

2021 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

2021 Season Hurdles Report

Men's 110m Hurdles

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2021 Season Hurdles Report

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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

2021 Top 10 Times - Men's 110m Hurdles

Holloway, Grant (USA) (1997)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Semi-Final 1 - 2020 USA Olympic Trials (Eugene, OR) (TV Analysis)												Vazel (2021) https://twitter.com/pjvazel/status/1409323602432999426?s=21						
date	26-Jun	time	2.49	3.49	4.45	5.40	6.36	7.36	8.35	9.36	10.38	11.42	12.81	5 / 1				
reaction time	0.169	interval	7 steps	1.00	0.96	0.95	0.96	1.00	0.99	1.01	1.02	1.04	1.39	PB		2.91	2.95	3.07
wind	1.8 m/s	velocity	5.51	9.14	9.52	9.62	9.52	9.14	9.23	9.05	8.96	8.79	10.09	8.59		9.42	9.29	8.93
Holloway, Grant (USA) (1997)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2020 USA Olympic Trials (Eugene, OR) (TV Analysis)												Henson (2021) - Athlete First: 2021 year end hurdle report						
date	26-Jun	time	2.40	3.37	4.34	5.30	6.27	7.24	8.26	9.27	10.33	11.42	12.96	4 / 1				
reaction time	0.146	interval	7 steps	0.97	0.97	0.96	0.97	0.97	1.02	1.01	1.06	1.09	1.54			2.90	2.96	3.16
wind	0.4 m/s	velocity	5.72	9.42	9.42	9.52	9.42	9.42	8.96	9.05	8.62	8.39	9.10	8.49		9.46	9.26	8.68
Allen, Devon (USA) (1994)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2021 Boris Hanžeković Memorial (Zagreb, CRO) (TV Analysis)												Henson (2021) - Athlete First: 2021 year end hurdle report						
date	14-Sep	time	2.46	3.50	4.50	5.47	6.47	7.47	8.47	9.47	10.50	11.53	12.99	5 / 1				
reaction time	0.126	interval		1.04	1.00	0.97	1.00	1.00	1.00	1.00	1.03	1.03	1.46	PB		3.01	3.00	3.06
wind	0.7 m/s	velocity	5.58	8.79	9.14	9.42	9.14	9.14	9.14	9.14	8.87	8.87	9.60	8.47		9.11	9.14	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 - 2021 Golden Gala Pietro Mennea (Florence, ITA) (TV Analysis)												Henson (2021) - Athlete First: 2021 year end hurdle report						
date	10-Jun	time	2.44	3.50	4.48	5.48	6.48	7.48	8.48	9.50	10.50	11.56	13.01	4 / 1				
reaction time	0.147	interval		1.06	0.98	1.00	1.00	1.00	1.00	1.02	1.00	1.06	1.45			3.04	3.00	3.08
wind	-0.1 m/s	velocity	5.62	8.62	9.33	9.14	9.14	9.14	9.14	8.96	9.14	8.62	9.67	8.46		9.02	9.14	8.90
Holloway, Grant (USA) (1997)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Heat 3 - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)												Henson (2021) - Athlete First: 2021 year end hurdle report						
date	3-Aug	time	2.37	3.37	4.35	5.34	6.31	7.31	8.31	9.34	10.41	11.47	13.02	9 / 1				
reaction time	0.127	interval	7 steps	1.00	0.98	0.99	0.97	1.00	1.00	1.03	1.07	1.06	1.55			2.97	2.97	3.16
wind	-0.1 m/s	velocity	5.79	9.14	9.33	9.23	9.42	9.14	9.14	8.87	8.54	8.62	9.05	8.45		9.23	9.23	8.68
Parchment, Hansle (JAM) (1990)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2021 Meeting de Paris (Paris, FRA) (TV Analysis)												Henson (2021) - Athlete First: 2021 year end hurdle report						
date	28-Aug	time	2.46	3.48	4.48	5.48	6.46	7.46	8.44	9.46	10.50	11.54	13.03	6 / 1				
reaction time	0.138	interval	7 steps	1.02	1.00	1.00	0.98	1.00	0.98	1.02	1.04	1.04	1.49			3.02	2.96	3.10
wind	0.7 m/s	velocity	5.58	8.96	9.14	9.14	9.33	9.14	9.33	8.96	8.79	8.79	9.41	8.44		9.08	9.26	8.85
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
Heat 1 - 2021 Jamaican National Championships (Kingston, JAM) (TV Analysis)												Henson (2021) - Athlete First: 2021 year end hurdle report						
date	26-Jun	time	2.47	3.53	4.53	5.56	6.53	7.57	8.57	9.57	10.58	11.59	13.04	4 / 1				
reaction time		interval		1.06	1.00	1.03	0.97	1.04	1.00	1.00	1.01	1.01	1.45			3.09	3.01	3.02
wind	1.3 m/s	velocity	5.55	8.62	9.14	8.87	9.42	8.79	9.14	9.14	9.05	9.05	9.67	8.44		8.87	9.11	9.08
Parchment, Hansle (JAM) (1990)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)												Henson (2021) - Athlete First: 2021 year end hurdle report						
date	5-Aug	time	2.50	3.54	4.56	5.54	6.52	7.50	8.50	9.54	10.56	11.58	13.04	7 / 1				
reaction time	0.130	interval	7 steps	1.04	1.02	0.98	0.98	0.98	1.00	1.04	1.02	1.02	1.46			3.04	2.96	3.08
wind	-0.5 m/s	velocity	5.49	8.79	8.96	9.33	9.33	9.33	9.14	8.79	8.96	8.96	9.60	8.44		9.02	9.26	8.90
Izumiya, Shunsuke (JPN) (2000)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2021 Japanese National Championships (Osaka, JPN)												Okudaira (2021) - https://twitter.com/mimishaca/status/1409407799885447172?s=21						
date	27-Jun	time	2.55	3.57	4.60	5.62	6.64	7.66	8.68	9.68	10.70	11.77	13.06	6 / 1				
reaction time	0.155	interval	7 steps	1.02	1.03	1.02	1.02	1.02	1.02	1.00	1.02	1.07	1.29	NR PB		3.07	3.06	3.09
wind	1.2 m/s	velocity	5.38	8.96	8.87	8.96	8.96	8.96	8.96	9.14	8.96	8.54	10.87	8.42		8.93	8.96	8.87
Allen, Devon (USA) (1994)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2021 Weltklasse (Zürich, SUI) (TV Analysis)												Henson (2021) - Athlete First: 2021 year end hurdle report						
date	9-Sep	time	2.48	3.52	4.52	5.52	6.54	7.56	8.58	9.60	10.60	11.64	13.06	4 / 1				
reaction time	0.115	interval		1.04	1.00	1.00	1.02	1.02	1.02	1.02	1.00	1.04	1.42			3.04	3.06	3.06
wind	0.6 m/s	velocity	5.53	8.79	9.14	9.14	8.96	8.96	8.96	8.96	9.14	8.79	9.87	8.42		9.02	8.96	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 - 2021 Weltklasse (Zürich, SUI) (TV Analysis)												Henson (2021) - Athlete First: 2021 year end hurdle report						
date	9-Sep	time	2.46	3.50	4.54	5.54	6.56	7.58	8.58	9.58	10.62	11.66	13.06	7 / 2				
reaction time	0.128	interval	7 steps	1.04	1.04	1.00	1.02	1.02	1.00	1.00	1.04	1.04	1.40			3.08	3.04	3.08
wind	0.6 m/s	velocity	5.58	8.79	8.79	9.14	8.96	8.96	9.14	9.14	8.79	8.79	10.01	8.42		8.90	9.02	8.90
Holloway, Grant (USA) (1997)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2021 Tom Jones Invitational (Gainesville, FL) (TV Analysis)												Henson (2021) - Athlete First: 2021 year end hurdle report						
date	17-Apr	time	2.50	3.52	4.49	5.47	6.45	7.44	8.42	9.47	10.53	11.59	13.07	6 / 1				
reaction time		interval	7 steps	1.02	0.97	0.98	0.98	0.99	0.98	1.05	1.06	1.06	1.48			2.97	2.95	3.17
wind	1.3 m/s	velocity	5.49	8.96	9.42	9.33	9.33	9.23	9.33	8.70	8.62	8.62	9.47	8.42		9.23	9.29	8.65
Allen, Devon (USA) (1994)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2021 Athletissima (Lausanne, SUI) (TV Analysis)												Henson (2021) - Athlete First: 2021 year end hurdle report						
date	26-Aug	time	2.48	3.48	4.52	5.56	6.56	7.56	8.56	9.56	10.56	11.62	13.07	5 / 1				
reaction time	0.140	interval		1.00	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.06	1.45			3.08	3.00	3.06
wind	2.5 m/s	velocity	5.53	9.14	8.79	8.79	9.14	9.14	9.14	9.14	9.14	8.62	9.67	8.42		8.90	9.14	8.96

2021 Boris Hanžeković Memorial (Zagreb, CRO) (TV Analysis)

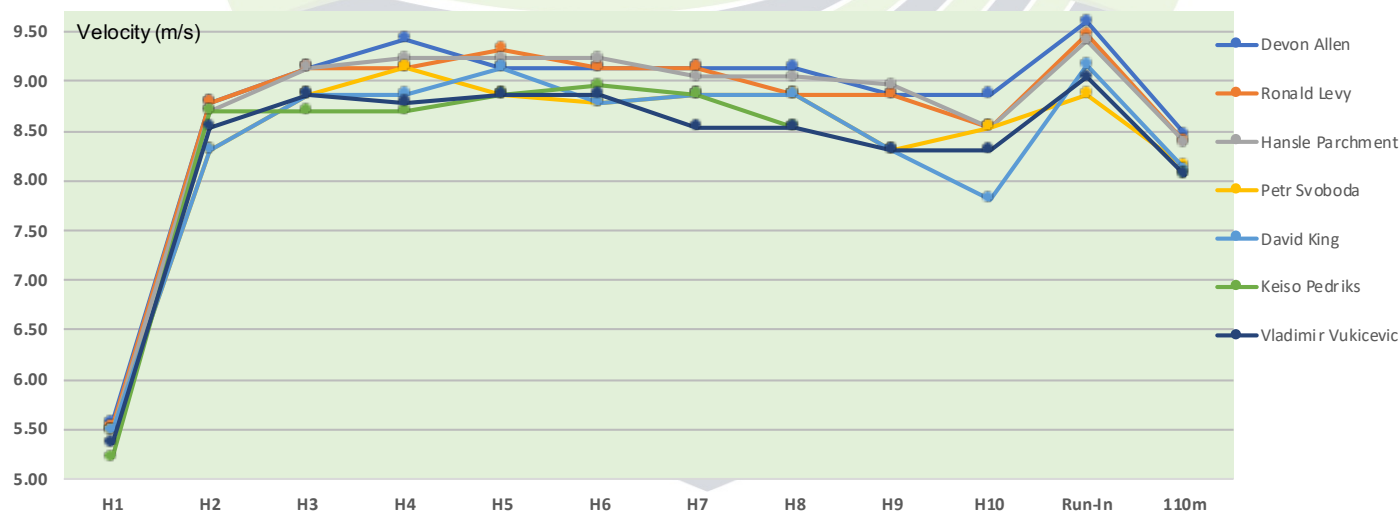
110m Hurdles

Date: 2021.09.14

Wind: 0.7 m/s

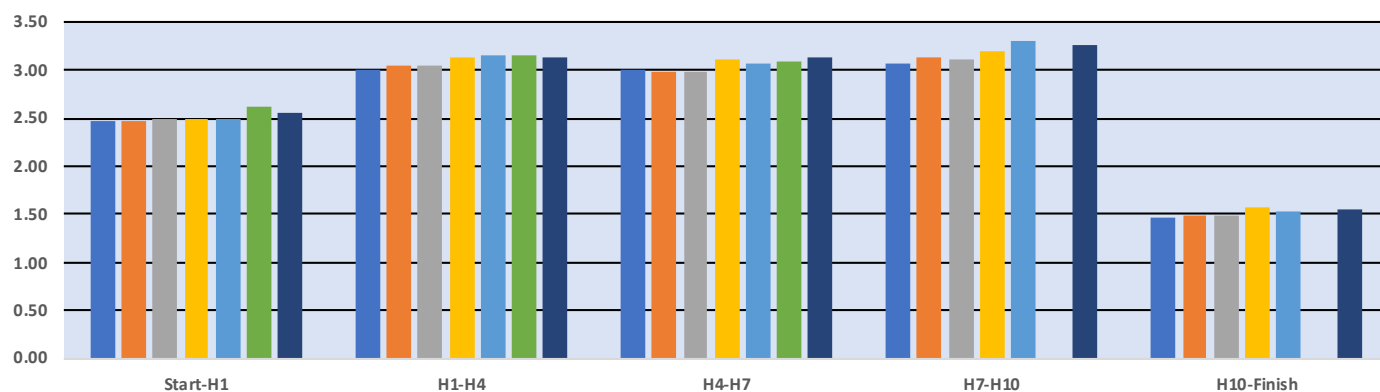
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Allen, Devon (USA) (1994)	time		2.46	3.50	4.50	5.47	6.47	7.47	8.47	9.47	10.50	11.53		12.99	5 / 1	3.01	3.00	3.06
	reaction time	0.126		1.04	1.00	0.97	1.00	1.00	1.00	1.00	1.03	1.03	1.46	PB				
	velocity		5.58	8.79	9.14	9.42	9.14	9.14	9.14	9.14	8.87	8.87	9.60	8.47				
Levy, Ronald (JAM) (1992)	time		2.48	3.52	4.52	5.52	6.50	7.50	8.50	9.53	10.56	11.63		13.11	4 / 2	3.04	2.98	3.13
	reaction time	0.156		7 steps	1.04	1.00	1.00	0.98	1.00	1.03	1.03	1.07	1.48					
	velocity		5.53	8.79	9.14	9.14	9.33	9.14	9.14	8.87	8.87	8.54	9.47	8.39				
Parchment, Hansle (JAM) (1990)	time		2.50	3.55	4.55	5.54	6.53	7.52	8.53	9.54	10.56	11.63		13.12	6 / 3	3.04	2.99	3.10
	reaction time	0.141		7 steps	1.05	1.00	0.99	0.99	0.99	1.01	1.01	1.02	1.07	1.49				
	velocity		5.49	8.70	9.14	9.23	9.23	9.23	9.05	9.05	8.96	8.54	9.41	8.38				
Svoboda, Petr (CZE) (1984)	time		2.50	3.60	4.63	5.63	6.66	7.70	8.73	9.76	10.86	11.93		13.51	7 / 4	3.13	3.10	3.20
	reaction time	0.167			1.10	1.03	1.00	1.03	1.04	1.03	1.10	1.07	1.58					
	velocity		5.49	8.31	8.87	9.14	8.87	8.79	8.87	8.87	8.31	8.54	8.87	8.14				
King, David (GBR) (1994)	time		2.50	3.60	4.63	5.66	6.66	7.70	8.73	9.76	10.86	12.03		13.56	3 / 5	3.16	3.07	3.30
	reaction time	0.140		7 steps	1.10	1.03	1.03	1.00	1.04	1.03	1.10	1.17	1.53					
	velocity		5.49	8.31	8.87	8.87	9.14	8.79	8.87	8.87	8.31	7.81	9.16	8.11				
Pedriks, Keiso (EST) (1994)	time		2.63	3.68	4.73	5.78	6.81	7.83	8.86	9.93				13.63	8 / 6	3.15	3.08	
	reaction time	0.182		7 steps	1.05	1.05	1.05	1.03	1.02	1.03	1.07			PB				
	velocity		5.22	8.70	8.70	8.70	8.87	8.96	8.87	8.54				8.07				
Vukicevic, Vladimir (NOR) (1991)	time		2.56	3.63	4.66	5.70	6.73	7.76	8.83	9.90	11.00	12.10		13.65	2 / 7	3.14	3.13	3.27
	reaction time	0.136			1.07	1.03	1.04	1.03	1.03	1.07	1.10	1.10	1.55					
	velocity		5.36	8.54	8.87	8.79	8.87	8.87	8.54	8.54	8.31	8.31	9.05	8.06				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=v9hTtUSA-Wc>

2021 Weltklasse (Zürich, SUI) (TV Analysis)

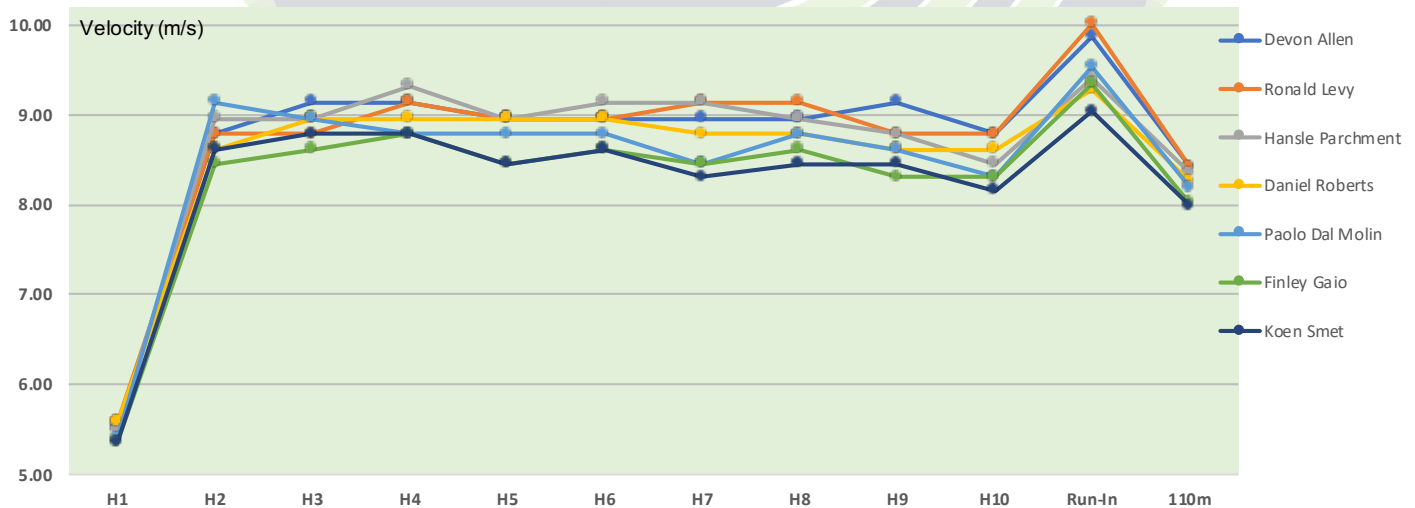
110m Hurdles

Date: 2021.09.09

Wind: 0.6 m/s

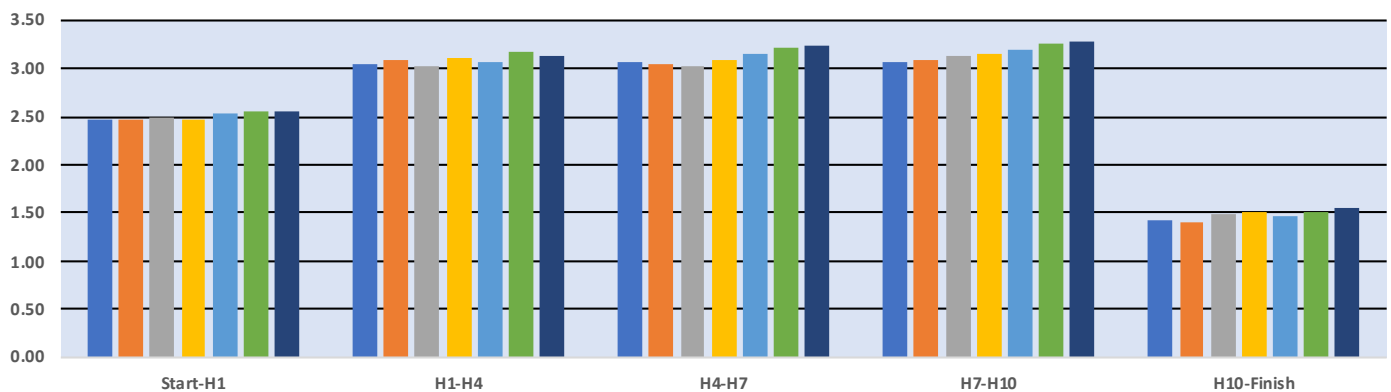
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Allen, Devon (USA) (1994)	time		2.48	3.52	4.52	5.52	6.54	7.56	8.58	9.60	10.60	11.64		13.06	4 / 1			
	reaction time	0.115											1.42			3.04	3.06	3.06
	interval velocity		5.53	8.79	9.14	9.14	8.96	8.96	8.96	8.96	9.14	8.79	9.87	8.42		9.02	8.96	8.96
Levy, Ronald (JAM) (1992)	time		2.46	3.50	4.54	5.54	6.56	7.58	8.58	9.58	10.62	11.66		13.06	7 / 2			
	reaction time	0.128											1.40			3.08	3.04	3.08
	interval velocity		5.58	8.79	8.79	9.14	8.96	8.96	9.14	9.14	8.79	8.79	10.01	8.42		8.90	9.02	8.90
Parchment, Hansle (JAM) (1990)	time		2.50	3.52	4.54	5.52	6.54	7.54	8.54	9.56	10.60	11.68		13.17	5 / 3			
	reaction time	0.132											1.49			3.02	3.02	3.14
	interval velocity		5.49	8.96	8.96	9.33	8.96	9.14	9.14	8.96	8.79	8.46	9.41	8.35		9.08	9.08	8.73
Roberts, Daniel (USA) (1997)	time		2.46	3.52	4.54	5.56	6.58	7.60	8.64	9.68	10.74	11.80		13.31	3 / 4			
	reaction time	0.173											1.51			3.10	3.08	3.16
	interval velocity		5.58	8.62	8.96	8.96	8.96	8.96	8.79	8.79	8.62	8.62	9.28	8.26		8.85	8.90	8.68
Dal Molin, Paolo (ITA) (1987)	time		2.54	3.54	4.56	5.60	6.64	7.68	8.76	9.80	10.86	11.96		13.43	2 / 5			
	reaction time	0.135											1.47			3.06	3.16	3.20
	interval velocity		5.40	9.14	8.96	8.79	8.79	8.79	8.46	8.79	8.62	8.31	9.54	8.19		8.96	8.68	8.57
Gaio, Finley (SUI) (1999)	time		2.56	3.64	4.70	5.74	6.82	7.88	8.96	10.02	11.12	12.22		13.72	8 / 6			
	reaction time	0.135											1.50			3.18	3.22	3.26
	interval velocity		5.36	8.46	8.62	8.79	8.46	8.62	8.46	8.62	8.31	8.31	9.35	8.02		8.62	8.52	8.41
Smet, Koen (NED) (1992)	time		2.56	3.62	4.66	5.70	6.78	7.84	8.94	10.02	11.10	12.22		13.77	1 / 7			
	reaction time	0.132											1.55			3.14	3.24	3.28
	interval velocity		5.36	8.62	8.79	8.79	8.46	8.62	8.31	8.46	8.46	8.16	9.05	7.99		8.73	8.46	8.36



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=f-Bnl2iZogM>

2021 Meeting de Paris (Paris, FRA) (TV Analysis)

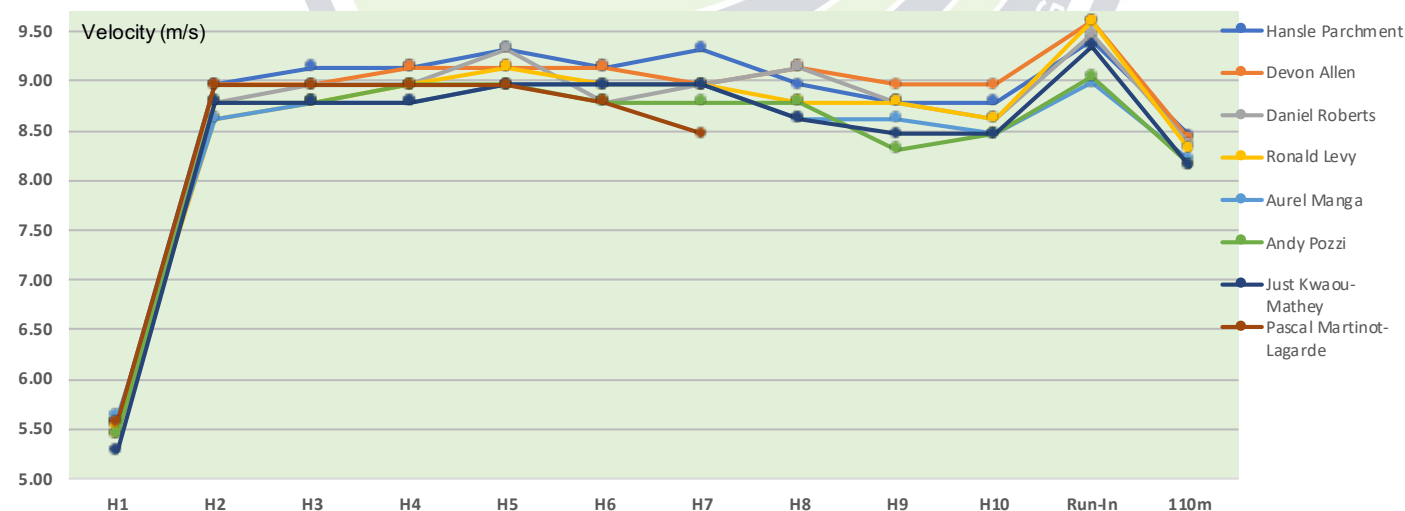
110m Hurdles

Date: 2021.08.28

Wind: 0.7 m/s

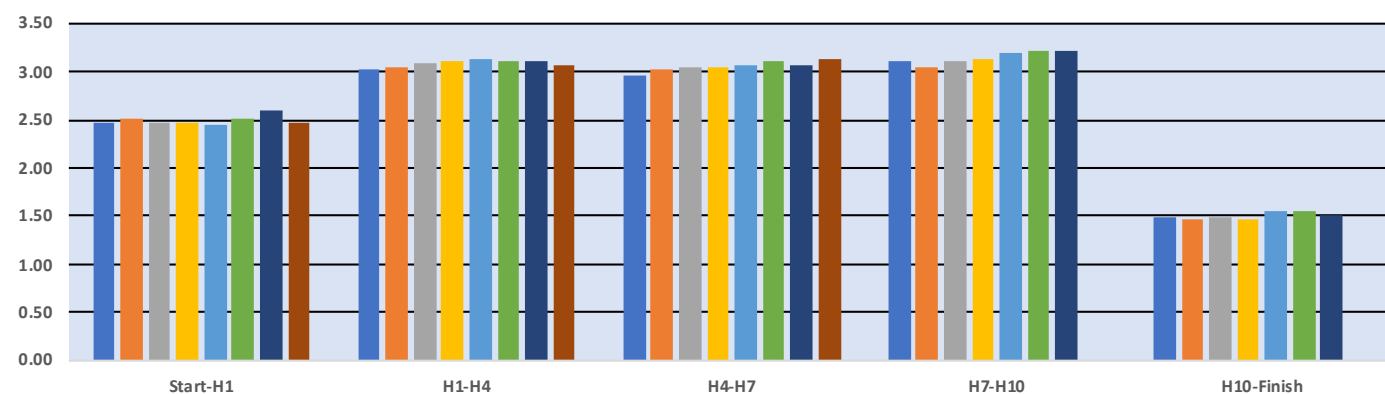
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Parchment, Hansle (JAM) (1990)	time		2.46	3.48	4.48	5.48	6.46	7.46	8.44	9.46	10.50	11.54		13.03	6 / 1			
	reaction time	0.138											1.49			3.02	2.96	3.10
	interval		7 steps	1.02	1.00	1.00	0.98	1.00	0.98	1.02	1.04	1.04	1.49			9.08	9.26	8.85
Allen, Devon (USA) (1994)	time		2.52	3.54	4.56	5.56	6.56	7.56	8.58	9.58	10.60	11.62		13.08	5 / 2			
	reaction time	0.141											1.46			3.04	3.02	3.04
	interval		7 steps	1.02	1.02	1.00	1.00	1.00	1.02	1.00	1.02	1.02	1.46			9.02	9.08	9.02
Roberts, Daniel (USA) (1997)	time		2.46	3.50	4.52	5.54	6.52	7.56	8.58	9.58	10.62	11.68		13.16	2 / 3			
	reaction time	0.169											1.48			3.08	3.04	3.10
	interval		7 steps	1.04	1.02	1.02	0.98	1.04	1.02	1.00	1.04	1.06	1.48			8.90	9.02	8.85
Levy, Ronald (JAM) (1992)	time		2.48	3.54	4.58	5.60	6.60	7.62	8.64	9.68	10.72	11.78		13.24	4 / 4			
	reaction time	0.144											1.46			3.12	3.04	3.14
	interval		7 steps	1.06	1.04	1.02	1.00	1.02	1.02	1.04	1.04	1.06	1.46			8.79	9.02	8.73
Manga, Aurel (FRA) (1992)	time		2.44	3.50	4.54	5.58	6.60	7.62	8.64	9.70	10.76	11.84		13.40	7 / 5			
	reaction time	0.154											1.56			3.14	3.06	3.20
	interval		7 steps	1.06	1.04	1.04	1.02	1.02	1.02	1.06	1.06	1.08	1.56			8.73	8.96	8.57
Pozzi, Andy (GBR) (1992)	time		2.52	3.56	4.60	5.62	6.64	7.68	8.72	9.76	10.86	11.94		13.49	8 / 6			
	reaction time	0.126											1.55			3.10	3.10	3.22
	interval		7 steps	1.04	1.04	1.02	1.02	1.04	1.04	1.04	1.10	1.08	1.55			8.85	8.85	8.52
Kwaou-Mathey, Just (FRA) (1999)	time		2.60	3.64	4.68	5.72	6.74	7.76	8.78	9.84	10.92	12.00		13.50	1 / 7			
	reaction time	0.161											1.50			3.12	3.06	3.22
	interval		7 steps	1.04	1.04	1.04	1.02	1.02	1.02	1.06	1.08	1.08	1.50			8.79	8.96	8.52
Martinet-Lagarde, Pascal (FRA) (1991)	time		2.46	3.48	4.50	5.52	6.54	7.58	8.66						3 / --			
	reaction time	0.150														3.06	3.14	
	interval		7 steps	1.02	1.02	1.02	1.02	1.04	1.08							8.96	8.73	
	velocity		5.58	8.96	8.96	8.96	8.96	8.96	8.79	8.46								



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=1Q-OmB5Kl_m4

2021 Athletissima (Lausanne, SUI) (TV Analysis)

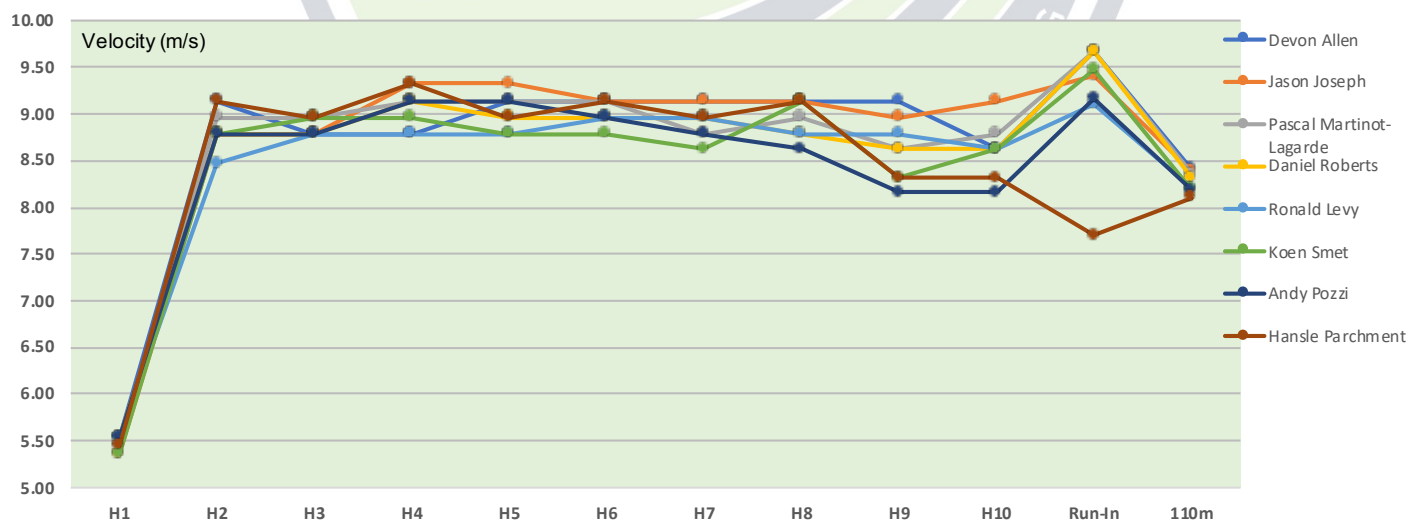
110m Hurdles

Date: 2021.08.26

Wind: 2.5 m/s

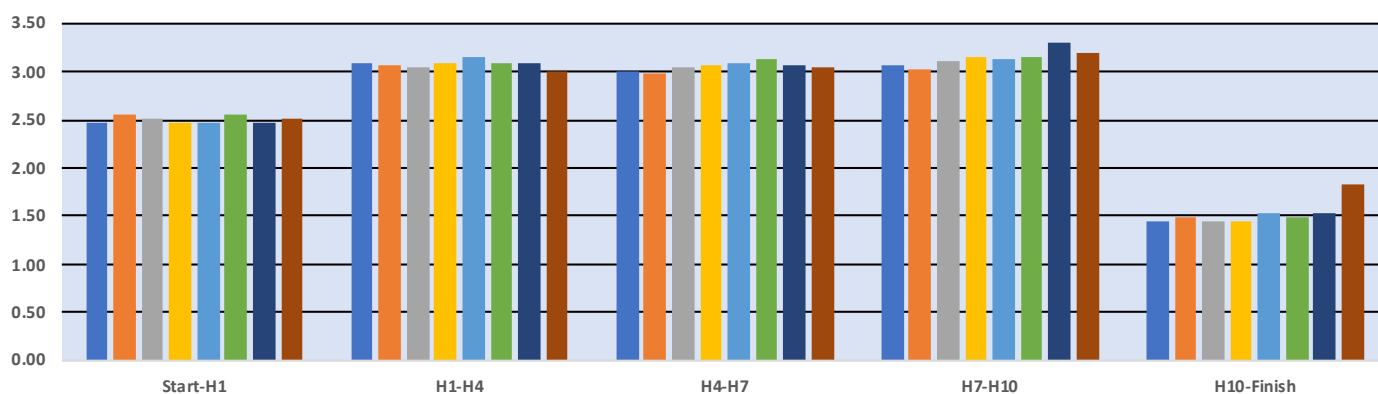
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Allen, Devon (USA) (1994)	time		2.48	3.48	4.52	5.56	6.56	7.56	8.56	9.56	10.56	11.62		13.07	5 / 1			
	reaction time	0.140											1.45			3.08	3.00	3.06
	interval			1.00	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.06	1.45			8.90	9.14	8.96
Joseph, Jason (SUI) (1998)	time		2.56	3.60	4.64	5.62	6.60	7.60	8.60	9.60	10.62	11.62		13.11	3 / 2			
	reaction time	0.149											1.49			3.06	2.98	3.02
	interval		7 steps	1.04	1.04	0.98	0.98	1.00	1.00	1.00	1.02	1.00	1.49			8.96	9.20	9.08
Martinot-Lagarde, Pascal (FRA) (1991)	time		2.52	3.54	4.56	5.56	6.56	7.56	8.60	9.62	10.68	11.72		13.17	2 / 3			
	reaction time	0.149											1.45			3.04	3.04	3.12
	interval		7 steps	1.02	1.02	1.00	1.00	1.00	1.04	1.02	1.06	1.04	1.45			9.02	9.02	8.79
Roberts, Daniel (USA) (1997)	time		2.48	3.52	4.56	5.56	6.58	7.60	8.62	9.66	10.72	11.78		13.23	7 / 4			
	reaction time	0.178											1.45			3.08	3.06	3.16
	interval			1.04	1.04	1.00	1.02	1.02	1.02	1.04	1.06	1.06	1.45			8.90	8.96	8.68
Levy, Ronald (JAM) (1992)	time		2.48	3.56	4.60	5.64	6.68	7.70	8.72	9.76	10.80	11.86		13.40	4 / 5			
	reaction time	0.113											1.54			3.16	3.08	3.14
	interval		7 steps	1.08	1.04	1.04	1.04	1.02	1.02	1.04	1.04	1.06	1.54			8.68	8.90	8.73
Smet, Koen (NED) (1992)	time		2.56	3.60	4.62	5.64	6.68	7.72	8.78	9.78	10.88	11.94		13.42	1 / 6			
	reaction time	0.144											1.48			3.08	3.14	3.16
	interval			1.04	1.02	1.02	1.04	1.04	1.06	1.00	1.10	1.06	1.48			8.90	8.73	8.68
Pozzi, Andy (GBR) (1992)	time		2.48	3.52	4.56	5.56	6.56	7.58	8.62	9.68	10.80	11.92		13.45	8 / 7			
	reaction time	0.149											1.53			3.08	3.06	3.30
	interval		7 steps	1.04	1.04	1.00	1.00	1.02	1.04	1.06	1.12	1.12	1.53			8.90	8.96	8.31
Parchment, Hansle (JAM) (1990)	time		2.52	3.52	4.54	5.52	6.54	7.54	8.56	9.56	10.66	11.76		13.58	6 / 8			
	reaction time	0.133											1.82			3.00	3.04	3.20
	interval		7 steps	1.00	1.02	0.98	1.02	1.00	1.02	1.00	1.10	1.10	1.82			9.14	9.02	8.57
	velocity		5.53	8.79	8.79	9.14	9.14	8.96	8.79	8.62	8.31	8.62	9.67	8.42				



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=QGOvkoiEs8U>

2020 Olympic Games (Tokyo, JPN) (TV Analysis)

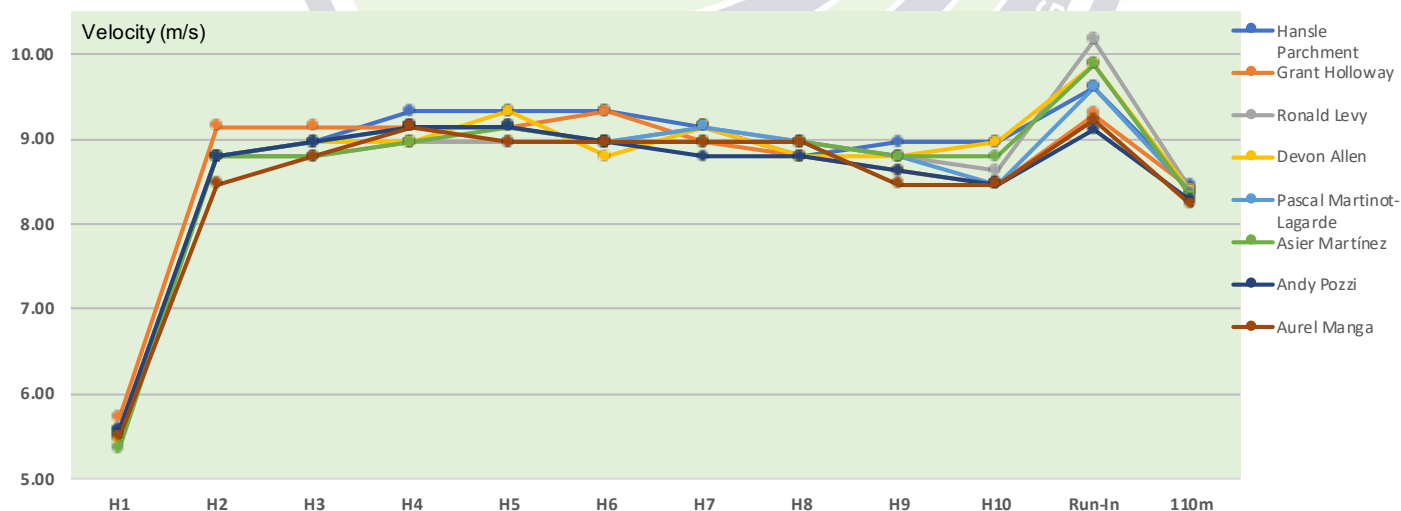
110m Hurdles

Date: 2021.08.05

Wind: -0.5 m/s

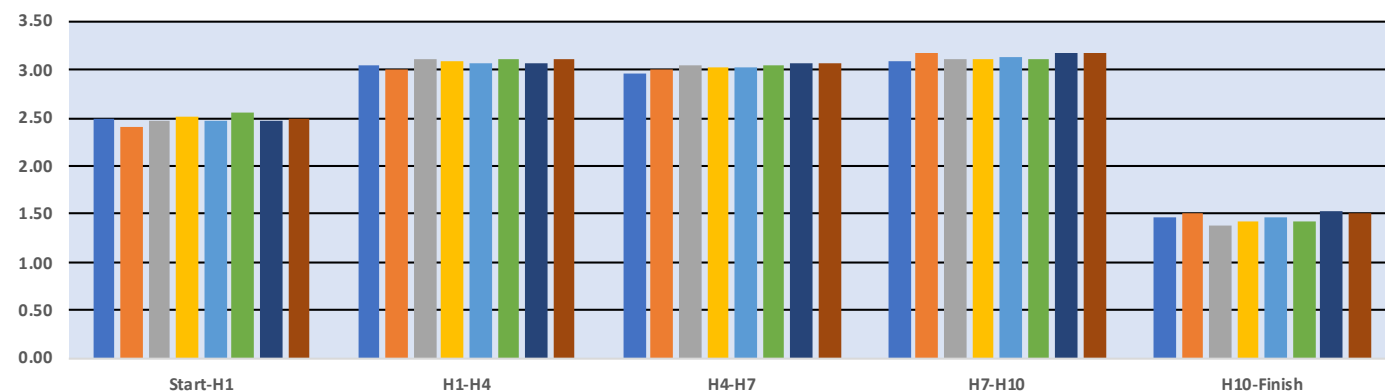
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Parchment, Hansle (JAM) (1990)	time		2.50	3.54	4.56	5.54	6.52	7.50	8.50	9.54	10.56	11.58		13.04	7 / 1			
	reaction time	0.130														3.04	2.96	3.08
	interval		7 steps	1.04	1.02	0.98	0.98	0.98	1.00	1.04	1.02	1.02	1.46			9.02	9.26	8.90
	velocity		5.49	8.79	8.96	9.33	9.33	9.33	9.14	8.79	8.96	8.96	9.60	8.44				
Holloway, Grant (USA) (1997)	time		2.40	3.40	4.40	5.40	6.40	7.38	8.40	9.44	10.50	11.58		13.09	4 / 2			
	reaction time	0.136														3.00	3.00	3.18
	interval		7 steps	1.00	1.00	1.00	1.00	0.98	1.02	1.04	1.06	1.08	1.51			9.14	9.14	8.62
	velocity		5.72	9.14	9.14	9.14	9.14	9.33	8.96	8.79	8.62	8.46	9.28	8.40				
Levy, Ronald (JAM) (1992)	time		2.46	3.50	4.54	5.56	6.58	7.60	8.60	9.62	10.66	11.72		13.10	5 / 3			
	reaction time	0.146														3.10	3.04	3.12
	interval		7 steps	1.04	1.04	1.02	1.02	1.02	1.00	1.02	1.04	1.06	1.38			8.85	9.02	8.79
	velocity		5.58	8.79	8.79	8.96	8.96	8.96	9.14	8.96	8.79	8.62	10.16	8.40				
Allen, Devon (USA) (1994)	time		2.52	3.56	4.58	5.60	6.58	7.62	8.62	9.66	10.70	11.72		13.14	6 / 4			
	reaction time	0.133														3.08	3.02	3.10
	interval			1.04	1.02	1.02	0.98	1.04	1.00	1.04	1.04	1.02	1.42			8.90	9.08	8.85
	velocity		5.44	8.79	8.96	8.96	9.33	8.79	9.14	8.79	8.79	8.96	9.87	8.37				
Martinot-Lagarde, Pascal (FRA) (1991)	time		2.48	3.52	4.54	5.54	6.54	7.56	8.56	9.58	10.62	11.70		13.16	8 / 5			
	reaction time	0.120														3.06	3.02	3.14
	interval		7 steps	1.04	1.02	1.00	1.00	1.02	1.00	1.02	1.04	1.08	1.46			8.96	9.08	8.73
	velocity		5.53	8.79	8.96	9.14	9.14	8.96	9.14	8.96	8.79	8.46	9.60	8.36				
Martínez, Asier (ESP) (2000)	time		2.56	3.60	4.64	5.66	6.66	7.68	8.70	9.72	10.76	11.80		13.22	2 / 6			
	reaction time	0.155														3.10	3.04	3.10
	interval		7 steps	1.04	1.04	1.02	1.00	1.02	1.02	1.02	1.04	1.04	1.42	PB		8.85	9.02	8.85
	velocity		5.36	8.79	8.79	8.96	9.14	8.96	8.96	8.79	8.79	8.79	9.87	8.32				
Pozzi, Andy (GBR) (1992)	time		2.46	3.50	4.52	5.52	6.52	7.54	8.58	9.62	10.68	11.76		13.30	3 / 7			
	reaction time	0.140														3.06	3.06	3.18
	interval		7 steps	1.04	1.02	1.00	1.00	1.02	1.04	1.04	1.06	1.08	1.54			8.96	8.96	8.62
	velocity		5.58	8.79	8.96	9.14	9.14	8.96	8.79	8.79	8.62	8.46	9.10	8.27				
Manga, Aurel (FRA) (1992)	time		2.50	3.58	4.62	5.62	6.64	7.66	8.68	9.70	10.78	11.86		13.38	9 / 8			
	reaction time	0.151														3.12	3.06	3.18
	interval		7 steps	1.08	1.04	1.00	1.02	1.02	1.02	1.02	1.08	1.08	1.52			8.79	8.96	8.62
	velocity		5.49	8.46	8.79	9.14	8.96	8.96	8.96	8.96	8.46	8.46	9.22	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=QG0vkojEs8U>

