58				7.01	
	H1 lead leg	R	strides	24						15	16	16	16	19.5	106.5					
Carter, Kori (USA) (1992)				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
FINAL - 2017 USATF National Championships (Sacramento, CA)																				
	date	25-Jun	time	6.34	10.31	14.25	18.28	22.49	27.09	32.13	37.10	42.04	47.08		52.95	7 / 3				
	reaction time	0.244	interval		3.97	3.94	4.03	4.21	4.60	5.04	4.97	4.94	5.04	5.87	PB		11.94	13.85	14.95	
			velocity	7.10	8.82	8.88	8.68	8.31	7.61	6.94	7.04	7.09	6.94	6.81	7.55		8.79	7.58	7.02	
	H1 lead leg	L	strides	24	15	15	15	115	17	17	17	17	17	20	289					
Carter, Kori (USA) (1992)				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
FINAL - 2017 IAAF World Championships (London, GBR) (TV Analysis)																				
	date	10-Aug	time	6.20	10.28	14.28	18.48	22.92	27.32	32.00	36.92	41.92	47.04	Henson (2020) - Athlete First: 2017 year end hurdle report						
	reaction time	0.151	interval		4.08	4.00	4.20	4.44	4.40	4.68	4.92	5.00	5.12	6.03	53.07	9 / 1				
			velocity	7.26	8.58	8.75	8.33	7.88	7.95	7.48	7.11	7.00	6.84	6.63	7.54		8.55	7.77	6.98	
	H1 lead leg	L	strides	24	15	15	15	16	16	16	17	17	17	20	188					
Spencer, Ashley (USA) (1993)				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
FINAL - 2017 USATF National Championships (Sacramento, CA)																				
	date	25-Jun	time												53.11	3 / 4				
	reaction time	0.188	interval	No Information Available												PB				
			velocity																	
	H1 lead leg		strides																	
Moline Georganne (USA) (1990)				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
FINAL - 2017 USATF National Championships (Sacramento, CA)																				
	date	25-Jun	time	6.34	10.44	14.65	18.92	23.22	27.69	32.36	37.10	42.04	47.05		53.14	6 / 5				
	reaction time	0.272	interval		4.10	4.21	4.27	4.30	4.47	4.67	4.74	4.94	5.01	6.09	PB		12.58	13.44	14.69	
			velocity	7.10	8.54	8.31	8.20	8.14	7.83	7.49	7									

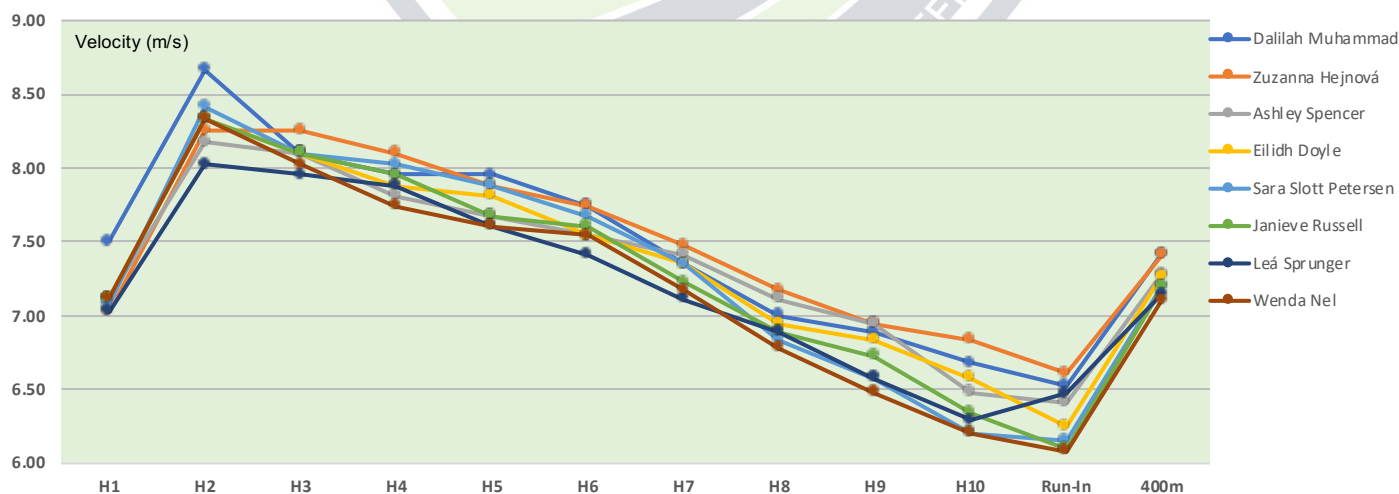
2017 Memorial van Damme (Brussels, BEL) (TV Analysis)

Women's 400m Hurdles

Date 2017.09.01

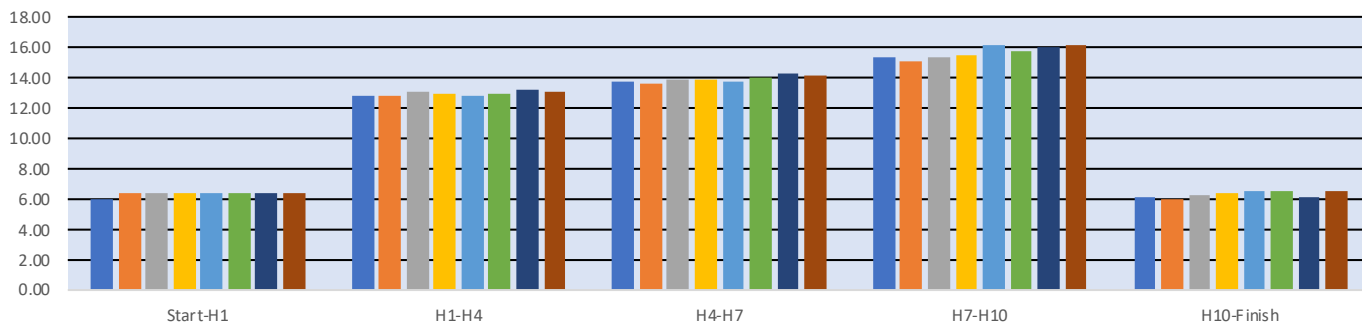
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Muhammad, Dalilah (USA) (1990)	time		6.00	10.04	14.36	18.76	23.16	27.68	32.44	37.44	42.52	47.76		53.89	6 / 1			
	reaction time	0.154																
	interval		7.50	4.04	4.32	4.40	4.40	4.52	4.76	5.00	5.08	5.24	6.13			12.76	13.68	15.32
	velocity		8.66	8.10	7.95	7.95	7.74	7.35	7.00	6.89	6.68	6.53	7.42			8.23	7.68	6.85
Hejnová, Zuzana (CZE) (1986)	time		6.40	10.64	14.88	19.20	23.64	28.16	32.84	37.72	42.76	47.88		53.93	7 / 2			
	reaction time	0.156																
	interval		7.03	4.24	4.32	4.44	4.52	4.68	4.88	5.04	5.12	5.12	6.05			12.80	13.64	15.04
	velocity		8.25	8.25	8.10	7.88	7.74	7.48	7.17	6.94	6.84	6.61	7.42			8.20	7.70	6.98
Spencer, Ashley (USA) (1993)	time		6.32	10.60	14.92	19.40	23.96	28.60	33.32	38.24	43.28	48.68		54.92	5 / 3			
	reaction time	0.167																
	interval		7.12	4.28	4.32	4.48	4.56	4.64	4.72	4.92	5.04	5.40	6.24			13.08	13.92	15.36
	velocity		8.18	8.10	7.81	7.68	7.54	7.42	7.11	6.94	6.48	6.41	7.28			8.03	7.54	6.84
Doyle, Eilidh (GBR) (1987)	time		6.32	10.52	14.84	19.28	23.76	28.40	33.16	38.20	43.32	48.64		55.04	4 / 4			
	reaction time	0.196																
	interval		7.12	4.20	4.32	4.44	4.48	4.64	4.76	5.04	5.12	5.32	6.40			12.96	13.88	15.48
	velocity		8.33	8.10	7.88	7.81	7.54	7.35	6.94	6.84	6.58	6.25	7.27			8.10	7.56	6.78
Petersen, Sara Slott (DEN) (1987)	time		6.36	10.52	14.84	19.20	23.64	28.20	32.96	38.08	43.40	49.04		55.54	3 / 5			
	reaction time	0.216																
	interval		4.16	4.32	4.36	4.44	4.56	4.76	5.12	5.32	5.64	6.50				12.84	13.76	16.08
	velocity		7.08	8.41	8.10	8.03	7.88	7.68	7.35	6.84	6.58	6.21	6.15	7.20		8.18	7.63	6.53
Russell, Janieve (JAM) (1993)	time		6.32	10.52	14.84	19.24	23.80	28.40	33.24	38.32	43.52	49.04		55.60	9 / 6			
	reaction time	0.178																
	interval		4.20	4.32	4.40	4.56	4.60	4.84	5.08	5.20	5.52	6.56				12.92	14.00	15.80
	velocity		7.12	8.33	8.10	7.95	7.68	7.61	7.23	6.89	6.73	6.34	6.10	7.19		8.13	7.50	6.65
Sprunger, Leá (SUI) (1990)	time		6.40	10.76	15.16	19.60	24.20	28.92	33.84	38.92	44.24	49.80		55.98	8 / 7			
	reaction time	0.165																
	interval		4.36	4.40	4.44	4.60	4.72	4.92	5.08	5.32	5.56	6.18				13.20	14.24	15.96
	velocity		7.03	8.03	7.95	7.88	7.61	7.42	7.11	6.89	6.58	6.29	6.47	7.15		7.95	7.37	6.58
Nel, Wenda (RSA) (1988)	time		6.32	10.52	14.88	19.40	24.00	28.64	33.52	38.68	44.08	49.72		56.30	2 / 8			
	reaction time	0.219																
	interval		7.12	4.20	4.36	4.52	4.60	4.64	4.88	5.16	5.40	5.64	6.58			13.08	14.12	16.20
	velocity		8.33	8.03	7.74	7.61	7.54	7.17	6.78	6.48	6.21	6.08	7.10			8.03	7.44	6.48