2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Decathlon

Date: 2021.08.05

Wind: -1.0 m/s

Heat 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Warner, Damion (CAN) (1989)	time												13.46	7 / 1			
	reaction time	0.148											ODB		0.00	0.00	0.00
	interval	7 s													#DIV/0!	#DIV/0!	#DIV/0!
	velocity	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.04	8.17				

110m Hurdles

Date: 2021.08.04

Wind: -0.1 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
Holloway, Grant (USA) (1997)	time	2.43	3.43	4.43	5.43	6.44	7.44	8.47	9.49	10.52	11.60		13.13	4 / 1			
	reaction time	0.130													3.00	3.04	3.13
	interval	7 steps	1.00	1.00	1.00	1.01	1.00	1.03	1.02	1.03	1.08	1.53			9.14	9.02	8.76
	velocity	5.65	9.14	9.14	9.14	9.05	9.14	8.87	8.96	8.87	8.46	9.16	8.38				
Parchment, Hansle (JAM) (1990)	time	2.53	3.60	4.61	5.61	6.61	7.57	8.57	9.65	10.65	11.72		13.23	6 / 2			
	reaction time	0.145													3.08	2.96	3.15
	interval	7 steps	1.07	1.01	1.00	1.00	0.96	1.00	1.08	1.00	1.07	1.51			8.90	9.26	8.70
	velocity	5.42	8.54	9.05	9.14	9.14	9.52	9.14	8.46	9.14	8.54	9.28	8.31				

Date: 2021.08.04

Wind: 0.1 m/s

Semi-Final 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Allen, Devon (USA) (1994)	time	2.52	3.55	4.57	5.60	6.60	7.60	8.64	9.67	10.71	11.76		13.18	5 / 1			
	reaction time	0.121													3.08	3.04	3.12
	interval		1.03	1.02	1.03	1.00	1.00	1.04	1.03	1.04	1.05	1.42			8.90	9.02	8.79
	velocity	5.44	8.87	8.96	8.87	9.14	9.14	8.79	8.87	8.79	8.70	9.87	8.35				

110m Hurdles

Date: 2021.08.03

Wind: 0.1 m/s

Heat 5

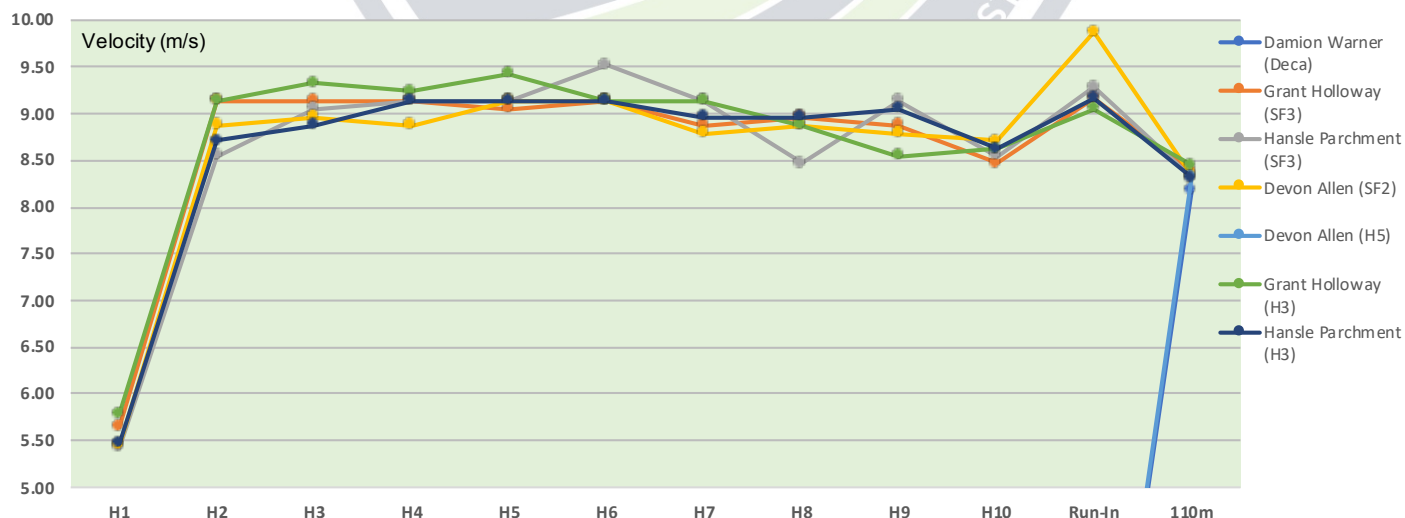
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Allen, Devon (USA) (1994)	time												13.21	5 / 1			
	reaction time	0.146													0.00	0.00	0.00
	interval														#DIV/0!	#DIV/0!	#DIV/0!
	velocity	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.06	8.33				

Date: 2021.08.03

Wind: 0.1 m/s

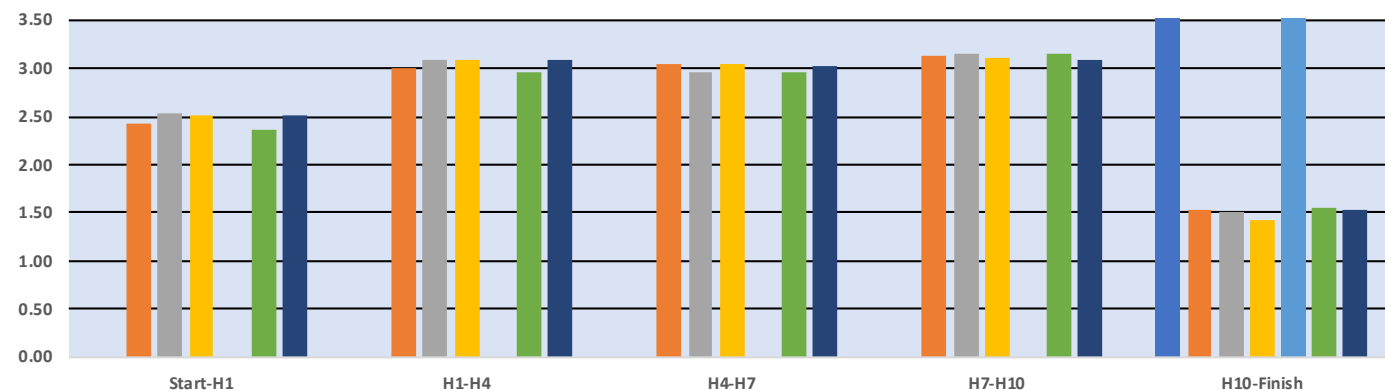
Heat 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.37	3.37	4.35	5.34	6.31	7.31	8.31	9.34	10.41	11.47		13.02	9 / 1			
	reaction time	0.127													2.97	2.97	3.16
	interval	7 steps	1.00	0.98	0.99	0.97	1.00	1.00	1.03	1.07	1.06	1.55			9.23	9.23	8.68
	velocity	5.79	9.14	9.33	9.23	9.42	9.14	9.14	8.87	8.54	8.62	9.05	8.45				
Parchment, Hansle (JAM) (1990)	time	2.51	3.56	4.59	5.59	6.59	7.59	8.61	9.63	10.64	11.70		13.23	7 / 2			
	reaction time	0.155													3.08	3.02	3.09
	interval	7 steps	1.05	1.03	1.00	1.00	1.00	1.02	1.02	1.01	1.06	1.53			8.90	9.08	8.87
	velocity	5.47	8.70	8.87	9.14	9.14	9.14	8.96	8.96	9.05	8.62	9.16	8.31				



Time Intervals (s)

Hurdle Phases



Evaluated with:
 Decathlon ObjectusVideo
 Semi-Finals ObjectusVideo
 Heat 5 ObjectusVideo
 Heat 3 ObjectusVideo

Quality & Frame Rate:
 1920 x 1080 @ 25fps
 1920 x 1080 @ 24fps

Timing From:
 First Movement
 First Movement

Source:
<https://www.youtube.com/watch?v=xtp0fQWio/s>
<https://www.youtube.com/watch?v=IGMTvXAbiZU>

2021 Müller British Grand Prix (Gateshead, GBR) (TV Analysis)

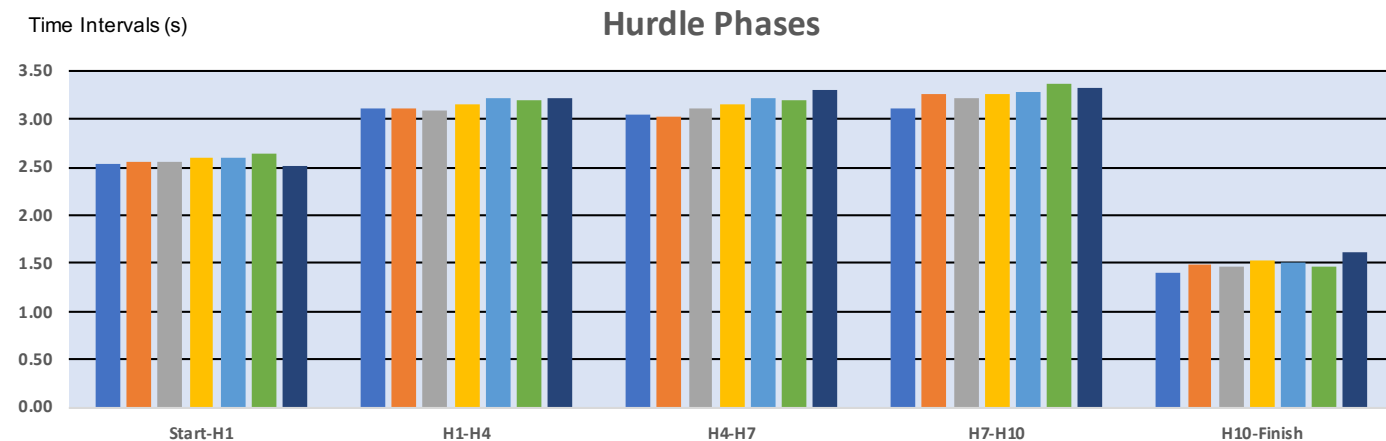
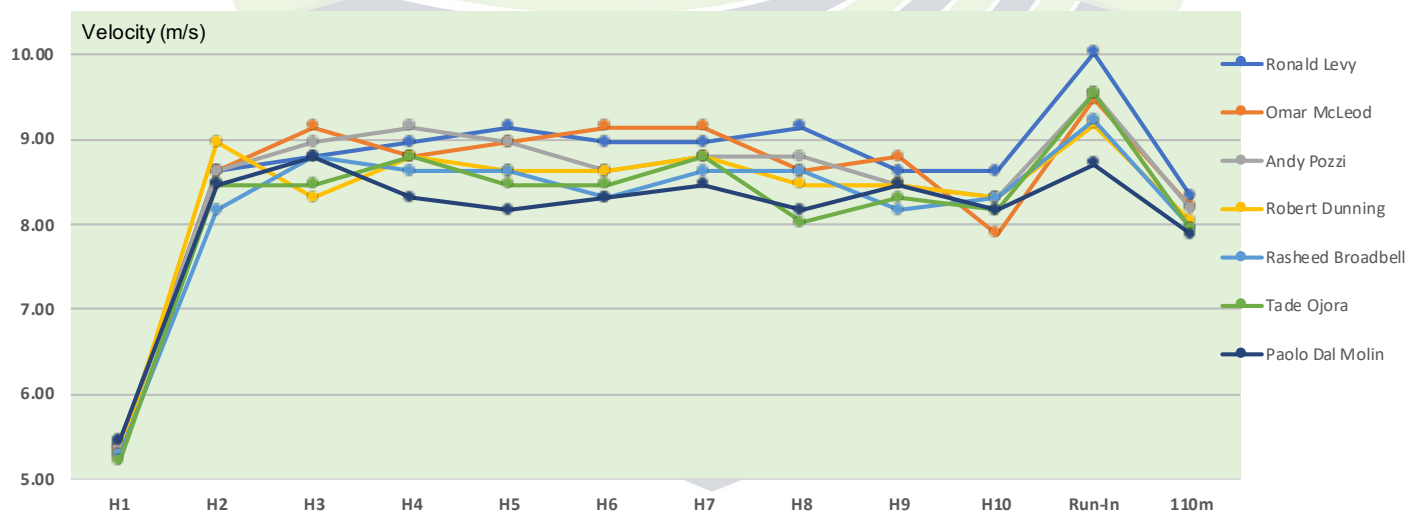
110m Hurdles

Date: 2021.07.13

Wind: 0.8 m/s

FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Levy, Ronald (JAM) (1992)	time		2.54	3.60	4.64	5.66	6.66	7.68	8.70	9.70	10.76	11.82		13.22	4 / 1			
	reaction time	0.150														3.12	3.04	3.12
	interval		7 steps	1.06	1.04	1.02	1.00	1.02	1.02	1.00	1.06	1.06	1.40			8.79	9.02	8.79
McLeod, Omar (JAM) (1994)	time		2.56	3.62	4.62	5.66	6.68	7.68	8.68	9.74	10.78	11.94		13.42	5 / 2			
	reaction time	0.140														3.10	3.02	3.26
	interval			1.06	1.00	1.04	1.02	1.00	1.00	1.06	1.04	1.16	1.48			8.85	9.08	8.41
Pozzi, Andy (GBR) (1992)	time		2.56	3.62	4.64	5.64	6.66	7.72	8.76	9.80	10.88	11.98		13.45	3 / 3			
	reaction time	0.114														3.08	3.12	3.22
	interval		7 steps	1.06	1.02	1.00	1.02	1.06	1.04	1.04	1.08	1.10	1.47			8.90	8.79	8.52
Dunning, Robert (USA) (1997)	time		2.60	3.62	4.72	5.76	6.82	7.88	8.92	10.00	11.08	12.18		13.71	6 / 4			
	reaction time	0.130														3.16	3.16	3.26
	interval		7 steps	1.02	1.10	1.04	1.06	1.06	1.04	1.08	1.08	1.10	1.53			8.68	8.68	8.41
Broadbell, Rasheed (JAM) (2000)	time		2.60	3.72	4.76	5.82	6.88	7.98	9.04	10.10	11.22	12.32		13.84	2 / 5			
	reaction time	0.165														3.22	3.22	3.28
	interval		7 steps	1.12	1.04	1.06	1.06	1.10	1.06	1.06	1.12	1.10	1.52			8.52	8.52	8.36
Ojora, Tade (GBR) (1999)	time		2.64	3.72	4.80	5.84	6.92	8.00	9.04	10.18	11.28	12.40		13.87	7 / 6			
	reaction time	0.151														3.20	3.20	3.36
	interval			1.08	1.08	1.04	1.08	1.08	1.04	1.14	1.10	1.12	1.47			8.57	8.57	8.16
Dal Molin, Paolo (ITA) (1987)	time		2.52	3.60	4.64	5.74	6.86	7.96	9.04	10.16	11.24	12.36		13.97	8 / 7			
	reaction time	0.150														3.22	3.30	3.32
	interval		7 steps	1.08	1.04	1.10	1.12	1.10	1.08	1.12	1.08	1.12	1.61			8.52	8.31	8.26
	velocity		5.44	8.46	8.79	8.31	8.16	8.31	8.46	8.16	8.46	8.16	8.71	7.87				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1078 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=6T0k5f5eqPw>

2021 István Gyulai Memorial (Székesfehérvár, HUN) (TV Analysis)

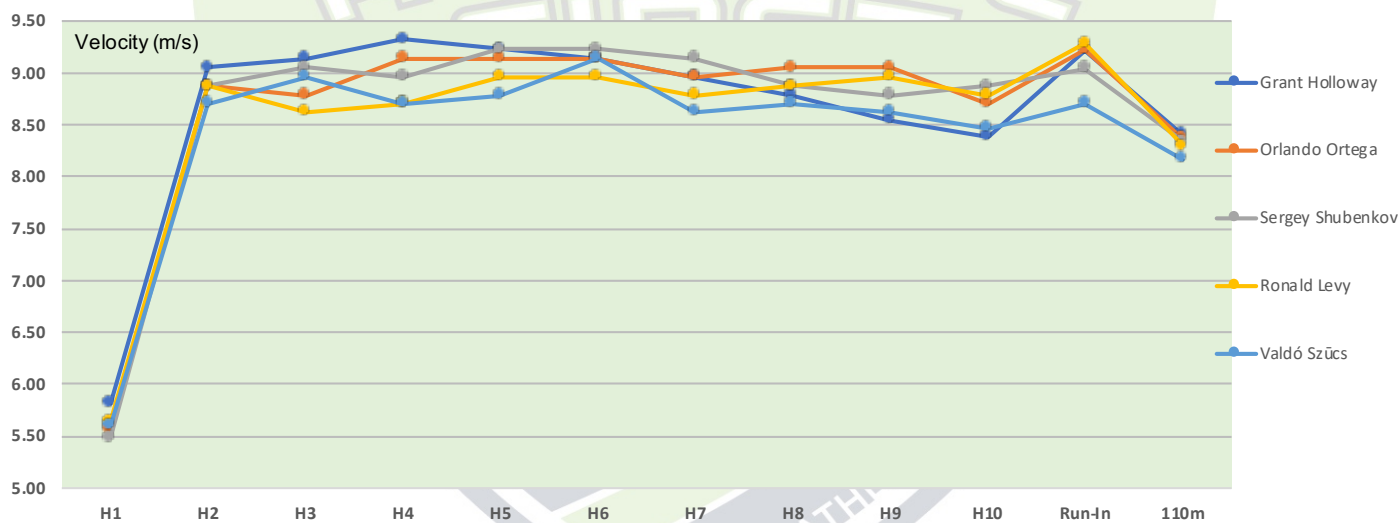
110m Hurdles

Date: 2021.07.06

Wind: -0.1 m/s

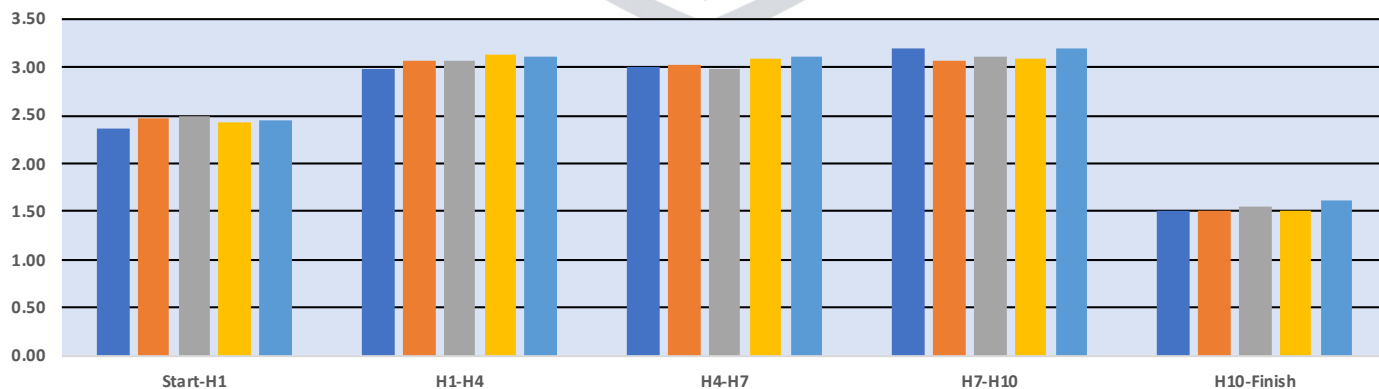
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.36	3.37	4.37	5.35	6.34	7.34	8.36	9.40	10.47	11.56		13.08	4 / 1			
	reaction time	0.145													2.99	3.01	3.20
	interval	7 steps	1.01	1.00	0.98	0.99	1.00	1.02	1.04	1.07	1.09	1.52			9.17	9.11	8.57
Ortega, Orlando (ESP) (1991)	time	2.47	3.50	4.54	5.54	6.54	7.54	8.56	9.57	10.58	11.63		13.15	5 / 2			
	reaction time	0.134													3.07	3.02	3.07
	interval	7 steps	1.03	1.04	1.00	1.00	1.00	1.02	1.01	1.01	1.05	1.52			8.93	9.08	8.93
Shubenkov, Sergey (ANA) (1990)	time	2.50	3.53	4.54	5.56	6.55	7.54	8.54	9.57	10.61	11.64		13.19	6 / 3			
	reaction time	0.150													3.06	2.98	3.10
	interval	7 steps	1.03	1.01	1.02	0.99	0.99	1.00	1.03	1.04	1.03	1.55			8.96	9.20	8.85
Levy, Ronald (JAM) (1992)	time	2.43	3.46	4.52	5.57	6.59	7.61	8.65	9.68	10.70	11.74		13.25	3 / 4			
	reaction time	0.140													3.14	3.08	3.09
	interval	7 steps	1.03	1.06	1.05	1.02	1.02	1.04	1.03	1.02	1.04	1.51			8.73	8.90	8.87
Szűcs, Valdó (HUN) (1995)	time	2.45	3.50	4.52	5.57	6.61	7.61	8.67	9.72	10.78	11.86		13.47	2 / 5			
	reaction time	0.147													3.12	3.10	3.19
	interval	7 steps	1.05	1.02	1.05	1.04	1.00	1.06	1.05	1.06	1.08	1.61			8.79	8.85	8.60
	velocity	5.81	9.05	9.14	9.33	9.23	9.14	8.96	8.79	8.54	8.39	9.22	8.41				
	velocity	5.55	8.87	8.79	9.14	9.14	9.14	8.96	9.05	9.05	8.70	9.22	8.37				
	velocity	5.49	8.87	9.05	8.96	9.23	9.23	9.14	8.87	8.79	8.87	9.05	8.34				
	velocity	5.65	8.87	8.62	8.70	8.96	8.96	8.79	8.87	8.96	8.79	9.28	8.30				
	velocity	5.60	8.70	8.96	8.70	8.79	9.14	8.62	8.70	8.62	8.46	8.71	8.17				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1078 @ 60fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=xR6lqcrGpql>

2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

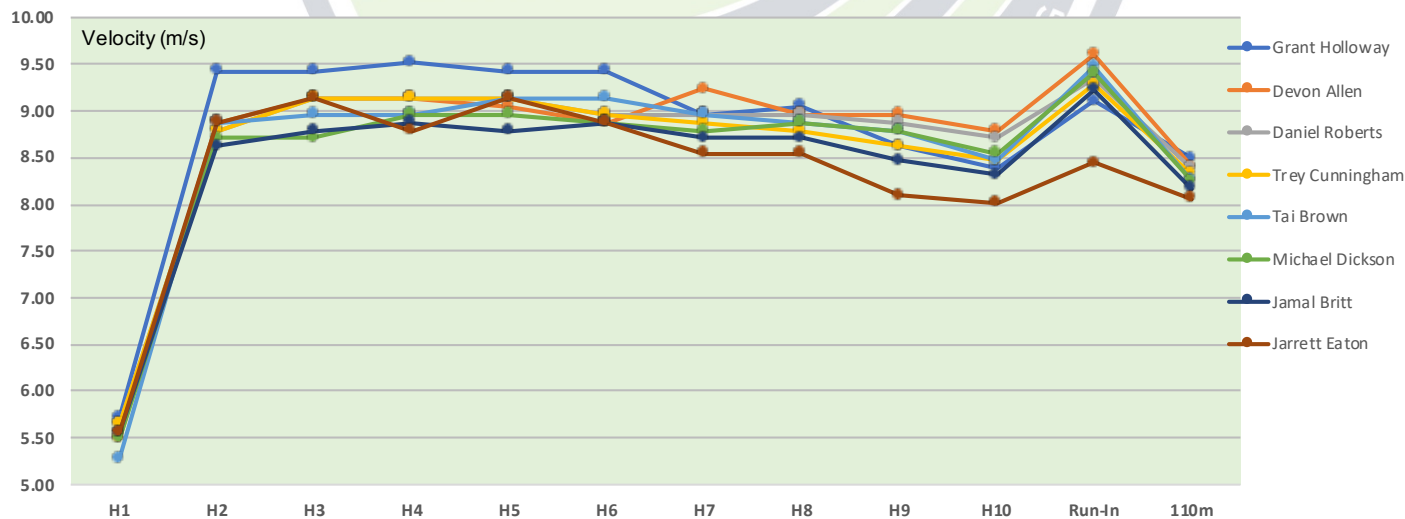
110m Hurdles

Date: 2021.06.26

Wind: 0.4 m/s

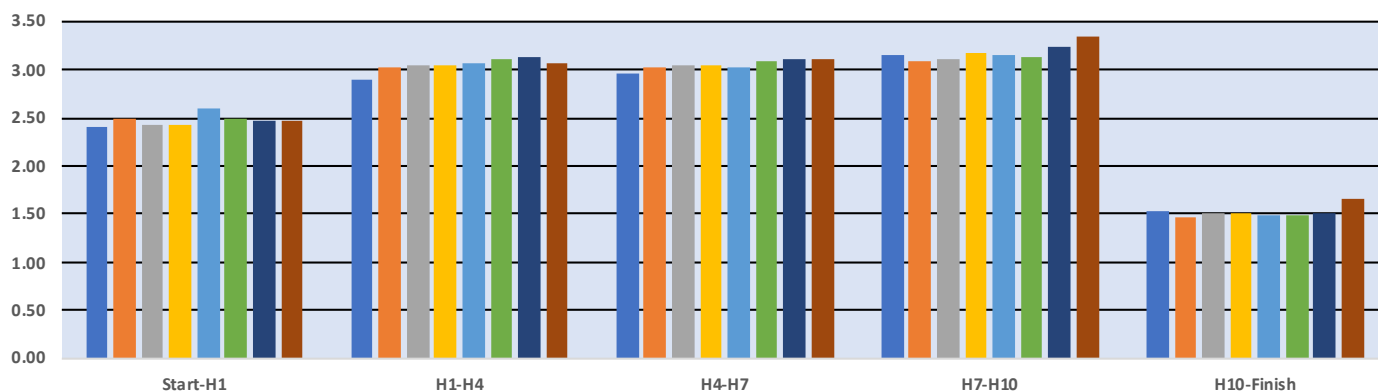
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time		2.40	3.37	4.34	5.30	6.27	7.24	8.26	9.27	10.33	11.42		12.96	4 / 1			
	reaction time	0.146											1.54			2.90	2.96	3.16
	interval		7 steps	0.97	0.97	0.96	0.97	0.97	1.02	1.01	1.06	1.09	1.54			9.46	9.26	8.68
Allen, Devon (USA) (1994)	time		2.50	3.53	4.53	5.53	6.54	7.57	8.56	9.58	10.60	11.64		13.10	5 / 2			
	reaction time	0.152											1.46			3.03	3.03	3.08
	interval			1.03	1.00	1.00	1.01	1.03	0.99	1.02	1.02	1.04	1.46			9.05	9.05	8.90
Roberts, Daniel (USA) (1998)	time		2.43	3.47	4.47	5.47	6.47	7.49	8.51	9.53	10.56	11.61		13.11	6 / 3			
	reaction time	0.201											1.50			3.04	3.04	3.10
	interval			1.04	1.00	1.00	1.00	1.02	1.02	1.02	1.03	1.05	1.50			9.02	9.02	8.85
Cunningham, Trey (USA) (1998)	time		2.43	3.47	4.47	5.47	6.47	7.49	8.52	9.56	10.62	11.70		13.21	3 / 4			
	reaction time	0.165											1.51			3.04	3.05	3.18
	interval		7 steps	1.04	1.00	1.00	1.00	1.02	1.03	1.04	1.06	1.08	1.51	=PB		9.02	8.99	8.62
Brown, Tai (USA) (2000)	time		2.60	3.63	4.65	5.67	6.67	7.67	8.69	9.72	10.76	11.84		13.32	8 / 5			
	reaction time	0.174											1.48			3.07	3.02	3.15
	interval			1.03	1.02	1.02	1.00	1.00	1.02	1.03	1.04	1.08	1.48	PB		8.93	9.08	8.70
Dickson, Michael (USA) (1997)	time		2.50	3.55	4.60	5.62	6.64	7.67	8.71	9.74	10.78	11.85		13.34	2 / 6			
	reaction time	0.201											1.49			3.12	3.09	3.14
	interval		7 steps	1.05	1.05	1.02	1.02	1.03	1.04	1.03	1.04	1.07	1.49			8.79	8.87	8.73
Britt, Jamal (USA) (1998)	time		2.47	3.53	4.57	5.60	6.64	7.67	8.72	9.77	10.85	11.95		13.47	7 / 7			
	reaction time	0.158											1.52			3.13	3.12	3.23
	interval		7 steps	1.06	1.04	1.03	1.04	1.03	1.05	1.05	1.08	1.10	1.52			8.76	8.79	8.49
Eaton, Jarrett (USA) (1989)	time		2.47	3.50	4.50	5.54	6.54	7.57	8.64	9.71	10.84	11.98		13.64	1 / 8			
	reaction time	0.137											1.66			3.07	3.10	3.34
	interval		7 steps	1.03	1.00	1.04	1.00	1.03	1.07	1.07	1.13	1.14	1.66			8.93	8.85	8.21
	velocity		5.72	9.42	9.42	9.52	9.42	9.42	8.96	9.05	8.62	8.39	9.10	8.49				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=2sin2Dbspu8>

2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

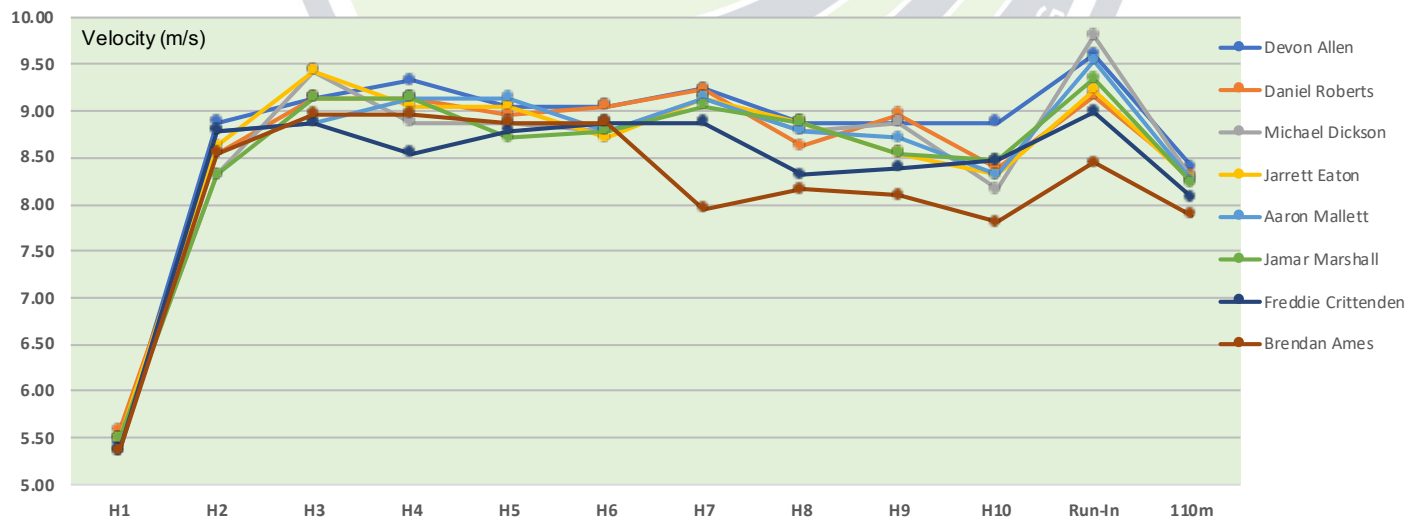
110m Hurdles

Date: 2021.06.26

Wind: 1.2 m/s

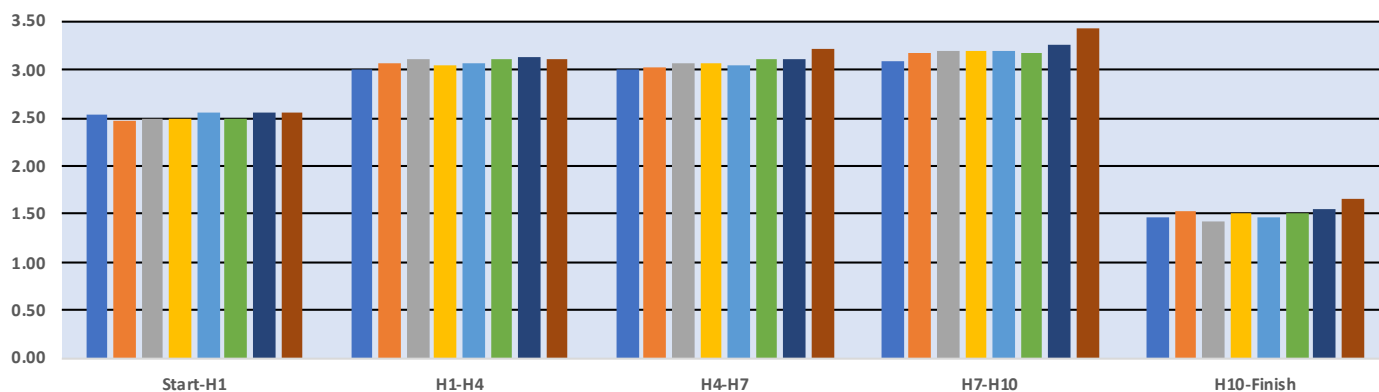
Semi-Final 2

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Allen, Devon (USA) (1994)	time		2.53	3.56	4.56	5.54	6.55	7.56	8.55	9.58	10.61	11.64		13.10	5 / 1			
	reaction time	0.124														3.01	3.01	3.09
	interval			1.03	1.00	0.98	1.01	1.01	0.99	1.03	1.03	1.03	1.46			9.11	9.11	8.87
Roberts, Daniel (USA) (1998)	time		2.46	3.53	4.53	5.53	6.55	7.56	8.55	9.61	10.63	11.72		13.25	4 / 2			
	reaction time	0.179														3.07	3.02	3.17
	interval			1.07	1.00	1.00	1.02	1.01	0.99	1.06	1.02	1.09	1.53			8.93	9.08	8.65
Dickson, Michael (USA) (1997)	time		2.50	3.60	4.57	5.60	6.63	7.67	8.67	9.71	10.74	11.86		13.29	6 / 3			
	reaction time	0.173														3.10	3.07	3.19
	interval			1.10	0.97	1.03	1.03	1.04	1.00	1.04	1.03	1.12	1.43			8.85	8.93	8.60
Eaton, Jarrett (USA) (1989)	time		2.50	3.56	4.53	5.54	6.55	7.60	8.60	9.63	10.70	11.80		13.32	3 / 4			
	reaction time	0.157														3.04	3.06	3.20
	interval			1.06	0.97	1.01	1.01	1.05	1.00	1.03	1.07	1.10	1.52			9.02	8.96	8.57
Mallett, Aaron (USA) (1994)	time		2.56	3.60	4.63	5.63	6.63	7.67	8.67	9.71	10.76	11.86		13.33	7 / 5			
	reaction time	0.198														3.07	3.04	3.19
	interval			1.04	1.03	1.00	1.00	1.04	1.00	1.04	1.05	1.10	1.47			8.93	9.02	8.60
Marshall, Jamar (USA) (2001)	time		2.50	3.60	4.60	5.60	6.65	7.69	8.70	9.73	10.80	11.88		13.38	1 / 6			
	reaction time	0.137														3.10	3.10	3.18
	interval			1.10	1.00	1.00	1.05	1.04	1.01	1.03	1.07	1.08	1.50			8.85	8.85	8.62
Crittenden, Freddie (USA) (1994)	time		2.56	3.60	4.63	5.70	6.74	7.77	8.80	9.90	10.99	12.07		13.63	2 / 7			
	reaction time	0.175														3.14	3.10	3.27
	interval			1.04	1.03	1.07	1.04	1.03	1.03	1.10	1.09	1.08	1.56			8.73	8.85	8.39
Ames, Brendan (USA) (1988)	time		2.56	3.63	4.65	5.67	6.70	7.73	8.88	10.00	11.13	12.30		13.96	8 / 7			
	reaction time	0.208														3.11	3.21	3.42
	interval			1.07	1.02	1.02	1.03	1.03	1.15	1.12	1.13	1.17	1.66			8.82	8.54	8.02
	velocity		5.49	8.31	9.42	8.87	8.87	8.79	9.14	8.79	8.87	8.16	8.09	7.81				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: https://www.youtube.com/watch?v=ALtrPk_oJc0

2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

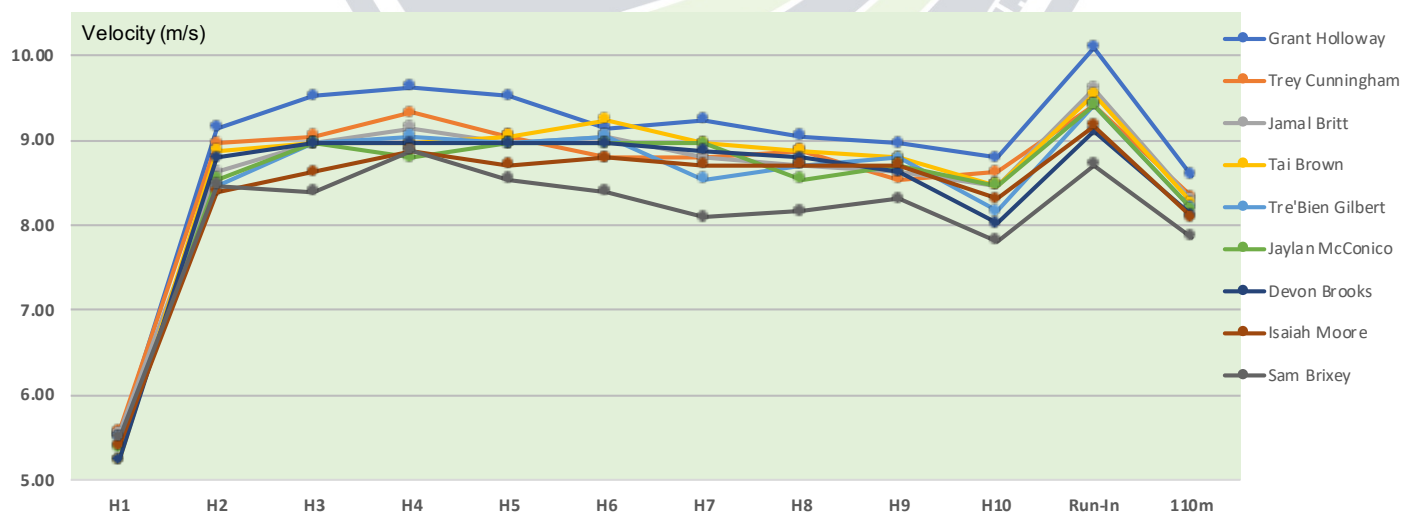
110m Hurdles

Date: 2021.06.26

Wind: 1.8 m/s

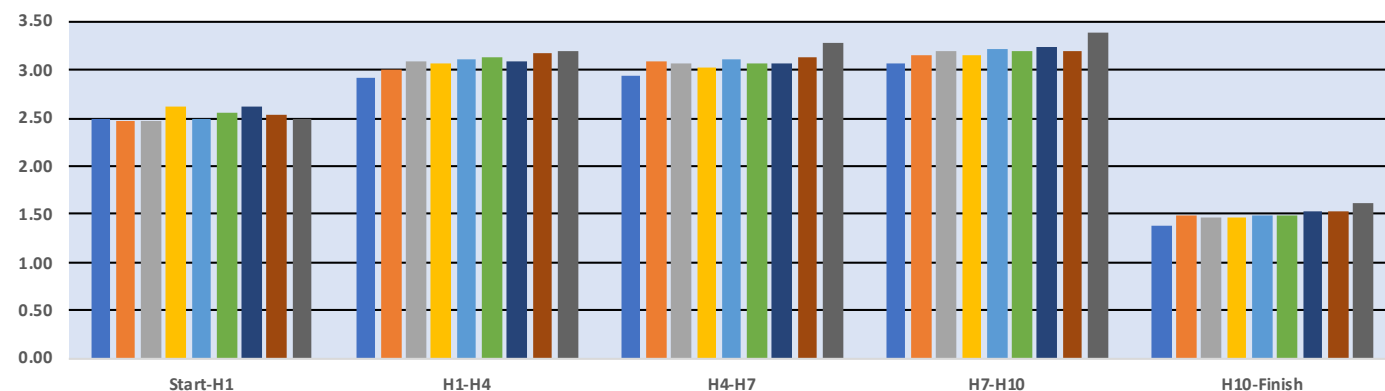
Semi-Final 1

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time		2.49	3.49	4.45	5.40	6.36	7.36	8.35	9.36	10.38	11.42		12.81	5 / 1			
	reaction time	0.169														2.91	2.95	3.07
	interval		7 steps	1.00	0.96	0.95	0.96	1.00	0.99	1.01	1.02	1.04	1.39	PB		9.42	9.29	8.93
Cunningham, Trey (USA) (1998)	time		2.46	3.48	4.49	5.47	6.48	7.52	8.56	9.59	10.66	11.72		13.21	6 / 2			
	reaction time	0.163														3.01	3.09	3.16
	interval		7 steps	1.02	1.01	0.98	1.01	1.04	1.03	1.07	1.06	1.06	1.49	PB		9.11	8.87	8.68
Britt, Jamal (USA) (1998)	time		2.47	3.53	4.55	5.55	6.57	7.58	8.62	9.67	10.73	11.81		13.27	3 / 3			
	reaction time	0.147														3.08	3.07	3.19
	interval		7 steps	1.06	1.02	1.00	1.02	1.01	1.04	1.05	1.06	1.08	1.46	PB		8.90	8.93	8.60
Brown, Tai (USA) (2000)	time		2.62	3.65	4.67	5.69	6.70	7.69	8.71	9.74	10.78	11.86		13.33	2 / 4			
	reaction time	0.173														3.07	3.02	3.15
	interval			1.03	1.02	1.02	1.01	0.99	1.02	1.03	1.04	1.08	1.47	PB		8.93	9.08	8.70
Gilbert, Tre'Bien (USA) (1999)	time		2.50	3.58	4.60	5.61	6.63	7.64	8.71	9.76	10.80	11.92		13.41	8 / 5			
	reaction time	0.191														3.11	3.10	3.21
	interval		7 steps	1.08	1.02	1.01	1.02	1.01	1.07	1.05	1.04	1.12	1.49	PB		8.82	8.85	8.54
McConico, Jaylan (USA) (1998)	time		2.55	3.62	4.64	5.68	6.70	7.72	8.74	9.81	10.86	11.94		13.43	4 / 6			
	reaction time	0.209														3.13	3.06	3.20
	interval			1.07	1.02	1.04	1.02	1.02	1.02	1.07	1.05	1.08	1.49			8.76	8.96	8.57
Brooks, Devon (USA) (1998)	time		2.62	3.66	4.68	5.70	6.72	7.74	8.77	9.81	10.87	12.01		13.55	1 / 7			
	reaction time	0.264														3.08	3.07	3.24
	interval		7 steps	1.04	1.02	1.02	1.02	1.02	1.03	1.04	1.06	1.14	1.54			8.90	8.93	8.46
Moore, Isaiah (USA) (1996)	time		2.54	3.63	4.69	5.72	6.77	7.81	8.86	9.91	10.96	12.06		13.59	7 / 8			
	reaction time	0.147														3.18	3.14	3.20
	interval			1.09	1.06	1.03	1.05	1.04	1.05	1.05	1.05	1.10	1.53			8.62	8.73	8.57
Brixey, Sam (USA) (1998)	time		2.50	3.58	4.67	5.70	6.77	7.86	8.99	10.11	11.21	12.38		13.99	9 / 9			
	reaction time	0.148														3.20	3.29	3.39
	interval		7 steps	1.08	1.09	1.03	1.07	1.09	1.13	1.12	1.10	1.17	1.61			8.57	8.33	8.09
	velocity		5.49	8.46	8.39	8.87	8.54	8.39	8.09	8.16	8.31	7.81	8.71	7.86				



Time Intervals (s)

Hurdle Phases



1st Place - Grant Holloway

Source: Vazel, P.J. (2021.06.27). Retrieved from

<https://twitter.com/pivazel/status/1409323602432999426?s=21>

2nd-9th Place

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

110m Hurdles

Date: 2021.06.25

Wind: 0.5 m/s

Heat 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Allen, Devon (USA) (1994)	time	2.50	3.53	4.56	5.63	6.63	7.63	8.66	9.73	10.73	11.76		13.26	3 / 1			
	reaction time	0.139										1.50			3.13	3.03	3.10
	interval		1.03	1.03	1.07	1.00	1.00	1.03	1.07	1.00	1.03	9.35	8.30		8.76	9.05	8.85
Dickson, Michael (USA) (1997)	time	2.53	3.57	4.60	5.66	6.66	7.66	8.70	9.73	10.73	11.78		13.26	2 / 2			
	reaction time	0.208										1.48			3.13	3.04	3.08
	interval		1.04	1.03	1.06	1.00	1.00	1.04	1.03	1.00	1.05	9.47	8.30		8.76	9.02	8.90
	velocity	5.49	8.87	8.87	8.54	9.14	9.14	8.87	8.54	9.14	8.87						
	velocity																
	velocity																

Date: 2021.06.25

Wind: 1.5 m/s

Heat 2

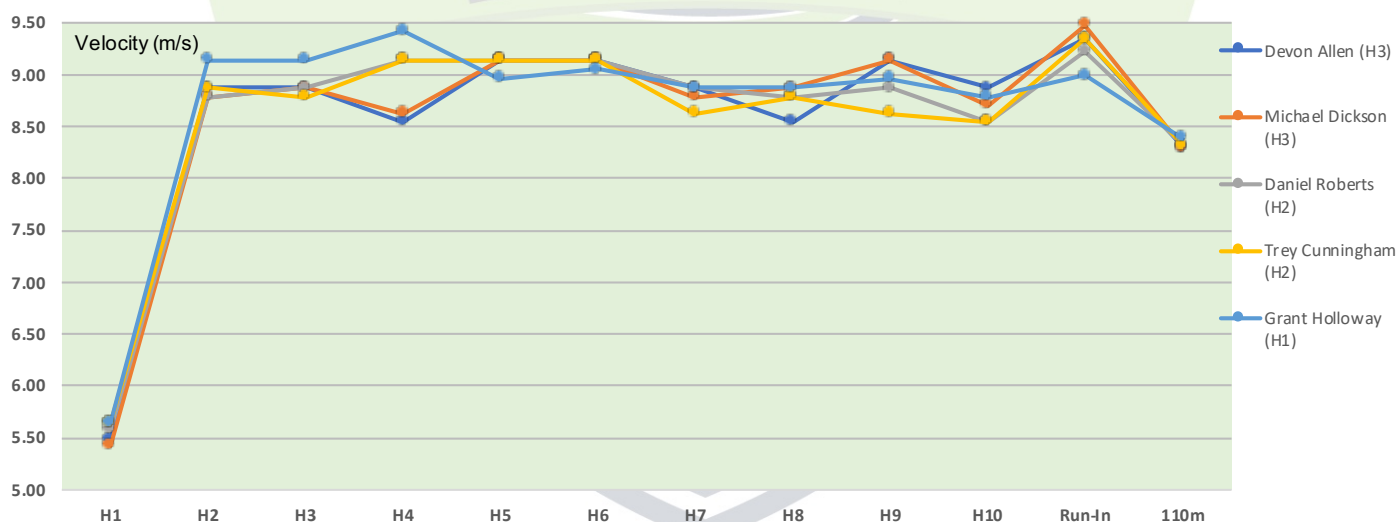
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Roberts, Daniel (USA) (1998)	time	2.46	3.50	4.53	5.53	6.53	7.53	8.56	9.60	10.63	11.70		13.22	1 / 1			
	reaction time	0.182										1.52			3.07	3.03	3.14
	interval		1.04	1.03	1.00	1.00	1.00	1.03	1.04	1.03	1.07	9.22	8.32		8.93	9.05	8.73
Cunningham, Trey (USA) (1998)	time	2.43	3.46	4.50	5.50	6.50	7.50	8.56	9.60	10.66	11.73		13.23	3 / 2			
	reaction time	0.162										1.50			3.07	3.06	3.17
	interval		1.03	1.04	1.00	1.00	1.00	1.06	1.04	1.06	1.07	9.35	8.31		8.93	8.96	8.65
	velocity	5.65	8.87	8.79	9.14	9.14	9.14	8.62	8.79	8.62	8.54						
	velocity																
	velocity																

Date: 2021.06.25

Wind: 0.7 m/s

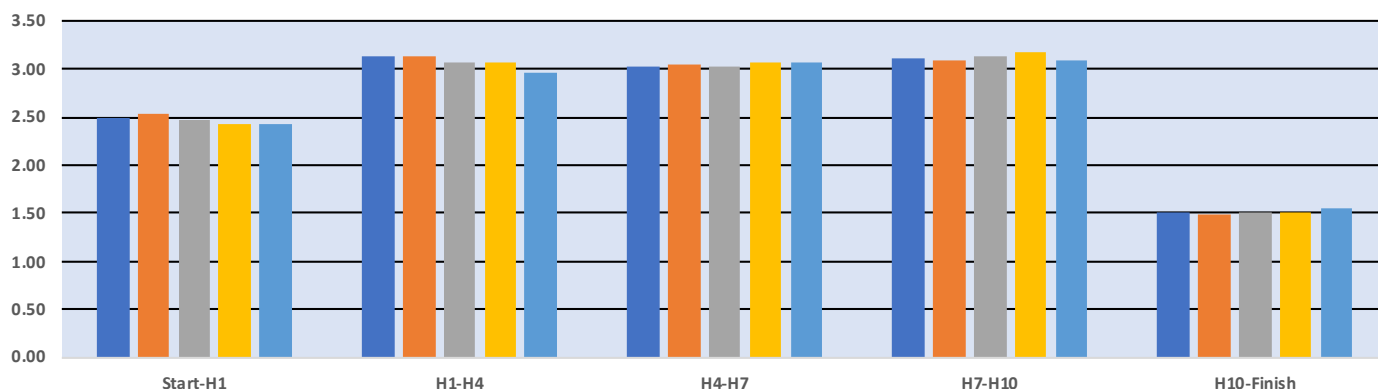
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.43	3.43	4.43	5.40	6.42	7.43	8.46	9.49	10.51	11.55		13.11	4 / 1			
	reaction time	0.175										1.56			2.97	3.06	3.09
	interval		1.00	1.00	0.97	1.02	1.01	1.03	1.03	1.02	1.04	9.39	8.39		9.23	8.96	8.87
	velocity	5.65	9.14	9.14	9.42	8.96	9.05	8.87	8.87	8.96	8.79						
	velocity																
	velocity																



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=ObAFK8AeHsk&t=95s>

2021 Jamaican National Championships (Kingston, JAM) (TV Analysis)

110m Hurdles

Date: 2021.06.26

Wind: 1.3 m/s

Heat 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	2.47	3.53	4.53	5.56	6.53	7.57	8.57	9.57	10.58	11.59		13.04	4 / 1			
	reaction time											1.45			3.09	3.01	3.02
	interval		1.06	1.00	1.03	0.97	1.04	1.00	1.00	1.01	1.01	1.45			8.87	9.11	9.08
Levy, Ronald (JAM) (1992)	time	2.53	3.53	4.56	5.56	6.53	7.53	8.53	9.53	10.56	11.60		13.08	5 / 2			
	reaction time											1.48			3.03	2.97	3.07
	interval	7 steps	1.00	1.03	1.00	0.97	1.00	1.00	1.00	1.03	1.04	1.48			9.05	9.23	8.93
	velocity	5.55	8.62	9.14	8.87	9.42	8.79	9.14	9.14	9.05	9.05	9.67	8.44				
	velocity	5.42	9.14	8.87	9.14	9.42	9.14	9.14	9.14	8.87	8.79	9.47	8.41				

2021 Fanny Blankers Koen Games (Hengelo, NED) (TV Analysis)

Date: 2021.06.06

Wind: 1.7 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	2.37	3.43	4.48	5.50	6.47	7.47	8.54	9.56	10.58	11.66		13.08	5 / 1			
	reaction time											1.42			3.13	3.04	3.12
	interval		1.06	1.05	1.02	0.97	1.00	1.07	1.02	1.02	1.08	1.42			8.76	9.02	8.79
Allen, Devon (USA) (1994)	time	2.47	3.54	4.54	5.60	6.64	7.67	8.73	9.74	10.77	11.86		13.32	4 / 2			
	reaction time											1.46			3.13	3.13	3.13
	interval		1.07	1.00	1.06	1.04	1.03	1.06	1.01	1.03	1.09	1.46			8.76	8.76	8.76
Belocian, Wilhem (FRA) (1995)	time	2.47	3.54	4.54	5.57	6.60	7.62	8.64	9.67	10.74	11.84		13.34	6 / 3			
	reaction time											1.50			3.10	3.07	3.20
	interval		1.07	1.00	1.03	1.03	1.02	1.02	1.03	1.07	1.10	1.50			8.85	8.93	8.57
	velocity	5.55	8.54	9.14	8.87	8.87	8.96	8.96	8.87	8.54	8.31	9.35	8.25				
	velocity	5.55	8.54	9.14	8.87	8.87	8.96	8.96	8.87	8.54	8.31	9.35	8.25				

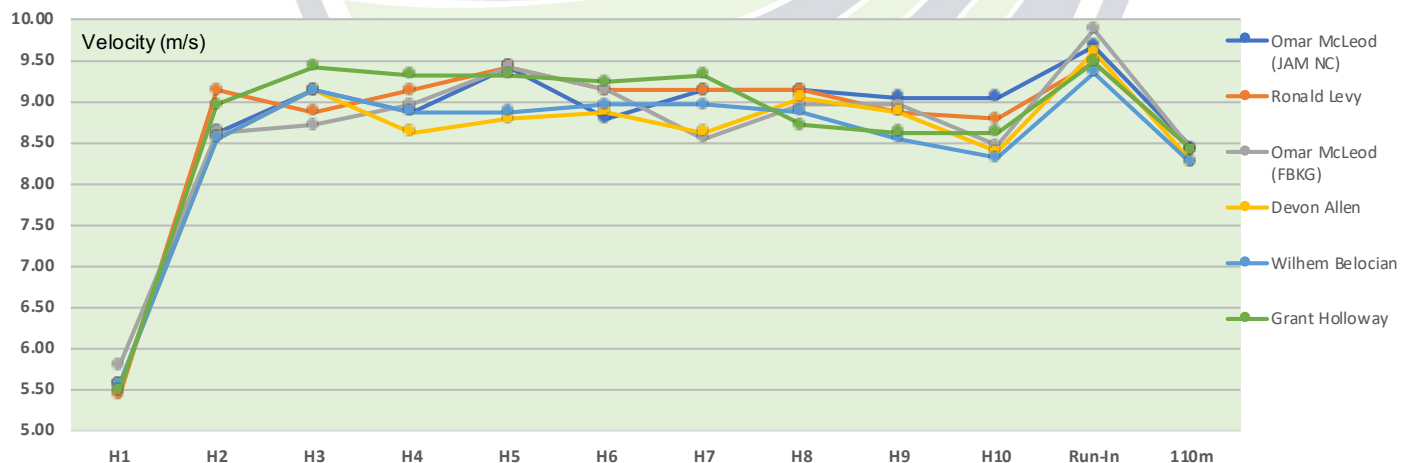
2021 Tom Jones Invitational (Gainesville, FL) (TV Analysis)

Date: 2021.04.17

Wind: 1.3 m/s

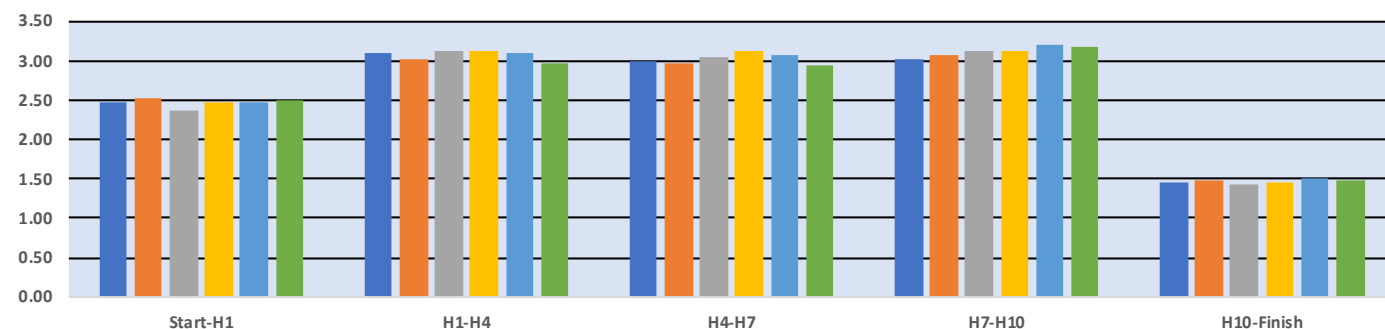
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.50	3.52	4.49	5.47	6.45	7.44	8.42	9.47	10.53	11.59		13.07	6 / 1			
	reaction time											1.48			2.97	2.95	3.17
	interval	7 steps	1.02	0.97	0.98	0.98	0.99	0.98	1.05	1.06	1.06	1.48			9.23	9.29	8.65
	velocity	5.49	8.96	9.42	9.33	9.33	9.23	9.33	8.70	8.62	8.62	9.47	8.42				



Time Intervals (s)

Hurdle Phases



Jamaican National Championships

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=i5M1Zoz12Vs>

Tom Jones Invitational

Evaluated with: ObjectusVideo

Quality & Frame Rate: 608 x 1080 @ 60fps

Timing From: Gun Flash

Source: https://www.youtube.com/watch?v=N-welm9Q_ZQ

Fanny Blankers Koen Games

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 60fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=dkI9wp8nyAQ>

2021 NCAA Championships (Eugene, OR) (TV Analysis)

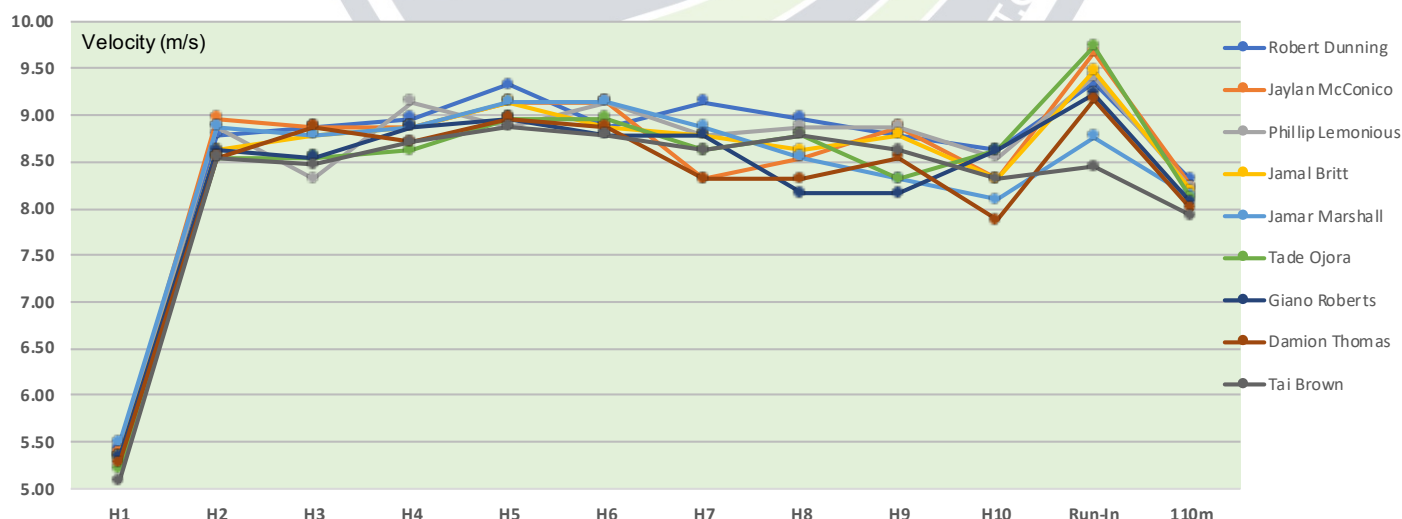
100m Hurdles

Date: 2021.06.11

Wind: -0.6 m/s

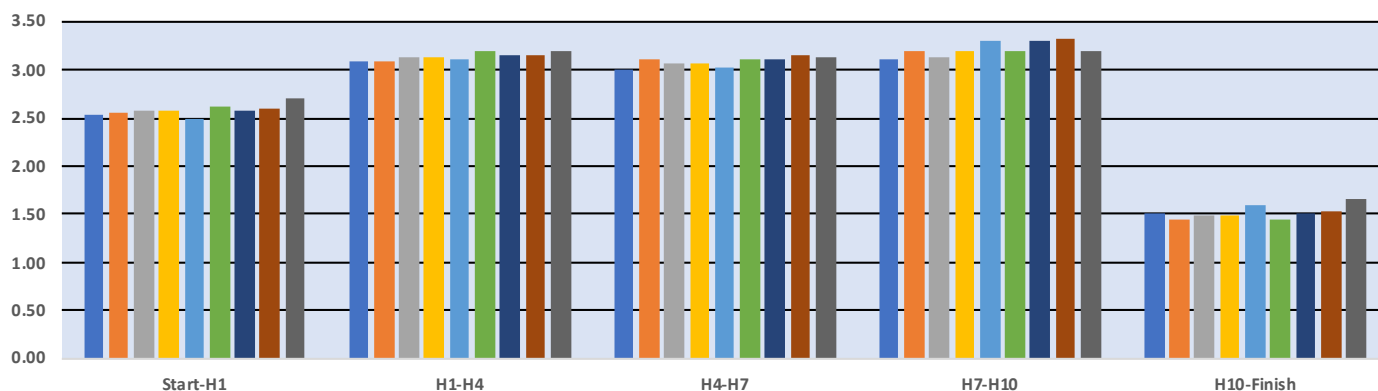
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Dunning, Robert (USA) (1997)	time	2.53	3.57	4.60	5.62	6.60	7.63	8.63	9.65	10.69	11.75		13.25	2 / 1			
	reaction time	0.161													3.09	3.01	3.12
	interval	7 steps	1.04	1.03	1.02	0.98	1.03	1.00	1.02	1.04	1.06	1.50			8.87	9.11	8.79
McConico, Jaylan (USA) (1998)	time	2.55	3.57	4.60	5.63	6.63	7.63	8.73	9.80	10.83	11.93		13.38	4 / 2			
	reaction time	0.194													3.08	3.10	3.20
	interval	velocity	5.38	8.96	8.87	8.87	9.14	9.14	8.31	8.54	8.87	8.31	9.67		8.90	8.85	8.57
Lemonious, Phillip (JAM) (1998)	time	2.57	3.60	4.70	5.70	6.73	7.73	8.77	9.80	10.83	11.90		13.39	5 / 3			
	reaction time	0.150													3.13	3.07	3.13
	interval	7 steps	1.03	1.10	1.00	1.03	1.00	1.04	1.03	1.03	1.07	1.49	PB		8.76	8.93	8.76
Britt, Jamal (USA) (1998)	time	2.57	3.63	4.67	5.70	6.70	7.73	8.77	9.83	10.87	11.97		13.45	8 / 4			
	reaction time	0.203													3.13	3.07	3.20
	interval	7 steps	1.06	1.04	1.03	1.00	1.03	1.04	1.06	1.04	1.10	1.48	PB		8.76	8.93	8.57
Marshall, Jamar (USA) (2001)	time	2.50	3.53	4.57	5.60	6.60	7.60	8.63	9.70	10.80	11.93		13.53	7 / 5			
	reaction time	0.161													3.10	3.03	3.30
	interval	7 steps	1.03	1.04	1.03	1.00	1.00	1.03	1.07	1.10	1.13	1.60			8.85	9.05	8.31
Ojora, Tade (GBR) (1999)	time	2.63	3.70	4.77	5.83	6.85	7.87	8.93	9.97	11.07	12.13		13.57	9 / 6			
	reaction time	0.224													3.20	3.10	3.20
	interval	velocity	5.22	8.54	8.54	8.62	8.96	8.96	8.62	8.79	8.31	8.62	9.74		8.57	8.85	8.57
Roberts, Giano (USA) (2000)	time	2.57	3.63	4.70	5.73	6.75	7.79	8.83	9.95	11.07	12.13		13.65	3 / 7			
	reaction time	0.152													3.16	3.10	3.30
	interval	velocity	5.34	8.62	8.54	8.87	8.96	8.79	8.79	8.16	8.16	8.62	9.22		8.68	8.85	8.31
Thomas, Damion (JAM) (1999)	time	2.60	3.67	4.70	5.75	6.77	7.80	8.90	10.00	11.07	12.23		13.76	6 / 8			
	reaction time	0.200													3.15	3.15	3.33
	interval	7 steps	1.07	1.03	1.05	1.02	1.03	1.10	1.10	1.07	1.16	1.53			8.70	8.70	8.23
Brown, Tai (USA) (2000)	time	2.70	3.77	4.85	5.90	6.93	7.97	9.03	10.07	11.13	12.23		13.89	1 / 9			
	reaction time	0.161													3.20	3.13	3.20
	interval	velocity	5.08	8.54	8.46	8.70	8.87	8.79	8.62	8.79	8.62	8.31	8.45		8.57	8.76	8.57



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=bODE6lNmmg>

2021 Golden Gala Pietro Mennea (Florence, ITA) (TV Analysis)

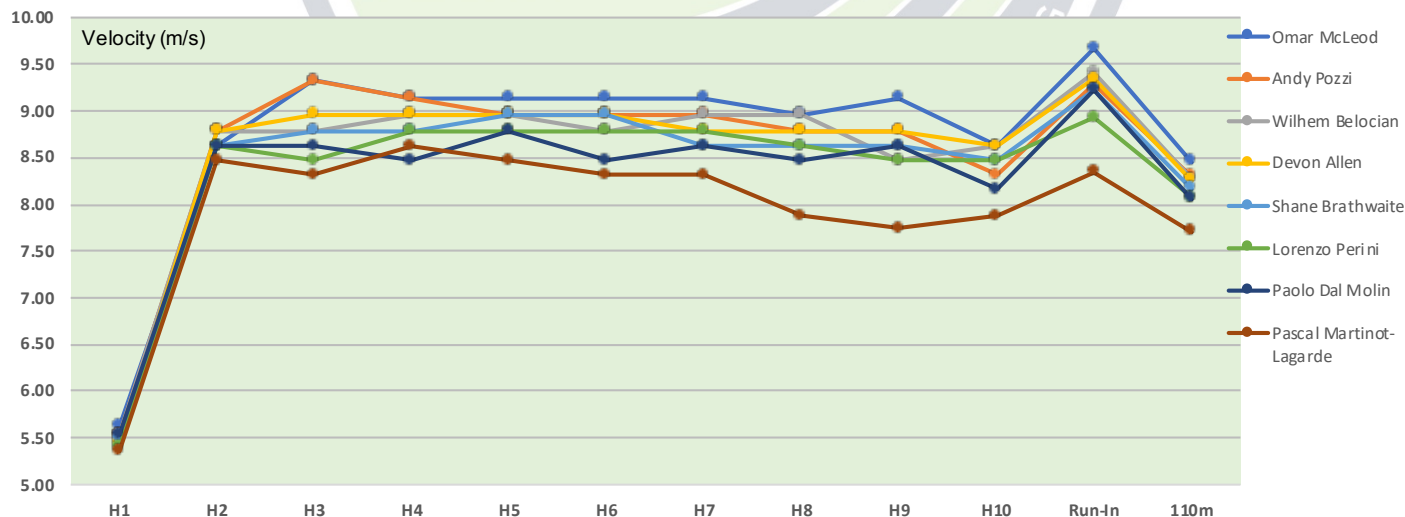
110m Hurdles

Date: 2021.06.10

Wind: -0.1 m/s

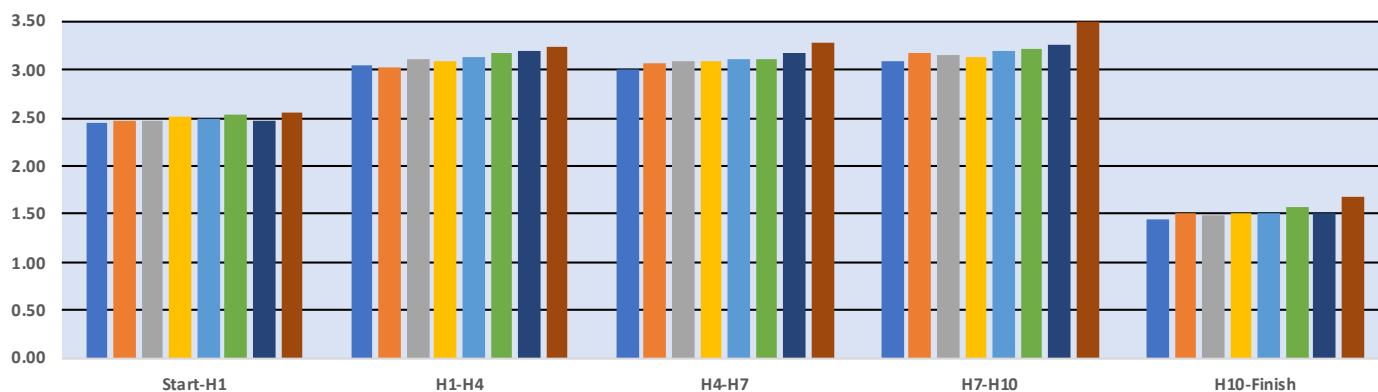
FINAL

			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		2.44	3.50	4.48	5.48	6.48	7.48	8.48	9.50	10.50	11.56		13.01	4 / 1			
	reaction time	0.147											1.45			3.04	3.00	3.08
	interval			1.06	0.98	1.00	1.00	1.00	1.00	1.02	1.00	1.06	1.45			9.02	9.14	8.90
Pozzi, Andy (GBR) (1992)	time		2.48	3.52	4.50	5.50	6.52	7.54	8.56	9.60	10.64	11.74		13.25	3 / 2			
	reaction time	0.113											1.51			3.02	3.06	3.18
	interval			1.04	0.98	1.00	1.02	1.02	1.02	1.04	1.04	1.10	1.51			9.08	8.96	8.62
Belocian, Wilhem (FRA) (1995)	time		2.48	3.52	4.56	5.58	6.60	7.64	8.66	9.68	10.76	11.82		13.31	6 / 3			
	reaction time	0.138											1.49			3.10	3.08	3.16
	interval			1.04	1.04	1.02	1.02	1.04	1.02	1.02	1.08	1.06	1.49			8.85	8.90	8.68
Allen, Devon (USA) (1994)	time		2.52	3.56	4.58	5.60	6.62	7.64	8.68	9.72	10.76	11.82		13.32	5 / 4			
	reaction time	0.136											1.50			3.08	3.08	3.14
	interval			1.04	1.02	1.02	1.02	1.02	1.04	1.04	1.04	1.06	1.50			8.90	8.90	8.73
Brathwaite, Shane (BAR) (1990)	time		2.50	3.56	4.60	5.64	6.66	7.68	8.74	9.80	10.86	11.94		13.46	1 / 5			
	reaction time	0.122											1.52			3.14	3.10	3.20
	interval			1.06	1.04	1.04	1.02	1.02	1.06	1.06	1.06	1.08	1.52			8.73	8.85	8.57
Perini, Lorenzo (ITA) (1994)	time		2.54	3.60	4.68	5.72	6.76	7.80	8.84	9.90	10.98	12.06		13.63	8 / 6			
	reaction time	0.140											1.57			3.18	3.12	3.22
	interval			1.06	1.08	1.04	1.04	1.04	1.04	1.06	1.08	1.08	1.57			8.62	8.79	8.52
Dal Molin, Paolo (ITA) (1987)	time		2.48	3.54	4.60	5.68	6.72	7.80	8.86	9.94	11.00	12.12		13.64	2 / 7			
	reaction time	0.142											1.52			3.20	3.18	3.26
	interval			1.06	1.06	1.08	1.04	1.08	1.06	1.08	1.06	1.12	1.52			8.57	8.62	8.41
Martino-Lagarde, Pascal (FRA) (1991)	time		2.56	3.64	4.74	5.80	6.88	7.98	9.08	10.24	11.42	12.58		14.26	7 / 8			
	reaction time	0.162											1.68			3.24	3.28	3.50
	interval			1.08	1.10	1.06	1.08	1.10	1.10	1.16	1.18	1.16	1.68			8.46	8.36	7.83
	velocity		5.62	8.62	9.33	9.14	9.14	9.14	9.14	8.96	9.14	8.62	9.67	8.46				
	velocity		5.53	8.79	9.33	9.14	8.96	8.96	8.96	8.79	8.79	8.31	9.28	8.30				
	velocity		5.53	8.79	9.33	9.14	8.96	8.96	8.96	8.79	8.79	8.31	9.28	8.30				
	velocity		5.44	8.79	8.96	8.96	8.96	8.96	8.79	8.79	8.79	8.62	9.35	8.26				
	velocity		5.49	8.62	8.79	8.79	8.96	8.96	8.62	8.62	8.62	8.46	9.22	8.17				
	velocity		5.40	8.62	8.46	8.79	8.79	8.79	8.79	8.62	8.46	8.46	8.93	8.07				
	velocity		5.36	8.62	8.62	8.46	8.79	8.46	8.62	8.46	8.62	8.16	9.22	8.06				
	velocity		5.36	8.46	8.31	8.62	8.46	8.31	8.31	7.88	7.75	7.88	8.35	7.71				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=fo1QXVBxBgQ>

Biomechanical Analysis

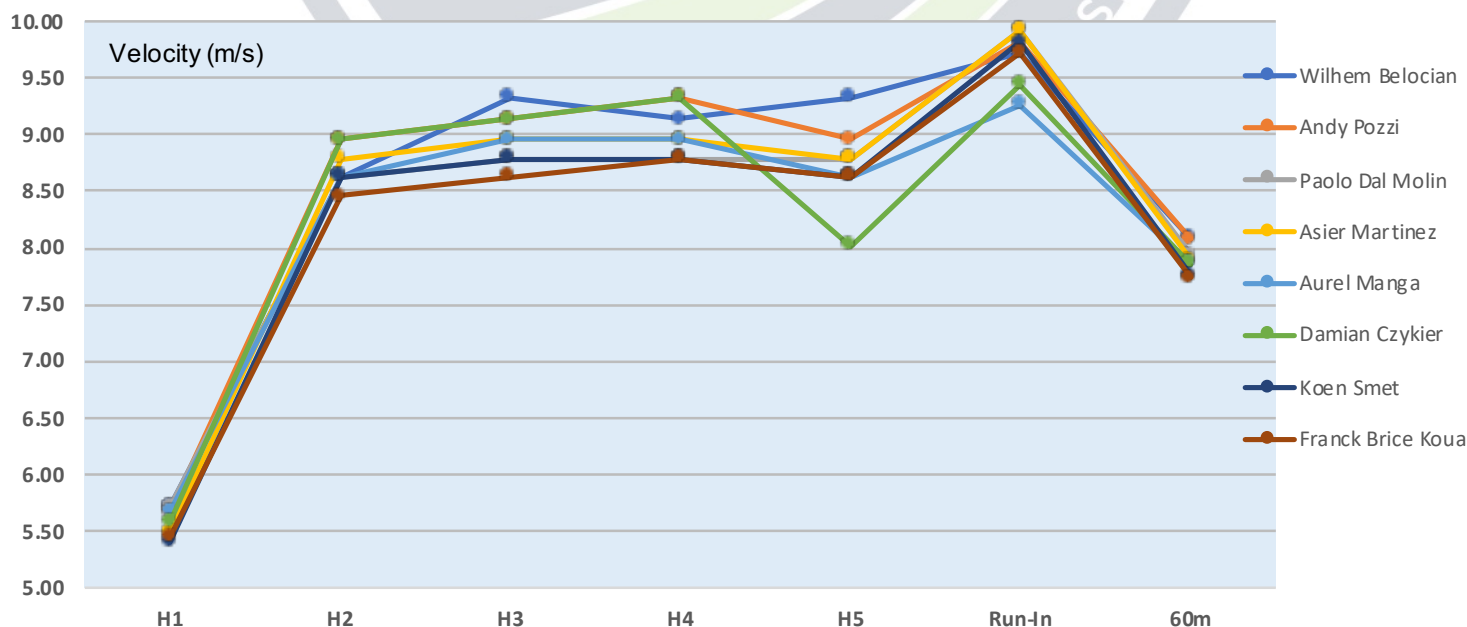
2021 European Indoor Championships (Toruń, POL) (TV Analysis)

Men's 60m Hurdles

Date: 2021.03.07

FINAL

		H1	H2	H3	H4	H5	Run-In	60m	Lane / Place
Belocian, Wilhem (FRA) (1995)	time	2.40	3.46	4.44	5.44	6.42		7.42	5 / 1
	reaction time	0.129						PB	
	interval velocity	5.72	8.62	9.33	9.14	9.33	9.72	8.09	
Pozzi, Andy (GBR) (1992)	time	2.42	3.44	4.44	5.42	6.44		7.43	6 / 2
	reaction time	0.151						=PB	
	interval velocity	7 steps 5.67	1.02 8.96	1.00 9.14	0.98 9.33	1.02 8.96	0.99 9.82	8.08	
Dal Molin, Paolo (ITA) (1987)	time	2.40	3.46	4.50	5.54	6.58		7.56	7 / 3
	reaction time	0.133							
	interval velocity	7 steps 5.72	1.06 8.62	1.04 8.79	1.04 8.79	1.04 8.79	0.98 9.92	7.94	
Martinez, Asier (ESP) (2000)	time	2.50	3.54	4.56	5.58	6.62		7.60	8 / 4
	reaction time	0.150						PB	
	interval velocity	7 steps 5.49	1.04 8.79	1.02 8.96	1.02 8.96	1.04 8.79	0.98 9.92	7.89	
Manga, Aurel (FRA) (1992)	time	2.42	3.48	4.50	5.52	6.58		7.63	3 / 5
	reaction time	0.152							
	interval velocity	7 steps 5.67	1.06 8.62	1.02 8.96	1.02 8.96	1.06 8.62	1.05 9.26	7.86	
Czykier, Damian (POL) (1992)	time	2.46	3.48	4.48	5.46	6.60		7.63	4 / 6
	reaction time	0.148							
	interval velocity	7 steps 5.58	1.02 8.96	1.00 9.14	0.98 9.33	1.14 8.02	1.03 9.44	7.86	
Smet, Koen (BEL) (1992)	time	2.54	3.60	4.64	5.68	6.74		7.73	1 / 7
	reaction time	0.144							
	interval velocity		1.06 5.40	1.04 8.62	1.04 8.79	1.06 8.62	0.99 9.82	7.76	
Koua, Franck Brice (ITA) (2001)	time	2.52	3.60	4.66	5.70	6.76		7.76	2 / 8
	reaction time	0.165							
	interval velocity		1.08 5.44	1.06 8.62	1.04 8.79	1.06 8.62	1.00 9.72	7.73	



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=uScuTGO4k8c>

Women's 100m Hurdles

2021 Top 10 Times - Women's 100m Hurdles

Camacho-Quinn, Jasmine (PUR) (1996)																			
Semi-Final 3 - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)																			
date		1-Aug	time	2.47	3.47	4.44	5.37	6.31	7.24	8.19	9.14	10.10	11.10	Henson (2021) - Athlete First: 2021 year end hurdle report					
reaction time		0.175	interval		1.00	0.97	0.93	0.94	0.93	0.95	0.95	0.96	1.00	1.16	OR NR	2.90	2.82	2.91	
wind		-0.2 m/s	velocity	5.26	8.50	8.76	9.14	9.04	9.14	8.95	8.95	8.85	8.50	8.66	8.16	8.79	9.04	8.76	
Camacho-Quinn, Jasmine (PUR) (1996)																			
FINAL - 2021 Tom Jones Invitational (Gainesville, FL) (TV Analysis)																			
date		17-Apr	time	2.43	3.43	4.43	5.40	6.37	7.30	8.24	9.24	10.17	11.17	Henson (2021) - Athlete First: 2021 year end hurdle report					
reaction time			interval		1.00	1.00	0.97	0.97	0.93	0.94	1.00	0.93	1.00	1.15	NR PB	2.97	2.84	2.93	
wind		1.7 m/s	velocity	5.35	8.50	8.50	8.76	8.76	9.14	9.04	8.50	9.14	8.50	8.74	8.12	8.59	8.98	8.70	
Camacho-Quinn, Jasmine (PUR) (1996)																			
FINAL - 2021 István Gyulai Memorial (Székesfehérvár, HUN) (TV Analysis)																			
date		6-Jul	time	2.48	3.50	4.47	5.43	6.37	7.30	8.24	9.21	10.18	11.14	Henson (2021) - Athlete First: 2021 year end hurdle report					
reaction time		0.178	interval		1.02	0.97	0.96	0.94	0.93	0.94	0.97	0.97	0.96	1.20		2.95	2.81	2.90	
wind		0.2 m/s	velocity	5.24	8.33	8.76	8.85	9.04	9.14	9.04	8.76	8.76	8.85	8.38	8.10	8.64	9.07	8.79	
Camacho-Quinn, Jasmine (PUR) (1996)																			
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)																			
date		2-Aug	time	2.44	3.44	4.42	5.38	6.32	7.26	8.20	9.14	10.10	11.14	12.37		5 / 1			
reaction time		0.149	interval		1.00	0.98	0.96	0.94	0.94	0.94	0.94	0.96	1.04	1.23		2.94	2.82	2.94	
wind		-0.3 m/s	velocity	5.33	8.50	8.67	8.85	9.04	9.04	9.04	9.04	8.85	8.17	8.17	8.08	8.67	9.04	8.67	
Camacho-Quinn, Jasmine (PUR) (1996)																			
FINAL - 2021 Golden Gala Pietro Mennea (Florence, ITA) (TV Analysis)																			
date		10-Jun	time	2.46	3.46	4.44	5.40	6.34	7.28	8.22	9.20	10.18	11.18	12.38		5 / 1			
reaction time		0.153	interval		1.00	0.98	0.96	0.94	0.94	0.94	0.98	0.98	1.00	1.20		2.94	2.82	2.96	
wind		-0.8 m/s	velocity	5.28	8.50	8.67	8.85	9.04	9.04	9.04	8.67	8.67	8.50	8.37	8.08	8.67	9.04	8.61	
Anderson, Brittany (JAM) (2001)																			
Semi-Final 2 - 2020 Olympic Games (Tokyo, JPN)																			
date		1-Aug	time																
reaction time		0.166	interval	No Information Available															
wind		0.0 m/s	velocity																
Camacho-Quinn, Jasmine (PUR) (1996)																			
Heat 5 - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)																			
date		31-Jul	time	2.47	3.47	4.47	5.44	6.38	7.34	8.29	9.25	10.23	11.23	Henson (2021) - Athlete First: 2021 year end hurdle report					
reaction time		0.153	interval		1.00	1.00	0.97	0.94	0.96	0.95	0.96	0.98	1.00	1.18		2.97	2.85	2.94	
wind		0.3 m/s	velocity	5.26	8.50	8.50	8.76	9.04	8.85	8.95	8.85	8.67	8.50	8.52	8.06	8.59	8.95	8.67	
Amusan, Tobi (NGR) (1997)																			
FINAL - 2021 Weltklasse (Zürich, SUI) (TV Analysis)																			
date		9-Sep	time	2.50	3.50	4.48	5.42	6.36	7.32	8.26	9.24	10.22	11.26	Henson (2021) - Athlete First: 2021 year end hurdle report					
reaction time		0.134	interval		1.00	0.98	0.94	0.94	0.96	0.94	0.98	0.98	1.04	1.16	AR	2.92	2.84	3.00	
wind		0.4 m/s	velocity	5.20	8.50	8.67	9.04	9.04	8.85	9.04	8.67	8.67	8.17	8.66	8.05	8.73	8.98	8.50	
Marshall, Tonea (USA) (1998)																			
Quarterfinal 1 - 2021 NCAA Championships Preliminary East Round (Jacksonville, FL) (TV Analysis)																			
date		29-May	time	2.40	3.40	4.36	5.32	6.30	7.27	8.23	9.20	10.22	11.24	Henson (2021) - Athlete First: 2021 year end hurdle report					
reaction time			interval		1.00	0.96	0.96	0.98	0.97	0.96	0.97	1.02	1.02	1.20	PB	2.92	2.91	3.01	
wind		0.8 m/s	velocity	5.42	8.50	8.85	8.85	8.67	8.76	8.85	8.76	8.33	8.33	8.38	8.04	8.73	8.76	8.47	
Camacho-Quinn, Jasmine (PUR) (1996)																			
FINAL - 2021 Fanny Blankers Koen Games (Hengelo, NED) (TV Analysis)																			
date		6-Jun	time	2.43	3.46	4.44	5.40	6.35	7.31	8.27	9.24	10.20	11.18	Henson (2021) - Athlete First: 2021 year end hurdle report					
reaction time			interval		1.03	0.98	0.96	0.95	0.96	0.96	0.97	0.96	0.98	1.26		2.97	2.87	2.91	
wind		0.5 m/s	velocity	5.35	8.25	8.67	8.85	8.95	8.85	8.85	8.76	8.85	8.67	7.98	8.04	8.59	8.89	8.76	
Camacho-Quinn, Jasmine (PUR) (1996)																			
FINAL - 2021 USATF Grand Prix (Eugene, OR) (TV Analysis)																			
date		24-Apr	time	2.47	3.47	4.45	5.40	6.37	7.32	8.29	9.28	10.26	11.26	Henson (2021) - Athlete First: 2021 year end hurdle report					
reaction time			interval		1.00	0.98	0.95	0.97	0.95	0.97	0.99	0.98	1.00	1.20		2.93	2.89	2.97	
wind		-0.3 m/s	velocity	5.26	8.50	8.67	8.95	8.76	8.95	8.76	8.59	8.67	8.50	8.37	8.03	8.70	8.82	8.59	
Harrison, Kendra (USA) (1992)																			
FINAL - 2020 USA Olympic Trials (Eugene, OR) (TV Analysis)																			
date		20-Jun	time	2.45	3.45	4.43	5.39	6.34	7.30	8.26	9.22	10.22	11.24	Henson (2021) - Athlete First: 2021 year end hurdle report					
reaction time		0.186	interval		1.00	0.98	0.96	0.95	0.96	0.96	0.96	1.00	1.02	1.23		2.94	2.87	2.98	
wind		0.8 m/s	velocity	5.31	8.50	8.67	8.85	8.95	8.85	8.85	8.85	8.50	8.33	8.17	8.02	8.67	8.89	8.56	