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=6MLDclNFIYY>

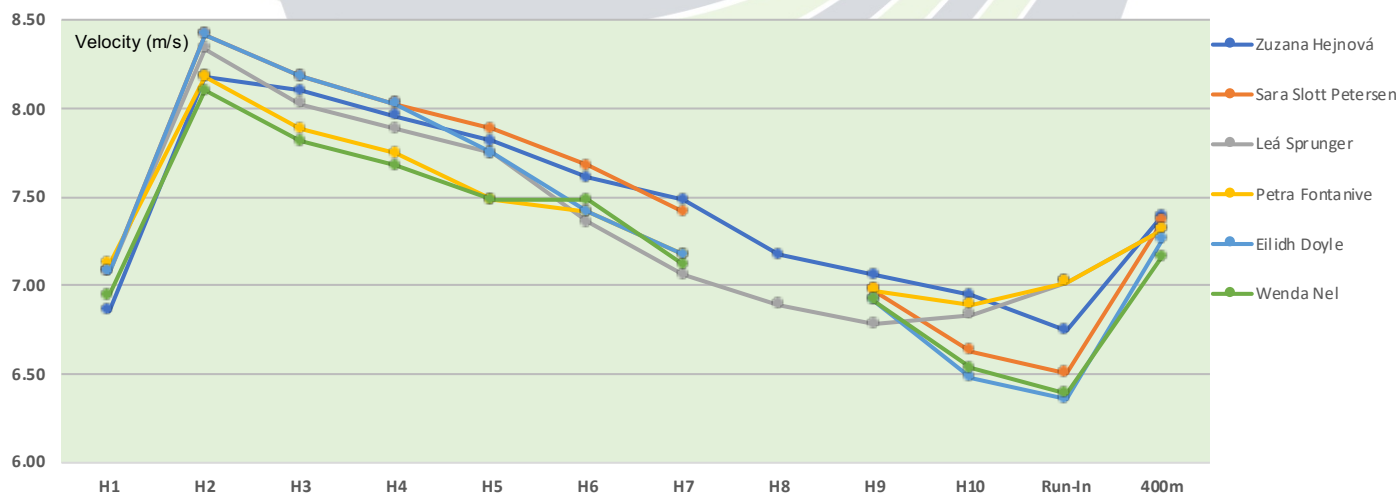
2017 Weltklasse (Zürich, SUI) (TV Analysis)

Women's 400m Hurdles

Date 2017.08.24

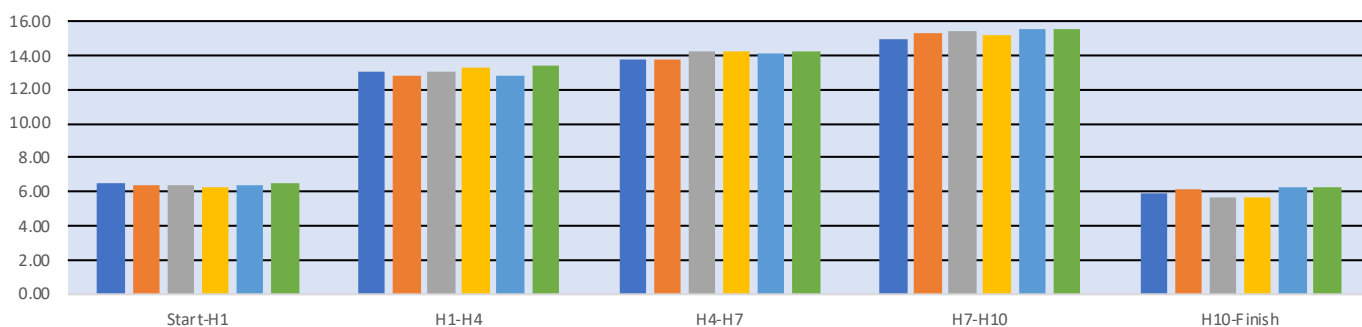
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-in	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Hejnová, Zuzana (CZE) (1986)	time		6.56	10.84	15.16	19.56	24.04	28.64	33.32	38.20	43.16	48.20		54.13	5 / 1	13.00	13.76	14.88
	reaction time	0.158																
	interval		6.86	8.18	8.10	7.95	7.81	7.61	7.48	7.17	7.06	6.94	6.75	7.39				
	velocity		8.08	7.63	7.06													
H1 lead leg	R	strides	22	15	15	15	15	15	15	16	16	16	19.7	179.7				
Petersen, Sara Slott (DEN) (1987)	time		6.36	10.52	14.80	19.16	23.60	28.16	32.88		42.92	48.20		54.35	7 / 2	12.80	13.72	15.32
	reaction time	0.146									10.04	5.28	6.15					
	interval		7.08	8.41	8.18	8.03	7.88	7.68	7.42		6.97	6.63	6.50	7.36				
	velocity		8.20	7.65	6.85													
H1 lead leg	R	strides	21	15	15		15	15	15		17	20.5	133.5					
Sprunger, Leá (SUI) (1990)	time		6.36	10.56	14.92	19.36	23.88	28.64	33.60	38.68	43.84	48.96		54.66	6 / 3	13.00	14.24	15.36
	reaction time	0.124									5.16	5.12	5.70					
	interval		7.08	8.33	8.03	7.88	7.74	7.35	7.06	6.89	6.78	6.84	7.02	7.32				
	velocity		8.08	7.37	6.84													
H1 lead leg	R	strides	21	14	14	14	14	15	15	15	15	15	18.2	170.2				
Fontanive, Petra (SUI) (1988)	time		6.32	10.60	15.04	19.56	24.24	28.96	33.84		43.88	48.96		54.66	4 / 4	13.24	14.28	15.12
	reaction time	0.157									10.04	5.08	5.70					
	interval		7.12	8.18	7.88	7.74	7.48	7.42	7.17	6.97	6.89	7.02	7.32					
	velocity		7.93	7.35	6.94													
H1 lead leg	L	strides	23	16	16		16	17	17		17	21	143					
Doyle, Eilidh (GBR) (1987)	time		6.36	10.52	14.80	19.16	23.68	28.40	33.28		43.40	48.80		55.09	3 / 5	12.80	14.12	15.52
	reaction time	0.163									10.12	5.40	6.29					
	interval		7.08	8.41	8.18	8.03	7.74	7.42	7.17	6.92	6.48	6.36	7.26					
	velocity		8.20	7.44	6.77													
H1 lead leg	L	strides	23	15	15		15	16	16		18	21.7	139.7					
Nel, Wenda (RSA) (1988)	time		6.48	10.80	15.28	19.84	24.52	29.20	34.12		44.24	49.60		55.86	2 / 6	13.36	14.28	15.48
	reaction time	0.198									10.12	5.36	6.26					
	interval		6.94	8.10	7.81	7.68	7.48	7.48	7.11	6.92	6.53	6.39	7.16					
	velocity		7.86	7.35	6.78													
H1 lead leg	L	strides	23	16	16		16	16	17			17	21.2	142.2				



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=TVGOvaTv5mQ>

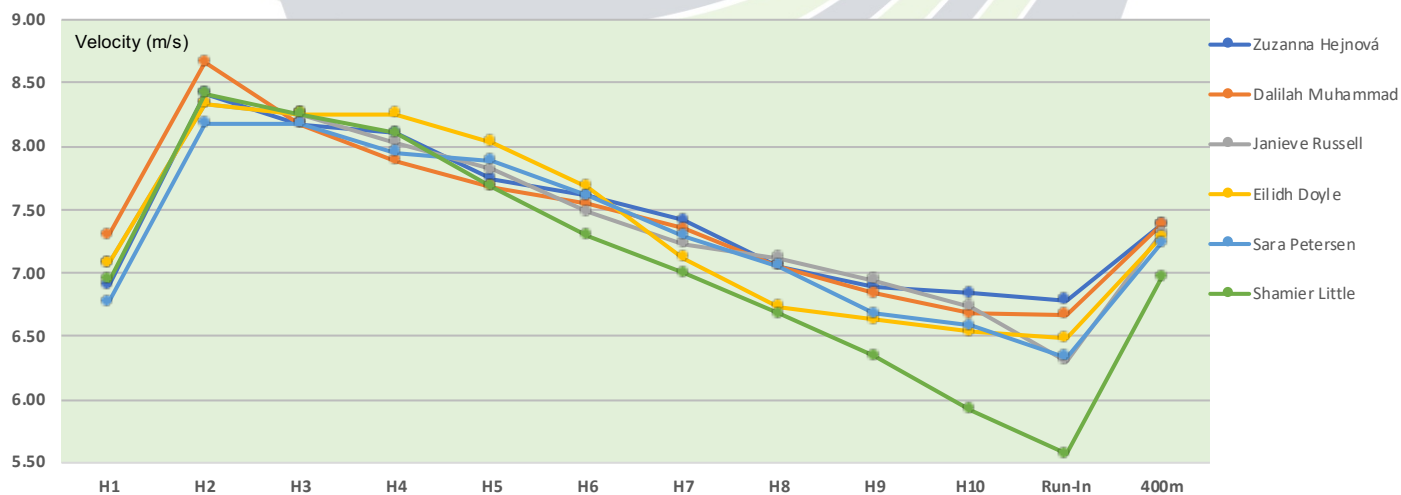
2017 Müller Grand Prix (Birmingham, GBR) (TV Analysis)

Women's 400m Hurdles

Date 2017.08.20

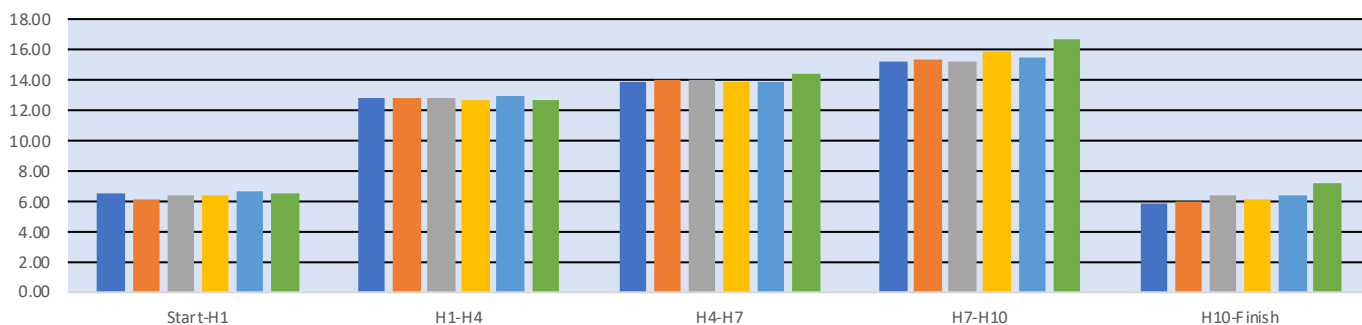
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Hejnová, Zuzana (CZE) (1986)	time		6.52	10.68	14.96	19.28	23.80	28.40	33.12	38.08	43.16	48.28		54.18	5 / 1			
	reaction time	0.155														12.76	13.84	15.16
	interval		6.90	4.16	4.28	4.32	4.52	4.60	4.72	4.96	5.08	5.12	5.90			8.23	7.59	6.93
	velocity																	
Muhammad, Dalilah (USA) (1990)	time		6.16	10.20	14.48	18.92	23.48	28.12	32.88	37.84	42.96	48.20		54.20	4 / 2			
	reaction time	0.159														12.76	13.96	15.32
	interval		7.31	8.66	8.18	7.88	7.68	7.54	7.35	7.06	6.84	6.68	6.67			8.23	7.52	6.85
	velocity																	
Russell, Janieve (JAM) (1993)	time		6.36	10.56	14.80	19.16	23.64	28.32	33.16	38.08	43.12	48.32		54.67	6 / 3			
	reaction time	0.134														12.80	14.00	15.16
	interval		7.08	8.33	8.25	8.03	7.81	7.48	7.23	7.11	6.94	6.73	6.30			8.20	7.50	6.93
	velocity																	
Doyle, Eilidh (GBR) (1987)	time		6.36	10.56	14.80	19.04	23.40	27.96	32.88	38.08	43.36	48.72		54.89	2 / 4			
	reaction time	0.158														12.68	13.84	15.84
	interval		7.08	8.33	8.25	8.25	8.03	7.68	7.11	6.73	6.63	6.53	6.48			8.28	7.59	6.63
	velocity																	
Petersen, Sara Slott (DEN) (1987)	time		6.64	10.92	15.20	19.60	24.04	28.64	33.44	38.40	43.64	48.96		55.28	7 / 5			
	reaction time	0.154														12.96	13.84	15.52
	interval		6.78	8.18	8.18	7.95	7.88	7.61	7.29	7.06	6.68	6.58	6.33			8.10	7.59	6.77
	velocity																	
Little, Shamier (USA) (1995)	time		6.48	10.64	14.88	19.20	23.76	28.56	33.56	38.80	44.32	50.24		57.42	3 / 6			
	reaction time	0.220														12.72	14.36	16.68
	interval		6.94	8.41	8.25	8.10	7.68	7.29	7.00	6.68	6.34	5.91	5.57			8.25	7.31	6.29
	velocity																	
H1 lead leg	time		22	15	15	15	15	15	15	16	16	16	20	180				
	interval																	
	velocity																	
	strides																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=nrcrd-d76wsY>

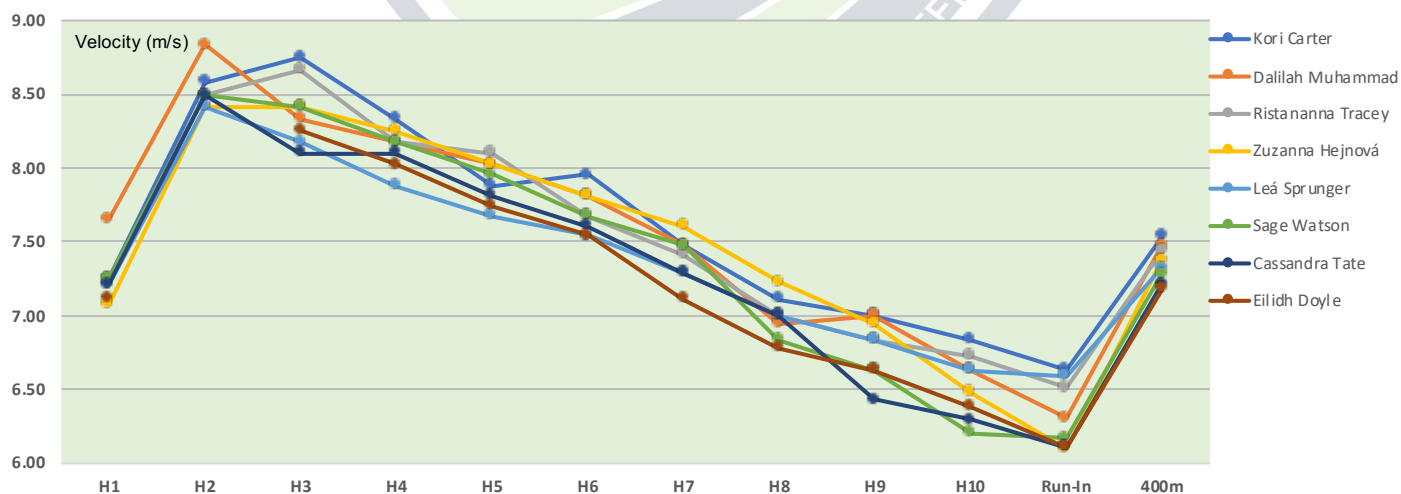
2017 IAAF World Championships (London, GBR) (TV Analysis)

Women's 400m Hurdles

Date 2017.08.10

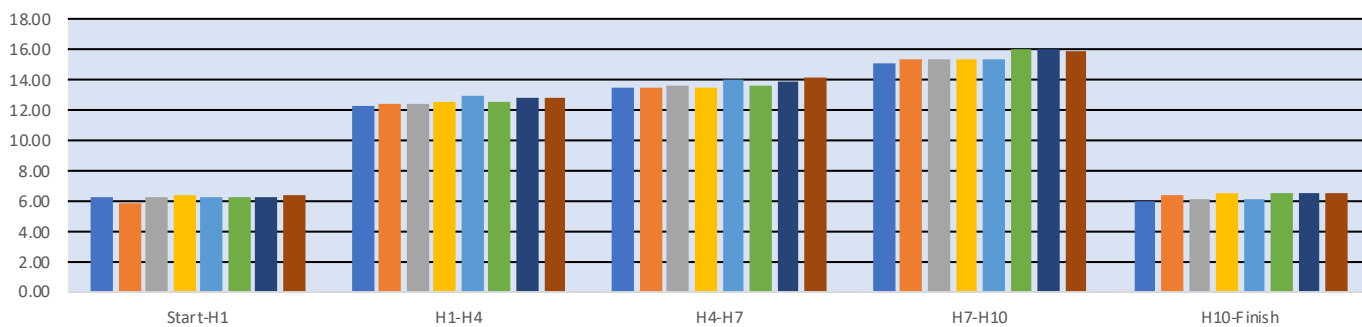
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Carter, Kori (USA) (1992)	time		6.20	10.28	14.28	18.48	22.92	27.32	32.00	36.92	41.92	47.04		53.07	9 / 1			
	reaction time	0.151														12.28	13.52	15.04
	interval		7.26	8.58	8.75	8.33	7.88	7.95	7.48	7.11	7.00	6.84	6.63	7.54		8.55	7.77	6.98
	H1 lead leg	L	24	15	15	15	16	16	16	17	17	17	20	188				
Muhammad, Dalilah (USA) (1990)	time		5.88	9.84	14.04	18.32	22.68	27.16	31.84	36.88	41.88	47.16		53.50	4 / 2			
	reaction time	0.152														12.44	13.52	15.32
	interval		7.65	8.84	8.33	8.18	8.03	7.81	7.48	6.94	7.00	6.63	6.31	7.48		8.44	7.77	6.85
	H1 lead leg	R	23	15	15	15	15	15	15	16	16	16	20	181				
Tracey, Ristananna (JAM) (1992)	time		6.24	10.36	14.40	18.68	23.00	27.56	32.28	37.28	42.40	47.60		53.74	7 / 3			
	reaction time	0.178														12.44	13.60	15.32
	interval		7.21	8.50	8.66	8.18	8.10	7.68	7.42	7.00	6.84	6.73	6.51	7.44		8.44	7.72	6.85
	H1 lead leg	L	23	15	15	15	15	16	16	17	17	17	20.2	186.2				
Hejnová, Zuzana (CZE) (1986)	time		6.36	10.52	14.68	18.92	23.28	27.76	32.36	37.20	42.24	47.64		54.20	6 / 4			
	reaction time	0.151														12.56	13.44	15.28
	interval		7.08	8.41	8.41	8.25	8.03	7.81	7.61	7.23	6.94	6.48	6.10	7.38		8.36	7.81	6.87
	H1 lead leg	R	22	15	15	15	15	15	15	16	16	17	20.5	181.5				
Sprunger, Leá (SUI) (1990)	time		6.24	10.40	14.68	19.12	23.68	28.32	33.12	38.12	43.24	48.52		54.59	5 / 5			
	reaction time	0.183														12.88	14.00	15.40
	interval		7.21	8.41	8.18	7.88	7.68	7.54	7.29	7.00	6.84	6.63	6.59	7.33		8.15	7.50	6.82
	H1 lead leg	R	21	14	14	15	15	15	15	15	15	15	18.7	172.7				
Watson, Sage (CAN) (1994)	time		6.20	10.32	14.48	18.76	23.16	27.72	32.40	37.52	42.80	48.44		54.92	8 / 6			
	reaction time	0.172														12.56	13.64	16.04
	interval		7.26	8.50	8.41	8.18	7.95	7.68	7.48	6.84	6.63	6.21	6.17	7.28		8.36	7.70	6.55
	H1 lead leg	R	22	15	15	15	15	15	15	16	16	17	20	181				
Tate, Cassandra (USA) (1990)	time		6.24	10.36	14.68	19.00	23.48	28.08	32.88	37.88	43.32	48.88		55.43	3 / 7			
	reaction time	0.216														12.76	13.88	16.00
	interval		7.21	8.50	8.10	8.10	7.81	7.61	7.29	7.00	6.43	6.29	6.11	7.22		8.23	7.56	6.56
	H1 lead leg	R	22		15	15	15	15	15	15	17	17	20	166				
Doyle, Eilidh (GBR) (1987)	time		6.32		14.80	19.16	23.68	28.32	33.24	38.40	43.68	49.16		55.71	2 / 8			
	reaction time	0.157														12.84	14.08	15.92
	interval		7.12		8.48	4.36	4.52	4.64	4.92	5.16	5.28	5.48	6.55			8.18	7.46	6.60
	H1 lead leg	L	23		8.25	8.03	7.74	7.54	7.11	6.78	6.63	6.39	6.11	7.18				
						15	15	16	17	17	18	18	21.5	160.5				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: https://www.youtube.com/watch?v=TFn_Y86bw64