2021 Weltklasse (Zürich, SUI) (TV Analysis)

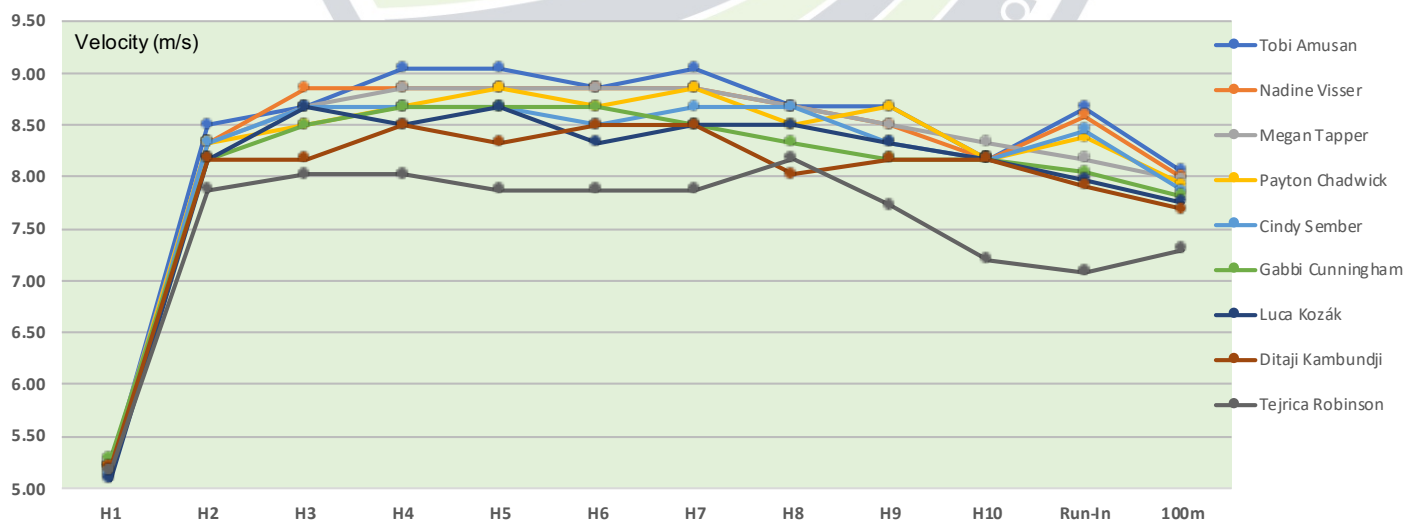
100m Hurdles

Date: 2021.09.09

Wind: 0.4 m/s

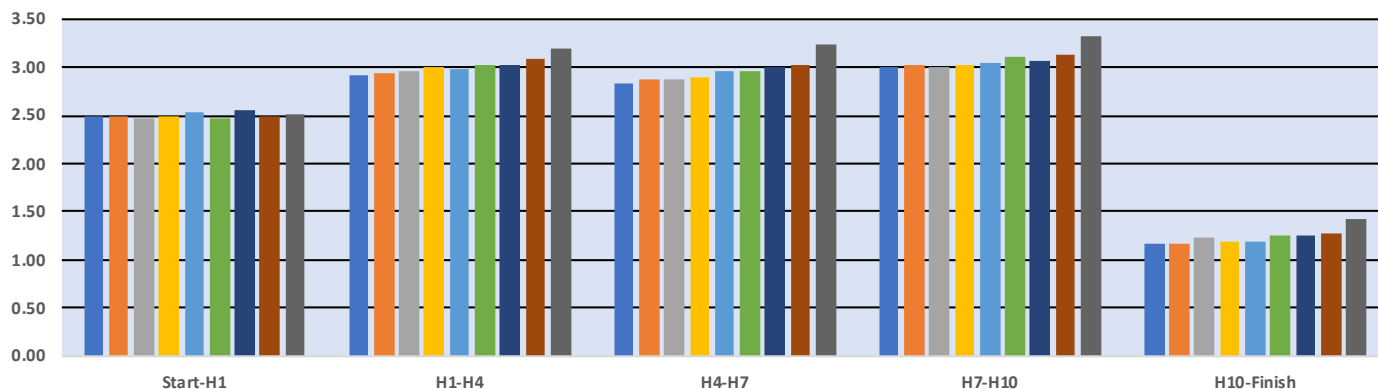
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Amusan, Tobi (NGR) (1997)	time		2.50	3.50	4.48	5.42	6.36	7.32	8.26	9.24	10.22	11.26		12.42	3 / 1			
	reaction time	0.134												AR		2.92	2.84	3.00
	interval			1.00	0.98	0.94	0.94	0.96	0.94	0.98	0.98	1.04	1.16	8.05		8.73	8.98	8.50
Visser, Nadine (NED) (1995)	time		2.50	3.52	4.48	5.44	6.40	7.36	8.32	9.30	10.30	11.34		12.51	4 / 2			
	reaction time	0.141												NR PB		2.94	2.88	3.02
	interval			1.02	0.96	0.96	0.96	0.96	0.96	0.98	1.00	1.04	1.17	7.99		8.67	8.85	8.44
Tapper, Megan (JAM) (1994)	time		2.48	3.50	4.48	5.44	6.40	7.36	8.32	9.30	10.30	11.32		12.55	5 / 3			
	reaction time	0.151														2.96	2.88	3.00
	interval			1.02	0.98	0.96	0.96	0.96	0.96	0.98	1.00	1.02	1.23	7.97		8.61	8.85	8.50
Chadwick, Payton (USA) (1995)	time		2.50	3.52	4.52	5.50	6.46	7.44	8.40	9.40	10.38	11.42		12.62	7 / 4			
	reaction time	0.132												PB		3.00	2.90	3.02
	interval			1.02	1.00	0.98	0.96	0.98	0.96	1.00	0.98	1.04	1.20	7.92		8.50	8.79	8.44
Sember, Cindy (GBR) (1994)	time		2.54	3.56	4.54	5.52	6.50	7.50	8.48	9.46	10.48	11.52		12.71	6 / 5			
	reaction time	0.161														2.98	2.96	3.04
	interval			1.02	0.98	0.98	0.98	1.00	0.98	0.98	1.02	1.04	1.19	7.87		8.56	8.61	8.39
Cunningham, Gabbi (USA) (1998)	time		2.46	3.50	4.50	5.48	6.46	7.44	8.44	9.46	10.50	11.54		12.79	2 / 6			
	reaction time	0.140														3.02	2.96	3.10
	interval			1.04	1.00	0.98	0.98	0.98	1.00	1.02	1.04	1.04	1.25	7.82		8.44	8.61	8.23
Kozák, Luca (HUN) (1996)	time		2.56	3.60	4.58	5.58	6.56	7.58	8.58	9.58	10.60	11.64		12.90	8 / 7			
	reaction time	0.187														3.02	3.00	3.06
	interval			1.04	0.98	1.00	0.98	1.02	1.00	1.00	1.02	1.04	1.26	7.75		8.44	8.50	8.33
Kambundji, Ditaji (SUI) (2002)	time		2.50	3.54	4.58	5.58	6.60	7.60	8.60	9.66	10.70	11.74		13.01	9 / 8			
	reaction time	0.142														3.08	3.02	3.14
	interval			1.04	1.04	1.00	1.02	1.00	1.00	1.06	1.04	1.04	1.27	7.69		8.28	8.44	8.12
Robinson, Tejrica (USA) (1998)	time		2.52	3.60	4.66	5.72	6.80	7.88	8.96	10.00	11.10	12.28		13.70	1 / 9			
	reaction time	0.134														3.20	3.24	3.32
	interval			1.08	1.06	1.06	1.08	1.08	1.08	1.04	1.10	1.18	1.42	7.30		7.97	7.87	7.68



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1078 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=vdPduqA76jQ>

2021 Memorial van Damme (Brussels, BEL) (TV Analysis)

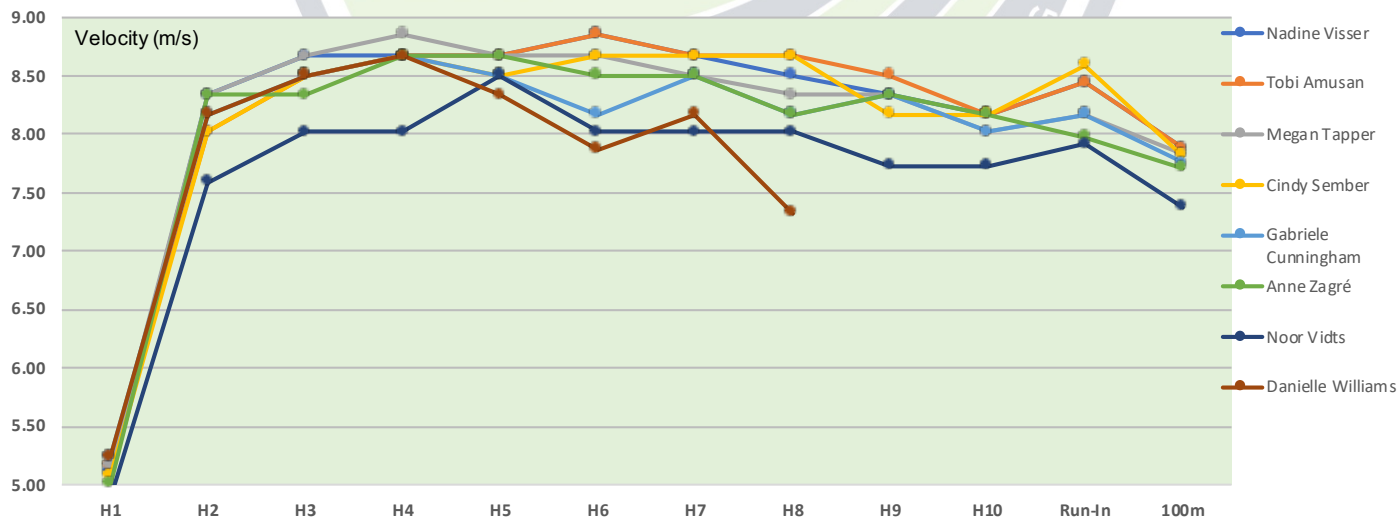
100m Hurdles

Date: 2021.09.03

Wind: 0.7 m/s

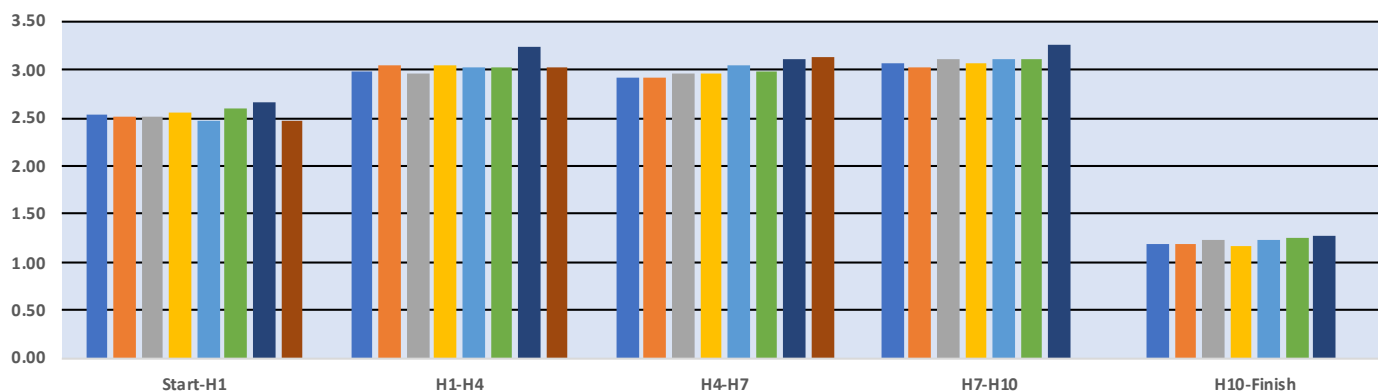
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Visser, Nadine (NED) (1995)	time		2.54	3.56	4.54	5.52	6.50	7.46	8.44	9.44	10.46	11.50		12.69	7 / 1			
	reaction time	0.141											1.19			2.98	2.92	3.06
	interval velocity		5.12	8.33	8.67	8.67	8.67	8.85	8.67	8.50	8.33	8.17	8.45	7.88		8.56	8.73	8.33
Amusan, Tobi (NGR) (1997)	time		2.52	3.58	4.58	5.56	6.54	7.50	8.48	9.46	10.46	11.50		12.69	5 / 2			
	reaction time	0.163											1.19			3.04	2.92	3.02
	interval velocity		5.16	8.02	8.50	8.67	8.67	8.85	8.67	8.67	8.50	8.17	8.45	7.88		8.39	8.73	8.44
Tapper, Megan (JAM) (1994)	time		2.52	3.54	4.52	5.48	6.46	7.44	8.44	9.46	10.48	11.54		12.77	6 / 3			
	reaction time	0.154											1.23			2.96	2.96	3.10
	interval velocity		5.16	8.33	8.67	8.85	8.67	8.67	8.50	8.33	8.33	8.02	8.17	7.83		8.61	8.61	8.23
Sember, Cindy (GBR) (1994)	time		2.56	3.62	4.62	5.60	6.60	7.58	8.56	9.54	10.58	11.62		12.79	2 / 4			
	reaction time	0.174											1.17			3.04	2.96	3.06
	interval velocity		5.08	8.02	8.50	8.67	8.50	8.67	8.67	8.67	8.17	8.17	8.59	7.82		8.39	8.61	8.33
Cunningham, Gabriele (USA) (1998)	time		2.48	3.52	4.52	5.50	6.50	7.54	8.54	9.58	10.60	11.66		12.89	4 / 5			
	reaction time	0.166											1.23			3.02	3.04	3.12
	interval velocity		5.24	8.17	8.50	8.67	8.50	8.17	8.50	8.17	8.33	8.02	8.17	7.76		8.44	8.39	8.17
Zagré, Anne (BEL) (1990)	time		2.60	3.62	4.64	5.62	6.60	7.60	8.60	9.64	10.66	11.70		12.96	8 / 6			
	reaction time	0.153											1.26			3.02	2.98	3.10
	interval velocity		5.00	8.33	8.33	8.67	8.67	8.50	8.50	8.17	8.33	8.17	7.98	7.72		8.44	8.56	8.23
Vidts, Noor (BEL) (1996)	time		2.66	3.78	4.84	5.90	6.90	7.96	9.02	10.08	11.18	12.28		13.55	1 / 7			
	reaction time	0.150											1.27			3.24	3.12	3.26
	interval velocity		4.89	7.59	8.02	8.02	8.50	8.02	8.02	8.02	7.73	7.73	7.91	7.38		7.87	8.17	7.82
Williams, Danielle (JAM) (1992)	time		2.48	3.52	4.52	5.50	6.52	7.60	8.64	9.80					3 / --			
	reaction time	0.129														3.02	3.14	
	interval velocity		5.24	8.17	8.50	8.67	8.33	7.87	8.17	7.33						8.44	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=fwwaaSDT074>

2021 Meeting de Paris (Paris, FRA) (TV Analysis)

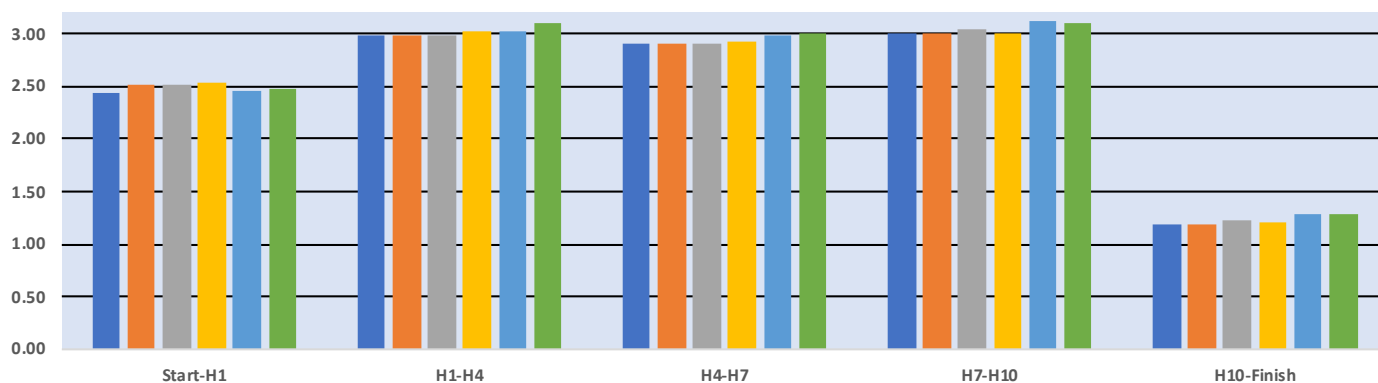
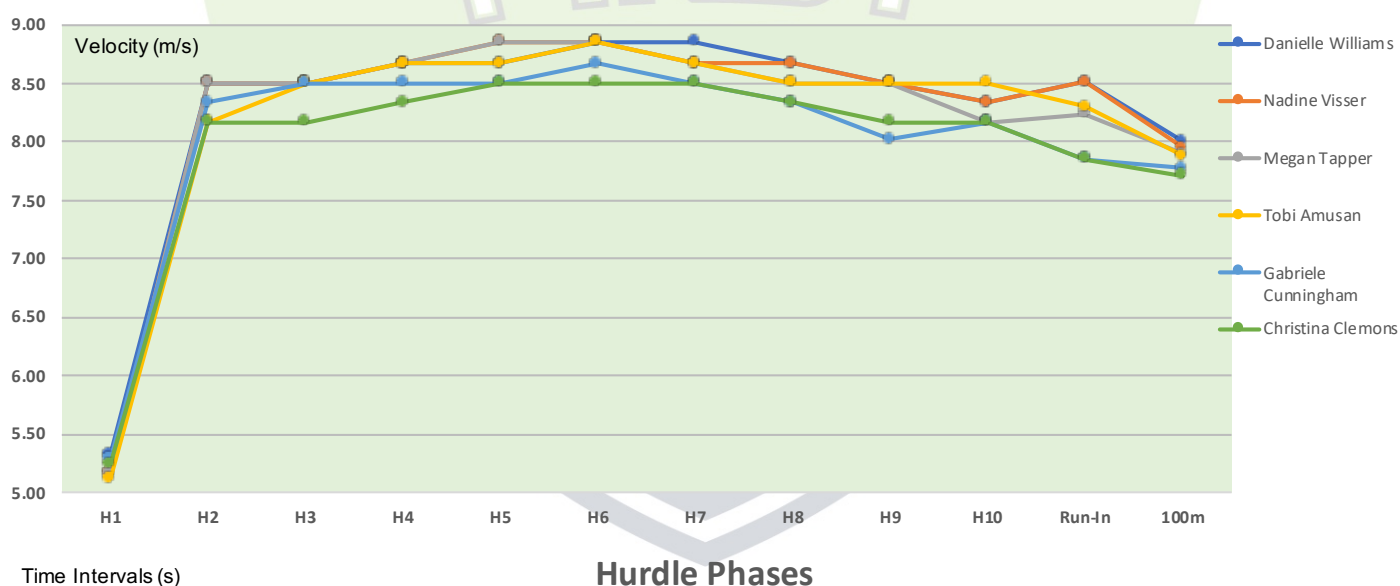
100m Hurdles

Date: 2021.08.28

Wind: 1.7 m/s

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Williams, Danielle (JAM) (1992)	time	2.44	3.44	4.44	5.42	6.40	7.36	8.32	9.30	10.30	11.32		12.50	2 / 1			
	reaction time	0.137										1.18			2.98	2.90	3.00
	interval velocity		1.00	1.00	0.98	0.98	0.96	0.96	0.98	1.00	1.02	1.18			8.56	8.79	8.50
Visser, Nadine (NED) (1995)	time	2.52	3.52	4.52	5.50	6.46	7.42	8.40	9.38	10.38	11.40		12.58	3 / 2			
	reaction time	0.152											NR PB		2.98	2.90	3.00
	interval velocity		1.00	1.00	0.98	0.96	0.96	0.98	1.00	1.02	1.02	1.18	7.95		8.56	8.79	8.50
Tapper, Megan (JAM) (1994)	time	2.52	3.52	4.52	5.50	6.46	7.42	8.40	9.40	10.40	11.44		12.66	5 / 3			
	reaction time	0.152										1.22			2.98	2.90	3.04
	interval velocity		1.00	1.00	0.98	0.96	0.96	0.98	1.00	1.00	1.04	1.22	7.90		8.56	8.79	8.39
Amusan, Tobi (NGR) (1997)	time	2.54	3.58	4.58	5.56	6.54	7.50	8.48	9.48	10.48	11.48		12.69	4 / 4			
	reaction time	0.155										1.21			3.02	2.92	3.00
	interval velocity		1.04	1.00	0.98	0.98	0.96	0.98	1.00	1.00	1.00	1.21	7.88		8.44	8.73	8.50
Cunningham, Gabriele (USA) (1998)	time	2.46	3.48	4.48	5.48	6.48	7.46	8.46	9.48	10.54	11.58		12.86	6 / 5			
	reaction time	0.169										1.28			3.02	2.98	3.12
	interval velocity		1.02	1.00	1.00	1.00	0.98	1.00	1.02	1.06	1.04	1.28	7.78		8.44	8.56	8.17
Clemons, Christina (USA) (1990)	time	2.48	3.52	4.56	5.58	6.58	7.58	8.58	9.60	10.64	11.68		12.96	7 / 6			
	reaction time	0.150										1.28			3.10	3.00	3.10
	interval velocity		1.04	1.04	1.02	1.00	1.00	1.00	1.02	1.04	1.04	1.28	7.72		8.23	8.50	8.23



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=JF2MV57m2UA>

2020 Olympic Games (Tokyo, JPN) (TV Analysis)

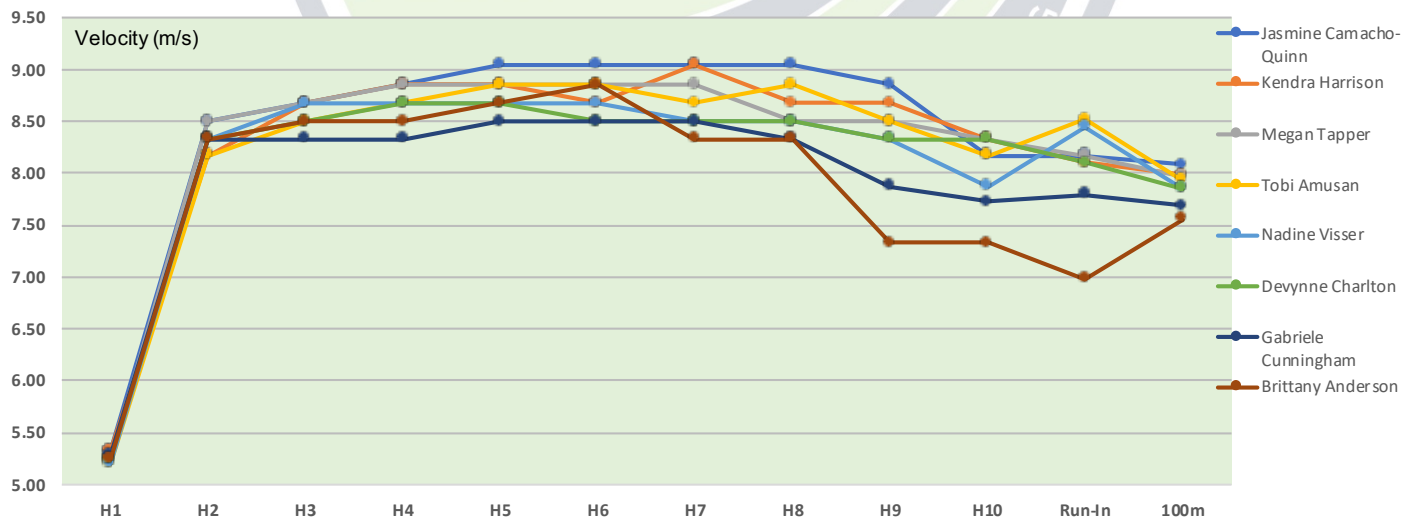
100m Hurdles

Date: 2021.08.02

Wind: -0.3 m/s

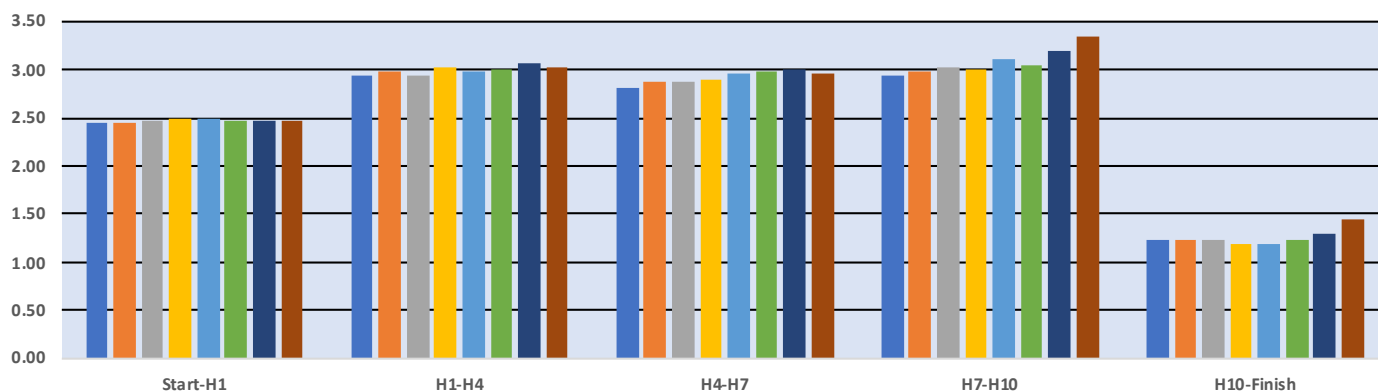
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	time		2.44	3.44	4.42	5.38	6.32	7.26	8.20	9.14	10.10	11.14		12.37	5 / 1			
	reaction time	0.149											1.23			2.94	2.82	2.94
	interval velocity		5.33	8.50	8.67	8.85	9.04	9.04	9.04	9.04	8.85	8.17	8.17	8.08		8.67	9.04	8.67
Harrison, Kendra (USA) (1992)	time		2.44	3.48	4.46	5.42	6.38	7.36	8.30	9.28	10.26	11.28		12.52	4 / 2			
	reaction time	0.158											1.24			2.98	2.88	2.98
	interval velocity		5.33	8.17	8.67	8.85	8.85	8.67	9.04	8.67	8.67	8.33	8.10	7.99		8.56	8.85	8.56
Tapper, Megan (JAM) (1994)	time		2.48	3.48	4.46	5.42	6.38	7.34	8.30	9.30	10.30	11.32		12.55	9 / 3			
	reaction time	0.166											1.23			2.94	2.88	3.02
	interval velocity		5.24	8.50	8.67	8.85	8.85	8.85	8.85	8.50	8.50	8.33	8.17	7.97		8.67	8.85	8.44
Amusan, Tobi (NGR) (1997)	time		2.50	3.54	4.54	5.52	6.48	7.44	8.42	9.38	10.38	11.42		12.60	6 / 4			
	reaction time	0.161											1.18			3.02	2.90	3.00
	interval velocity		5.20	8.17	8.50	8.67	8.85	8.85	8.67	8.85	8.50	8.17	8.52	7.94		8.44	8.79	8.50
Visser, Nadine (NED) (1995)	time		2.50	3.52	4.50	5.48	6.46	7.44	8.44	9.44	10.46	11.54		12.73	3 / 5			
	reaction time	0.152											1.19			2.98	2.96	3.10
	interval velocity		5.20	8.33	8.67	8.67	8.67	8.67	8.50	8.50	8.33	7.87	8.45	7.86		8.56	8.61	8.23
Charlton, Devynne (BAH) (1995)	time		2.48	3.50	4.50	5.48	6.46	7.46	8.46	9.46	10.48	11.50		12.74	8 / 6			
	reaction time	0.144											1.24			3.00	2.98	3.04
	interval velocity		5.24	8.33	8.50	8.67	8.67	8.50	8.50	8.50	8.33	8.33	8.10	7.85		8.50	8.56	8.39
Cunningham, Gabriele (USA) (1998)	time		2.46	3.48	4.50	5.52	6.52	7.52	8.52	9.54	10.62	11.72		13.01	2 / 7			
	reaction time	0.172											1.29			3.06	3.00	3.20
	interval velocity		5.28	8.33	8.33	8.33	8.50	8.50	8.50	8.33	7.87	7.73	7.79	7.69		8.33	8.50	7.97
Anderson, Brittany (JAM) (2001)	time		2.48	3.50	4.50	5.50	6.48	7.44	8.46	9.48	10.64	11.80		13.24	7 / 8			
	reaction time	0.164											1.44			3.02	2.96	3.34
	interval velocity		5.24	8.33	8.50	8.50	8.67	8.85	8.33	8.33	7.33	7.33	6.98	7.55		8.44	8.61	7.63



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=9hrIYSJokPA>

2020 Olympic Games (Tokyo, JPN) (TV Analysis)

100m Hurdles

Date: 2021.08.01

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
Camacho-Quinn, Jasmine (PUR) (199)	2.47	3.47	4.44	5.37	6.31	7.24	8.19	9.14	10.10	11.10	12.26	12.26	7 / 1			
reaction time	0.175													2.90	2.82	2.91
interval		1.00	0.97	0.93	0.94	0.93	0.95	0.95	0.96	1.00	1.16	OR NR		8.79	9.04	8.76
velocity	5.26	8.50	8.76	9.14	9.04	9.14	8.95	8.95	8.85	8.50	8.66	8.16				

Date: 2021.08.01

Wind: 0.0 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
Anderson, Brittany (JAM) (2001)												12.40	4 / 1	0.00	0.00	0.00
reaction time	0.158													#DIV/0!	#DIV/0!	#DIV/0!
interval												0.81				
velocity	#DIV/0!											8.06				
Harrison, Kendra (USA) (1992)												12.51	7 / 2	0.00	0.00	0.00
reaction time	0.166													#DIV/0!	#DIV/0!	#DIV/0!
interval												0.80				
velocity	#DIV/0!											7.99				

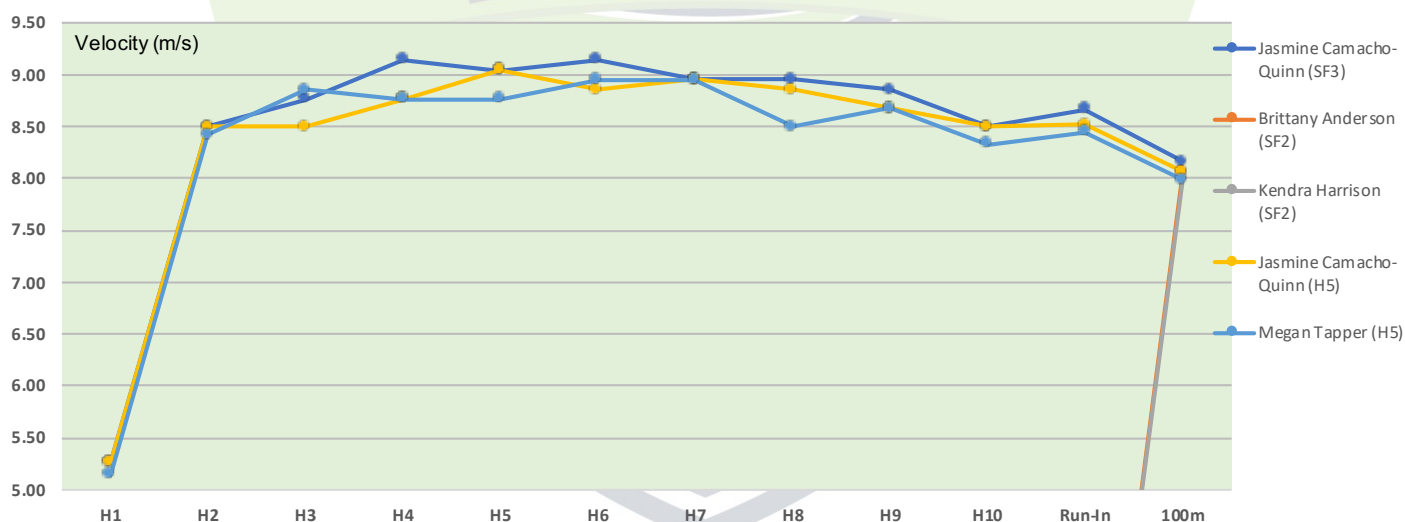
100m Hurdles

Date: 2021.07.31

Wind: 0.3 m/s

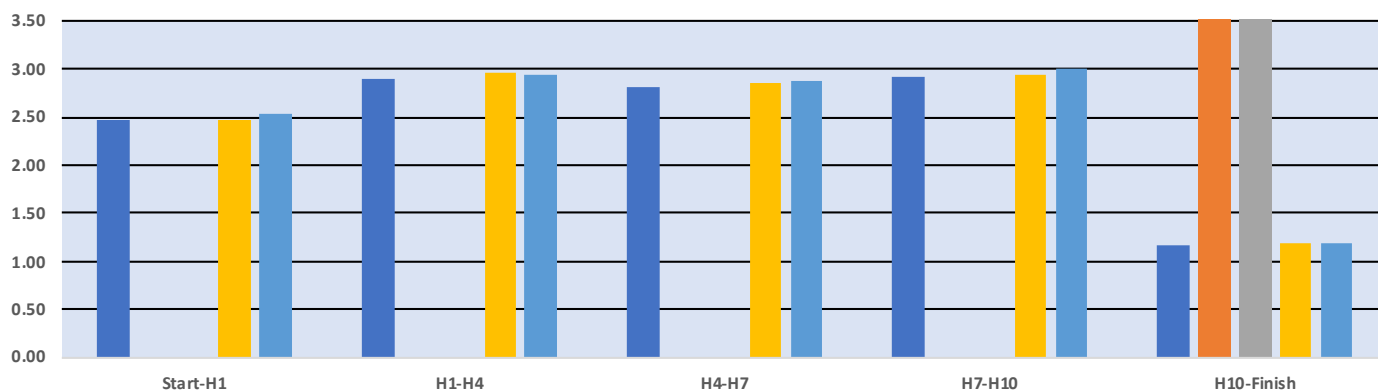
Heat 5

	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	2.47	3.47	4.47	5.44	6.38	7.34	8.29	9.25	10.23	11.23	12.41	12.41	2 / 1	2.97	2.85	2.94
reaction time	0.153													8.59	8.95	8.67
interval		1.00	1.00	0.97	0.94	0.96	0.95	0.96	0.98	1.00	1.18					
velocity	5.26	8.50	8.50	8.76	9.04	8.85	8.95	8.85	8.67	8.50	8.52	8.06				
Tapper, Megan (JAM) (1994)	2.53	3.54	4.50	5.47	6.44	7.39	8.34	9.34	10.32	11.34	12.53	12.53	5 / 2	2.94	2.87	3.00
reaction time	0.152													8.67	8.89	8.50
interval		1.01	0.96	0.97	0.97	0.95	0.95	1.00	0.98	1.02	1.19	PB				
velocity	5.14	8.42	8.85	8.76	8.76	8.95	8.95	8.50	8.67	8.33	8.45	7.98				



Time Intervals (s)

Hurdle Phases



Semi-Final 3

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 24fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=AeBK5Gc304c>

Heat 5

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 24fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=1h72o8u5PM>

Semi-Final 2

Evaluated with: ObjectusVideo

Quality & Frame Rate:

Timing From:

Source:

2021 Müller British Grand Prix (Gateshead, GBR) (TV Analysis)

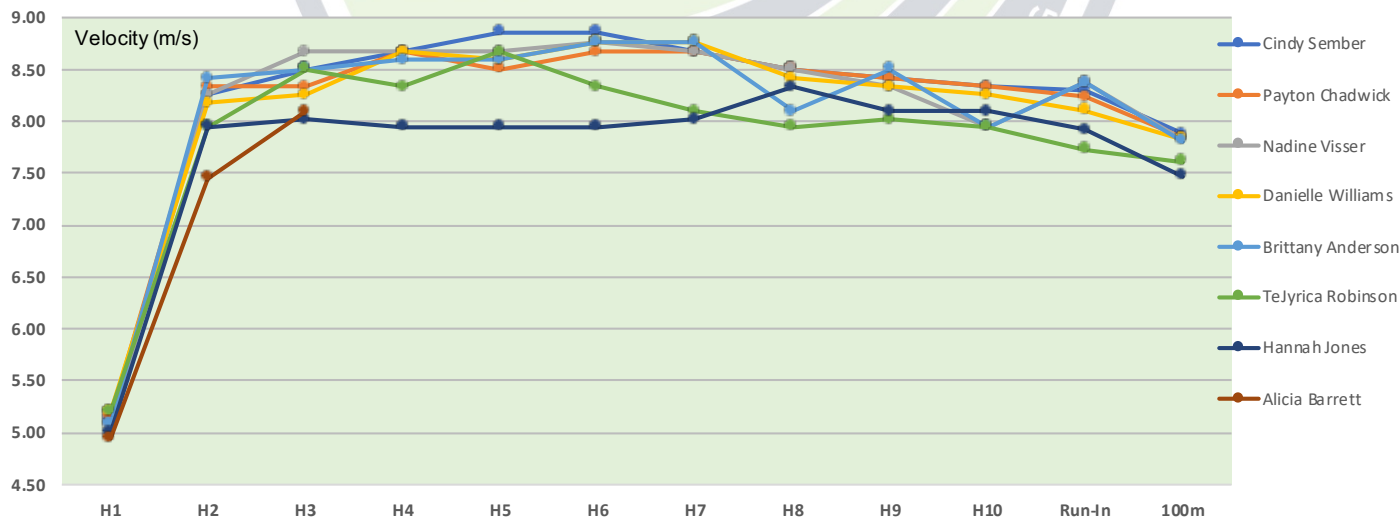
100m Hurdles

Date: 2021.07.13

Wind: 1.5 m/s

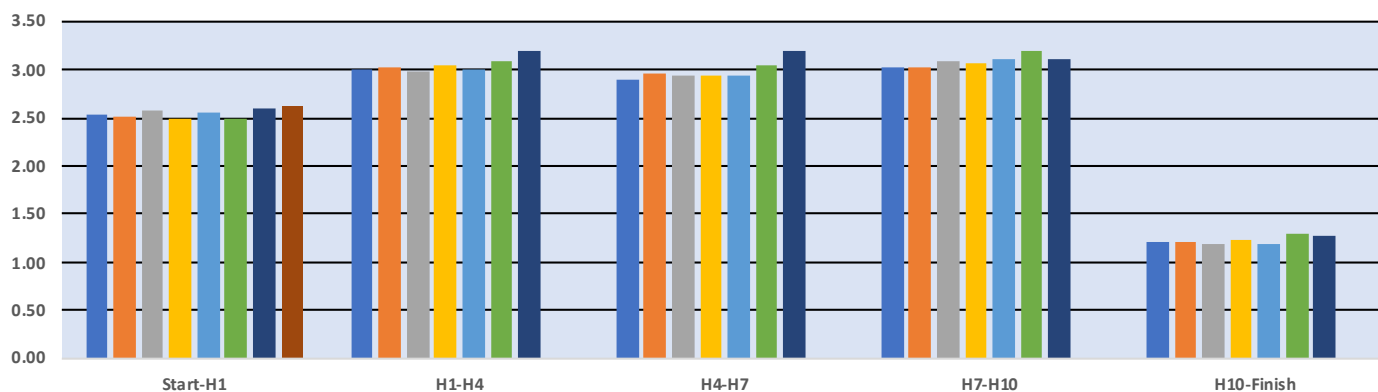
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Sember, Cindy (GBR) (1994)	time	2.54	3.57	4.57	5.55	6.51	7.47	8.45	9.45	10.46	11.48		12.69	4 / 1			
	reaction time	0.195													3.01	2.90	3.03
	interval velocity		1.03	1.00	0.98	0.96	0.96	0.98	1.00	1.01	1.02	1.21			8.47	8.79	8.42
Chadwick, Payton (USA) (1995)	time	2.52	3.54	4.56	5.54	6.54	7.52	8.50	9.50	10.51	11.53		12.75	3 / 2			
	reaction time	0.172													3.02	2.96	3.03
	interval velocity		1.02	1.02	0.98	1.00	0.98	0.98	1.00	1.01	1.02	1.22			8.44	8.61	8.42
Visser, Nadine (NED) (1995)	time	2.57	3.60	4.58	5.56	6.54	7.51	8.49	9.49	10.51	11.58		12.78	7 / 3			
	reaction time	0.180													2.99	2.93	3.09
	interval velocity		1.03	0.98	0.98	0.98	0.97	0.98	1.00	1.02	1.07	1.20			8.53	8.70	8.25
Williams, Danielle (JAM) (1992)	time	2.50	3.54	4.57	5.55	6.54	7.51	8.48	9.49	10.51	11.54		12.78	6 / 4			
	reaction time	0.158													3.05	2.93	3.06
	interval velocity		1.04	1.03	0.98	0.99	0.97	0.97	1.01	1.02	1.03	1.24			8.36	8.70	8.33
Anderson, Brittany (JAM) (2001)	time	2.56	3.57	4.57	5.56	6.55	7.52	8.49	9.54	10.54	11.61		12.81	5 / 5			
	reaction time	0.191													3.00	2.93	3.12
	interval velocity		1.01	1.00	0.99	0.99	0.97	0.97	1.05	1.00	1.07	1.20			8.50	8.70	8.17
Robinson, TeJyrica (USA) (1998)	time	2.50	3.57	4.57	5.59	6.57	7.59	8.64	9.71	10.77	11.84		13.14	2 / 6			
	reaction time	0.147													3.09	3.05	3.20
	interval velocity		1.07	1.00	1.02	0.98	1.02	1.05	1.07	1.06	1.07	1.30			8.25	8.36	7.97
Jones, Hannah (AUS) (1995)	time	2.60	3.67	4.73	5.80	6.87	7.94	9.00	10.02	11.07	12.12		13.39	8 / 7			
	reaction time	0.175													3.20	3.20	3.12
	interval velocity		1.07	1.06	1.07	1.07	1.07	1.06	1.02	1.05	1.05	1.27			7.97	7.97	8.17
Barrett, Alicia (GBR) (1998)	time	2.63	3.77	4.82									dnf	1 / --			
	reaction time	0.180															
	interval velocity		1.14	1.05													
			4.94	7.46	8.10												