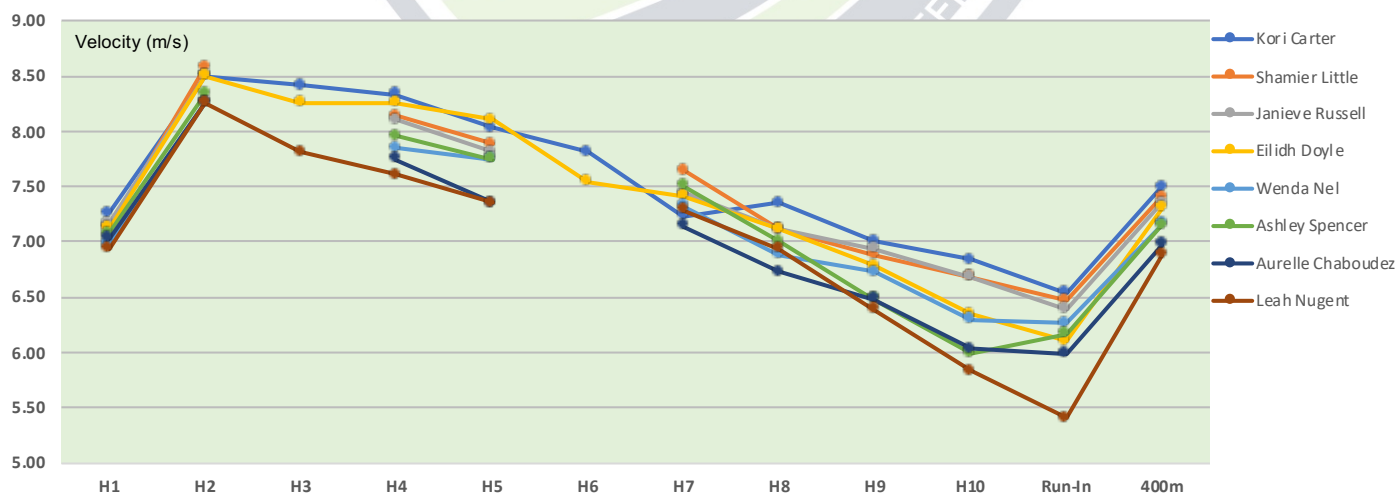
2017 Herculis Meeting International d'Athletisme (Monaco, MON) (TV Analysis)

Women's 400m Hurdles

Date 2017.07.21

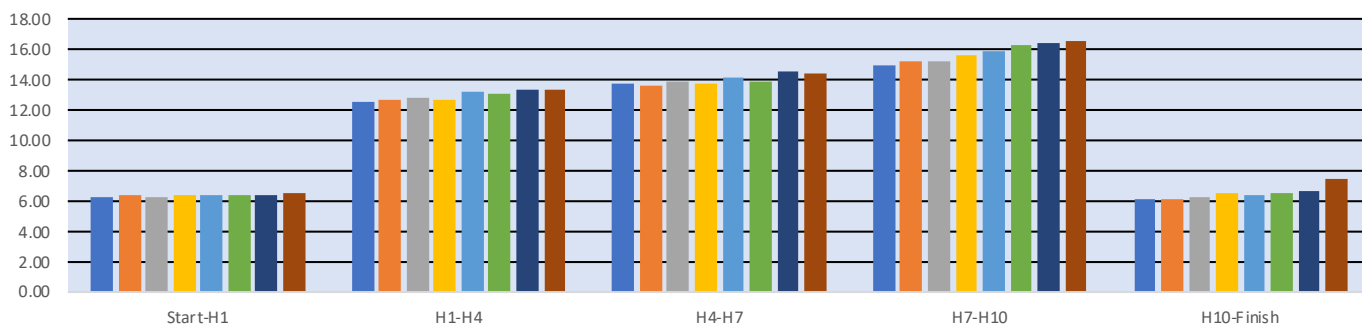
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Carter, Kori (USA) (1992)	time		6.20	10.32	14.48	18.68	23.04	27.52	32.36	37.12	42.12	47.24		53.36	6 / 1			
	reaction time	0.142														12.48	13.68	14.88
	interval		7.26	4.12	4.16	4.20	4.36	4.48	4.84	4.76	5.00	5.12	6.12			8.41	7.68	7.06
	velocity																	
Little, Shamier (USA) (1995)	time		6.32	10.40		19.00	23.44		32.60	37.52	42.60	47.84		54.02	4 / 2			
	reaction time	0.214														12.68	13.60	15.24
	interval		7.12	4.08		8.60	4.44		9.16	4.92	5.08	5.24	6.18			8.28	7.72	6.89
	velocity																	
Russell, Janieve (JAM) (1993)	time		6.28	10.40		19.04	23.52		32.92	37.84	42.88	48.12		54.38	3 / 3			
	reaction time	0.186														12.76	13.88	15.20
	interval		7.17	4.12		8.64	4.48		9.40	4.92	5.04	5.24	6.26			8.23	7.56	6.91
	velocity																	
Doyle, Eilidh (GBR) (1987)	time		6.32	10.44	14.68	18.92	23.24	27.88	32.60	37.52	42.68	48.20		54.75	7 / 4			
	reaction time	0.196														12.60	13.68	15.60
	interval		7.12	4.12	4.24	4.24	4.32	4.64	4.72	4.92	5.16	5.52	6.55			8.33	7.68	6.73
	velocity																	
Nel, Wenda (RSA) (1988)	time		6.44	10.68		19.60	24.12		33.68	38.76	43.96	49.52		55.90	2 / 5			
	reaction time	0.213														13.16	14.08	15.84
	interval		7.09	4.24		8.92	4.52		9.56	5.08	5.20	5.56	6.38			7.98	7.46	6.63
	velocity																	
Spencer, Ashley (USA) (1993)	time		6.36	10.56		19.36	23.88		33.20	38.20	43.60	49.44		55.92	5 / 6			
	reaction time	0.180														13.00	13.84	16.24
	interval		7.08	4.20		8.80	4.52		9.32	5.00	5.84	5.84	6.48			8.08	7.59	6.47
	velocity																	
Chaboudez, Aurelie (FRA) (1993)	time		6.40	10.64		19.68	24.44		34.24	39.44	44.84	50.64		57.32	1 / 7			
	reaction time	0.202														13.28	14.56	16.40
	interval		7.03	4.24		9.04	4.76		9.80	5.20	5.40	5.80	6.68			7.91	7.21	6.40
	velocity																	
Nugent, Leah (JAM) (1992)	time		6.48	10.72	15.20	19.80	24.56		34.16	39.20	44.68	50.68		58.07	8 / 8			
	reaction time	0.241														13.32	14.36	16.52
	interval		6.94	4.24	4.48	4.60	4.76		9.60	5.04	5.48	6.00	7.39			7.88	7.31	6.36
	velocity																	
	time																	
	reaction time																	
	interval																	
	velocity																	