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=Wd8ybBUY-Js>

2021 István Gyulai Memorial (Székesfehérvár, HUN) (TV Analysis)

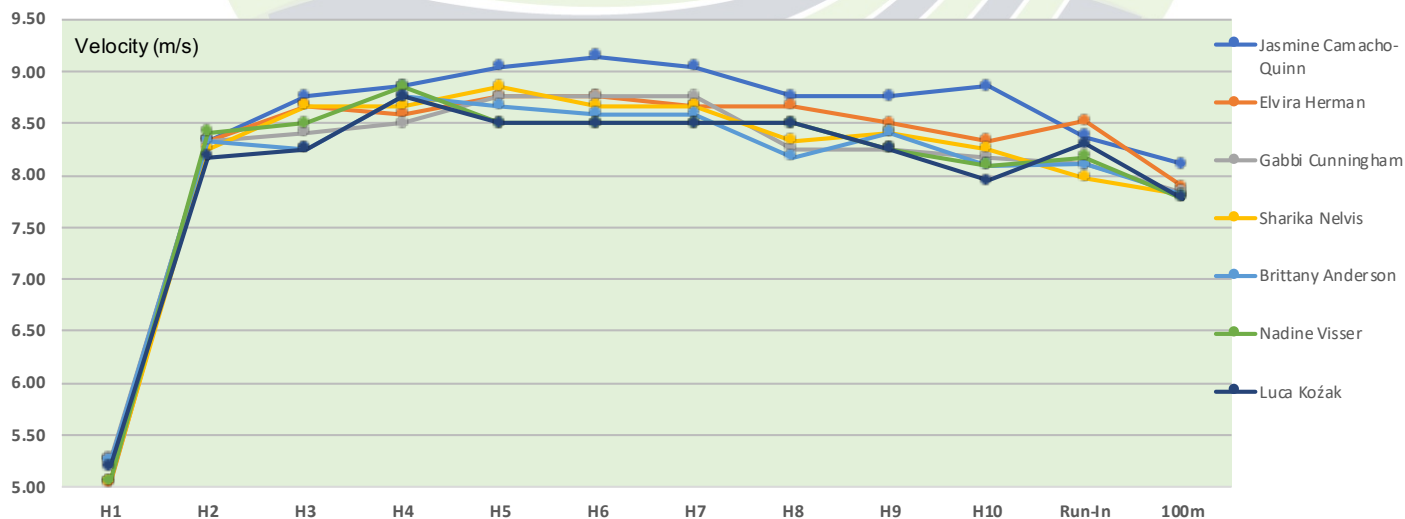
100m Hurdles

Date: 2021.07.06

Wind: 0.2 m/s

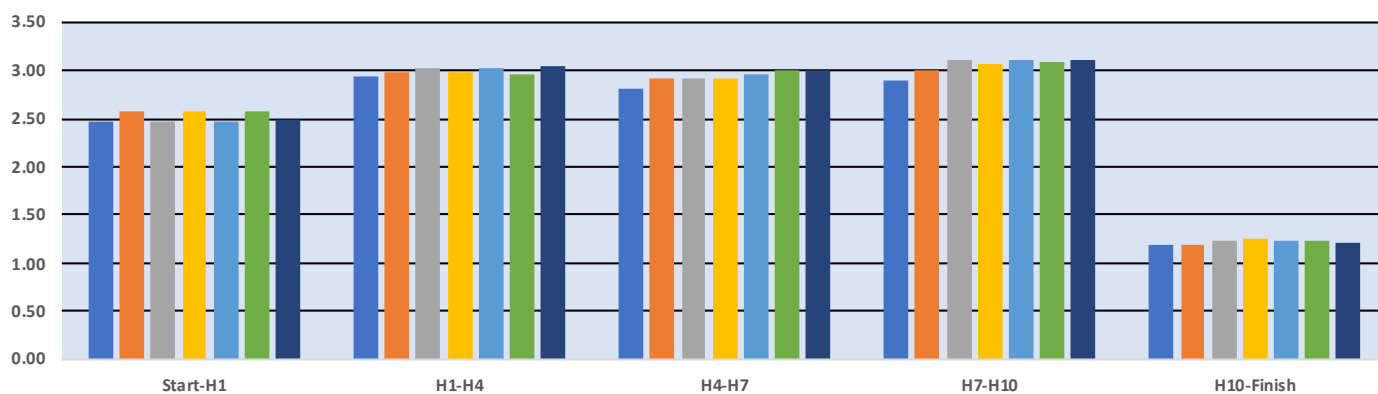
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	time		2.48	3.50	4.47	5.43	6.37	7.30	8.24	9.21	10.18	11.14		12.34	4 / 1			
	reaction time	0.178														2.95	2.81	2.90
	interval			1.02	0.97	0.96	0.94	0.93	0.94	0.97	0.97	0.96	1.20			8.64	9.07	8.79
Herman, Elvira (BLR) (1997)	time		2.58	3.60	4.58	5.57	6.54	7.51	8.49	9.47	10.47	11.49		12.67	3 / 2			
	reaction time	0.152														2.99	2.92	3.00
	interval			1.02	0.98	0.99	0.97	0.97	0.98	0.98	1.00	1.02	1.18			8.53	8.73	8.50
Cunningham, Gabbi (USA) (1998)	time		2.47	3.49	4.50	5.50	6.47	7.44	8.41	9.44	10.47	11.51		12.75	7 / 3			
	reaction time	0.171														3.03	2.91	3.10
	interval			1.02	1.01	1.00	0.97	0.97	0.97	1.03	1.03	1.04	1.24			8.42	8.76	8.23
Nelvis, Sharika (USA) (1990)	time		2.57	3.60	4.58	5.56	6.52	7.50	8.48	9.50	10.51	11.54		12.80	1 / 4			
	reaction time	0.152														2.99	2.92	3.06
	interval			1.03	0.98	0.98	0.96	0.98	0.98	1.02	1.01	1.03	1.26			8.53	8.73	8.33
Anderson, Brittany (JAM) (2001)	time		2.48	3.50	4.53	5.50	6.48	7.47	8.46	9.50	10.51	11.56		12.80	2 / 4			
	reaction time	0.134														3.02	2.96	3.10
	interval			1.02	1.03	0.97	0.98	0.99	0.99	1.04	1.01	1.05	1.24			8.44	8.61	8.23
Visser, Nadine (NED) (1995)	time		2.57	3.58	4.58	5.54	6.54	7.54	8.54	9.54	10.57	11.62		12.85	5 / 6			
	reaction time	0.152														2.97	3.00	3.08
	interval			1.01	1.00	0.96	1.00	1.00	1.00	1.03	1.05	1.23				8.59	8.50	8.28
Kozák, Luca (HUN) (1996)	time		2.50	3.54	4.57	5.54	6.54	7.54	8.54	9.54	10.57	11.64		12.85	6 / 7			
	reaction time	0.150														3.04	3.00	3.10
	interval			1.04	1.03	0.97	1.00	1.00	1.00	1.03	1.07	1.21				8.39	8.50	8.23
	time																	
	reaction time																	
	interval																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=IGkDW0YnCD8>

2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

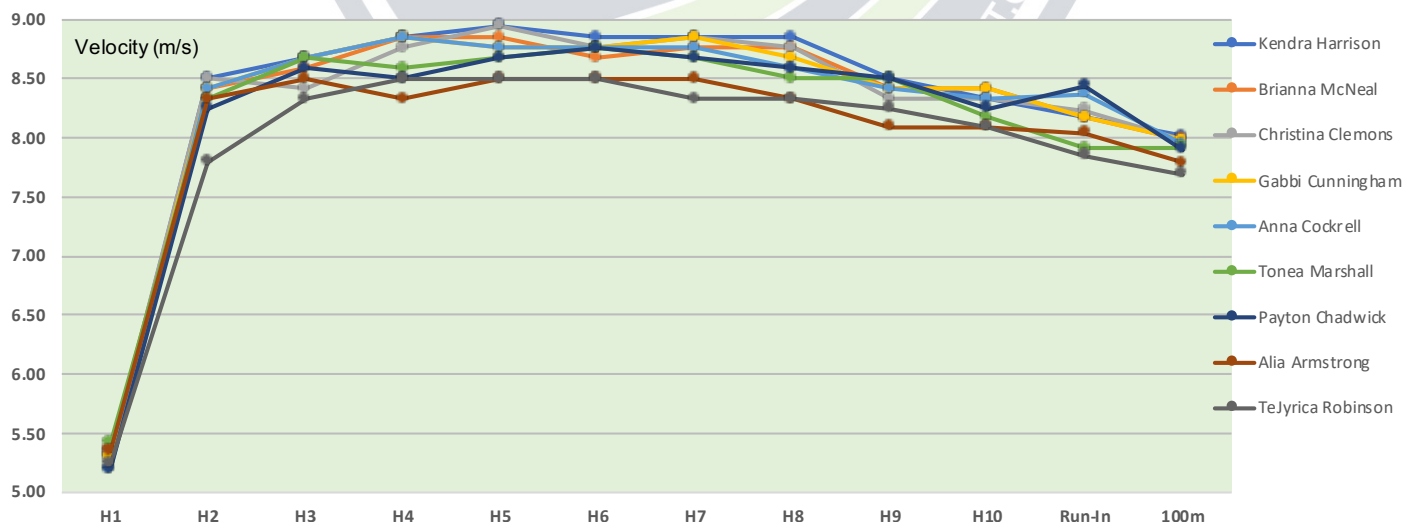
100m Hurdles

Date: 2021.06.20

Wind: 0.8 m/s

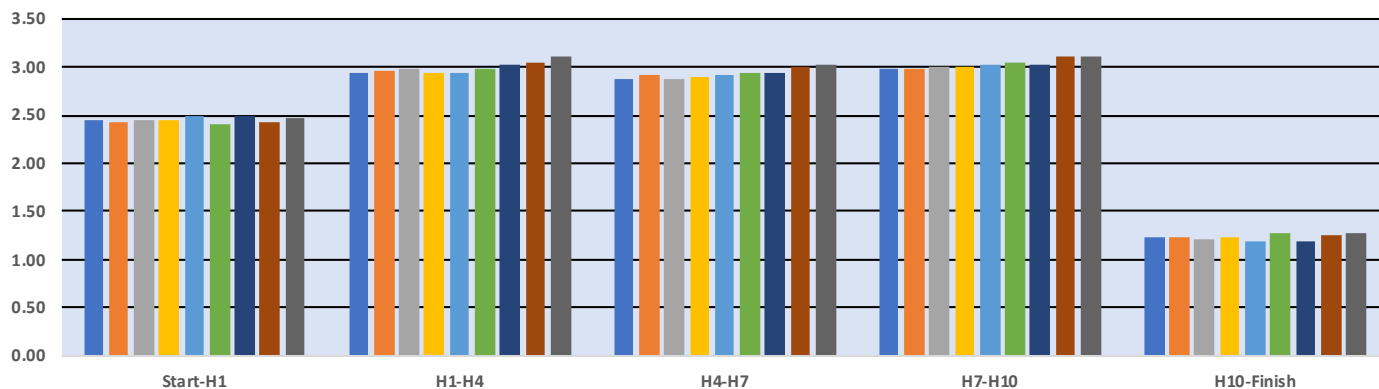
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.45	3.45	4.43	5.39	6.34	7.30	8.26	9.22	10.22	11.24		12.47	4 / 1			
	reaction time	0.186													2.94	2.87	2.98
	interval		1.00	0.98	0.96	0.95	0.96	0.96	0.96	1.00	1.02	1.23			8.67	8.89	8.56
McNeal, Brianna (USA) (1991)	time	2.42	3.43	4.42	5.38	6.34	7.32	8.29	9.26	10.27	11.28		12.51	2 / 2			
	reaction time	0.152													2.96	2.91	2.99
	interval		1.01	0.99	0.96	0.96	0.98	0.97	0.97	1.01	1.01	1.23			8.61	8.76	8.53
Clemons, Christina (USA) (1990)	time	2.44	3.44	4.45	5.42	6.37	7.34	8.30	9.27	10.29	11.31		12.53	6 / 3			
	reaction time	0.139													2.98	2.88	3.01
	interval		1.00	1.01	0.97	0.95	0.97	0.96	0.97	1.02	1.02	1.22			8.56	8.85	8.47
Cunningham, Gabbi (USA) (1998)	time	2.45	3.46	4.44	5.40	6.37	7.34	8.30	9.28	10.29	11.30		12.53	8 / 4			
	reaction time	0.153													2.95	2.90	3.00
	interval		1.01	0.98	0.96	0.97	0.97	0.96	0.98	1.01	1.01	1.23			8.64	8.79	8.50
Cockrell, Anna (USA) (1997)	time	2.50	3.51	4.49	5.45	6.42	7.39	8.36	9.35	10.36	11.38		12.58	3 / 5			
	reaction time	0.147													2.95	2.91	3.02
	interval		1.01	0.98	0.96	0.97	0.97	0.97	0.99	1.01	1.02	1.20			8.64	8.76	8.44
Marshall, Tonea (USA) (1998)	time	2.40	3.42	4.40	5.39	6.37	7.34	8.32	9.32	10.32	11.36		12.63	5 / 6			
	reaction time	0.130													2.99	2.93	3.04
	interval		1.02	0.98	0.99	0.98	0.97	0.98	1.00	1.00	1.04	1.27			8.53	8.70	8.39
Chadwick, Payton (USA) (1995)	time	2.50	3.53	4.52	5.52	6.50	7.47	8.45	9.44	10.44	11.47		12.66	7 / 7			
	reaction time	0.190													3.02	2.93	3.02
	interval		1.03	0.99	1.00	0.98	0.97	0.98	0.99	1.00	1.03	1.19			8.44	8.70	8.44
Armstrong, Alia (USA) (2000)	time	2.43	3.45	4.45	5.47	6.47	7.47	8.47	9.49	10.54	11.59		12.84	1 / 8			
	reaction time	0.153													3.04	3.00	3.12
	interval		1.02	1.00	1.02	1.00	1.00	1.00	1.02	1.05	1.05	1.25			8.39	8.50	8.17
Robinson, TeJyrica (USA) (1998)	time	2.48	3.57	4.59	5.59	6.59	7.59	8.61	9.63	10.66	11.71		12.99	9 / 9			
	reaction time	0.143													3.11	3.02	3.10
	interval		1.09	1.02	1.00	1.00	1.00	1.02	1.02	1.03	1.05	1.28			8.20	8.44	8.23
	velocity																



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=G15l57y6nBM>

2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

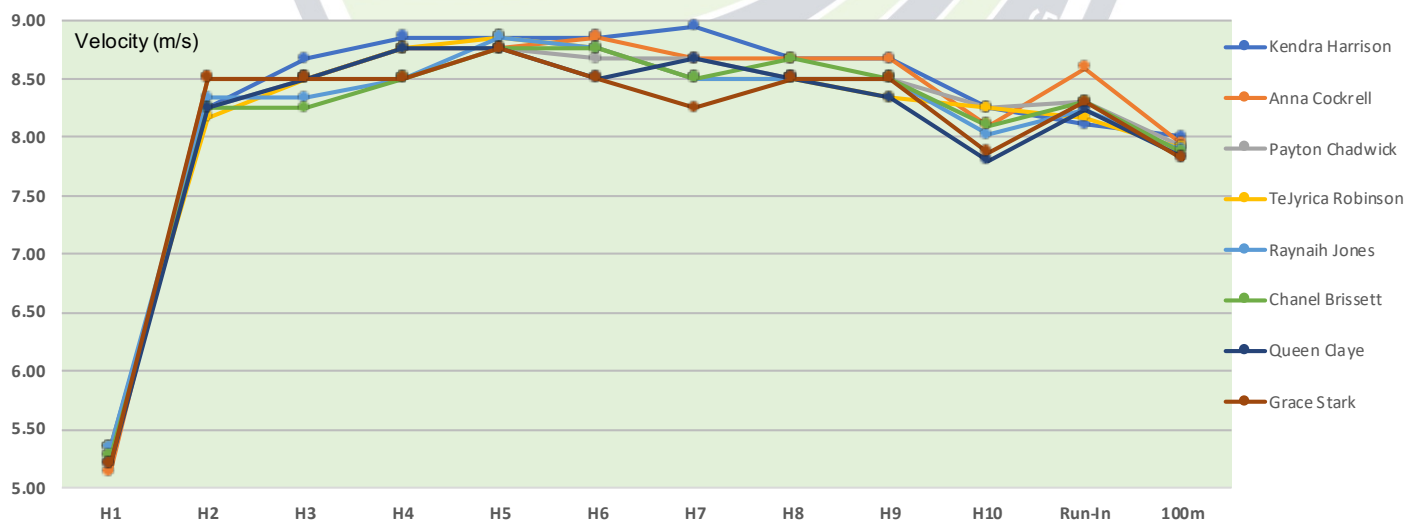
100m Hurdles

Date: 2021.06.20

Wind: 1.3 m/s

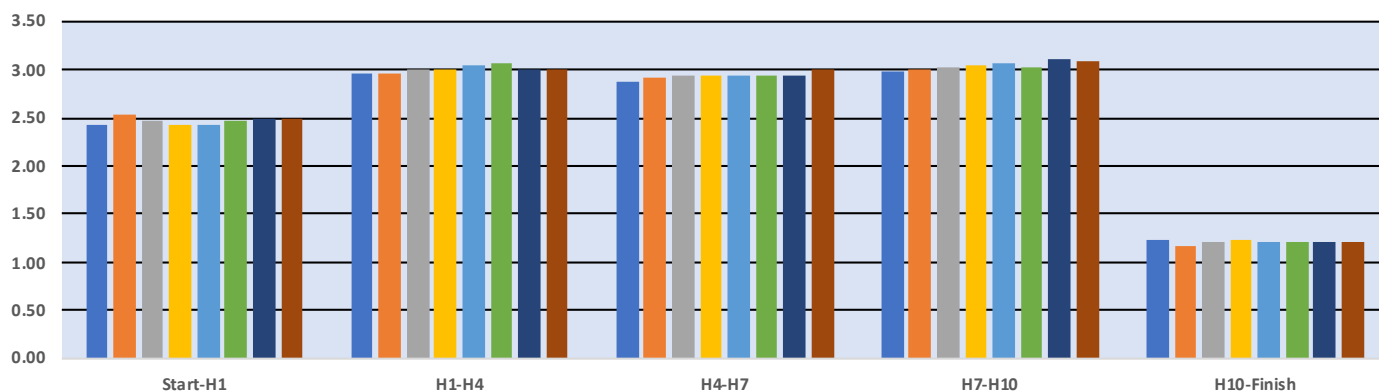
Semi-Final 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.43	3.46	4.44	5.40	6.36	7.32	8.27	9.25	10.23	11.26		12.50	5 / 1			
	reaction time	0.211													2.97	2.87	2.99
	interval		1.03	0.98	0.96	0.96	0.96	0.95	0.98	0.98	1.03	1.24			8.59	8.89	8.53
Cockrell, Anna (USA) (1997)	time	2.53	3.53	4.53	5.50	6.47	7.43	8.41	9.39	10.37	11.42		12.59	4 / 2			
	reaction time	0.172													2.97	2.91	3.01
	interval		1.00	1.00	0.97	0.97	0.96	0.98	0.98	1.05	1.17				8.59	8.76	8.47
Chadwick, Payton (USA) (1995)	time	2.47	3.50	4.50	5.47	6.44	7.42	8.40	9.40	10.40	11.43		12.64	7 / 3			
	reaction time	0.175													3.00	2.93	3.03
	interval		1.03	1.00	0.97	0.97	0.98	0.98	1.00	1.00	1.03	1.21	PB		8.50	8.70	8.42
Robinson, TeJyrica (USA) (1998)	time	2.43	3.47	4.47	5.44	6.40	7.37	8.37	9.37	10.39	11.42		12.65	1 / 4			
	reaction time	0.173													3.01	2.93	3.05
	interval		1.04	1.00	0.97	0.96	0.97	1.00	1.00	1.02	1.03	1.23	PB		8.47	8.70	8.36
Jones, Rayniah (USA) (2001)	time	2.43	3.45	4.47	5.47	6.43	7.40	8.40	9.40	10.40	11.46		12.68	6 / 5			
	reaction time	0.141													3.04	2.93	3.06
	interval		1.02	1.02	1.00	0.96	0.97	1.00	1.00	1.00	1.06	1.22			8.39	8.70	8.33
Brissett, Chanel (USA) (1999)	time	2.47	3.50	4.53	5.53	6.50	7.47	8.47	9.45	10.45	11.50		12.71	8 / 6			
	reaction time	0.192													3.06	2.94	3.03
	interval		1.03	1.03	1.00	0.97	0.97	1.00	0.98	1.00	1.05	1.21			8.33	8.67	8.42
Claye, Queen (USA) (1988)	time	2.50	3.53	4.53	5.50	6.47	7.47	8.45	9.45	10.47	11.56		12.78	2 / 7			
	reaction time	0.174													3.00	2.95	3.11
	interval		1.03	1.00	0.97	0.97	1.00	0.98	1.00	1.02	1.09	1.22			8.50	8.64	8.20
Stark, Grace (USA) (2001)	time	2.50	3.50	4.50	5.50	6.47	7.47	8.50	9.50	10.50	11.58		12.79	3 / 8			
	reaction time	0.193													3.00	3.00	3.08
	interval		1.00	1.00	1.00	0.97	1.00	1.03	1.00	1.00	1.08	1.21			8.50	8.50	8.28
	velocity																
			5.35	8.25	8.67	8.85	8.85	8.85	8.95	8.67	8.67	8.25	8.10	8.00			



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=R44xyEnCZ-w&t=7s>

2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

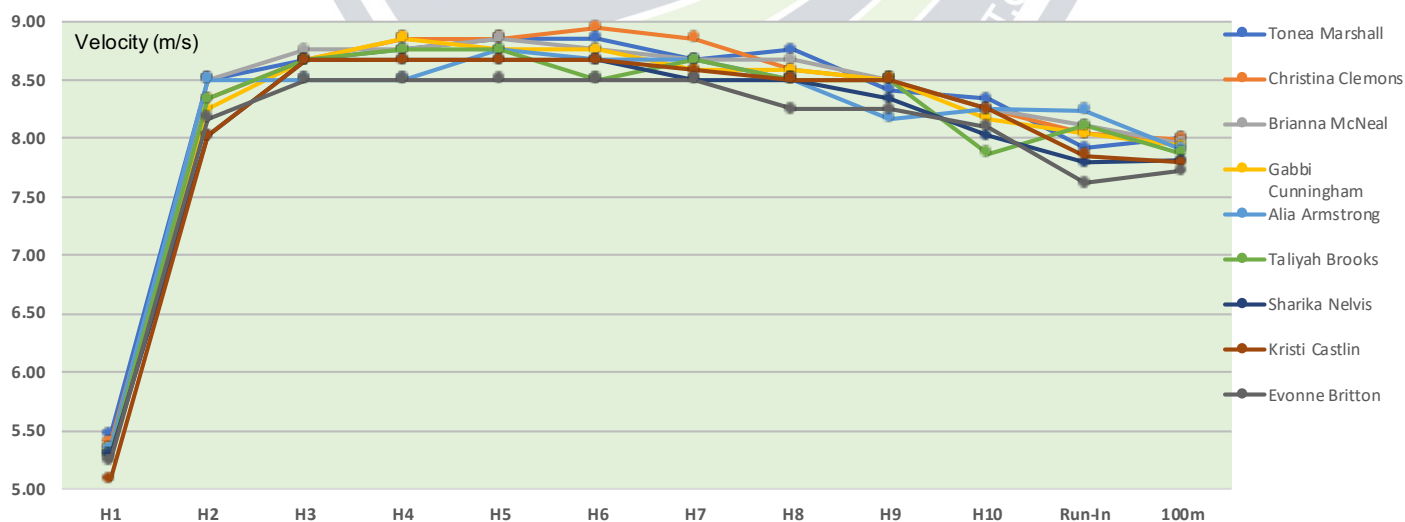
100m Hurdles

Date: 2021.06.20

Wind: 1.2 m/s

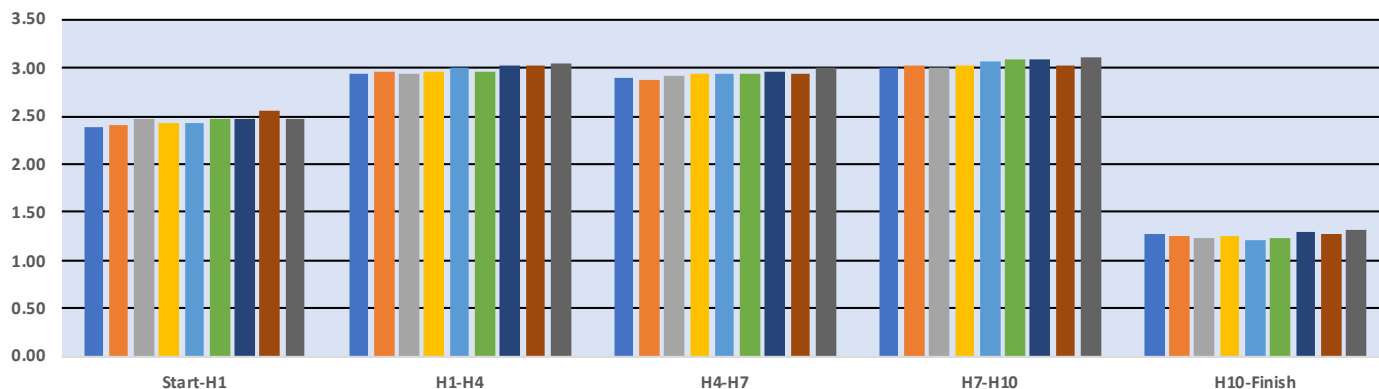
Semi-Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Marshall, Tonia (USA) (1998)	time	2.38	3.38	4.36	5.33	6.29	7.25	8.23	9.20	10.21	11.23		12.50	2 / 1	2.95	2.90	3.00
	reaction time	0.137															
	interval		1.00	0.98	0.97	0.96	0.96	0.98	0.97	1.01	1.02	1.27					
Clemons, Christina (USA) (1990)	time	2.41	3.43	4.41	5.37	6.33	7.28	8.24	9.23	10.23	11.26		12.51	3 / 2	2.96	2.87	3.02
	reaction time	0.142															
	interval		1.02	0.98	0.96	0.96	0.95	0.96	0.99	1.00	1.03	1.25					
McNeal, Brianna (USA) (1991)	time	2.46	3.46	4.43	5.40	6.36	7.33	8.31	9.29	10.29	11.32		12.56	4 / 3	2.94	2.91	3.01
	reaction time	0.173															
	interval		1.00	0.97	0.97	0.96	0.97	0.98	0.98	1.00	1.03	1.24					
Cunningham, Gabbi (USA) (1998)	time	2.43	3.46	4.44	5.40	6.37	7.34	8.33	9.32	10.32	11.36		12.61	6 / 4	2.97	2.93	3.03
	reaction time	0.158															
	interval		1.03	0.98	0.96	0.97	0.97	0.99	0.99	1.00	1.04	1.25					
Armstrong, Alia (USA) (2000)	time	2.43	3.43	4.43	5.43	6.40	7.38	8.36	9.36	10.40	11.43		12.65	1 / 5	3.00	2.93	3.07
	reaction time	0.154															
	interval		1.00	1.00	1.00	0.97	0.98	0.98	1.00	1.04	1.03	1.22					
Brooks, Talyah (USA) (1995)	time	2.46	3.48	4.46	5.43	6.40	7.40	8.38	9.38	10.38	11.46		12.70	5 / 6	2.97	2.95	3.08
	reaction time	0.156															
	interval		1.02	0.98	0.97	0.97	1.00	0.98	1.00	1.00	1.08	1.24					
Nelvis, Sharika (USA) (1990)	time	2.46	3.52	4.50	5.48	6.46	7.44	8.44	9.44	10.46	11.52		12.81	7 / 7	3.02	2.96	3.08
	reaction time	0.160															
	interval		1.06	0.98	0.98	0.98	0.98	1.00	1.00	1.02	1.06	1.29					
Castlin, Kristi (USA) (1988)	time	2.56	3.62	4.60	5.58	6.56	7.54	8.53	9.53	10.53	11.56		12.84	8 / 8	3.02	2.95	3.03
	reaction time	0.162															
	interval		1.06	0.98	0.98	0.98	0.98	0.99	1.00	1.00	1.03	1.28					
Britton, Evonne (USA) (1991)	time	2.48	3.52	4.52	5.52	6.52	7.52	8.52	9.55	10.58	11.63		12.95	9 / 9	3.04	3.00	3.11
	reaction time	0.144															
	interval		1.04	1.00	1.00	1.00	1.00	1.00	1.03	1.03	1.05	1.32					
	velocity																



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=yvZQpw1bmlM&t=9s>

2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

100m Hurdles

Date: 2021.06.19

Wind: 0.1 m/s

Heat 4

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
McNeal, Brianna (USA) (1991)	time	2.43	3.46	4.42	5.38	6.34	7.30	8.26	9.26	10.26	11.26		12.50	1 / 1			
	reaction time	0.162															
	interval		1.03	0.96	0.96	0.96	0.96	0.96	1.00	1.00	1.00	1.24			2.95	2.88	3.00
	velocity	5.35	8.25	8.85	8.85	8.85	8.85	8.85	8.50	8.50	8.50	8.10	8.00		8.64	8.85	8.50
Cunningham, Gabbi (USA) (1998)	time	2.43	3.46	4.44	5.42	6.40	7.36	8.36	9.36	10.40	11.42		12.67	7 / 2			
	reaction time	0.162															
	interval		1.03	0.98	0.98	0.98	0.96	1.00	1.00	1.04	1.02	1.25	PB		2.99	2.94	3.06
	velocity	5.35	8.25	8.67	8.67	8.67	8.85	8.50	8.50	8.17	8.33	8.04	7.89		8.53	8.67	8.33

Date: 2021.06.19

Wind: 1.0 m/s

Heat 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Cockrell, Anna (USA) (1997)	time	2.50	3.53	4.53	5.53	6.50	7.46	8.43	9.43	10.43	11.46		12.63	4 / 1			
	reaction time	0.163															
	interval		1.03	1.00	1.00	0.97	0.96	0.97	1.00	1.03	1.03	1.17			3.03	2.90	3.03
	velocity	5.20	8.25	8.50	8.50	8.76	8.85	8.76	8.50	8.50	8.25	8.59	7.92		8.42	8.79	8.42
Jones, Rayniah (USA) (2001)	time	2.43	3.45	4.46	5.46	6.43	7.43	8.40	9.40	10.40	11.43		12.64	2 / 2			
	reaction time	0.142															
	interval		1.02	1.01	1.00	0.97	1.00	0.97	1.00	1.03	1.21	PB			3.03	2.94	3.03
	velocity	5.35	8.33	8.42	8.50	8.76	8.50	8.76	8.50	8.50	8.25	8.31	7.91		8.42	8.67	8.42
Chadwick, Payton (USA) (1995)	time	2.46	3.52	4.54	5.53	6.50	7.47	8.43	9.43	10.43	11.43		12.66	6 / 3			
	reaction time	0.182															
	interval		1.06	1.02	0.99	0.97	0.97	0.96	1.00	1.00	1.00	1.23	PB		3.07	2.90	3.00
	velocity	5.28	8.02	8.33	8.59	8.76	8.76	8.85	8.50	8.50	8.50	8.17	7.90		8.31	8.79	8.50

Date: 2021.06.19

Wind: 0.8 m/s

Heat 2

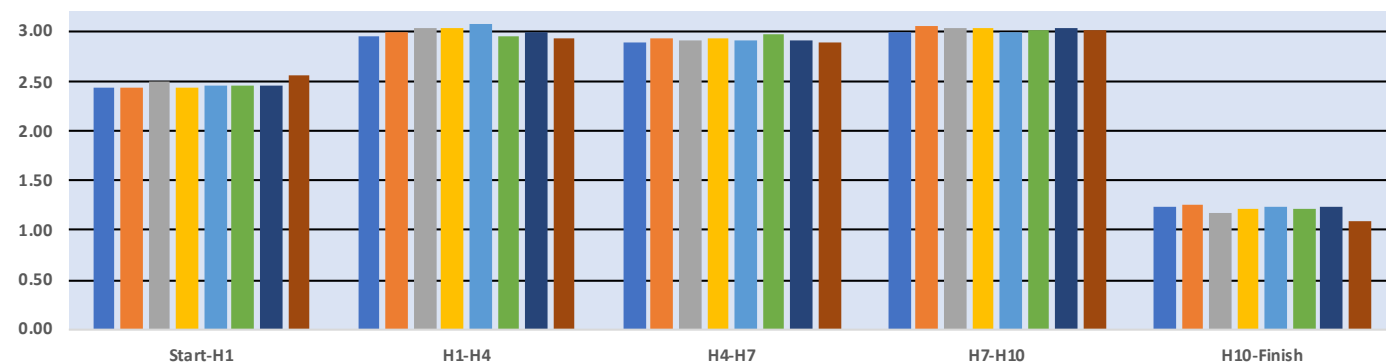
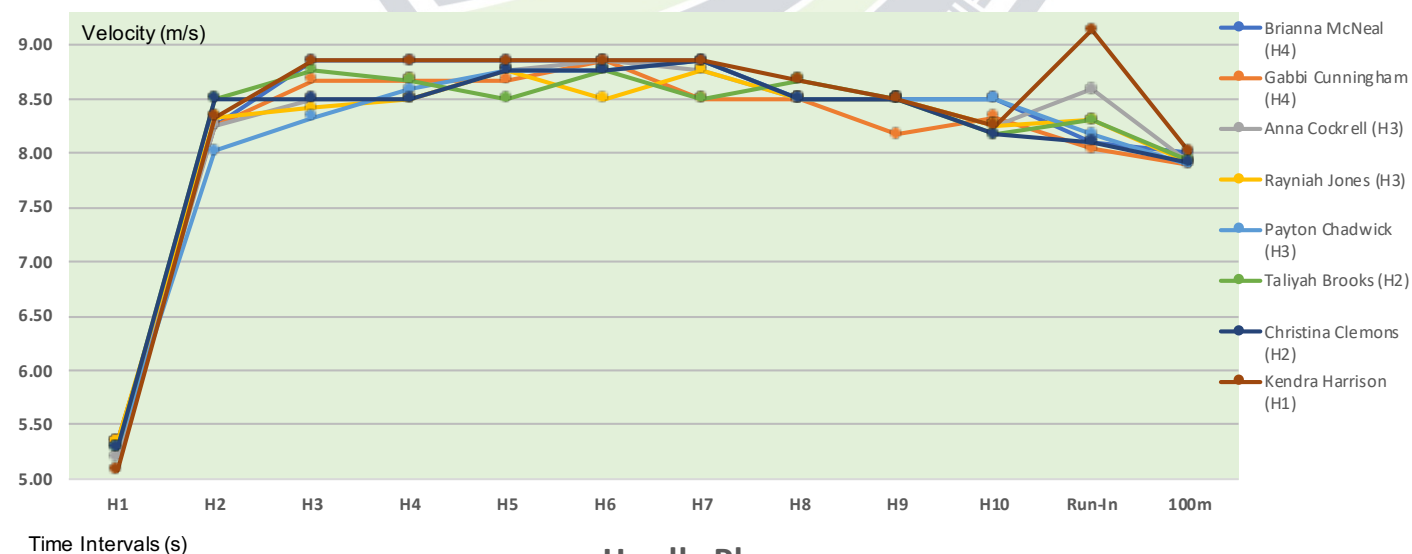
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Brooks, Taliyah (USA) (1995)	time	2.46	3.46	4.43	5.41	6.41	7.38	8.38	9.36	10.36	11.40		12.61	7 / 1			
	reaction time	0.167															
	interval		7 steps	1.00	0.97	0.98	1.00	0.97	1.00	0.98	1.04	1.21	PB		2.95	2.97	3.02
	velocity	5.28	8.50	8.76	8.67	8.50	8.76	8.50	8.67	8.50	8.17	8.31	7.93		8.64	8.59	8.44
Clemons, Christina (USA) (1990)	time	2.46	3.46	4.46	5.46	6.43	7.40	8.36	9.36	10.36	11.40		12.64	4 / 2			
	reaction time	0.143															
	interval		1.00	1.00	1.00	0.97	0.97	0.96	1.00	1.00	1.04	1.24			3.00	2.90	3.04
	velocity	5.28	8.50	8.50	8.50	8.76	8.76	8.85	8.50	8.50	8.17	8.10	7.91		8.50	8.79	8.39

Date: 2021.06.19

Wind: -0.3 m/s

Heat 1

		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	2.56	3.58	4.54	5.50	6.46	7.42	8.38	9.36	10.36	11.39		12.49	2 / 1			
	reaction time	0.291															
	interval		1.02	0.96	0.96	0.96	0.96	0.96	0.98	1.00	1.03	1.10			2.94	2.88	3.01
	velocity	5.08	8.33	8.85	8.85	8.85	8.85	8.85	8.67	8.50	8.25	9.14	8.01		8.67	8.85	8.47



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: Gun Flash (Heat 1)
 First Movement (Heats 2-4)
 Source: <https://www.youtube.com/watch?v=kanydEqsN0s>

2021 NCAA Championships (Eugene, OR) (TV Analysis)

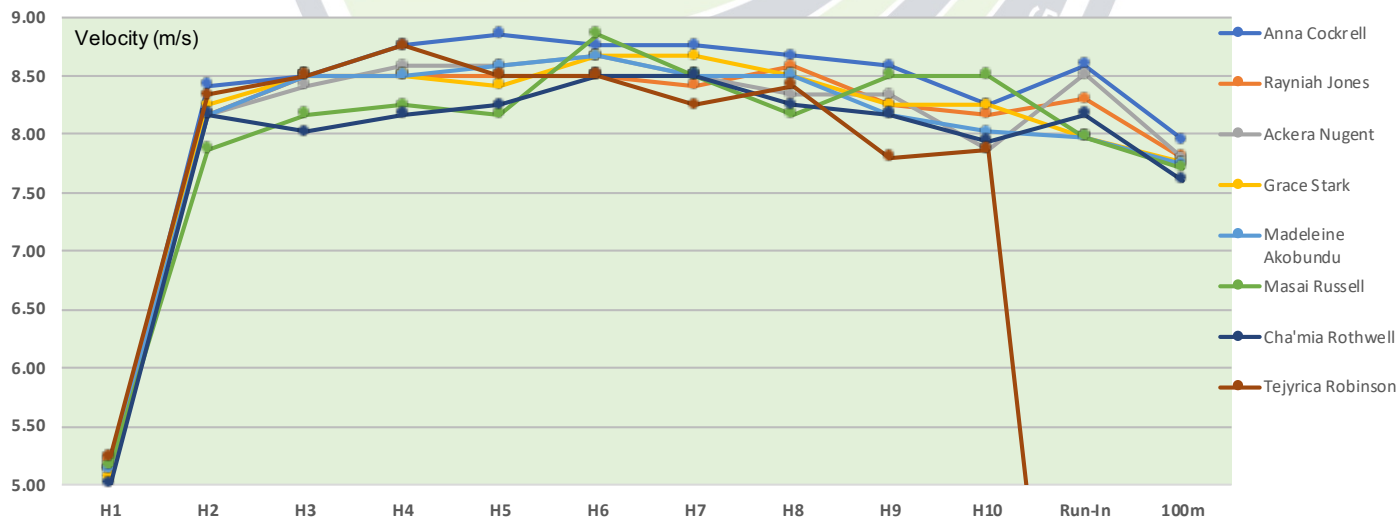
100m Hurdles

Date: 2021.06.12

Wind: 0.4 m/s

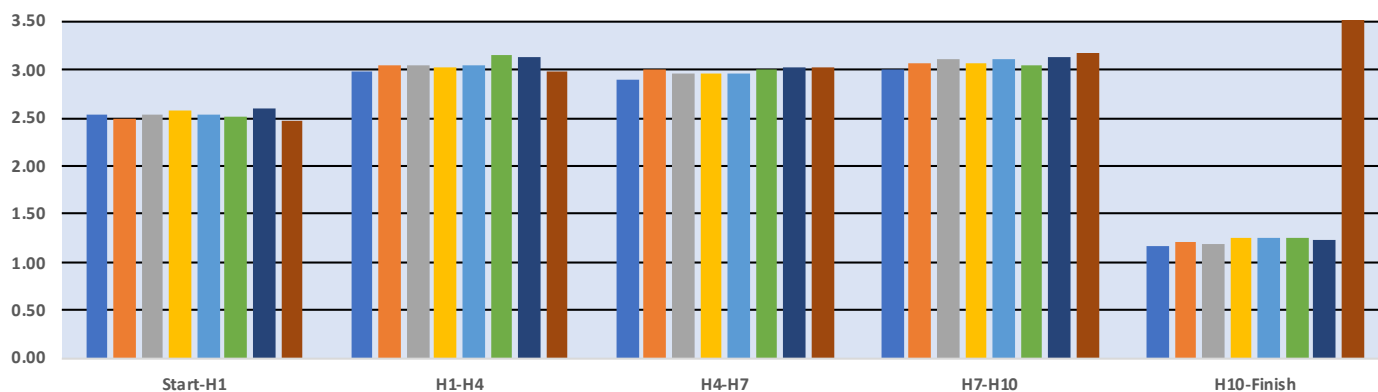
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Cockrell, Anna (USA) (1997)	time		2.53	3.54	4.54	5.51	6.47	7.44	8.41	9.39	10.38	11.41		12.58	7 / 1			
	reaction time	0.159											1.17			2.98	2.90	3.00
	interval velocity		5.14	8.42	8.50	8.76	8.85	8.76	8.76	8.67	8.59	8.25	8.59	7.95		8.56	8.79	8.50
Jones, Rayniah (USA) (2001)	time		2.50	3.54	4.54	5.54	6.54	7.54	8.55	9.54	10.57	11.61		12.82	2 / 2			
	reaction time	0.138											1.21			3.04	3.01	3.06
	interval velocity		5.20	8.17	8.50	8.50	8.50	8.50	8.42	8.59	8.25	8.17	8.31	7.80		8.39	8.47	8.33
Nugent, Ackera (JAM) (2002)	time		2.53	3.57	4.58	5.57	6.56	7.54	8.54	9.56	10.58	11.66		12.84	4 / 3			
	reaction time	0.148											1.18			3.04	2.97	3.12
	interval velocity		5.14	8.17	8.42	8.59	8.59	8.67	8.50	8.33	8.33	7.87	8.52	7.79		8.39	8.59	8.17
Stark, Grace (USA) (2001)	time		2.57	3.60	4.60	5.60	6.61	7.59	8.57	9.57	10.60	11.63		12.89	6 / 4			
	reaction time	0.207											1.26			3.03	2.97	3.06
	interval velocity		5.06	8.25	8.50	8.50	8.42	8.67	8.67	8.50	8.25	8.25	7.98	7.76		8.42	8.59	8.33
Akobundu, Madeleine (USA) (1998)	time		2.53	3.57	4.57	5.57	6.56	7.54	8.54	9.54	10.58	11.64		12.90	1 / 5			
	reaction time	0.196											1.26			3.04	2.97	3.10
	interval velocity		5.14	8.17	8.50	8.50	8.59	8.67	8.50	8.50	8.17	8.02	7.98	7.75		8.39	8.59	8.23
Russell, Masai (USA) (2000)	time		2.52	3.60	4.64	5.67	6.71	7.67	8.67	9.71	10.71	11.71		12.97	9 / 6			
	reaction time	0.233											1.26			3.15	3.00	3.04
	interval velocity		5.16	7.87	8.17	8.25	8.17	8.85	8.50	8.17	8.50	8.50	7.98	7.71		8.10	8.50	8.39
Rothwell, Cha'mia (USA) (1998)	time		2.60	3.64	4.70	5.74	6.77	7.77	8.77	9.80	10.84	11.91		13.14	8 / 7			
	reaction time	0.175											1.23			3.14	3.03	3.14
	interval velocity		5.00	8.17	8.02	8.17	8.25	8.50	8.50	8.25	8.17	7.94	8.17	7.61		8.12	8.42	8.12
Robinson, Tejryica (USA) (1998)	time		2.48	3.50	4.50	5.47	6.47	7.47	8.50	9.51	10.60	11.68		29.11	3 / 8			
	reaction time	0.152											17.43			2.99	3.03	3.18
	interval velocity		5.24	8.33	8.50	8.76	8.50	8.50	8.25	8.42	7.80	7.87	0.58	3.44		8.53	8.42	8.02



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=IjIMaymRKtM>

2021 NCAA Championships (Eugene, OR) (TV Analysis)

100m Hurdles

Date: 2021.06.10

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
Marshall, Tonia (USA) (1998)	time	2.40	3.40	4.40	5.37	6.33	7.30	8.29	9.27	10.27	11.27		12.48	5 / 1			
	reaction time	0.114										1.21			2.97	2.92	2.98
	interval		1.00	1.00	0.97	0.96	0.97	0.99	0.98	1.00	1.00	1.21			8.59	8.73	8.56
Cockrell, Anna (USA) (1997)	time	2.53	3.53	4.50	5.47	6.43	7.40	8.37	9.33	10.33	11.37		12.54	6 / 2			
	reaction time	0.138										1.17			2.94	2.90	3.00
	interval		1.00	0.97	0.97	0.96	0.97	0.97	0.96	1.00	1.04	1.17			8.67	8.79	8.50
	velocity		5.42	8.50	8.50	8.76	8.85	8.76	8.59	8.67	8.50	8.31	8.01				

2021 NCAA Championships Preliminary East Round (Jacksonville, FL) (TV Analysis)

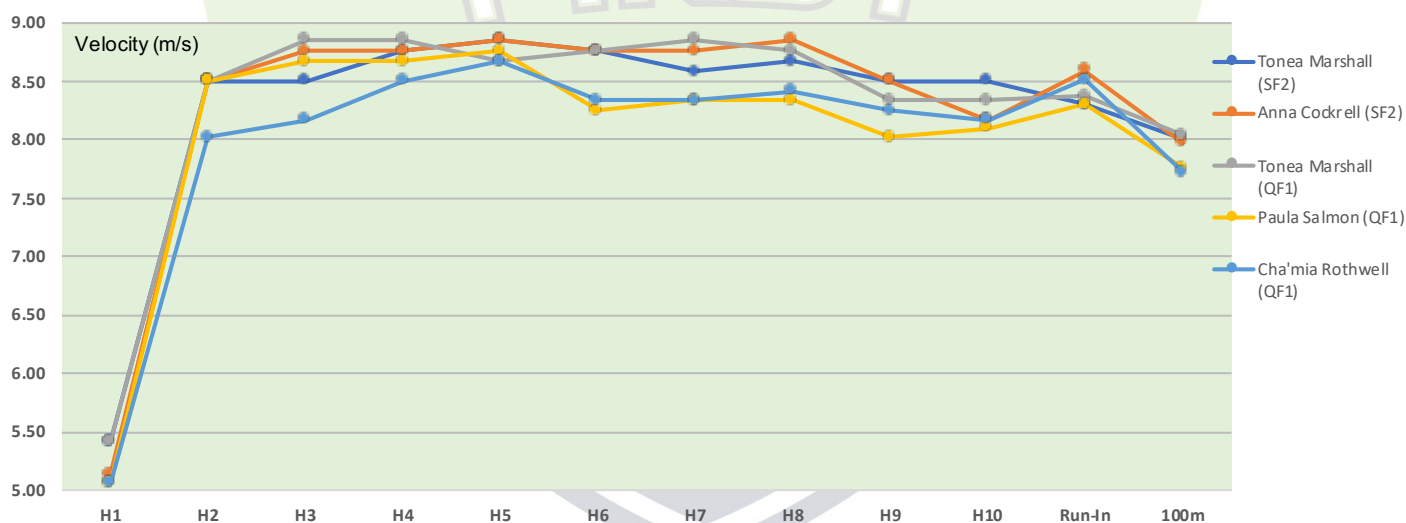
100m Hurdles

Date: 2021.05.29

Wind: 0.8 m/s

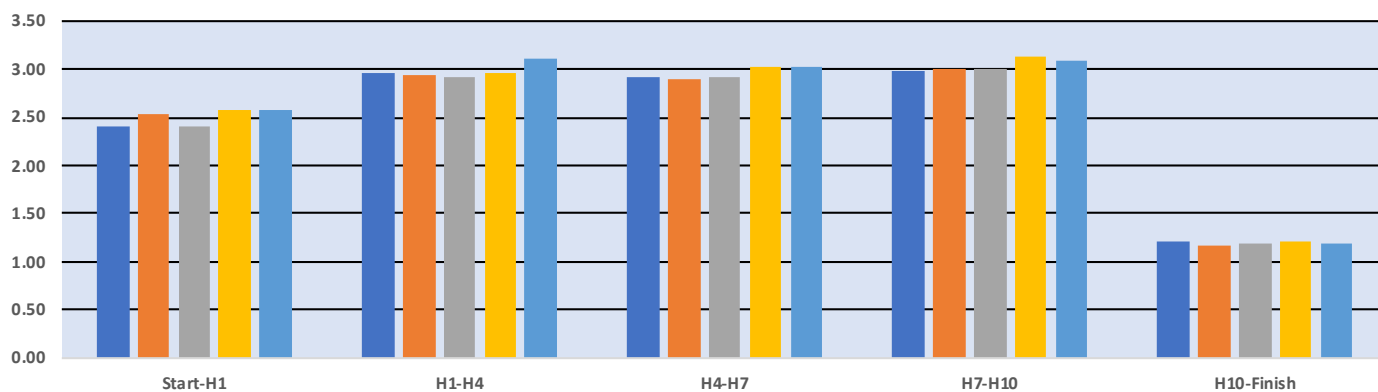
Quarter Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Marshall, Tonia (USA) (1998)	time	2.40	3.40	4.36	5.32	6.30	7.27	8.23	9.20	10.22	11.24		12.44	5 / 1			
	reaction time											1.20			2.92	2.91	3.01
	interval		1.00	0.96	0.96	0.98	0.97	0.96	0.97	1.02	1.02	1.20			8.73	8.76	8.47
Salmon, Paula (USA) (1999)	time	2.57	3.57	4.55	5.53	6.50	7.53	8.55	9.57	10.63	11.68		12.89	4 / 2			
	reaction time											1.21			2.96	3.02	3.13
	interval		1.00	0.98	0.98	0.97	1.03	1.02	1.02	1.06	1.05	1.21			8.61	8.44	8.15
Rothwell, Cha'mia (USA) (1998)	time	2.57	3.63	4.67	5.67	6.65	7.67	8.69	9.70	10.73	11.77		12.95	3 / 3			
	reaction time											1.18			3.10	3.02	3.08
	interval		1.06	1.04	1.00	0.98	1.02	1.02	1.01	1.03	1.04	1.18			8.23	8.44	8.28
	velocity		5.06	8.02	8.17	8.50	8.67	8.33	8.42	8.25	8.17	8.52	7.72				



Time Intervals (s)

Hurdle Phases



NCAA Championships Semi Final

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=LdvP0jaFXy&t=48s>

NCAA Championships Preliminary East Round Quarter Final

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=9fviEiKz018>

2021 Golden Gala Pietro Mennea (Florence, ITA) (TV Analysis)

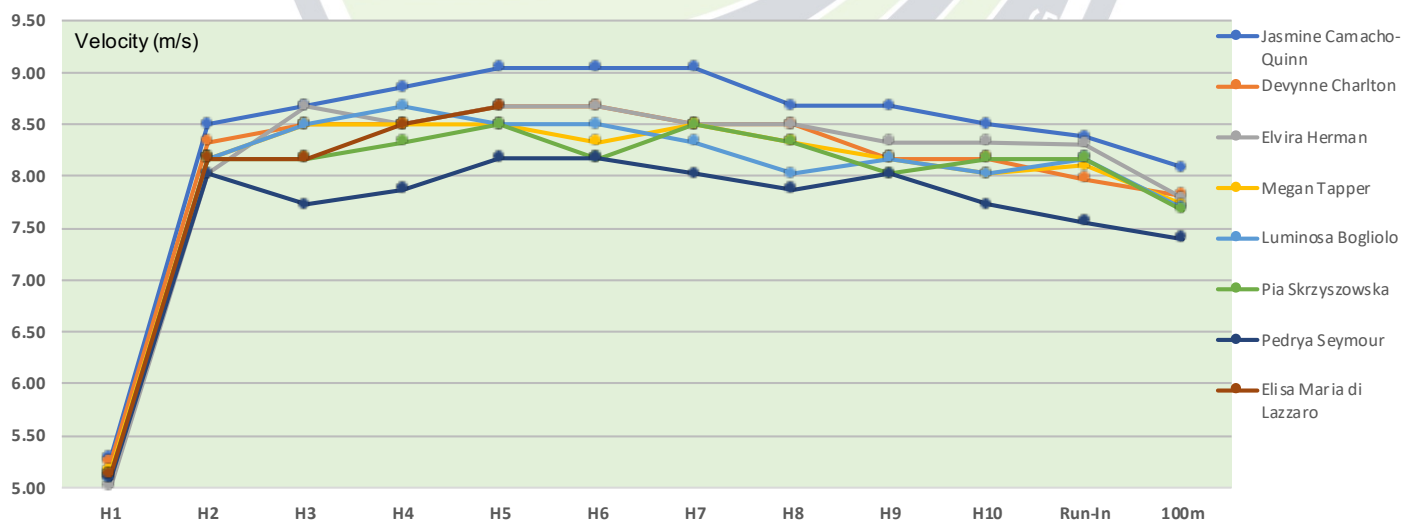
100m Hurdles

Date: 2021.06.10

Wind: -0.8 m/s

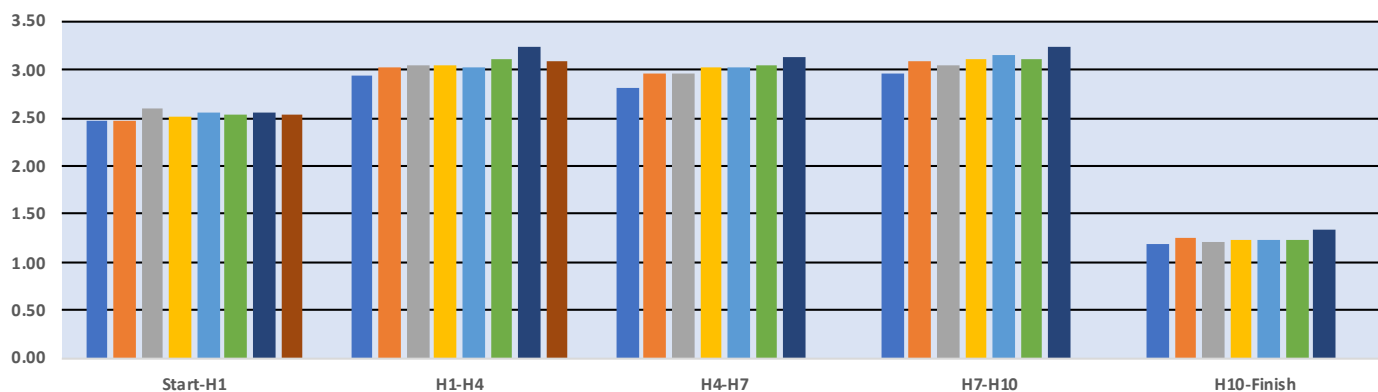
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	time		2.46	3.46	4.44	5.40	6.34	7.28	8.22	9.20	10.18	11.18		12.38	5 / 1			
	reaction time	0.153											1.20			2.94	2.82	2.96
	interval velocity		5.28	8.50	8.67	8.85	9.04	9.04	9.04	8.67	8.67	8.50	8.37	8.08		8.67	9.04	8.61
Charlton, Devynne (BAH) (1995)	time		2.48	3.50	4.50	5.50	6.48	7.46	8.46	9.46	10.50	11.54		12.80	2 / 2			
	reaction time	0.147											1.26			3.02	2.96	3.08
	interval velocity		5.24	8.33	8.50	8.50	8.67	8.67	8.50	8.50	8.17	8.17	7.98	7.81		8.44	8.61	8.28
Herman, Elvira (BLR) (1997)	time		2.60	3.66	4.64	5.64	6.62	7.60	8.60	9.60	10.62	11.64		12.85	3 / 3			
	reaction time	0.132											1.21			3.04	2.96	3.04
	interval velocity		5.00	8.02	8.67	8.50	8.67	8.67	8.50	8.50	8.33	8.33	8.31	7.78		8.39	8.61	8.39
Tapper, Megan (JAM) (1994)	time		2.52	3.56	4.56	5.56	6.56	7.58	8.58	9.60	10.64	11.70		12.94	4 / 4			
	reaction time	0.170											1.24			3.04	3.02	3.12
	interval velocity		5.16	8.17	8.50	8.50	8.50	8.33	8.50	8.33	8.17	8.02	8.10	7.73		8.39	8.44	8.17
Bogliolo, Luminosa (ITA) (1995)	time		2.56	3.60	4.60	5.58	6.58	7.58	8.60	9.66	10.70	11.76		12.99	6 / 5			
	reaction time	0.161											1.23			3.02	3.02	3.16
	interval velocity		5.08	8.17	8.50	8.67	8.50	8.50	8.33	8.02	8.17	8.02	8.17	7.70		8.44	8.44	8.07
Skrzysowska, Pia (POL) (2001)	time		2.54	3.58	4.62	5.64	6.64	7.68	8.68	9.70	10.76	11.80		13.03	7 / 6			
	reaction time	0.151											1.23			3.10	3.04	3.12
	interval velocity		5.12	8.17	8.17	8.33	8.50	8.17	8.50	8.33	8.02	8.17	8.17	7.67		8.23	8.39	8.17
Seymour, Pedrya (BAH) (1995)	time		2.56	3.62	4.72	5.80	6.84	7.88	8.94	10.02	11.08	12.18		13.51	1 / 7			
	reaction time	0.168											1.33			3.24	3.14	3.24
	interval velocity		5.08	8.02	7.73	7.87	8.17	8.17	8.02	7.87	8.02	7.73	7.56	7.40		7.87	8.12	7.87
di Lazzaro, Elisa Maria (ITA) (1998)	time		2.54	3.58	4.62	5.62	6.60							dnf	8 / --			
	reaction time	0.143														3.08		
	interval velocity		5.12	8.17	8.17	8.50	8.67									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=sCAUwDNCxiM>

2021 Müller Grand Prix (Gateshead, GBR) (TV Analysis)

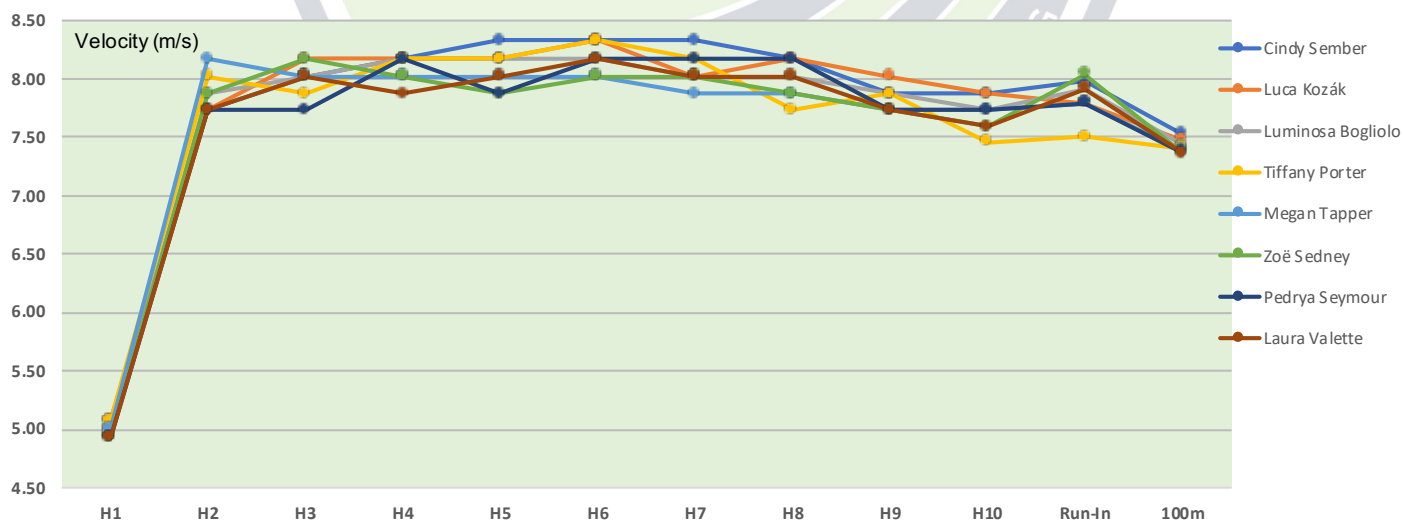
100m Hurdles

Date: 2021.05.23

Wind: -3.9 m/s

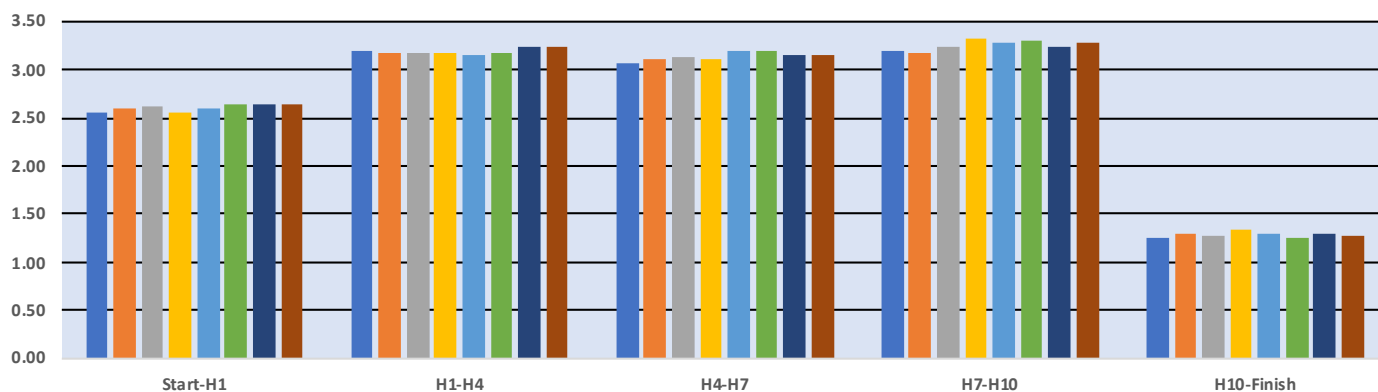
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Sember, Cindy (GBR) (1994)	time		2.56	3.66	4.72	5.76	6.78	7.80	8.82	9.86	10.94	12.02		13.28	5 / 1			
	reaction time	0.159		1.10	1.06	1.04	1.02	1.02	1.02	1.04	1.08	1.08	1.26			3.20	3.06	3.20
	interval velocity		5.08	7.73	8.02	8.17	8.33	8.33	8.33	8.17	7.87	7.87	7.98	7.53		7.97	8.33	7.97
Kozák, Luca (HUN) (1996)	time		2.60	3.70	4.74	5.78	6.82	7.84	8.90	9.94	11.00	12.08		13.37	6 / 2			
	reaction time	0.161		1.10	1.04	1.04	1.04	1.02	1.06	1.04	1.06	1.08	1.29			3.18	3.12	3.18
	interval velocity		5.00	7.73	8.17	8.17	8.17	8.33	8.02	8.17	8.02	7.87	7.79	7.48		8.02	8.17	8.02
Bogliolo, Luminosa (ITA) (1995)	time		2.62	3.70	4.76	5.80	6.84	7.88	8.94	10.00	11.08	12.18		13.45	3 / 3			
	reaction time	0.155		1.08	1.06	1.04	1.04	1.04	1.06	1.06	1.08	1.10	1.27			3.18	3.14	3.24
	interval velocity		4.96	7.87	8.02	8.17	8.17	8.17	8.02	8.02	7.87	7.73	7.91	7.43		8.02	8.12	7.87
Porter, Tiffany (GBR) (1987)	time		2.56	3.62	4.70	5.74	6.78	7.80	8.84	9.94	11.02	12.16		13.50	4 / 4			
	reaction time	0.131		1.06	1.08	1.04	1.04	1.02	1.04	1.10	1.08	1.14	1.34			3.18	3.10	3.32
	interval velocity		5.08	8.02	7.87	8.17	8.17	8.33	8.17	7.73	7.87	7.46	7.50	7.41		8.02	8.23	7.68
Tapper, Megan (JAM) (1994)	time		2.60	3.64	4.70	5.76	6.82	7.88	8.96	10.04	11.14	12.24		13.53	1 / 5			
	reaction time	0.153		1.04	1.06	1.06	1.06	1.06	1.08	1.08	1.10	1.10	1.29			3.16	3.20	3.28
	interval velocity		5.00	8.17	8.02	8.02	8.02	8.02	7.87	7.87	7.73	7.73	7.79	7.39		8.07	7.97	7.77
Sedney, Zoë (NED) (2001)	time		2.64	3.72	4.76	5.82	6.90	7.96	9.02	10.10	11.20	12.32		13.57	2 / 6			
	reaction time	0.186		1.08	1.04	1.06	1.08	1.06	1.06	1.08	1.10	1.12	1.25			3.18	3.20	3.30
	interval velocity		4.92	7.87	8.17	8.02	7.87	8.02	8.02	7.87	7.73	7.59	8.04	7.37		8.02	7.97	7.73
Seymour, Pedrya (BAH) (1995)	time		2.64	3.74	4.84	5.88	6.96	8.00	9.04	10.08	11.18	12.28		13.57	8 / 7			
	reaction time	0.191		1.10	1.10	1.04	1.08	1.04	1.04	1.04	1.10	1.10	1.29			3.24	3.16	3.24
	interval velocity		4.92	7.73	7.73	8.17	7.87	8.17	8.17	8.17	7.73	7.73	7.79	7.37		7.87	8.07	7.87
Valette, Laura (FRA) (1997)	time		2.64	3.74	4.80	5.88	6.94	7.98	9.04	10.10	11.20	12.32		13.59	7 / 8			
	reaction time	0.142		1.10	1.06	1.08	1.06	1.04	1.06	1.06	1.10	1.12	1.27			3.24	3.16	3.28
	interval velocity		4.92	7.73	8.02	7.87	8.02	8.17	8.02	8.02	7.73	7.59	7.91	7.36		7.87	8.07	7.77



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 60fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=ugk3SiZ5bjw>

Biomechanical Analysis

2021 Fanny Blankers Koen Games (Hengelo, NED) (TV Analysis)

100m Hurdles

Date: 2021.06.06

Wind: 0.5 m/s

FINAL

	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	2.43	3.46	4.44	5.40	6.35	7.31	8.27	9.24	10.20	11.18		12.44	5 / 1			
reaction time																
interval		1.03	0.98	0.96	0.95	0.96	0.97	0.97	0.96	0.98	1.26			2.97	2.87	2.91
velocity	5.35	8.25	8.67	8.85	8.95	8.85	8.85	8.76	8.85	8.67	7.98	8.04		8.59	8.89	8.76

2021 USATF Grand Prix (Eugene, OR) (TV Analysis)

Date: 2021.04.24

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
Camacho-Quinn, Jasmine (PUR) (199)	2.47	3.47	4.45	5.40	6.37	7.32	8.29	9.28	10.26	11.26		12.46	5 / 1			
reaction time																
interval		1.00	0.98	0.95	0.97	0.95	0.97	0.99	0.98	1.00	1.20			2.93	2.89	2.97
velocity	5.26	8.50	8.67	8.95	8.76	8.95	8.76	8.59	8.67	8.50	8.37	8.03		8.70	8.82	8.59
Anderson, Brittany (JAM) (2001)	2.53	3.54	4.54	5.50	6.47	7.47	8.46	9.46	10.50	11.57		12.82	8 / 2			
reaction time																
interval		1.01	1.00	0.96	0.97	1.00	0.99	1.00	1.04	1.07	1.25			2.97	2.96	3.11
velocity	5.14	8.42	8.50	8.85	8.76	8.50	8.59	8.50	8.17	7.94	8.04	7.80		8.59	8.61	8.20
Brooks, Taliyah (USA) (1995)	2.50	3.52	4.50	5.50	6.50	7.50	8.49	9.52	10.56	11.62		12.83	6 / 3			
reaction time																
interval	7 steps	1.02	0.98	1.00	1.00	1.00	0.99	1.03	1.04	1.06	1.21			3.00	2.99	3.13
velocity	5.20	8.33	8.67	8.50	8.50	8.50	8.59	8.25	8.17	8.02	8.31	7.79		8.50	8.53	8.15
McLaughlin, Sydney (USA) (1999)	2.57	3.63	4.65	5.65	6.65	7.65	8.65	9.65	10.67	11.71		12.86	2 / 4			
reaction time																
interval	7 steps	1.06	1.02	1.00	1.00	1.00	1.00	1.00	1.02	1.04	1.15	PB		3.08	3.00	3.06
velocity	5.06	8.02	8.33	8.50	8.50	8.50	8.50	8.50	8.33	8.17	8.74	7.78		8.28	8.50	8.33

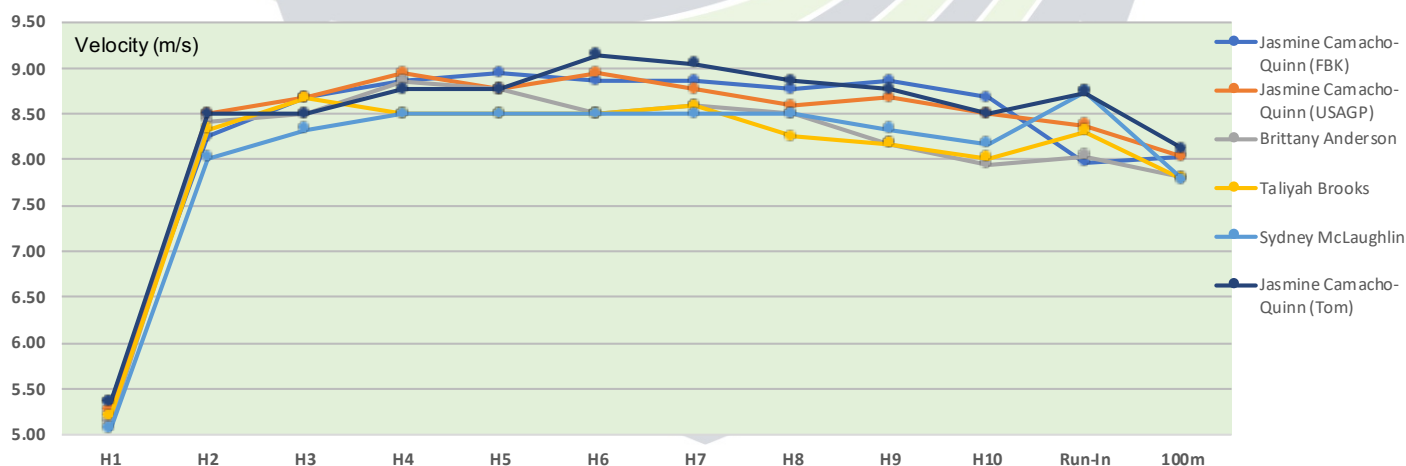
2021 Tom Jones Invitational (Gainesville, FL) (TV Analysis)

Date: 2021.04.17

Wind: 1.7 m/s

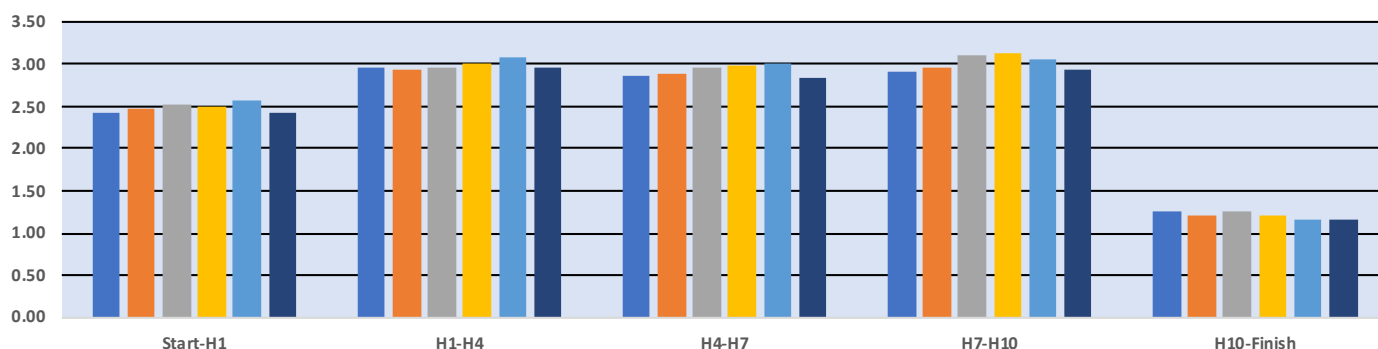
FINAL

	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	2.43	3.43	4.43	5.40	6.37	7.30	8.24	9.20	10.17	11.17		12.32	6 / 1			
reaction time																
interval		1.00	1.00	0.97	0.97	0.93	0.94	0.96	0.97	1.00	1.15	NR PB		2.97	2.84	2.93
velocity	5.35	8.50	8.50	8.76	8.76	9.14	9.04	8.85	8.76	8.50	8.74	8.12		8.59	8.98	8.70



Time Intervals (s)

Hurdle Phases



Tom Jones Invitational

Evaluated with: ObjectusVideo

Quality & Frame Rate: 60fps

Timing From: Gun Flash

Source: Coaches Video

Fanny Blankers Koen Games

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 60fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=nM9HI2U5GWI>

USATF Grand Prix

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=ZtemR0v6sw0>

Biomechanical Analysis

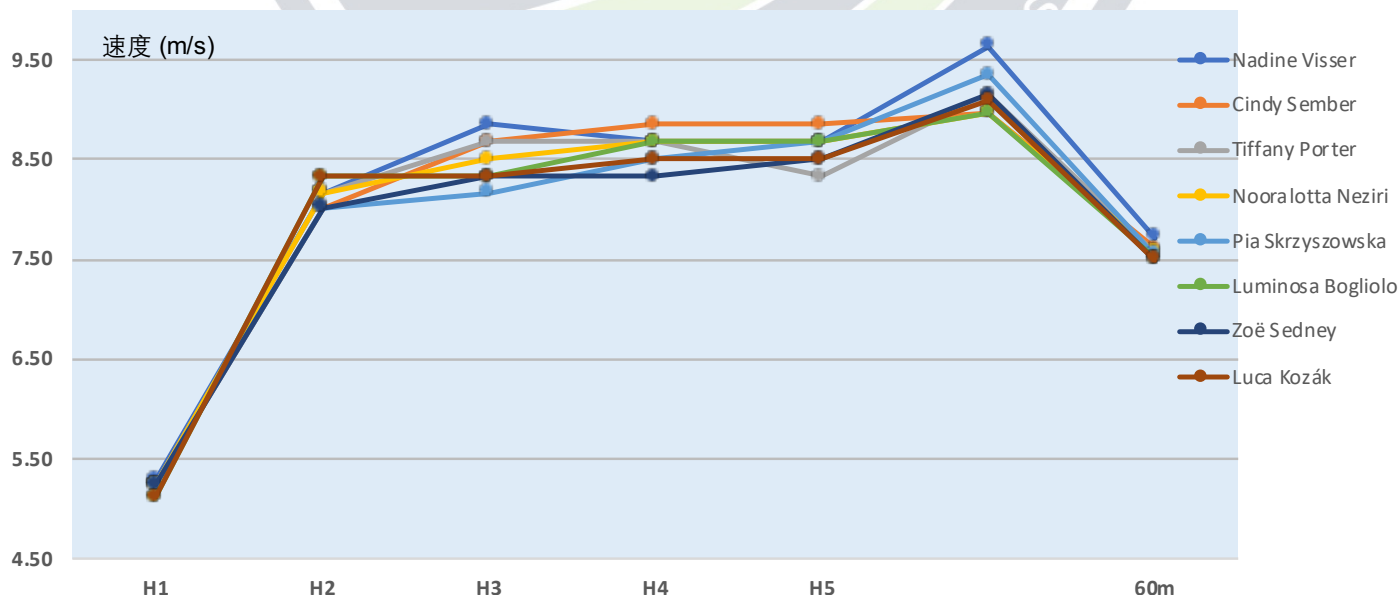
2021 European Indoor Championships (Toruń, POL) (TV Analysis)

Women's 60m Hurdles

Date: 2021.03.07

FINAL

		H1	H2	H3	H4	H5		60m	Lane / Place
Visser, Nadine (NED) (1995)	time	2.46	3.50	4.46	5.44	6.42		7.77	5 / 1
reaction time	0.135								
	interval		1.04	0.96	0.98	0.98	1.35	NR PB	
	velocity	5.28	8.17	8.85	8.67	8.67	9.63	7.72	
Sember, Cindy (GBR) (1994)	time	2.48	3.54	4.52	5.48	6.44		7.89	6 / 2
reaction time	0.165								
	interval		1.06	0.98	0.96	0.96	1.45	=PB	
	velocity	5.24	8.02	8.67	8.85	8.85	8.97	7.60	
Porter, Tiffany (GBR) (1987)	time	2.48	3.52	4.50	5.48	6.50		7.92	8 / 3
reaction time	0.156								
	interval		1.04	0.98	0.98	1.02	1.42		
	velocity	5.24	8.17	8.67	8.67	8.33	9.15	7.58	
Neziri, Nooralotta (FIN) (1992)	time	2.48	3.52	4.52	5.50	6.48		7.93	3 / 4
reaction time	0.133								
	interval		1.04	1.00	0.98	0.98	1.45		
	velocity	5.24	8.17	8.50	8.67	8.67	8.97	7.57	
Skrzysowska, Pia (POL) (2001)	time	2.48	3.54	4.58	5.58	6.56		7.95	4 / 5
reaction time	0.147								
	interval		1.06	1.04	1.00	0.98	1.39		
	velocity	5.24	8.02	8.17	8.50	8.67	9.35	7.55	
Bogliolo, Luminosa (ITA) (1995)	time	2.54	3.56	4.58	5.56	6.54		7.99	7 / 6
reaction time	0.160								
	interval		1.02	1.02	0.98	0.98	1.45	=PB	
	velocity	5.12	8.33	8.33	8.67	8.67	8.97	7.51	
Sedney, Zoë (NED) (2001)	time	2.48	3.54	4.56	5.58	6.58		8.00	2 / 7
reaction time	0.171								
	interval		1.06	1.02	1.02	1.00	1.42		
	velocity	5.24	8.02	8.33	8.33	8.50	9.15	7.50	
Kozák, Luca (HUN) (1996)	time	2.54	3.56	4.58	5.58	6.58		8.01	1 / 8
reaction time	0.195								
	interval		1.02	1.02	1.00	1.00	1.43		
	velocity	5.12	8.33	8.33	8.50	8.50	9.09	7.49	



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=HHmyK4wdJko>

Men's 400m Hurdles

2021 Top 10 Times - Men's 400m Hurdles

Warholm, Karsten (NOR) (1996)															
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)															
date	3-Aug	time	5.60	9.08	12.62	16.28	19.96	23.86	27.92	32.04	36.32	40.76	Run-In	400m	Lane/Place
reaction time	0.145	interval													6 / 1
		velocity	8.04	10.06	9.89	9.56	9.51	8.97	8.62	8.50	8.18	7.88	5.18	45.94	
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	15	18	WR	10.68 11.64 12.84
															9.83 9.02 8.18
Benjamin, Rai (USA) (1997)															
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)															
date	3-Aug	time	5.64	9.20	12.84	16.52	20.28	24.16	28.16	32.24	36.44	40.80	Run-In	400m	Lane/Place
reaction time	0.168	interval													5 / 2
		velocity	7.98	9.83	9.62	9.51	9.31	9.02	8.75	8.58	8.33	8.03	5.37	AR	10.88 11.64 12.64
H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	13	17		9.65 9.02 8.31
Warholm, Karsten (NOR) (1996)															
FINAL - 2021 Bislett Games (Oslo, NOR) (TV Analysis)															
date	1-Jul	time	5.58	9.10	12.70	16.34	20.16	24.08	28.18	32.38	36.78	41.44	Run-In	400m	Lane/Place
reaction time	0.163	interval													7 / 1
		velocity	8.06	9.94	9.72	9.62	9.16	8.93	8.54	8.33	7.95	7.51	5.26	WR	10.76 11.84 13.26
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	13	18		9.76 8.87 7.92
dos Santos, Alison (BRA) (2000)															
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)															
date	3-Aug	time	5.76	9.36	13.08	16.76	20.60	24.64	28.80	33.00	37.26	41.58	Run-In	400m	Lane/Place
reaction time	0.156	interval													7 / 3
		velocity	7.81	9.72	9.41	9.51	9.11	8.66	8.41	8.33	8.22	8.10	5.14	AR	11.00 12.04 12.78
H1 lead leg	L	strides	20	13	13	12	12	13	13	13	14	13	16.2		9.55 8.72 8.22
Benjamin, Rai (USA) (1997)															
FINAL - 2020 USA Olympic Trials (Eugene, OR) (TV Analysis)															
date	26-Jun	time	5.77	9.47	13.30	17.17	21.09	25.06	29.06	33.20	37.50	41.84	Run-In	400m	Lane/Place
reaction time	0.235	interval													5 / 1
		velocity	7.80	9.46	9.14	9.04	8.93	8.82	8.75	8.45	8.14	8.06	4.99	PB	11.40 11.89 12.78
H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	13	16		9.21 8.83 8.22
Warholm, Karsten (NOR) (1996)															
FINAL - 2021 Herculis Meeting International d'Athletisme (Monaco, MON) (TV Analysis)															
date	9-Jul	time	5.62	9.12	12.74	16.51	20.38	24.36	28.49	32.74	37.17	41.87	Run-In	400m	Lane/Place
reaction time	0.150	interval													7 / 1
		velocity	8.01	10.00	9.67	9.28	9.04	8.79	8.47	8.24	7.90	7.45	5.21		10.89 11.98 13.38
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	15	18		9.64 8.76 7.85
McMaster, Kyron (IVB) (1997)															
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)															
date	3-Aug	time	5.68	9.24	12.96	16.72	20.60	24.60	28.86	33.20	37.60	41.96	Run-In	400m	Lane/Place
reaction time	0.157	interval													4 / 4
		velocity	7.92	9.83	9.41	9.31	9.02	8.75	8.22	8.06	7.95	8.03	5.12	NR PB	11.04 12.14 13.10
H1 lead leg	R	strides	20	13	13	13	13	13	14	14	14	14	17		9.51 8.65 8.02
Samba, Abderrahman (QAT) (1995)															
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)															
date	3-Aug	time	5.84	9.48	13.12	16.88	20.72	24.80	28.92	33.16	37.48	41.90	Run-In	400m	Lane/Place
reaction time	0.186	interval													8 / 5
		velocity	7.71	9.62	9.62	9.31	9.11	8.58	8.50	8.25	8.10	7.92	5.22	NR	11.04 12.04 12.98
H1 lead leg	R	strides	21	13	13	13	13	13	13	13	14	14	17		9.51 8.72 8.09
Benjamin, Rai (USA) (1997)															
FINAL - 2021 USATF Golden Games (Walnut, CA) (TV Analysis)															
date	9-May	time	5.84	9.44	13.21	17.08	21.02	24.99	29.09	33.37	37.67	42.11	Run-In	400m	Lane/Place
reaction time		interval													5 / 1
		velocity	7.71	9.72	9.28	9.04	8.88	8.82	8.54	8.18	8.14	7.88	5.02		11.24 12.01 13.02
H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	13	16		9.34 8.74 8.06
Warholm, Karsten (NOR) (1996)															
Semi-Final 1 - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)															
date	1-Aug	time	5.60	9.14	12.76	16.51	20.42	24.42	28.59	32.93	37.32	42.07	Run-In	400m	Lane/Place
reaction time	0.156	interval													7 / 1
		velocity	8.04	9.89	9.67	9.33	8.95	8.75	8.39	8.06	7.97	7.37	5.23		10.91 12.08 13.48
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	15	17.5		9.62 8.69 7.79
dos Santos, Alison (BRA) (2000)															
Semi-Final 2 - 2020 Olympic Games (Tokyo, JPN)															
date	1-Aug	time													7 / 1
reaction time	0.171	interval													47.31
		velocity													AR PB
H1 lead leg		strides													8.45
dos Santos, Alison (BRA) (2000)															
FINAL - 2021 Bauhaus Galan (Stockholm, SWE) (TV Analysis)															
date	4-Jul	time	5.74	9.40	13.16	16.86	20.70	24.76	28.80	32.94	37.30	41.92	Run-In	400m	Lane/Place
reaction time	0.160	interval													7 / 1
		velocity	7.84	9.56	9.31	9.46	9.14	8.62	8.66	8.45	8.03	7.58	5.42	AR PB	11.12 11.94 13.12
H1 lead leg	L	strides		13	13	12	12	13	13	13	13	13	17		9.44 8.79 8.00
Warholm, Karsten (NOR) (1996)															
FINAL - 2021 Weltklasse (Zürich, SUI) (TV Analysis)															
date	9-Sep	time	5.72	9.28	12.96	16.72	20.56	24.56	28.68	32.88	37.44	42.08	Run-In	400m	Lane/Place
reaction time	0.150	interval													7 / 1
		velocity	7.87	9.83	9.51	9.31	9.11	8.75	8.50	8.33	7.68	7.54	5.27		11.00 11.96 13.40
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	15	15	18		9.55 8.78 7.84