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=BHvfaJ6fw_0

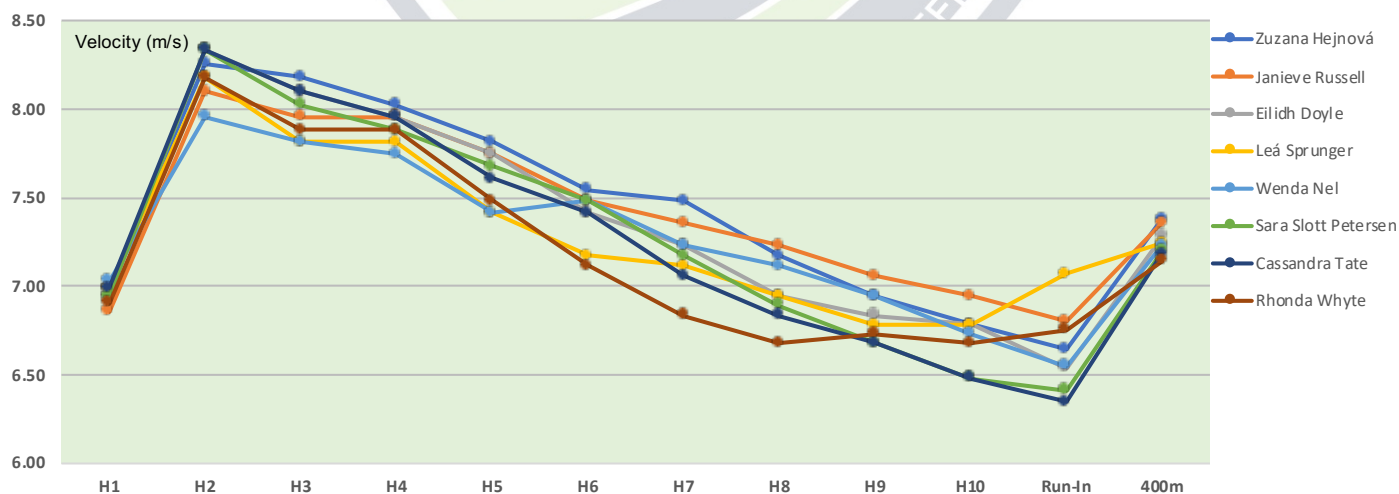
2017 Meeting International Mohammed VI D'Athletisme (Rabat, MAR) (TV Analysis)

Women's 400m Hurdles

Date 2017.07.16

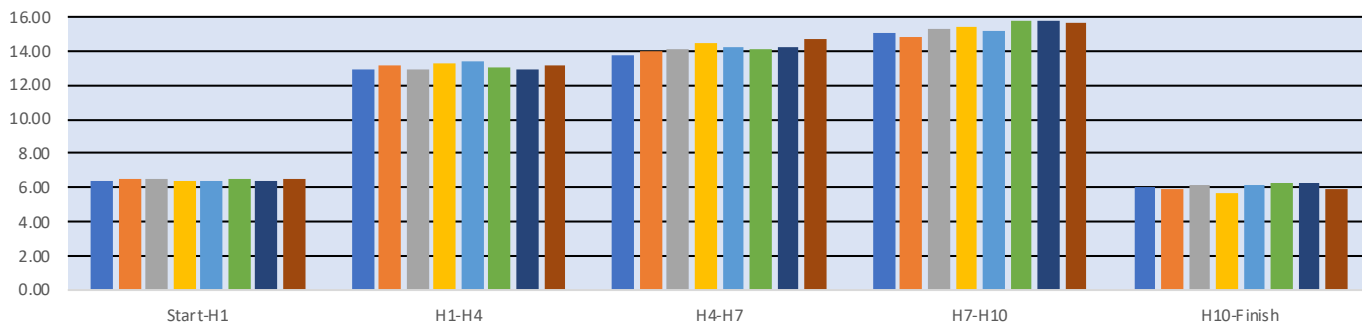
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Hejnová, Zuzana (CZE) (1986)	time		6.44	10.68	14.96	19.32	23.80	28.44	33.12	38.00	43.04	48.20		54.22	6 / 1			
	reaction time	0.155																
	interval		6.99	4.24	4.28	4.36	4.48	4.64	4.68	4.88	5.04	5.16	6.02			12.88	13.80	15.08
	velocity		6.99	8.25	8.18	8.03	7.81	7.54	7.48	7.17	6.94	6.78	6.64	7.38		8.15	7.61	6.96
Russell, Janieve (JAM) (1993)	time		6.56	10.88	15.28	19.68	24.20	28.88	33.64	38.48	43.44	48.48		54.36	7 / 2			
	reaction time	0.152																
	interval		6.86	4.32	4.40	4.40	4.52	4.68	4.76	4.84	4.96	5.04	5.88			13.12	13.96	14.84
	velocity		6.86	8.10	7.95	7.95	7.74	7.48	7.35	7.23	7.06	6.94	6.80	7.36		8.00	7.52	7.08
Doyle, Eilidh (GBR) (1987)	time		6.48	10.68	15.00	19.40	23.92	28.64	33.48	38.52	43.64	48.80		54.92	8 / 3			
	reaction time	0.157																
	interval		6.94	4.20	4.32	4.40	4.52	4.72	4.84	5.04	5.12	5.16	6.12			12.92	14.08	15.32
	velocity		6.94	8.33	8.10	7.95	7.74	7.42	7.23	6.94	6.84	6.78	6.54	7.28		8.13	7.46	6.85
Sprunger, Leá (SUI) (1990)	time		6.44	10.72	15.20	19.68	24.40	29.28	34.20	39.24	44.40	49.56		55.22	4 / 4			
	reaction time	0.130																
	interval		6.99	4.28	4.48	4.48	4.72	4.88	4.92	5.04	5.16	5.16	5.66			13.24	14.52	15.36
	velocity		6.99	8.18	7.81	7.81	7.42	7.17	7.11	6.94	6.78	6.78	7.07	7.24		7.93	7.23	6.84
Nel, Wenda (RSA) (1988)	time		6.40	10.80	15.28	19.80	24.52	29.20	34.04	38.96	44.00	49.20		55.31	2 / 5			
	reaction time	0.189																
	interval		7.03	4.40	4.48	4.52	4.72	4.68	4.84	5.08	5.24	5.20	6.11			13.40	14.24	15.16
	velocity		7.03	7.95	7.81	7.74	7.42	7.48	7.23	7.11	6.94	6.73	6.55	7.23		7.84	7.37	6.93
Petersen, Sara Slott (DEN) (1987)	time		6.48	10.68	15.04	19.48	24.04	28.72	33.60	38.68	43.92	49.32		55.56	5 / 6			
	reaction time	0.155																
	interval		6.94	4.20	4.36	4.44	4.56	4.68	4.88	5.08	5.24	5.40	6.24			13.00	14.12	15.72
	velocity		6.94	8.33	8.03	7.88	7.68	7.48	7.17	6.89	6.68	6.48	6.41	7.20		8.08	7.44	6.68
Tate, Cassandra (USA) (1990)	time		6.44	10.64	14.96	19.36	23.96	28.68	33.64	38.76	44.00	49.40		55.70	1 / 7			
	reaction time	0.213																
	interval		6.99	4.20	4.32	4.40	4.60	4.72	4.96	5.12	5.24	5.40	6.30			12.92	14.28	15.76
	velocity		6.99	8.33	8.10	7.95	7.61	7.42	7.06	6.84	6.68	6.48	6.35	7.18		8.13	7.35	6.66
Whyte, Rhonda (JAM) (1990)	time		6.52	10.80	15.24	19.68	24.36	29.28	34.40	39.64	44.84	50.08		56.00	3 / 8			
	reaction time	0.146																
	interval		6.90	4.28	4.44	4.44	4.68	4.92	5.12	5.24	5.20	5.24	5.92			13.16	14.72	15.68
	velocity		6.90	8.18	7.88	7.88	7.48	7.11	6.84	6.68	6.73	6.68	6.76	7.14		7.98	7.13	6.70



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=K0zP0AQVQ7o>

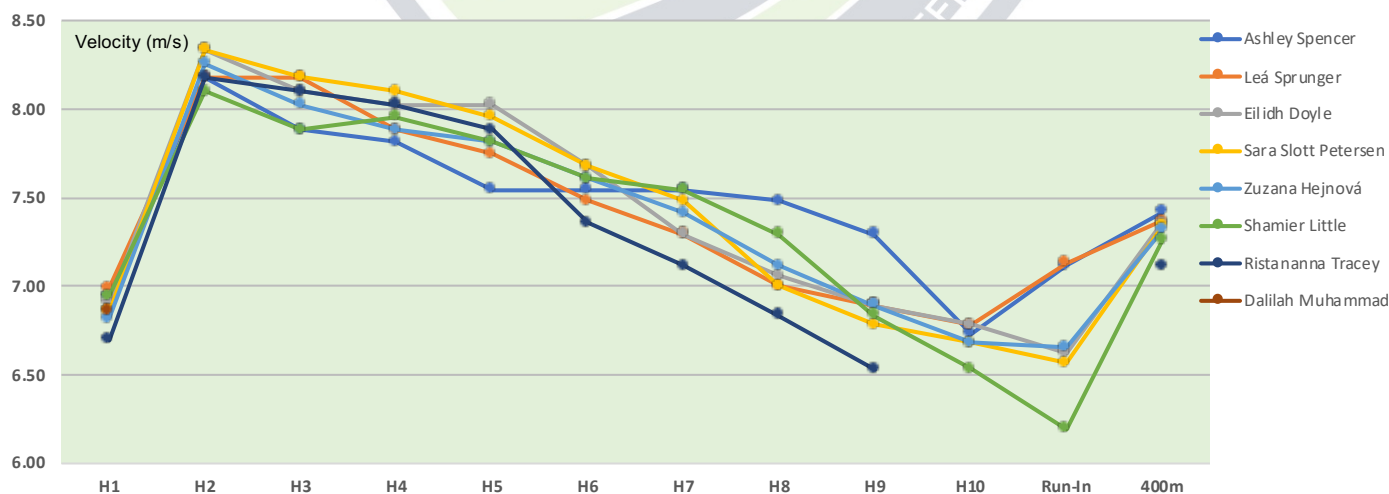
2017 Athletissima (Lausanne, SUI) (TV Analysis)

Women's 400m Hurdles

Date 2017.07.06

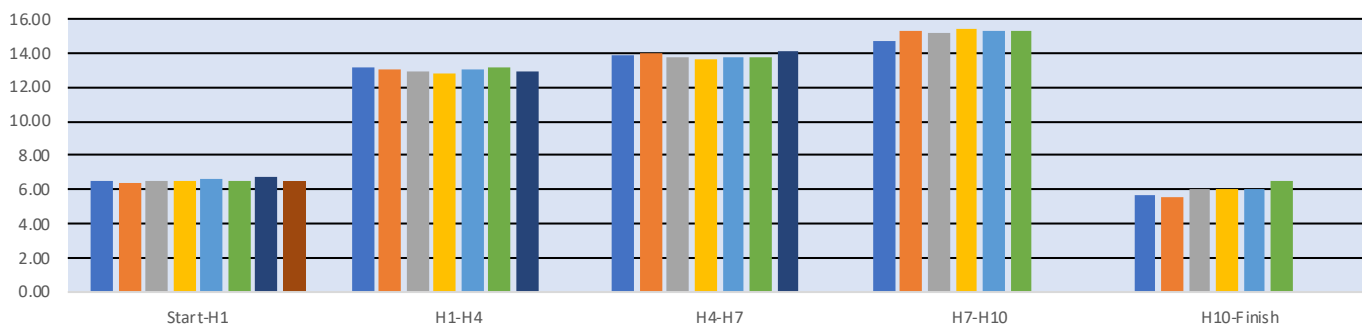
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Spencer, Ashley (USA) (1993)	time		6.48	10.76	15.20	19.68	24.32	28.96	33.60	38.28	43.08	48.28		53.90	6 / 1			
	reaction time	0.154																
	interval		6.94	4.28	4.44	4.48	4.64	4.64	4.64	4.68	4.80	5.20	5.62			13.20	13.92	14.68
	velocity		6.94	8.18	7.88	7.81	7.54	7.54	7.54	7.48	7.29	6.73	7.12	7.42		7.95	7.54	7.15
Sprunger, Leá (SUI) (1990)	time		6.44	10.72	15.00	19.44	23.96	28.64	33.44	38.44	43.52	48.68		54.29	7 / 2			
	reaction time	0.121																
	interval		6.99	4.28	4.28	4.44	4.52	4.68	4.80	5.00	5.08	5.16	5.61	PB		13.00	14.00	15.24
	velocity		6.99	8.18	8.18	7.88	7.74	7.48	7.29	7.00	6.89	6.78	7.13	7.37		8.08	7.50	6.89
Doyle, Eilidh (GBR) (1987)	time		6.52	10.72	15.04	19.40	23.76	28.32	33.12	38.08	43.16	48.32		54.36	1 / 3			
	reaction time	0.151																
	interval		6.90	4.20	4.32	4.36	4.36	4.56	4.80	4.96	5.08	5.16	6.04			12.88	13.72	15.20
	velocity		6.90	8.33	8.10	8.03	8.03	7.68	7.29	7.06	6.89	6.78	6.62	7.36		8.15	7.65	6.91
Petersen, Sara Slott (DEN) (1987)	time		6.56	10.76	15.04	19.36	23.76	28.32	33.00	38.00	43.16	48.40		54.49	3 / 4			
	reaction time	0.133																
	interval		6.86	4.20	4.28	4.32	4.40	4.56	4.68	5.00	5.16	5.24	6.09			12.80	13.64	15.40
	velocity		6.86	8.33	8.18	8.10	7.95	7.68	7.48	7.00	6.78	6.68	6.57	7.34		8.20	7.70	6.82
Hejnová, Zuzana (CZE) (1986)	time		6.60	10.84	15.20	19.64	24.12	28.72	33.44	38.36	43.44	48.68		54.69	2 / 5			
	reaction time	0.133																
	interval		6.82	4.24	4.36	4.44	4.48	4.60	4.72	4.92	5.08	5.24	6.01			13.04	13.80	15.24
	velocity		6.82	8.25	8.03	7.88	7.81	7.61	7.42	7.11	6.89	6.68	6.66	7.31		8.05	7.61	6.89
Little, Shamier (USA) (1995)	time		6.48	10.80	15.24	19.64	24.12	28.72	33.36	38.16	43.28	48.64		55.10	4 / 6			
	reaction time	0.230																
	interval		6.94	4.32	4.44	4.40	4.48	4.60	4.64	4.80	5.12	5.36	6.46			13.16	13.72	15.28
	velocity		6.94	8.10	7.88	7.95	7.81	7.61	7.54	7.29	6.84	6.53	6.19	7.26		7.98	7.65	6.87
Tracey, Ristananna (JAM) (1992)	time		6.72	11.00	15.32	19.68	24.12	28.88	33.80	38.92	44.28			56.23	8 / 7			
	reaction time	0.206																
	interval		6.70	4.28	4.32	4.36	4.44	4.76	4.92	5.12	5.36					12.96	14.12	
	velocity		6.70	8.18	8.10	8.03	7.88	7.35	7.11	6.84	6.53					8.10	7.44	
Muhammad, Dalilah (USA) (1990)	time		6.56												5 / --			
	reaction time	0.280																
	interval		6.86															
	velocity		6.86															



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=x3l1PCU1tek>

Biomechanical Analysis

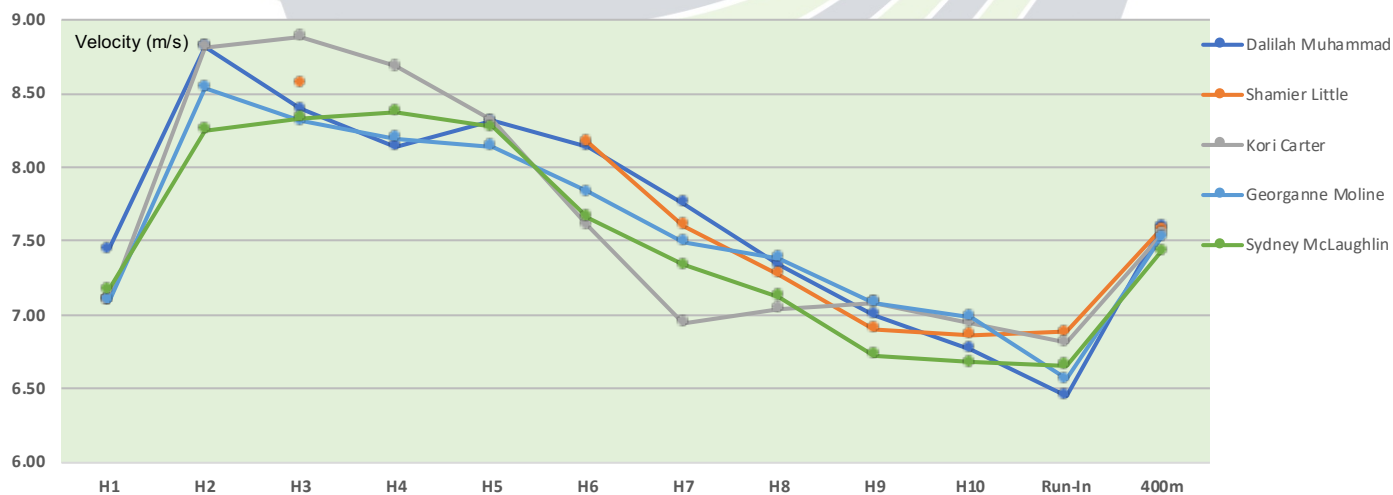
2017 USATF Championships (Sacramento, CA) (TV Analysis)