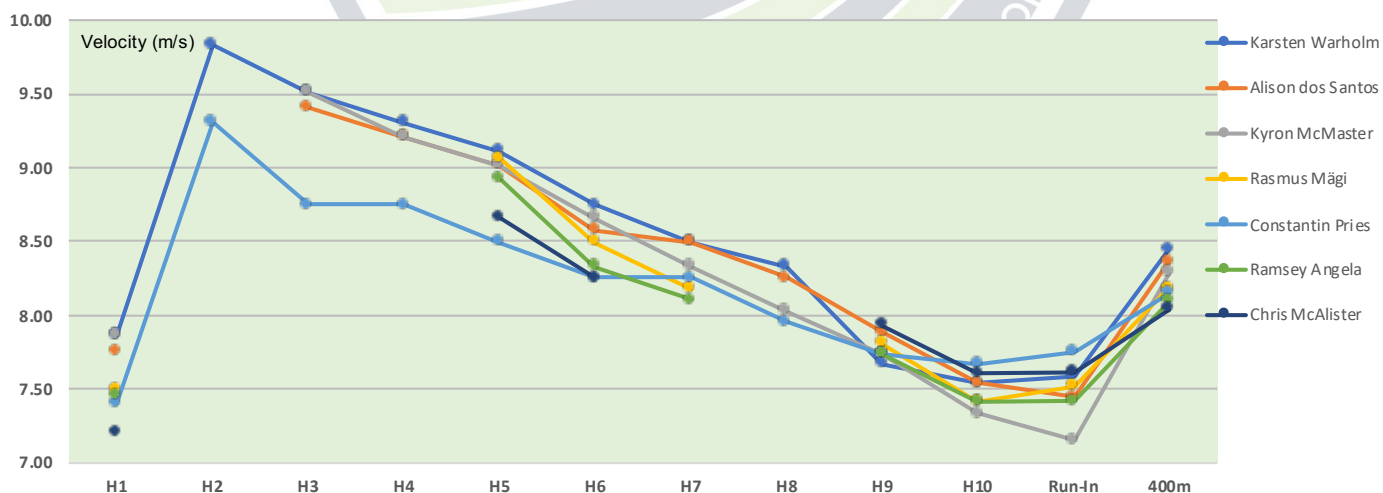
2021 Weltklasse (Zürich, SUI) (TV Analysis)

Men's 400m Hurdles

Date 2021.09.09

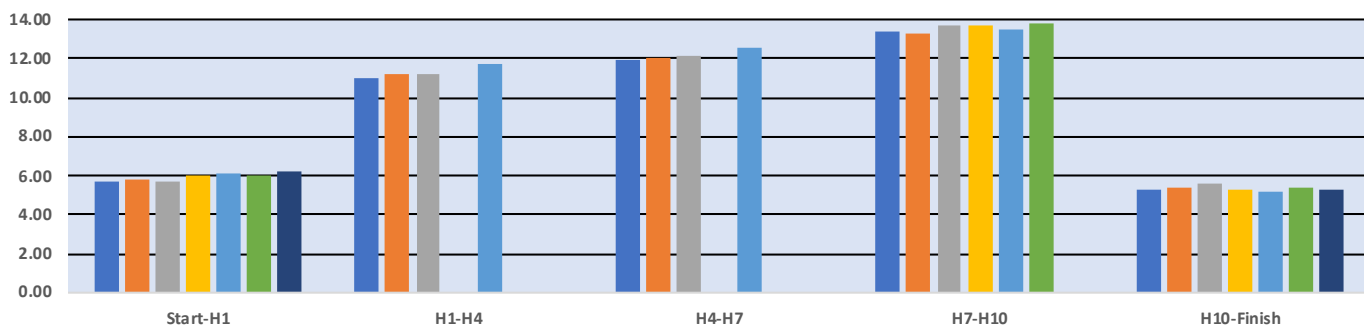
FINAL

			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		5.72	9.28	12.96	16.72	20.56	24.56	28.68	32.88	37.44	42.08		47.35	7 / 1			
	reaction time	0.150																
	interval			3.56	3.68	3.76	3.84	4.00	4.12	4.20	4.56	4.64	5.27			11.00	11.96	13.40
	velocity		7.87	9.83	9.51	9.31	9.11	8.75	8.50	8.33	7.68	7.54	7.59	8.45		9.55	8.78	7.84
dos Santos, Alison (BRA) (2000)	time		5.80		13.24	17.04	20.92	25.00	29.12	33.36	37.80	42.44		47.81	6 / 2			
	reaction time	0.181																
	interval			7.44	3.80	3.88	4.08	4.12	4.24	4.44	4.64	5.37				11.24	12.08	13.32
	velocity		7.76	9.41	9.02	8.58	8.50	8.25	7.88	7.54	7.45	8.37				9.34	8.69	7.88
McMaster, Kyrion (IVB) (1997)	time		5.72		13.08	16.88	20.76	24.80	29.00	33.36	37.88	42.65		48.24	5 / 3			
	reaction time	0.160																
	interval			7.36	3.80	3.88	4.04	4.20	4.36	4.52	4.77	5.59				11.16	12.12	13.65
	velocity		7.87	9.51	9.21	9.02	8.66	8.33	8.03	7.74	7.34	7.16	8.29			9.41	8.66	7.69
Mägi, Rasmus (EST) (1992)	time		6.00				21.44	25.56	29.84		38.80	43.52		48.84	3 / 4			
	reaction time	0.158					15.44	4.12	4.28		8.96	4.72	5.32					13.68
	interval						9.07	8.50	8.18		7.81	7.42	7.52	8.19				7.68
	velocity		7.50				13	13			14	14	17	77				
Preis, Constantin (GER) (1998)	time		6.08	9.84	13.84	17.84	21.96	26.20	30.44	34.84	39.36	43.92		49.08	8 / 5			
	reaction time	0.259																
	interval			3.76	4.00	4.00	4.12	4.24	4.24	4.40	4.52	4.56	5.16			11.76	12.60	13.48
	velocity		7.40	9.31	8.75	8.75	8.50	8.25	8.25	7.95	7.74	7.68	7.75	8.15		8.93	8.33	7.79
Angela, Ramsey (NED) (1999)	time		6.04				21.72	25.92	30.24		39.28	44.00		49.39	2 / 6			
	reaction time	0.167					15.68	4.20	4.32		9.04	4.72	5.39					13.76
	interval						8.93	8.33	8.10		7.74	7.42	7.42	8.10				7.63
	velocity		7.45				15	15			18	18	70					
McAlister, Chris (GBR) (1995)	time		6.24				22.40	26.64			39.88	44.48		49.73	1 / 7			
	reaction time	0.168					16.16	4.24			13.24	4.60	5.25					
	interval						8.66	8.25			7.93	7.61	7.62	8.04				
	velocity		7.21				14				15	15	51					



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=dzg9ik8r4kA>

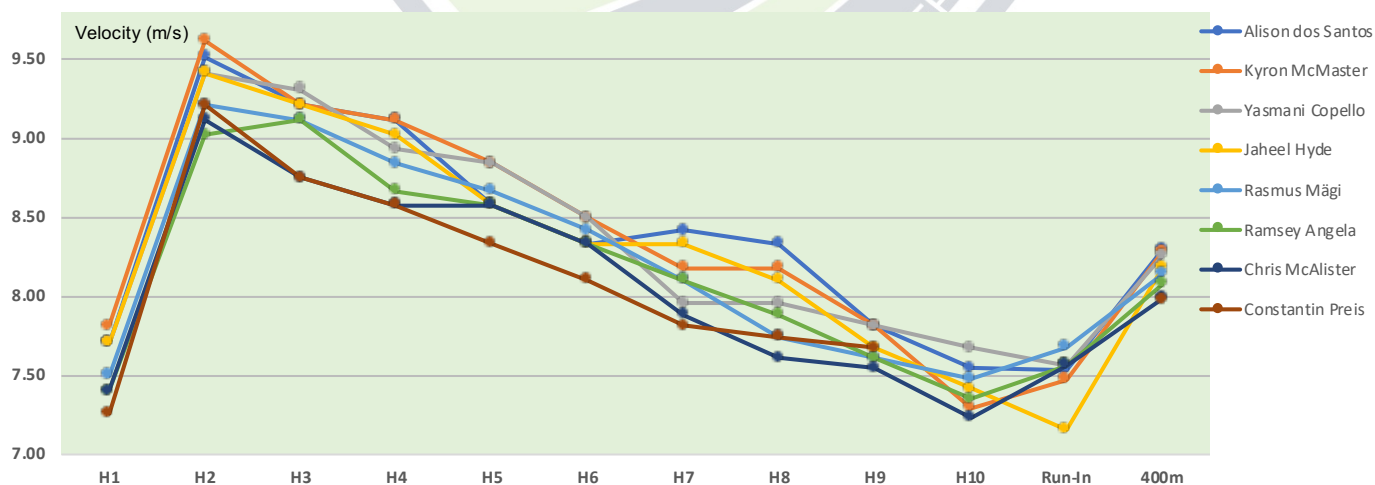
2021 Memorial van Damme (Brussels, BEL) (TV Analysis)

Men's 400m Hurdles

Date 2021.09.03

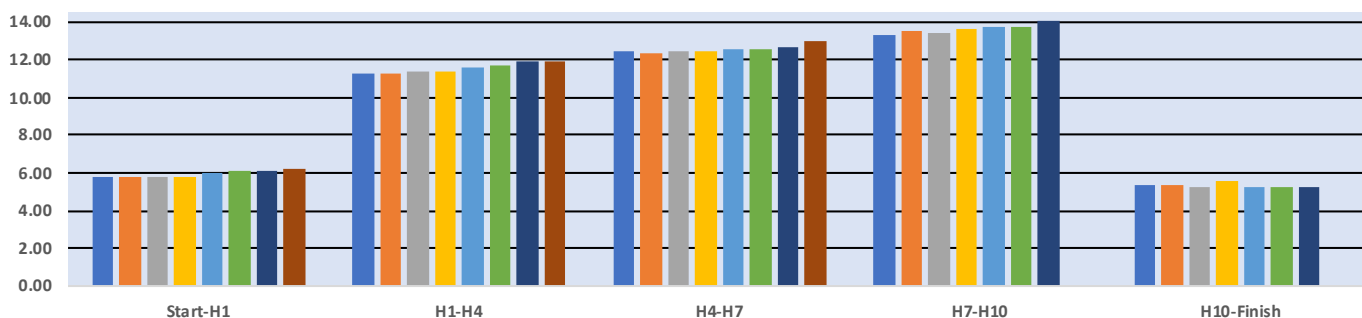
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
dos Santos, Alison (BRA) (2000)	time		5.84	9.52	13.32	17.16	21.24	25.44	29.60	33.80	38.28	42.92		48.23	6 / 1			
	reaction time	0.181																
	interval			3.68	3.80	3.84	4.08	4.20	4.16	4.20	4.48	4.64	5.31			11.32	12.44	13.32
	velocity		7.71	9.51	9.21	9.11	8.58	8.33	8.41	8.33	7.81	7.54	7.53	8.29		9.28	8.44	7.88
	H1 lead leg	L																
	strides		20	13	13	12	12	13	13	13	13	13	16.5	151.5				
McMaster, Kyron (IVB) (1997)	time		5.76	9.40	13.20	17.04	21.00	25.12	29.40	33.68	38.16	42.96		48.31	5 / 2			
	reaction time	0.176																
	interval			3.64	3.80	3.84	3.96	4.12	4.28	4.28	4.48	4.80	5.35			11.28	12.36	13.56
	velocity		7.81	9.62	9.21	9.11	8.84	8.50	8.18	8.18	7.81	7.29	7.48	8.28		9.31	8.50	7.74
	H1 lead leg	R																
	strides		20	13	13	13	13	13	14	14	14	15	17.5	159.5				
Copello, Yasmani (TUR) (1987)	time		5.84	9.56	13.32	17.24	21.20	25.32	29.72	34.12	38.60	43.16		48.45	4 / 3			
	reaction time	0.149																
	interval			3.72	3.76	3.92	3.96	4.12	4.40	4.40	4.48	4.56	5.29			11.40	12.48	13.44
	velocity		7.71	9.41	9.31	8.93	8.84	8.50	7.95	7.95	7.81	7.68	7.56	8.26		9.21	8.41	7.81
	H1 lead leg	R																
	strides		20	13	13	13	13	13	14	14	14	14	17.7	158.7				
Hyde, Jaheel (JAM) (1997)	time		5.84	9.56	13.36	17.24	21.32	25.52	29.72	34.04	38.60	43.32		48.91	7 / 4			
	reaction time	0.166																
	interval			3.72	3.80	3.88	4.08	4.20	4.20	4.32	4.56	4.72	5.59			11.40	12.48	13.60
	velocity		7.71	9.41	9.21	9.02	8.58	8.33	8.33	8.10	7.68	7.42	7.16	8.18		9.21	8.41	7.72
	H1 lead leg	L																
	strides		22	13	13	13	13	14	14	14	15	15	18	164				
Mägi, Rasmus (EST) (1992)	time		6.00	9.80	13.64	17.60	21.64	25.80	30.12	34.64	39.24	43.92		49.13	3 / 5			
	reaction time	0.178																
	interval			3.80	3.84	3.96	4.04	4.16	4.32	4.52	4.60	4.68	5.21			11.60	12.52	13.80
	velocity		7.50	9.21	9.11	8.84	8.66	8.41	8.10	7.74	7.61	7.48	7.68	8.14		9.05	8.39	7.61
	H1 lead leg	R																
	strides		20	13	13	13	13	13	14	14	14	14	17	158				
Angela, Ramsey (NED) (1999)	time		6.08	9.96	13.80	17.84	21.92	26.12	30.44	34.88	39.48	44.24		49.53	2 / 6			
	reaction time	0.197																
	interval			3.88	3.84	4.04	4.08	4.20	4.32	4.44	4.60	4.76	5.29			11.76	12.60	13.80
	velocity		7.40	9.02	9.11	8.66	8.58	8.33	8.10	7.88	7.61	7.35	7.56	8.08		8.93	8.33	7.61
	H1 lead leg	R																
	strides		22	14	14	14	14	15	15	15	15	15	18	171				
McAlister, Chris (GBR) (1995)	time		6.08	9.92	13.92	18.00	22.08	26.28	30.72	35.32	39.96	44.80		50.09	1 / 7			
	reaction time	0.144																
	interval			3.84	4.00	4.08	4.08	4.20	4.44	4.60	4.64	4.84	5.29			11.92	12.72	14.08
	velocity		7.40	9.11	8.75	8.58	8.58	8.33	7.88	7.61	7.54	7.23	7.56	7.99		8.81	8.25	7.46
	H1 lead leg	R																
	strides		22	14	14	14	14	14	14	15	15	15	15	137				
Preis, Constantin (GER) (1998)	time		6.20	10.00	14.00	18.08	22.28	26.60	31.08	35.60	40.16			50.12	8 / 8			
	reaction time	0.303																
	interval			3.80	4.00	4.08	4.20	4.32	4.48	4.52	4.56					11.88	13.00	
	velocity		7.26	9.21	8.75	8.58	8.33	8.10	7.81	7.74	7.68					8.84	8.08	
	H1 lead leg	L																
	strides		21	13	14	14	14	15	15	15	15							



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=9w3iku7JrNo>

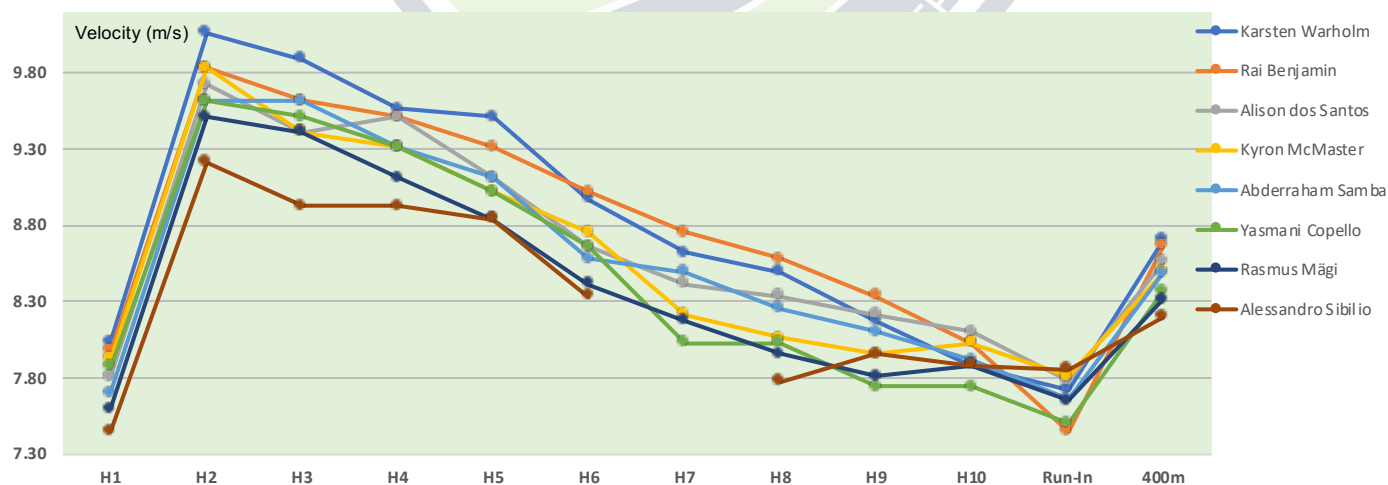
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Men's 400m Hurdles

Date 2021.08.03

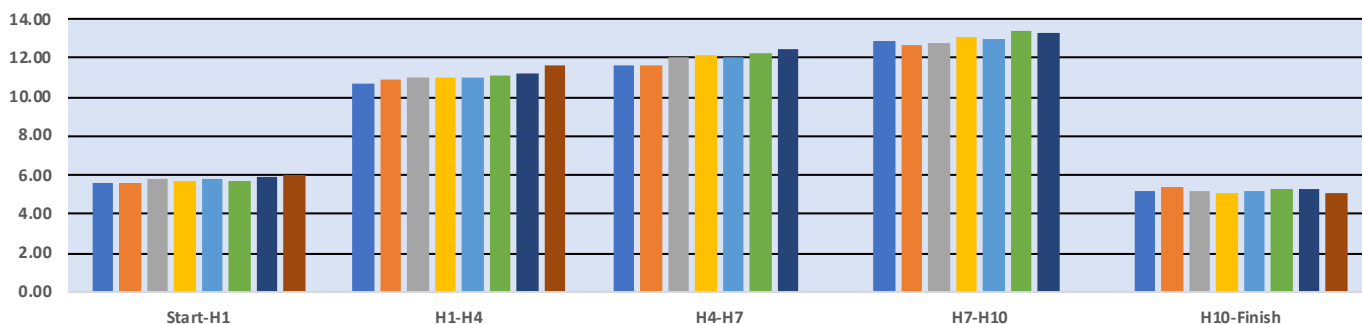
FINAL

			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		5.60	9.08	12.62	16.28	19.96	23.86	27.92	32.04	36.32	40.76		45.94	6 / 1			
	reaction time	0.145																
	interval			3.48	3.54	3.66	3.68	3.90	4.06	4.12	4.28	4.44	5.18	WR		10.68	11.64	12.84
	velocity		8.04	10.06	9.89	9.56	9.51	8.97	8.62	8.50	8.18	7.88	7.72	8.71		9.83	9.02	8.18
Benjamin, Rai (USA) (1997)	time		5.64	9.20	12.84	16.52	20.28	24.16	28.16	32.24	36.44	40.80		46.17	5 / 2			
	reaction time	0.168																
	interval			3.56	3.64	3.68	3.76	3.88	4.00	4.08	4.20	4.36	5.37	AR		10.88	11.64	12.64
	velocity		7.98	9.83	9.62	9.51	9.31	9.02	8.75	8.58	8.33	8.03	7.45	8.66		9.65	9.02	8.31
dos Santos, Alison (BRA) (2000)	time		5.76	9.36	13.08	16.76	20.60	24.64	28.80	33.00	37.26	41.58		46.72	7 / 3			
	reaction time	0.156																
	interval			3.60	3.72	3.68	3.84	4.04	4.16	4.20	4.26	4.32	5.14	AR		11.00	12.04	12.78
	velocity		7.81	9.72	9.41	9.51	9.11	8.66	8.41	8.33	8.22	8.10	7.78	8.56		9.55	8.72	8.22
McMaster, Kyron (IVB) (1997)	time		5.68	9.24	12.96	16.72	20.60	24.60	28.86	33.20	37.60	41.96		47.08	4 / 4			
	reaction time	0.157																
	interval			3.56	3.72	3.76	3.88	4.00	4.26	4.34	4.40	4.36	5.12	NR PB		11.04	12.14	13.10
	velocity		7.92	9.83	9.41	9.31	9.02	8.75	8.22	8.06	7.95	8.03	7.81	8.50		9.51	8.65	8.02
Samba, Abderrahman (QAT) (1995)	time		5.84	9.48	13.12	16.88	20.72	24.80	28.92	33.16	37.48	41.90		47.12	8 / 5			
	reaction time	0.186																
	interval			3.64	3.64	3.76	3.88	4.04	4.12	4.24	4.32	4.42	5.22			11.04	12.04	12.98
	velocity		7.71	9.62	9.62	9.31	9.11	8.58	8.50	8.25	8.10	7.92	7.66	8.49		9.51	8.72	8.09
Copello, Yasmani (TUR) (1987)	time		5.72	9.36	13.04	16.80	20.68	24.72	29.08	33.44	37.96	42.48		47.81	3 / 6			
	reaction time	0.166																
	interval			3.64	3.68	3.76	3.88	4.04	4.36	4.36	4.52	4.52	5.33	NR = PB		11.08	12.28	13.40
	velocity		7.87	9.62	9.51	9.31	9.02	8.66	8.03	8.03	7.74	7.74	7.50	8.37		9.48	8.55	7.84
Mägi, Rasmus (EST) (1992)	time		5.92	9.60	13.32	17.16	21.12	25.28	29.56	33.96	38.44	42.88		48.11	9 / 7			
	reaction time	0.167																
	interval			3.68	3.72	3.84	3.96	4.16	4.28	4.40	4.48	4.44	5.23	NR PB		11.24	12.40	13.32
	velocity		7.60	9.51	9.41	9.11	8.84	8.41	8.18	7.95	7.81	7.88	7.65	8.31		9.34	8.47	7.88
Sibilio, Alessandro (ITA) (1999)	time		6.04	9.84	13.76	17.68	21.64	25.84		34.84	39.24	43.68		48.77	2 / 8			
	reaction time	0.144																
	interval			3.80	3.92	3.92	3.96	4.20		9.00	4.40	4.44	5.09			11.64		
	velocity		7.45	9.21	8.93	8.93	8.84	8.33		7.78	7.95	7.88	7.86	8.20		9.02		
	H1 lead leg	R	21	13	13	13	13	13	14		15	15		130				



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=mGzBtclnfyg>

2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Men's 400m Hurdles

Date 2021.08.01

Semi-Final 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
dos Santos, Alison (BRA) (2000)	time												47.31	7 / 1			
	reaction time	0.171											AR				
	interval		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.31	8.45		0.00	0.00	0.00
	velocity	#DIV/0!										0.85	8.45		#DIV/0!	#DIV/0!	#DIV/0!
	strides											0	0				
	H1 lead leg																
Samba, Abderrahman (QAT) (1995)	time												47.47	5 / 2			
	reaction time	0.188											0.84		0.00	0.00	0.00
	interval		No Video			No Video			No Video			47.47			0.00	0.00	0.00
	velocity	#DIV/0!										0.84			#DIV/0!	#DIV/0!	#DIV/0!
	strides											0					
	H1 lead leg																
Sibilio, Alessandro (ITA) (1999)	time												47.93	4 / 3			
	reaction time	0.123											PB		0.00	0.00	0.00
	interval											47.93	8.35		#DIV/0!	#DIV/0!	#DIV/0!
	velocity	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.83	8.35		#DIV/0!	#DIV/0!	#DIV/0!
	strides											0	0				
	H1 lead leg																

Date 2021.08.01

Semi-Final 1

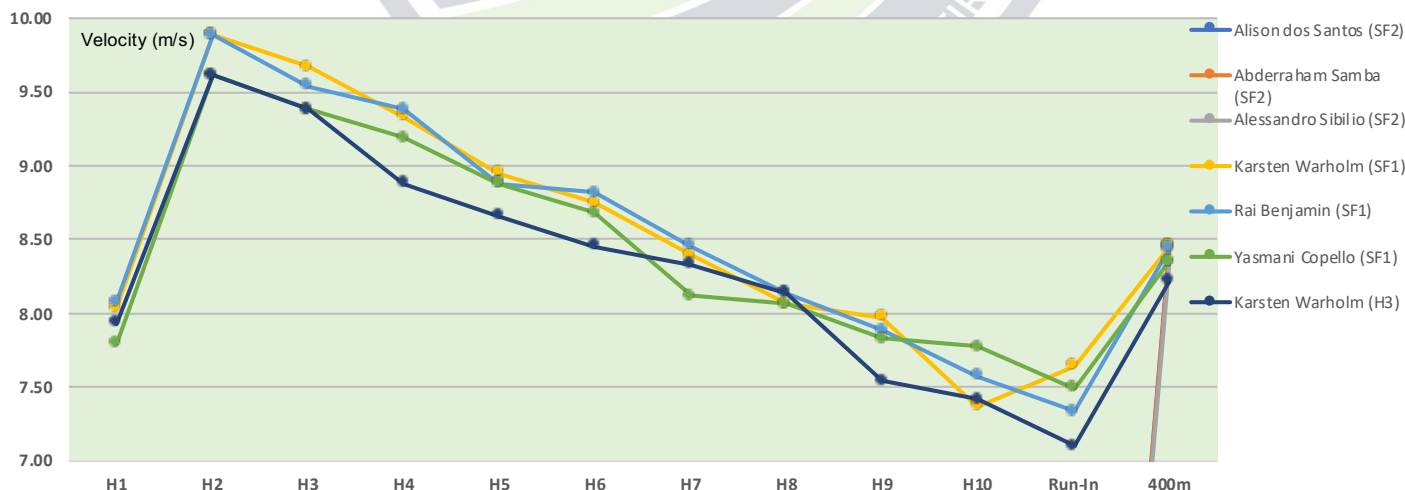
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Warholm, Karsten (NOR) (1996)	time	5.60	9.14	12.76	16.51	20.42	24.42	28.59	32.93	37.32	42.07		47.30	7 / 1			
	reaction time	0.156											5.23		10.91	12.08	13.48
	interval		3.54	3.62	3.75	3.91	4.00	4.17	4.34	4.39	4.75	5.23	7.65		9.62	8.69	7.79
	velocity	8.04	9.89	9.67	9.33	8.95	8.75	8.39	8.06	7.97	7.37	7.37	8.46				
	strides	20	13	13	13	13	13	13	13	13	15	17.5	156.5				
	H1 lead leg	L															
Benjamin, Rai (USA) (1997)	time	5.57	9.11	12.78	16.51	20.45	24.42	28.56	32.86	37.30	41.92		47.37	5 / 2			
	reaction time	0.184											5.45		10.94	12.05	13.36
	interval		3.54	3.67	3.73	3.94	3.97	4.14	4.30	4.44	4.62	5.45	8.44		9.60	8.71	7.86
	velocity	8.08	9.89	9.54	9.38	8.88	8.82	8.45	8.14	7.88	7.58	7.34	8.44				
	strides	20	13	13	13	13	13	13	13	13	13	16.7	153.7				
	H1 lead leg	R															
Copello, Yasmani (TUR) (1987)	time	5.77	9.41	13.14	16.95	20.89	24.92	29.23	33.57	38.04	42.54		47.88	4 / 3			
	reaction time	0.183											5.34		11.18	12.28	13.31
	interval		3.64	3.73	3.81	3.94	4.03	4.31	4.34	4.47	4.50	5.34	8.35		9.39	8.55	7.89
	velocity	7.80	9.62	9.38	9.19	8.88	8.68	8.12	8.06	7.83	7.78	7.49	8.35				
	strides	20	13	13	13	13	13	14	14	14	14	17.2	144.2				
	H1 lead leg	R															

Men's 400m Hurdles

Date 2021.07.30

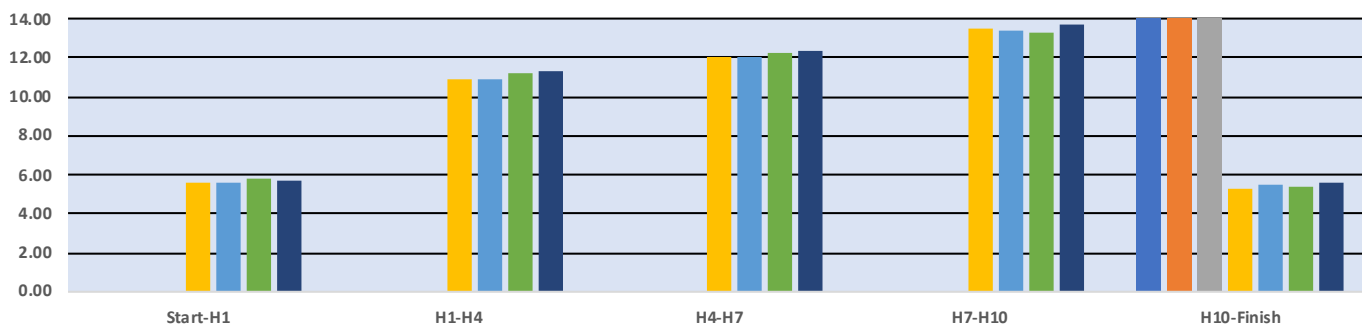
Heat 3

		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	5.67	9.31	13.04	16.98	21.02	25.16	29.36	33.66	38.30	43.02		48.65	8 / 1			
	reaction time	0.157											5.63		11.31	12.38	13.66
	interval		3.64	3.73	3.94	4.04	4.14	4.20	4.30	4.64	4.72	5.63	8.22		9.28	8.48	7.69
	velocity	7.94	9.62	9.38	8.88	8.66	8.45	8.33	8.14	7.54	7.42	7.10	8.22				
	strides	20	13	13	13	13	13	13	13	15	15	17	158				
	H1 lead leg	L															



Time Intervals (s)

Hurdle Phases



Evaluated with:
 Semi Final 2 ObjectusVideo
 Semi Final 1 ObjectusVideo
 Heat 3 ObjectusVideo

Quality & Frame Rate:
 1920 x 1080 @ 24fps
 1920 x 1080 @ 24fps

Timing From:
 First Movement
 First Movement

Source:
<https://www.youtube.com/watch?v=Ij8ubwFhee8>
<https://www.youtube.com/watch?v=Khs5A4xhHl4>

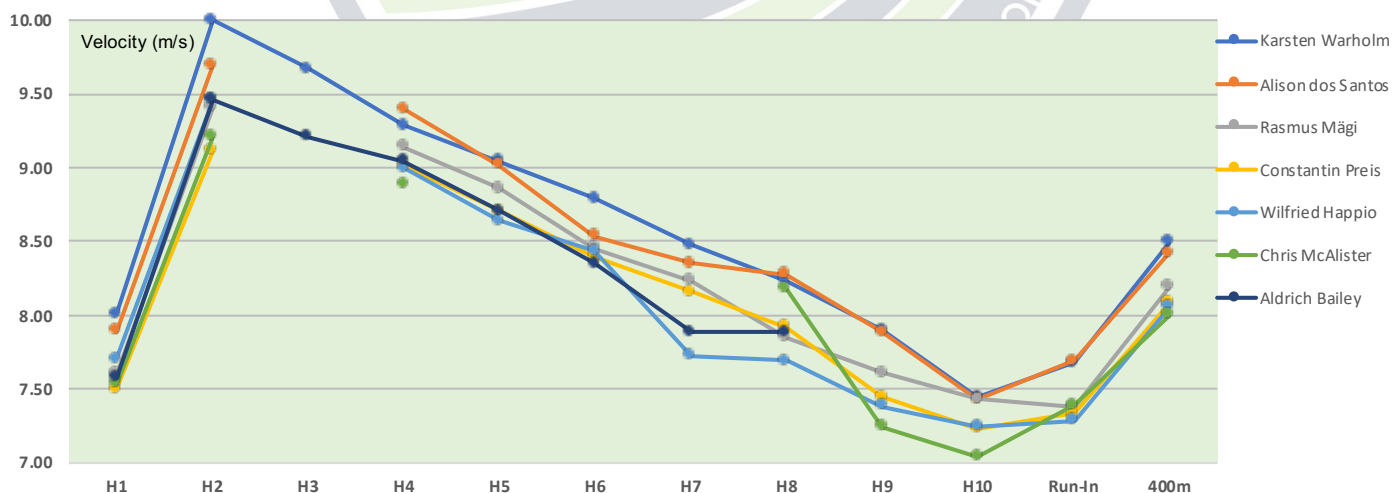
2021 Herculis Meeting International d'Athletisme (Monaco, MON) (TV Analysis)

Men's 400m Hurdles

Date 2021.07.09

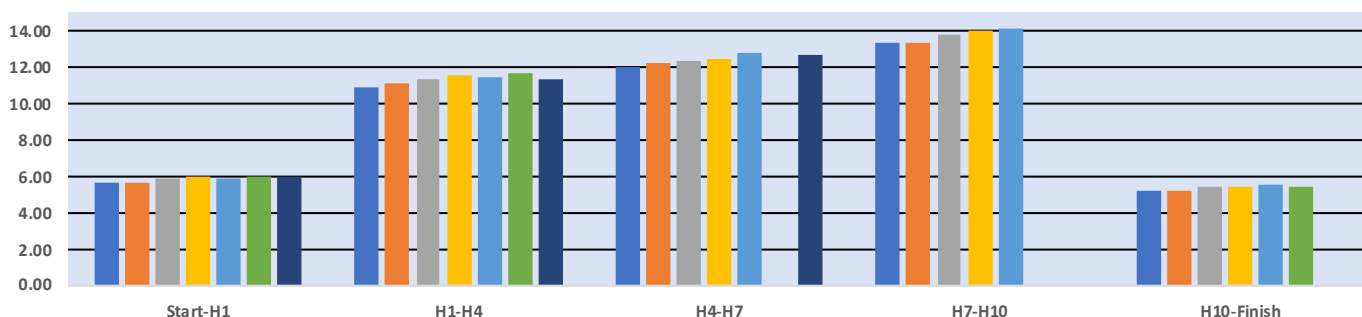
FINAL

			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		5.62	9.12	12.74	16.51	20.38	24.36	28.49	32.74	37.17	41.87		47.08	7 / 1			
	reaction time	0.150																
	interval		8.01	3.50	3.62	3.77	3.87	3.98	4.13	4.25	4.43	4.70	5.21			10.89	11.98	13.38
	velocity		8.01	10.00	9.67	9.28	9.04	8.79	8.47	8.24	7.90	7.45	7.68	8.50		9.64	8.76	7.85
dos Santos, Alison (BRA) (2000)	H1 lead leg	L	20	13	13	13	13	13	13	13	13	15	18	157				
	time		5.70	9.31		16.76	20.64	24.74	28.93	33.16	37.60	42.31		47.51	6 / 2			
	reaction time	0.177																
	interval			3.61		7.45	3.88	4.10	4.19	4.23	4.44	4.71	5.20			11.06	12.17	13.38
Mägi, Rasmus (EST) (1992)	velocity		7.89	9.70		9.40	9.02	8.54	8.35	8.27	7.88	7.43	7.69	8.42		9.49	8.63	7.85
	H1 lead leg	L	20	13	13		12	13	14		15	15	16.5	131.5				
	time		5.92	9.64		17.30	21.25	25.39	29.64	34.10	38.70	43.41		48.83	5 / 3			
	reaction time	0.152																
Preis, Constantin (GER) (1998)	interval			3.72		7.66	3.95	4.14	4.25	4.46	4.60	4.71	5.42			11.38	12.34	13.77
	velocity		7.60	9.41		9.14	8.86	8.45	8.24	7.85	7.61	7.43	7.38	8.19		9.23	8.51	7.63
	H1 lead leg	R	20	13			13	13	13	14	14	14		114				
	strides																	
Happio, Wilfried (FRA) (1998)	time		6.00	9.84		17.60	21.62	25.79	30.08	34.50	39.20	44.04		49.49	4 / 4			
	reaction time	0.231																
	interval			3.84		7.76	4.02	4.17	4.29	4.42	4.70	4.84	5.45			11.60	12.48	13.96
	velocity		7.50	9.11		9.02	8.71	8.39	8.16	7.92	7.45	7.23	7.34	8.08		9.05	8.41	7.52
Happio, Wilfried (FRA) (1998)	H1 lead leg	L	22	14			14	15	15		16	16		112				
	time		5.84	9.54		17.32	21.37	25.52	30.05	34.60	39.34	44.17		49.66	3 / 5			
	reaction time	0.123																
	interval			3.70		7.78	4.05	4.15	4.53	4.55	4.74	4.83	5.49			11.48	12.73	14.12
McAlister, Chris (GBR) (1995)	velocity		7.71	9.46		9.00	8.64	8.43	7.73	7.69	7.38	7.25	7.29	8.05		9.15	8.25	7.44
	H1 lead leg	L	20	13			13	13	14		15	15		103				
	time		5.97	9.77		17.65				34.77	39.60	44.57		49.98	2 / 6			
	reaction time	0.144																
Bailey, Aldrich (USA) (1994)	interval			3.80		7.88				17.12	4.83	4.97	5.41			11.68		
	velocity		7.54	9.21		8.88				8.18	7.25	7.04	7.39	8.00		8.99		
	H1 lead leg	R	22	14							16	16		68				
	strides																	
Bailey, Aldrich (USA) (1994)	time		5.94	9.64	13.44	17.31	21.33	25.52	29.96	34.40				dnf	8 / --			
	reaction time	0.225																
	interval			3.70	3.80	3.87	4.02	4.19	4.44	4.44								
	velocity		7.58	9.46	9.21	9.04	8.71	8.35	7.88	7.88						11.37	12.65	
Bailey, Aldrich (USA) (1994)	H1 lead leg	L	21	13	13	13	13	13	14	14				114		9.23	8.30	
	strides																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=pl5zgnzUj0o>

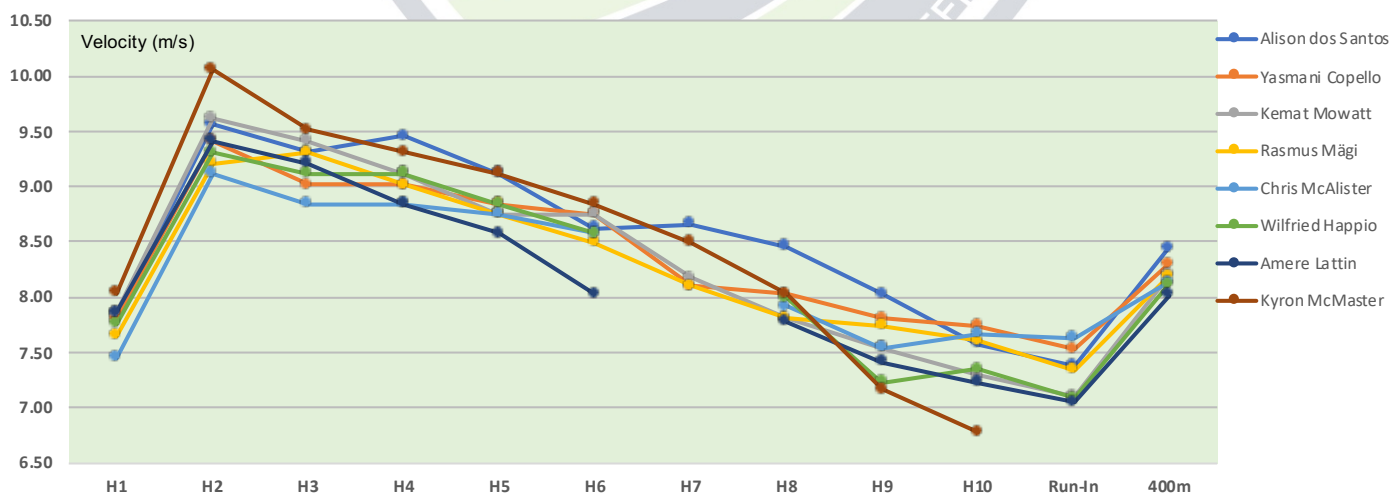
2021 Bauhaus Galan (Stockholm, SWE) (TV Analysis)