Women's 400m Hurdles

Date 2017.06.25

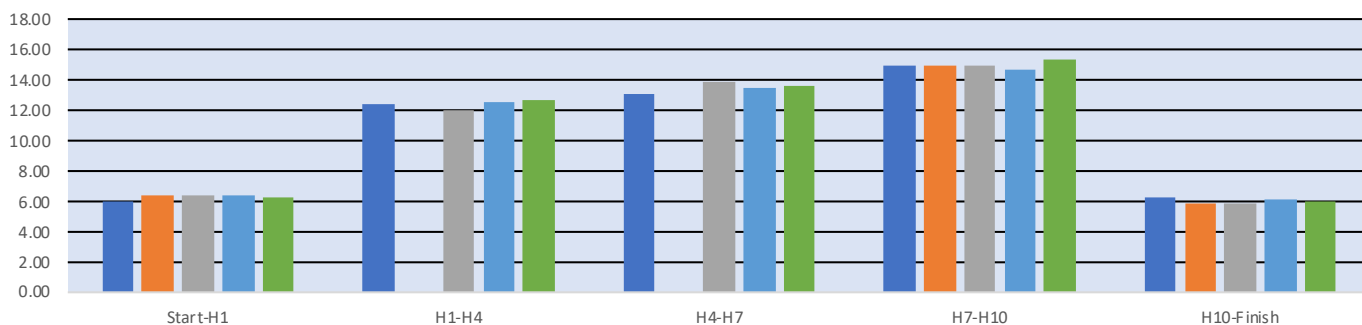
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Muhammad, Dalilah (USA) (1990)	time		6.04	10.01	14.18	18.48	22.69	26.99	31.50	36.27	41.27	46.44		52.64	5 / 1			
	reaction time	0.186												PB		12.44	13.02	14.94
	interval		7.45	3.97	4.17	4.30	4.21	4.30	4.51	4.77	5.00	5.17	6.20	7.60		8.44	8.06	7.03
	velocity																	
Little, Shamier (USA) (1995)	time		6.34		14.51			27.36	31.96	36.77	41.84	46.94		52.75	4 / 2			
	reaction time	0.217			8.17			12.85	4.60	4.81	5.07	5.10	5.81	PB				14.98
	interval		7.10		8.57			8.17	7.61	7.28	6.90	6.86	6.88	7.58				7.01
	velocity		24					15	16	16	16	16	19.5	106.5				
Carter, Kori (USA) (1992)	time		6.34	10.31	14.25	18.28	22.49	27.09	32.13	37.10	42.04	47.08		52.95	7 / 3			
	reaction time	0.244			3.94	4.03	4.21	4.60	5.04	4.97	4.94	5.04	5.87	PB		11.94	13.85	14.95
	interval		7.10	8.82	8.88	8.68	8.31	7.61	6.94	7.04	7.09	6.94	6.81	7.55		8.79	7.58	7.02
	velocity		24	15	15	15	115	17	17	17	17	17	20	289				
Spencer, Ashley (USA) (1993)			0.188	No Information Available										PB	53.11	3 / 4		
Moline, Georganne (USA) (1990)	time		6.34	10.44	14.65	18.92	23.22	27.69	32.36	37.10	42.04	47.05		53.14	6 / 5			
	reaction time	0.272			4.10	4.21	4.27	4.30	4.47	4.67	4.74	4.94	5.01	6.09	PB	12.58	13.44	14.69
	interval		7.10	8.54	8.31	8.20	8.14	7.83	7.49	7.38	7.09	6.99	6.57	7.53		8.35	7.81	7.15
	velocity		22	15	15	15	15	15	15	15	16	16	19.7	178.7				
McLaughlin, Sydney (USA) (1999)	time		6.27	10.51	14.71	18.89	23.12	27.69	32.46	37.37	42.57	47.81		53.82	8 / 6			
	reaction time	0.305			4.24	4.20	4.18	4.23	4.57	4.77	4.91	5.20	5.24	6.01	WJR PB	12.62	13.57	15.35
	interval		7.18	8.25	8.33	8.37	8.27	7.66	7.34	7.13	6.73	6.68	6.66	7.43		8.32	7.74	6.84
	velocity		23	14	14	14	14	15	15	15	16	16	18.5	174.5				
Stepter, Jaide (USA) (1994)			0.247	No Information Available											55.06	2 / 7		
Cockrell, Anna (USA) (1997)			0.209	No Information Available										PB	55.14	1 / 8		



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 640 x 360 @ 30fps

Timing From: First Movement

Source: https://www.youtube.com/watch?v=Ppoo_FbM5N8

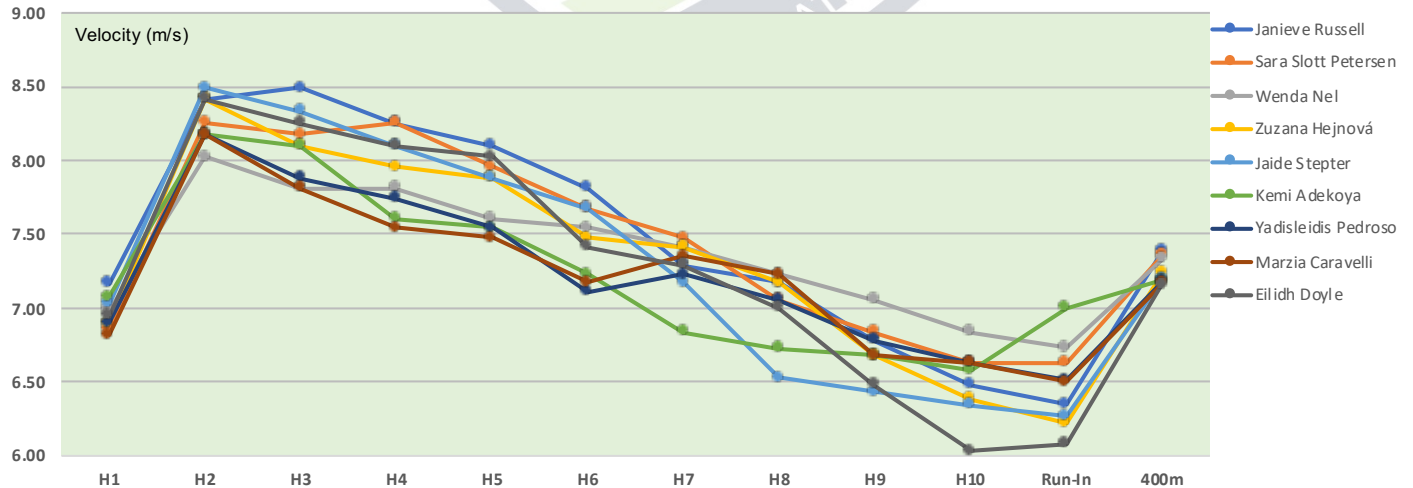
2017 Golden Gala Pietro Mennea (Rome, ITA) (TV Analysis)

Women's 400m Hurdles

Date 2017.06.08

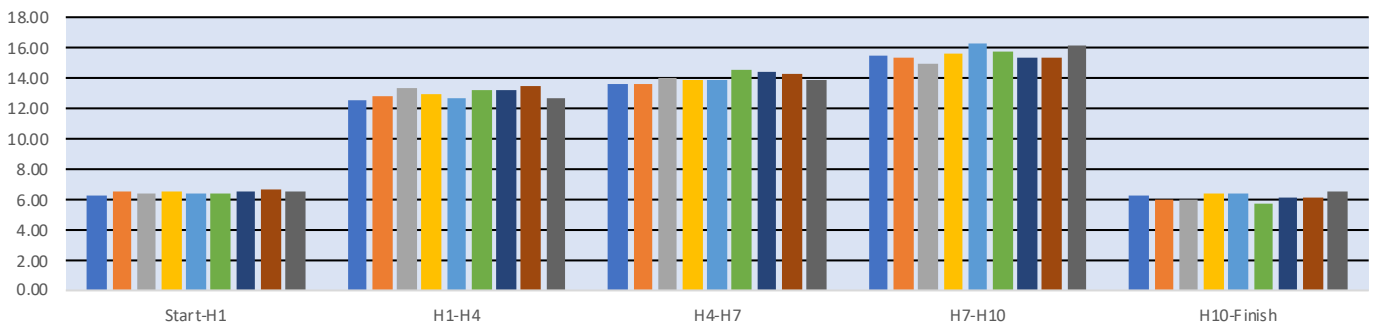
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Russell, Janieve (JAM) (1993)	time		6.28	10.44	14.56	18.80	23.12	27.60	32.40	37.28	42.44	47.84		54.14	8 / 1			
	reaction time	0.183																
	interval		7.17	4.16	4.12	4.24	4.32	4.48	4.80	4.88	5.16	5.40	6.30			12.52	13.60	15.44
	velocity		8.41	8.50	8.50	8.25	8.10	7.81	7.29	7.17	6.78	6.48	6.35	7.39		8.39	7.72	6.80
Petersen, Sara Slott (DEN) (1987)	time		6.56	10.80	15.08	19.32	23.72	28.28	32.96	37.92	43.04	48.32		54.35	4 / 2			
	reaction time	0.158																
	interval		4.24	4.28	4.24	4.40	4.56	4.68	4.96	5.12	5.28	6.03				12.76	13.64	15.36
	velocity		8.86	8.25	8.18	8.25	7.95	7.68	7.48	7.06	6.84	6.63	7.36			8.23	7.70	6.84
Nel, Wenda (RSA) (1988)	time		6.44	10.80	15.28	19.76	24.36	29.00	33.72	38.56	43.52	48.64		54.58	6 / 3			
	reaction time	0.171																
	interval		4.36	4.48	4.48	4.60	4.64	4.72	4.84	4.96	5.12	5.94				13.32	13.96	14.92
	velocity		6.99	8.03	7.81	7.81	7.61	7.54	7.42	7.23	7.06	6.84	7.33			7.88	7.52	7.04
Hejnová, Zuzana (CZE) (1986)	time		6.52	10.68	15.00	19.40	23.84	28.52	33.24	38.12	43.36	48.84		55.27	5 / 4			
	reaction time	0.152																
	interval		4.16	4.32	4.40	4.44	4.68	4.72	4.88	5.24	5.48	6.43				12.88	13.84	15.60
	velocity		6.90	8.41	8.10	7.95	7.88	7.48	7.42	7.17	6.68	6.39	7.24			8.15	7.59	6.73
Stepter, Jaide (USA) (1994)	time		6.40	10.52	14.72	19.04	23.48	28.04	32.92	38.28	43.72	49.24		55.62	9 / 5			
	reaction time	0.134																
	interval		4.12	4.20	4.32	4.44	4.56	4.88	5.36	5.44	5.52	6.38				12.64	13.88	16.32
	velocity		7.03	8.50	8.33	8.10	7.88	7.68	7.17	6.53	6.43	6.34	6.27	7.19		8.31	7.56	6.43
Adekoya, Kemi (BRN) (1993)	time		6.36	10.64	14.96	19.56	24.20	29.04	34.16	39.36	44.60	49.92		55.63	2 / 6			
	reaction time	0.169																
	interval		4.28	4.32	4.60	4.64	4.84	5.12	5.20	5.24	5.32	5.71				13.20	14.60	15.76
	velocity		7.08	8.18	8.10	7.61	7.54	7.23	6.84	6.73	6.68	6.58	7.01	7.19		7.95	7.19	6.66
Pedroso, Yadisleidis (ITA) (1987)	time		6.52	10.80	15.24	19.76	24.40	29.32	34.16	39.12	44.28	49.56		55.70	7 / 7			
	reaction time	0.200																
	interval		4.28	4.44	4.52	4.64	4.92	4.84	4.96	5.16	5.28	6.14				13.24	14.40	15.40
	velocity		6.90	8.18	7.88	7.74	7.54	7.11	7.23	7.06	6.78	6.63	6.51	7.18		7.93	7.29	6.82
Caravelli, Marzia (ITA) (1981)	time		6.60	10.88	15.36	20.00	24.68	29.56	34.32	39.16	44.40	49.68		55.83	1 / 8			
	reaction time	0.170																
	interval		4.28	4.48	4.64	4.68	4.88	4.76	4.84	5.24	5.28	6.15				13.40	14.32	15.36
	velocity		6.82	8.18	7.81	7.54	7.48	7.17	7.35	7.23	6.68	6.63	6.50	7.16		7.84	7.33	6.84
Doyle, Eilidh (GBR) (1987)	time		6.48	10.64	14.88	19.20	23.56	28.28	33.08	38.08	43.48	49.28		55.86	3 / 9			
	reaction time	0.165																
	interval		4.16	4.24	4.32	4.36	4.72	4.80	5.00	5.40	5.80	6.58				12.72	13.88	16.20
	velocity		6.94	8.41	8.25	8.10	8.03	7.42	7.29	7.00	6.48	6.03	6.08	7.16		8.25	7.56	6.48



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=Kw2vQ3aU5_Y

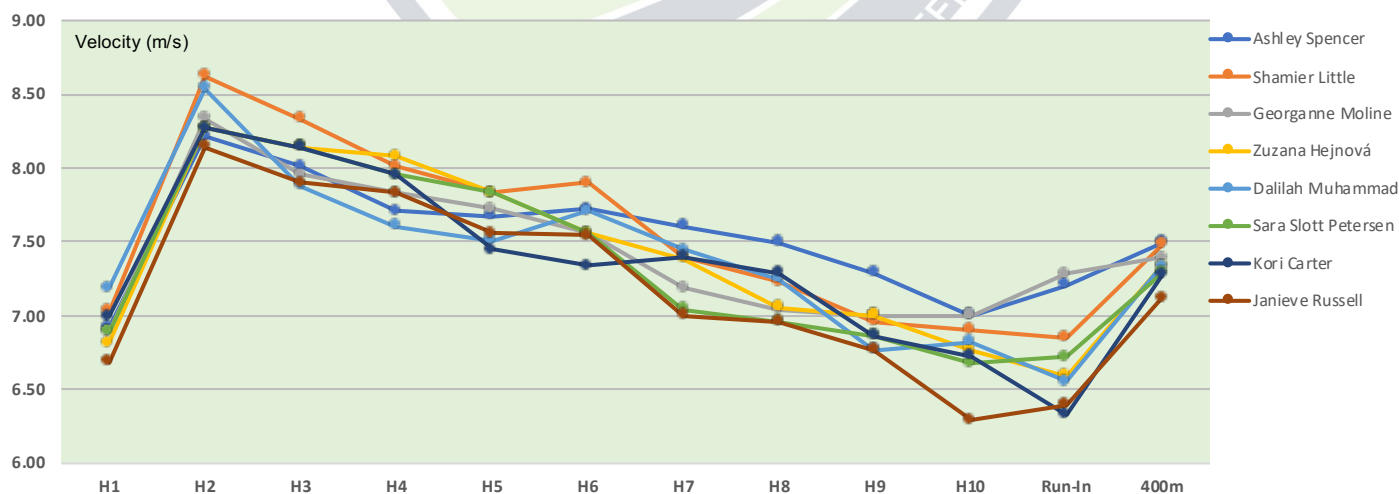
2017 Prefontaine Classic (Eugene, OR) (TV Analysis)

Women's 400m Hurdles

Date 2017.05.27

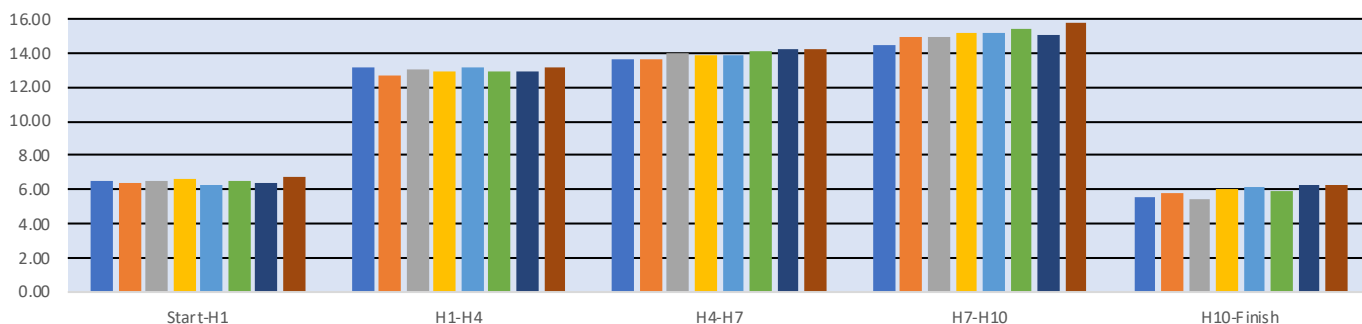
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Spencer, Ashley (USA) (1993)	time		6.50	10.76	15.13	19.67	24.23	28.76	33.36	38.03	42.83	47.83		53.38	6 / 1			
	reaction time	0.240																
	interval		6.92	4.26	4.37	4.54	4.56	4.53	4.60	4.67	4.80	5.00	5.55	PB		13.17	13.69	14.47
	velocity		8.22	8.01	7.71	7.68	7.73	7.61	7.49	7.29	7.00	7.21	7.49			7.97	7.67	7.26
Little, Shamier (USA) (1995)	time		6.40	10.46	14.66	19.03	23.50	27.93	32.66	37.50	42.53	47.60		53.44	1 / 2			
	reaction time	0.236																
	interval		7.03	4.06	4.20	4.37	4.47	4.43	4.73	4.84	5.03	5.07	5.84	PB		12.63	13.63	14.94
	velocity		8.62	8.33	8.01	7.83	7.90	7.40	7.23	6.96	6.90	6.85	7.49			8.31	7.70	7.03
Moline, Georganne (USA) (1990)	time		6.53	10.73	15.13	19.60	24.13	28.76	33.63	38.60	43.60	48.60		54.09	3 / 3			
	reaction time	0.285																
	interval		6.89	4.20	4.40	4.47	4.53	4.63	4.87	4.97	5.00	5.00	5.49			13.07	14.03	14.97
	velocity		8.33	7.95	7.83	7.73	7.56	7.19	7.04	7.00	7.00	7.00	7.29	7.40		8.03	7.48	7.01
Hejnová, Zuzana (CZE) (1986)	time		6.60	10.83	15.13	19.46	23.93	28.56	33.30	38.26	43.26	48.43		54.50	7 / 4			
	reaction time	0.173																
	interval		4.23	4.30	4.33	4.47	4.63	4.74	4.83	5.17	5.17	6.07				12.86	13.84	15.13
	velocity		8.27	8.14	8.08	7.83	7.56	7.38	7.06	7.00	6.77	6.59	7.34			8.16	7.59	6.94
Muhammad, Dalilah (USA) (1990)	time		6.26	10.36	14.80	19.40	24.06	28.60	33.30	38.13	43.30	48.43		54.53	5 / 5			
	reaction time	0.289																
	interval		4.10	4.44	4.60	4.66	4.54	4.70	4.83	5.17	5.13	6.10				13.14	13.90	15.13
	velocity		7.19	8.54	7.88	7.61	7.51	7.71	7.45	7.25	6.77	6.82	6.56	7.34		7.99	7.55	6.94
Petersen, Sara Slott (DEN) (1987)	time		6.53	10.76	15.06	19.46	23.93	28.56	33.53	38.56	43.66	48.90		54.85	4 / 6			
	reaction time	0.409																
	interval		4.23	4.30	4.40	4.47	4.63	4.97	5.03	5.10	5.24	5.95				12.93	14.07	15.37
	velocity		8.27	8.14	7.95	7.83	7.56	7.04	6.96	6.86	6.68	6.72	7.29			8.12	7.46	6.83
Carter, Kori (USA) (1992)	time		6.43	10.66	14.96	19.36	24.06	28.83	33.56	38.36	43.46	48.66		54.98	8 / 7			
	reaction time	0.280																
	interval		4.23	4.30	4.40	4.70	4.77	4.73	4.80	5.10	5.20	6.32				12.93	14.20	15.10
	velocity		7.00	8.27	8.14	7.95	7.45	7.34	7.40	6.86	6.73	6.33	7.28			8.12	7.39	6.95
Russell, Janieve (JAM) (1993)	time		6.73	11.03	15.46	19.93	24.56	29.20	34.20	39.23	44.40	49.96		56.21	2 / 8			
	reaction time	0.223																
	interval		4.30	4.43	4.47	4.63	4.64	5.00	5.03	5.17	5.56	6.25				13.20	14.27	15.76
	velocity		8.14	7.90	7.83	7.56	7.54	7.00	6.96	6.77	6.29	6.40	7.12			7.95	7.36	6.66



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

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Source: <https://www.youtube.com/watch?v=uGw47rzZiUA>