Men's 400m Hurdles

Date 2021.07.04

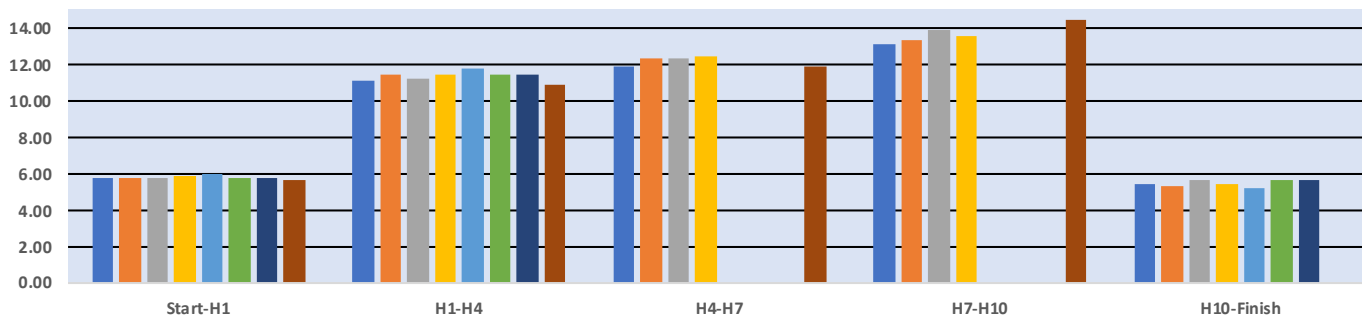
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
dos Santos, Alison (BRA) (2000)	time		5.74	9.40	13.16	16.86	20.70	24.76	28.80	32.94	37.30	41.92		47.34	7 / 1			
	reaction time	0.160																
	interval			3.66	3.76	3.70	3.84	4.06	4.04	4.14	4.36	4.62	5.42	AR PB		11.12	11.94	13.12
	velocity		7.84	9.56	9.31	9.46	9.11	8.62	8.66	8.45	8.03	7.58	7.38	8.45		9.44	8.79	8.00
	H1 lead leg	L			13	13	12	12	13	13	13	13	17	132				
Copello, Yasmani (TUR) (1987)	time		5.76	9.48	13.36	17.24	21.20	25.20	29.52	33.88	38.36	42.88		48.19	4 / 2			
	reaction time	0.167																
	interval			3.72	3.88	3.88	3.96	4.00	4.32	4.36	4.48	4.52	5.31			11.48	12.28	13.36
	velocity		7.81	9.41	9.02	9.02	8.84	8.75	8.10	8.03	7.81	7.74	7.53	8.30		9.15	8.55	7.86
	H1 lead leg	R		20	13	13	13	13	14	14	14	14	17.7	158.7				
Mowatt, Kemat (JAM) (1995)	time		5.72	9.36	13.08	16.92	20.92	24.92	29.20	33.68	38.32	43.12		48.75	8 / 3			
	reaction time	0.156																
	interval			3.64	3.72	3.84	4.00	4.00	4.28	4.48	4.64	4.80	5.63			11.20	12.28	13.92
	velocity		7.87	9.62	9.41	9.11	8.75	8.75	8.18	7.81	7.54	7.29	7.10	8.21		9.38	8.55	7.54
	H1 lead leg	L			13	13	13	13	13	14	14	14	17.7	138.7				
Mägi, Rasmus (EST) (1992)	time		5.88	9.68	13.44	17.32	21.32	25.44	29.76	34.24	38.76	43.36		48.81	5 / 4			
	reaction time	0.128																
	interval			3.80	3.76	3.88	4.00	4.12	4.32	4.48	4.52	4.60	5.45			11.44	12.44	13.60
	velocity		7.65	9.21	9.31	9.02	8.75	8.50	8.10	7.81	7.74	7.61	7.34	8.20		9.18	8.44	7.72
	H1 lead leg	R			13	13	13	13	13	14	14	14	17.2	137.2				
McAlister, Chris (GBR) (1995)	time		6.04	9.88	13.84	17.80	21.80	25.88		34.72	39.36	43.92		49.16	1 / 5			
	reaction time	0.134								8.84	4.64	4.56	5.24	PB		11.76		
	interval			3.84	3.96	3.84	4.00	4.08		7.92	7.54	7.68	7.63	8.14		8.93		
	velocity		7.45	9.11	8.84	8.84	8.75	8.58		7.92	7.54	7.68	7.63	8.14				
	H1 lead leg	R			14	14	14	14			15	15	18.5	118.5				
Happio, Wilfried (FRA) (1998)	time		5.80	9.56	13.40	17.24	21.20	25.28		34.04	38.88	43.64		49.28	2 / 6			
	reaction time	0.136								8.76	4.84	4.76	5.64			11.44		
	interval			3.76	3.84	3.84	3.96	4.08		7.99	7.23	7.35	7.09	8.12		9.18		
	velocity		7.76	9.31	9.11	9.11	8.84	8.58		7.99	7.23	7.35	7.09	8.12				
	H1 lead leg	L			20	13	13	13	13		15	15	18	146				
Lattin, Amere (USA) (1997)	time		5.72	9.44	13.24	17.20	21.28	25.64		34.64	39.36	44.20		49.87	3 / 7			
	reaction time	0.140								9.00	4.72	4.84	5.67			11.48		
	interval			3.72	3.80	3.96	4.08	4.36		7.78	7.42	7.23	7.05	8.02		9.15		
	velocity		7.87	9.41	9.21	8.84	8.58	8.03										
	H1 lead leg	L			20	13	13	13	14			15	15	17	133			
McMaster, Kyron (IVB) (1997)	time		5.60	9.08	12.76	16.52	20.36	24.32	28.44	32.80	37.68	42.84		dnf	6 / --			
	reaction time	0.177								4.12	4.36	4.88	5.16			10.92	11.92	14.40
	interval			3.48	3.68	3.76	3.84	3.96	4.12	4.36	4.88	5.16				9.62	8.81	7.29
	velocity		8.04	10.06	9.51	9.31	9.11	8.84	8.50	8.03	7.17	6.78						
	H1 lead leg	L			13	13	13	13	13	14	15	15		122				



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=FYXL6HSzYRc>

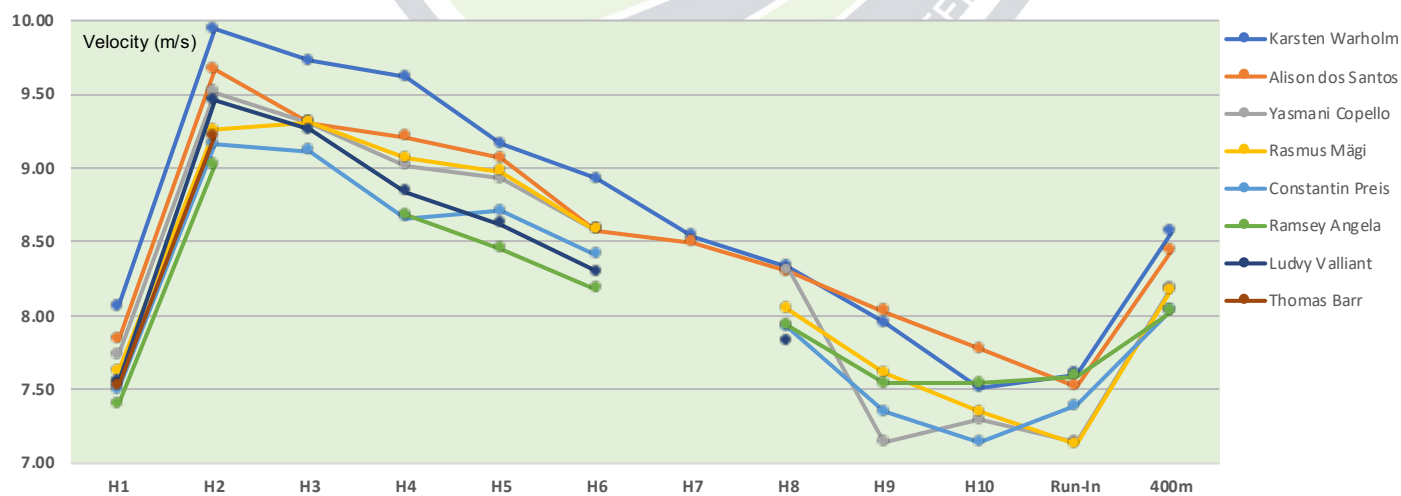
2021 Bislett Games (Oslo, NOR) (TV Analysis)

Men's 400m Hurdles

Date 2021.07.01

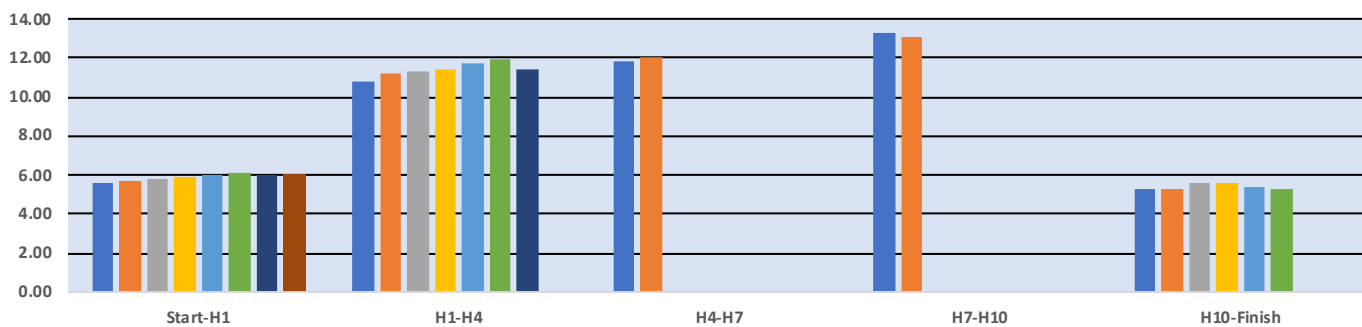
FINAL

				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			5.58	9.10	12.70	16.34	20.16	24.08	28.18	32.38	36.78	41.44		46.70	7 / 1			
	reaction time	0.163	interval		3.52	3.60	3.64	3.82	3.92	4.10	4.20	4.40	4.66	5.26	WR		10.76	11.84	13.26
			velocity	8.06	9.94	9.72	9.62	9.16	8.93	8.54	8.33	7.95	7.51	7.60	8.57		9.76	8.87	7.92
	H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	13	18	155				
dos Santos, Alison (BRA) (2000)	time			5.74	9.36	13.12	16.92	20.78	24.86	28.98	33.20	37.56	42.06		47.38	6 / 2			
	reaction time	0.179	interval		3.62	3.76	3.80	3.86	4.08	4.12	4.22	4.36	4.50	5.32	AR PB		11.18	12.06	13.08
			velocity	7.84	9.67	9.31	9.21	9.07	8.58	8.50	8.29	8.03	7.78	7.52	8.44		9.39	8.71	8.03
	H1 lead leg	L	strides	20	13	13	12	12	13	13	13	13	13	16.5	138.5				
Copello, Yasmani (TUR) (1987)	time			5.82	9.50	13.26	17.14	21.06	25.14		33.56	38.46	43.26		48.86	5 / 3			
	reaction time	0.198	interval		3.68	3.76	3.88	3.92	4.08		8.42	4.90	4.80	5.60			11.32		
			velocity	7.73	9.51	9.31	9.02	8.93	8.58		8.31	7.14	7.29	7.14	8.19		9.28		
	H1 lead leg	R	strides	20	13	13		13	13	13		14	15	114					
Mägi, Rasmus (EST) (1992)	time			5.90	9.68	13.44	17.30	21.20	25.28		33.98	38.58	43.34		48.95	3 / 4			
	reaction time	0.161	interval		3.78	3.76	3.86	3.90	4.08		8.70	4.60	4.76	5.61			11.40		
			velocity	7.63	9.26	9.31	9.07	8.97	8.58		8.05	7.61	7.35	7.13	8.17		9.21		
	H1 lead leg	R	strides	20	13	13		13	13	13		14	14	113					
Preis, Constantin (GER) (1998)	time			6.00	9.82	13.66	17.70	21.72	25.88		34.72	39.48	44.38		49.79	2 / 5			
	reaction time	0.246	interval		3.82	3.84	4.04	4.02	4.16		8.84	4.76	4.90	5.41			11.70		
			velocity	7.50	9.16	9.11	8.66	8.71	8.41		7.92	7.35	7.14	7.39	8.03		8.97		
	H1 lead leg	L	strides	22	14	14		14	15			16	16	111					
Angela, Ramsey (NED) (1999)	time			6.08	9.96		18.02	22.16	26.44		35.26	39.90	44.54		49.81	1 / 6			
	reaction time	0.199	interval		3.88		8.06	4.14	4.28		8.82	4.64	4.64	5.27			11.94		
			velocity	7.40	9.02		8.68	8.45	8.18		7.94	7.54	7.54	7.59	8.03		8.79		
	H1 lead leg	R	strides	22	14			15				15	15	81					
Vaillant, Ludvy (FRA) (1995)	time			5.96	9.66	13.44	17.40	21.46	25.68		34.62				dnf	8 / --			
	reaction time	0.245	interval		3.70	3.78	3.96	4.06	4.22		8.94						11.44		
			velocity	7.55	9.46	9.26	8.84	8.62	8.29		7.83						9.18		
	H1 lead leg	R	strides	21	13	13	13	13	13						86				
Barr, Thomas (IRL) (1992)	time			5.98	9.78										dnf	4 / --			
	reaction time	0.147	interval		3.80														
			velocity	7.53	9.21														
	H1 lead leg	R	strides	21	14										35				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 50fps

Timing From: First Movement

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

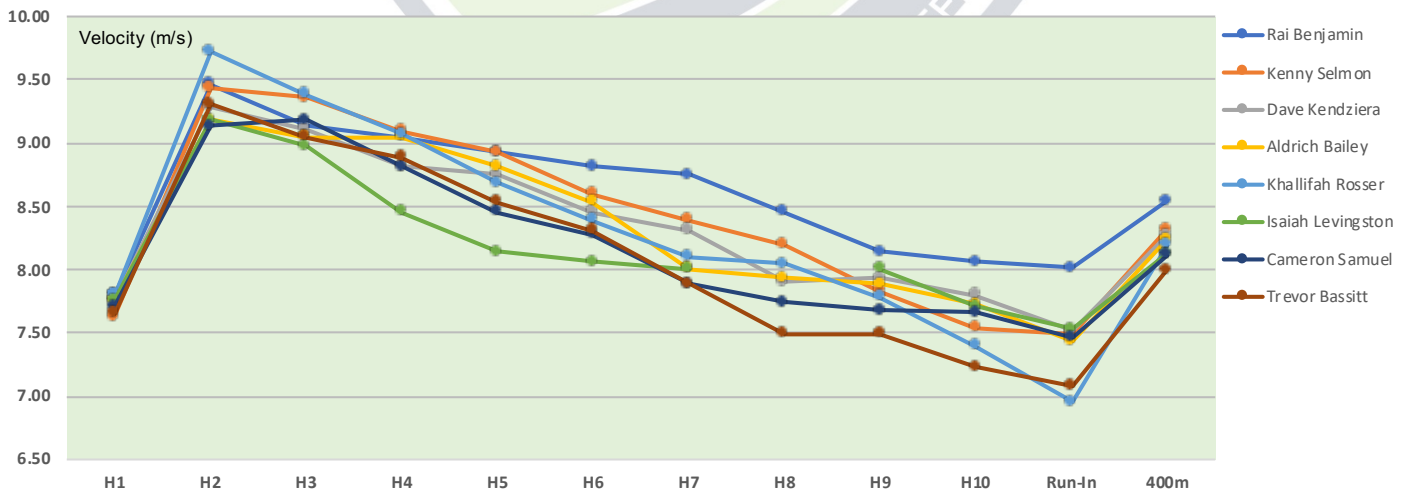
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Men's 400m Hurdles

Date 2021.06.26

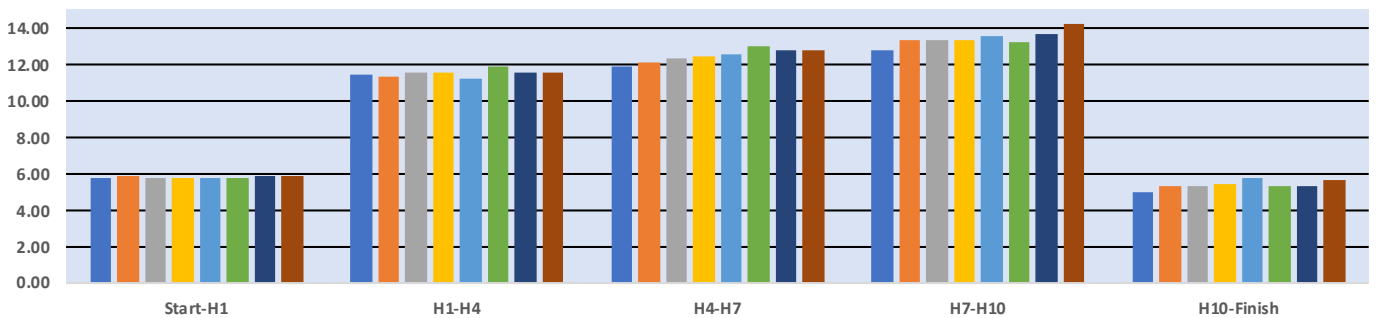
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Benjamin, Rai (USA) (1997)	time		5.77	9.47	13.30	17.17	21.09	25.06	29.06	33.20	37.50	41.84		46.83	5 / 1			
	reaction time	0.235																
	interval		7.80	3.70	3.83	3.87	3.92	3.97	4.00	4.14	4.30	4.34	4.99	PB		11.40	11.89	12.78
	velocity		9.46	9.14	9.04	8.93	8.82	8.75	8.45	8.14	8.06	8.02	8.54			9.21	8.83	8.22
Selmon, Kenny (USA) (1996)	time		5.90	9.61	13.35	17.20	21.12	25.19	29.36	33.63	38.10	42.74		48.08	6 / 2			
	reaction time	0.212																
	interval		7.63	3.71	3.74	3.85	3.92	4.07	4.17	4.27	4.47	4.64	5.34	PB		11.30	12.16	13.38
	velocity		9.43	9.36	9.09	8.93	8.60	8.39	8.20	7.83	7.54	7.49	8.32			9.29	8.63	7.85
Kendziera, Dave (USA) (1994)	time		5.80	9.57	13.41	17.38	21.38	25.52	29.73	34.16	38.57	43.06		48.38	4 / 3			
	reaction time	0.172																
	interval		7.76	3.77	3.84	3.97	4.00	4.14	4.21	4.43	4.41	4.49	5.32	PB		11.58	12.35	13.33
	velocity		9.28	9.11	8.82	8.75	8.45	8.31	7.90	7.94	7.80	7.52	8.27			9.07	8.50	7.88
Bailey, Aldrich (USA) (1994)	time		5.80	9.61	13.48	17.35	21.32	25.42	29.79	34.20	38.64	43.17		48.55	3 / 4			
	reaction time	0.228																
	interval		7.76	3.81	3.87	3.87	3.97	4.10	4.37	4.41	4.44	4.53	5.38	PB		11.55	12.44	13.38
	velocity		9.19	9.04	9.04	8.82	8.54	8.01	7.94	7.88	7.73	7.43	8.24			9.09	8.44	7.85
Rosser, Khallifah (USA) (1995)	time		5.77	9.37	13.10	16.96	20.99	25.16	29.48	33.83	38.33	43.06		48.81	8 / 5			
	reaction time	0.279																
	interval		3.60	3.73	3.86	4.03	4.17	4.32	4.35	4.50	4.73	5.75				11.19	12.52	13.58
	velocity		7.80	9.72	9.38	9.07	8.68	8.39	8.10	8.05	7.78	7.40	6.96	8.20		9.38	8.39	7.73
Levingston, Isaiah (USA) (1998)	time		5.80	9.61	13.51	17.65	21.95	26.29	30.66		39.40	43.94		49.25	9 / 6			
	reaction time	0.231																
	interval		3.81	3.90	4.14	4.30	4.34	4.37		8.74	4.54	5.31				11.85	13.01	13.28
	velocity		7.76	9.19	8.97	8.45	8.14	8.06	8.01		8.01	7.71	7.53	8.12		8.86	8.07	7.91
Samuel, Cameron (USA) (1999)	time		5.84	9.67	13.48	17.45	21.59	25.82	30.26	34.78	39.34	43.91		49.27	7 / 7			
	reaction time	0.199																
	interval		7.71	3.83	3.81	3.97	4.14	4.23	4.44	4.52	4.56	4.57	5.36			11.61	12.81	13.65
	velocity		9.14	9.19	8.82	8.45	8.27	7.88	7.74	7.68	7.66	7.46	8.12			9.04	8.20	7.69
Bassitt, Trevor (USA) (1998)	time		5.88	9.64	13.51	17.45	21.55	25.76	30.20	34.87	39.54	44.38		50.03	2 / 8			
	reaction time	0.206																
	interval		7.65	3.76	3.87	3.94	4.10	4.21	4.44	4.67	4.67	4.84	5.65			11.57	12.75	14.18
	velocity		9.31	9.04	8.88	8.54	8.31	7.88	7.49	7.49	7.23	7.08	8.00			9.08	8.24	7.40



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=XA2nUFe-CDI>

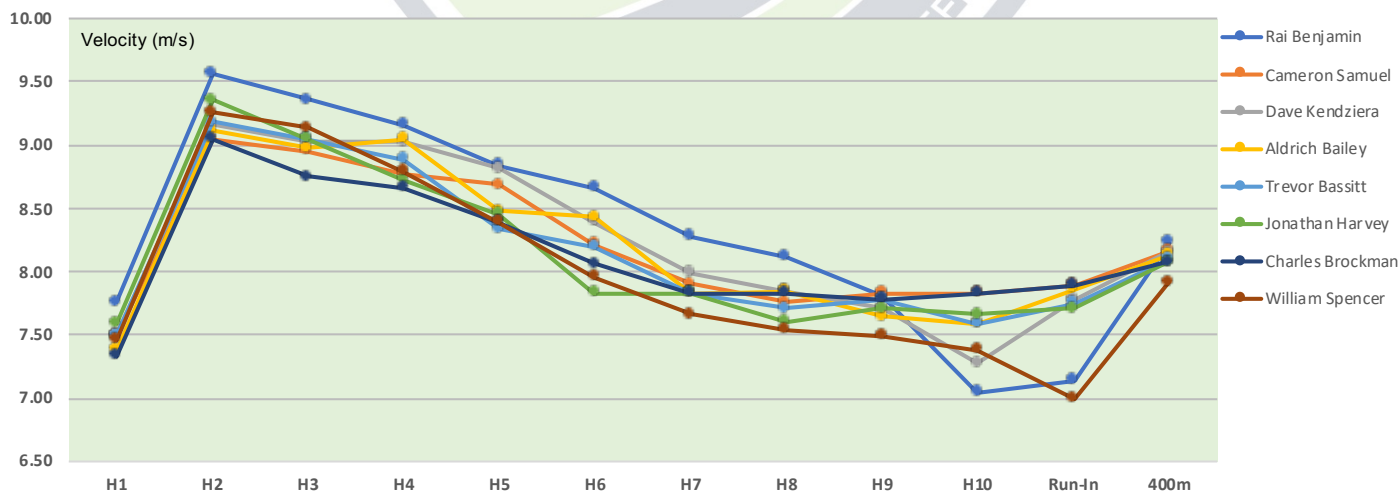
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Men's 400m Hurdles

Date 2021.06.25

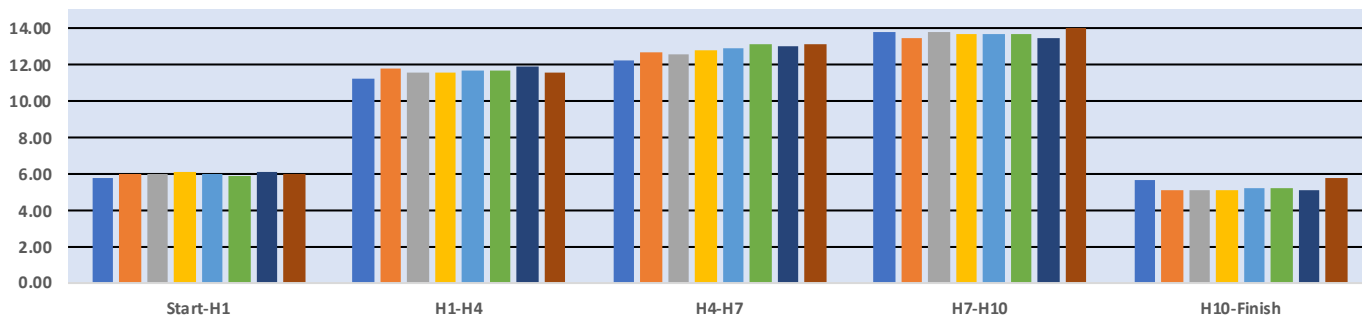
Semi-Final 2

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Benjamin, Rai (USA) (1997)	time		5.80	9.46	13.20	17.02	20.98	25.02	29.25	33.56	38.04	43.01		48.61	6 / 1			
	reaction time	0.197																
	interval		3.66	3.74	3.82	3.96	4.04	4.23	4.31	4.48	4.97	5.60				11.22	12.23	13.76
	velocity		7.76	9.56	9.36	9.16	8.84	8.66	8.27	8.12	7.81	7.04	8.23			9.36	8.59	7.63
Samuel, Cameron (USA) (1999)	time		6.00	9.87	13.78	17.77	21.80	26.06	30.49	35.00	39.47	43.94		49.01	5 / 2			
	reaction time	0.154																
	interval		3.87	3.91	3.99	4.03	4.26	4.43	4.51	4.47	4.47	5.07				11.77	12.72	13.45
	velocity		7.50	9.04	8.95	8.77	8.68	8.22	7.90	7.76	7.83	7.83	7.89	8.16		8.92	8.25	7.81
Kendziera, Dave (USA) (1994)	time		6.00	9.82	13.70	17.58	21.55	25.72	30.10	34.56	39.10	43.91		49.05	8 / 3			
	reaction time	0.190																
	interval		3.82	3.88	3.88	3.97	4.17	4.38	4.46	4.54	4.81	5.14				11.58	12.52	13.81
	velocity		7.50	9.16	9.02	8.82	8.39	7.99	7.85	7.71	7.28	7.78	8.15			9.07	8.39	7.60
Bailey, Aldrich (USA) (1994)	time		6.10	9.94	13.84	17.71	21.84	25.99	30.46	34.92	39.50	44.11		49.20	2 / 4			
	reaction time	0.188																
	interval		3.84	3.90	3.87	4.13	4.15	4.47	4.46	4.58	4.61	5.09				11.61	12.75	13.65
	velocity		7.38	9.11	8.97	9.04	8.47	8.43	7.83	7.85	7.64	7.59	7.86	8.13		9.04	8.24	7.69
Bassitt, Trevor (USA) (1998)	time		6.00	9.81	13.68	17.62	21.82	26.09	30.56	35.10	39.60	44.21		49.37	3 / 5			
	reaction time	0.176																
	interval		3.81	3.87	3.94	4.20	4.27	4.47	4.54	4.50	4.61	5.16				11.62	12.94	13.65
	velocity		7.50	9.19	9.04	8.88	8.33	8.20	7.83	7.71	7.78	7.59	7.75	8.10		9.04	8.11	7.69
Harvey, Jonathan (USA) (1997)	time		5.93	9.67	13.54	17.55	21.69	26.16	30.63	35.23	39.77	44.34		49.53	7 / 6			
	reaction time	0.140																
	interval		3.74	3.87	4.01	4.14	4.47	4.47	4.60	4.54	4.57	5.19				11.62	13.08	13.71
	velocity		7.59	9.36	9.04	8.73	8.45	7.83	7.83	7.61	7.71	7.66	7.71	8.08		9.04	8.03	7.66
Brockman, Charles (USA) (1999)	time		6.14	10.01	14.01	18.05	22.22	26.56	31.03	35.50	40.00	44.47		49.54	9 / 7			
	reaction time	0.241																
	interval		3.87	4.00	4.04	4.17	4.34	4.47	4.47	4.50	4.47	5.07				11.91	12.98	13.44
	velocity		7.33	9.04	8.75	8.66	8.39	8.06	7.83	7.83	7.78	7.83	7.89	8.07		8.82	8.09	7.81
Spencer, William (USA) (20010)	time		6.03	9.81	13.64	17.62	21.79	26.19	30.76	35.40	40.07	44.81		50.53	4 / 8			
	reaction time	0.174																
	interval		3.78	3.83	3.98	4.17	4.40	4.57	4.64	4.67	4.74	5.72				11.59	13.14	14.05
	velocity		7.46	9.26	9.14	8.79	8.39	7.95	7.66	7.54	7.49	7.38	6.99	7.92		9.06	7.99	7.47



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=Cm1GzHulwFg>

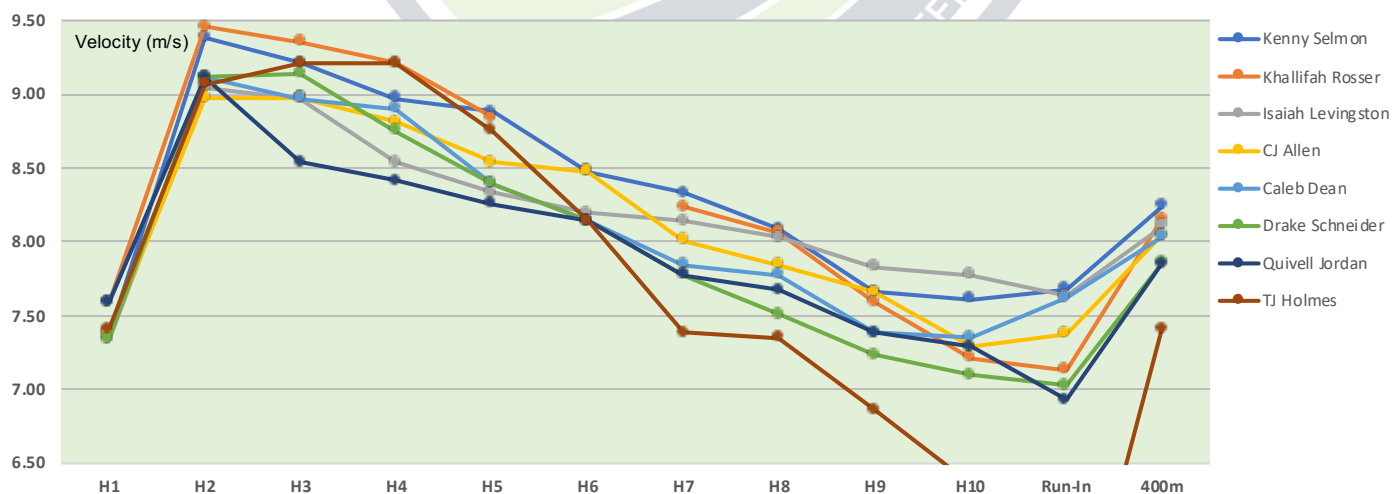
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Men's 400m Hurdles

Date 2021.06.25

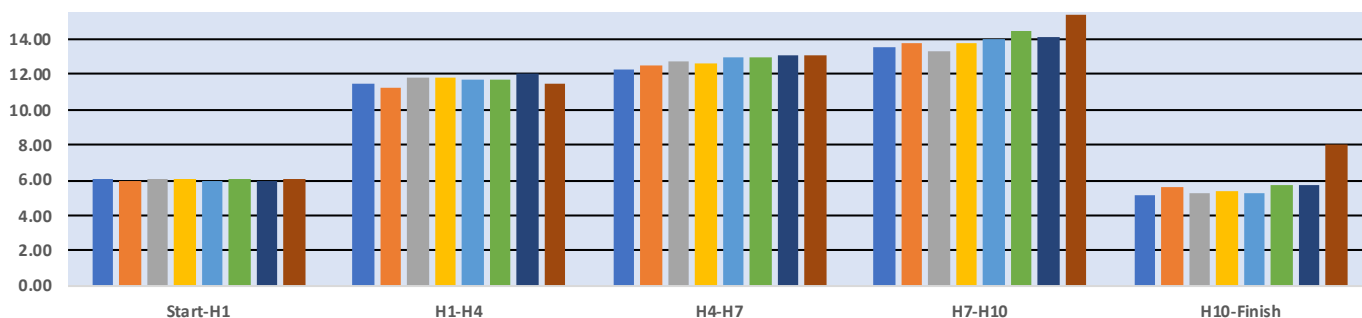
Semi-Final 1

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Selmon, Kenny (USA) (1996)	time		6.10	9.83	13.63	17.53	21.47	25.60	29.80	34.13	38.70	43.30		48.51	6 / 1			
	reaction time	0.242																
	interval			3.73	3.80	3.90	3.94	4.13	4.20	4.33	4.57	4.60	5.21			11.43	12.27	13.50
	velocity		7.38	9.38	9.21	8.97	8.88	8.47	8.33	8.08	7.66	7.61	7.68	8.25		9.19	8.56	7.78
Rosser, Khalifah (USA) (1995)	time		5.93	9.63	13.37	17.17	21.13		29.63	33.97	38.58	43.43		49.04	4 / 2			
	reaction time	0.209																
	interval			3.70	3.74	3.80	3.96		8.50	4.34	4.61	4.85	5.61			11.24	12.46	13.80
	velocity		7.59	9.46	9.36	9.21	8.84		8.24	8.06	7.59	7.22	7.13	8.16		9.34	8.43	7.61
Levingston, Isaiah (USA) (1998)	time		6.13	10.00	13.90	18.00	22.20	26.47	30.77	35.13	39.60	44.10		49.34	8 / 3			
	reaction time	0.247																
	interval			3.87	3.90	4.10	4.20	4.27	4.30	4.36	4.47	4.50	5.24			11.87	12.77	13.33
	velocity		7.34	9.04	8.97	8.54	8.33	8.20	8.14	8.03	7.83	7.78	7.63	8.11		8.85	8.22	7.88
Allen, CJ (USA) (1995)	time		6.10	10.00	13.90	17.87	21.97	26.10	30.47	34.93	39.50	44.30		49.72	3 / 4			
	reaction time	0.225																
	interval			3.90	3.90	3.97	4.10	4.13	4.37	4.46	4.57	4.80	5.42			11.77	12.60	13.83
	velocity		7.38	8.97	8.97	8.82	8.54	8.47	8.01	7.85	7.66	7.29	7.38	8.05		8.92	8.33	7.59
Dean, Caleb (USA) (2001)	time		5.93	9.77	13.67	17.60	21.77	26.07	30.53	35.03	39.77	44.53		49.78	7 / 5			
	reaction time	0.178																
	interval			3.84	3.90	3.93	4.17	4.30	4.46	4.50	4.74	4.76	5.25			11.67	12.93	14.00
	velocity		7.59	9.11	8.97	8.91	8.39	8.14	7.85	7.78	7.38	7.35	7.62	8.04		9.00	8.12	7.50
Schneider, Drake (USA) (1999)	time		6.13	9.97	13.80	17.80	21.97	26.27	30.77	35.43	40.27	45.20		50.89	9 / 6			
	reaction time	0.283																
	interval			3.84	3.83	4.00	4.17	4.30	4.46	4.64	4.84	4.93	5.69			11.67	12.97	14.43
	velocity		7.34	9.11	9.14	8.75	8.39	8.14	7.78	7.51	7.23	7.10	7.03	7.86		9.00	8.10	7.28
Jordan, Quivell (USA) (1999)	time		5.93	9.77	13.87	18.03	22.27	26.57	31.07	35.63	40.37	45.17		50.94	2 / 7			
	reaction time	0.178																
	interval			3.84	4.10	4.16	4.24	4.30	4.50	4.56	4.74	4.80	5.77			12.10	13.04	14.10
	velocity		7.59	9.11	8.54	8.41	8.25	8.14	7.78	7.68	7.38	7.29	6.93	7.85		8.68	8.05	7.45
Holmes, TJ (USA) (1995)	time		6.07	9.93	13.73	17.53	21.53	25.83	30.57	35.33	40.43	45.93		53.98	5 / 8			
	reaction time	0.189																
	interval			3.86	3.80	3.80	4.00	4.30	4.74	4.76	5.10	5.50	8.05			11.46	13.04	15.36
	velocity		7.41	9.07	9.21	9.21	8.75	8.14	7.38	7.35	6.86	6.36	4.97	7.41		9.16	8.05	6.84



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=QhAEK8AeHsk&t=95s>

2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Men's 400m Hurdles

Date 2021.06.24

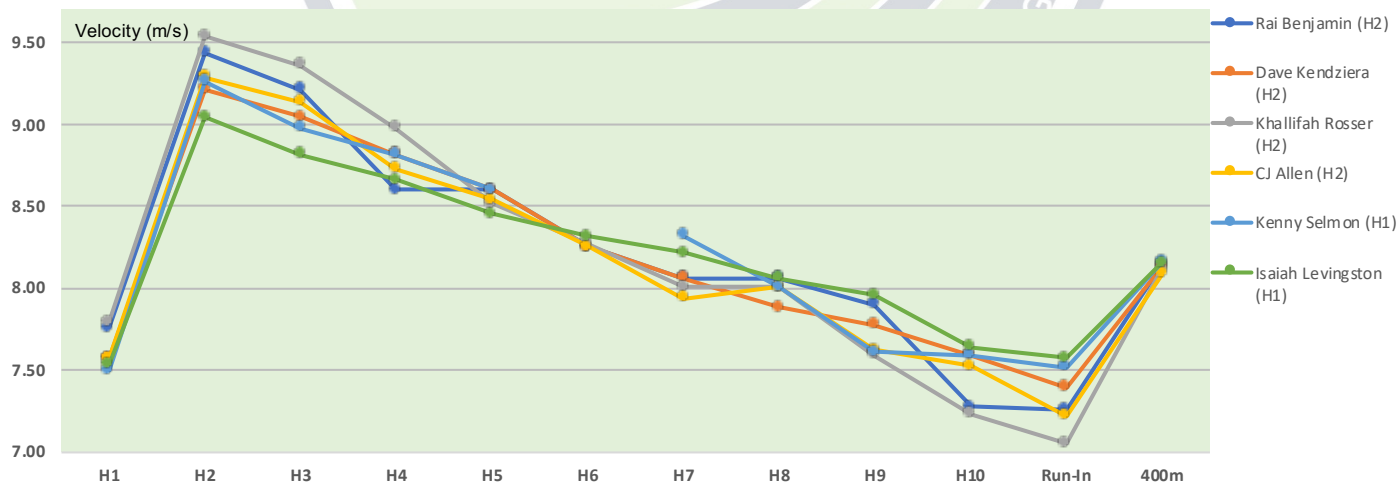
Heat 2

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Benjamin, Rai (USA) (1997)	time		5.80	9.51	13.31	17.38	21.45	25.69	30.03	34.37	38.80	43.61		49.12	6 / 1			
	reaction time	0.252																
	interval		3.71	3.80	4.07	4.07	4.24	4.34	4.34	4.43	4.43	4.81	5.51			11.58	12.65	13.58
	velocity		7.76	9.43	9.21	8.60	8.60	8.25	8.06	8.06	7.90	7.28	7.26	8.14		9.07	8.30	7.73
Kendziera, Dave (USA) (1994)	time		5.94	9.74	13.61	17.58	21.65	25.89	30.23	34.67	39.17	43.78		49.19	8 / 2			
	reaction time	0.250																
	interval		3.80	3.87	3.97	4.07	4.24	4.34	4.44	4.50	4.61	5.41				11.64	12.65	13.55
	velocity		7.58	9.21	9.04	8.82	8.60	8.25	8.06	7.88	7.78	7.59	7.39	8.13		9.02	8.30	7.75
Rosser, Khallifah (USA) (1995)	time		5.77	9.44	13.18	17.08	21.19	25.42	29.79	34.16	38.77	43.61		49.28	5 / 3			
	reaction time	0.246																
	interval		3.67	3.74	3.90	4.11	4.23	4.37	4.37	4.61	4.84	5.67				11.31	12.71	13.82
	velocity		7.80	9.54	9.36	8.97	8.52	8.27	8.01	8.01	7.59	7.23	7.05	8.12		9.28	8.26	7.60
Allen, CJ (USA) (1995)	time		5.94	9.71	13.54	17.55	21.65	25.89	30.30	34.67	39.26	43.91		49.45	4 / 4			
	reaction time	0.235																
	interval		3.77	3.83	4.01	4.10	4.24	4.41	4.37	4.59	4.65	5.54				11.61	12.75	13.61
	velocity		7.58	9.28	9.14	8.73	8.54	8.25	7.94	8.01	7.63	7.53	7.22	8.09		9.04	8.24	7.71

Date 2021.06.24

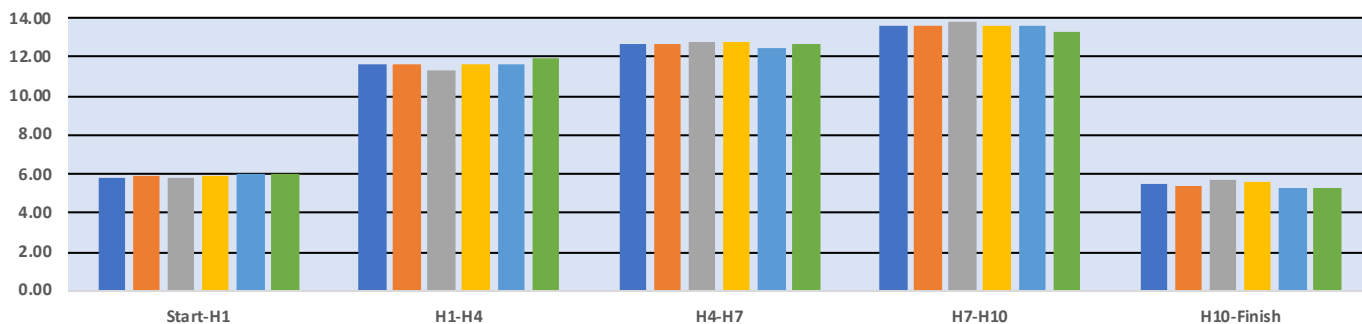
Heat 1

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Selmon, Kenny (USA) (1996)	time		6.00	9.78	13.68	17.65	21.72		30.13	34.50	39.10	43.71		49.03	3 / 1			
	reaction time	0.190							8.41	4.37	4.60	4.61	5.32			11.65	12.48	13.58
	interval		7.50	9.26	8.97	8.82	8.60		8.32	8.01	7.61	7.59	7.52	8.16		9.01	8.41	7.73
	velocity																	
Levingston, Isaiah (USA) (1998)	time		5.97	9.84	13.81	17.85	21.99	26.20	30.46	34.80	39.20	43.78		49.06	8 / 2			
	reaction time	0.192																
	interval		3.87	3.97	4.04	4.14	4.21	4.26	4.34	4.40	4.58	5.28				11.88	12.61	13.32
	velocity		7.54	9.04	8.82	8.66	8.45	8.31	8.22	8.06	7.95	7.64	7.58	8.15		8.84	8.33	7.88



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=ohCeUxH8lZY>

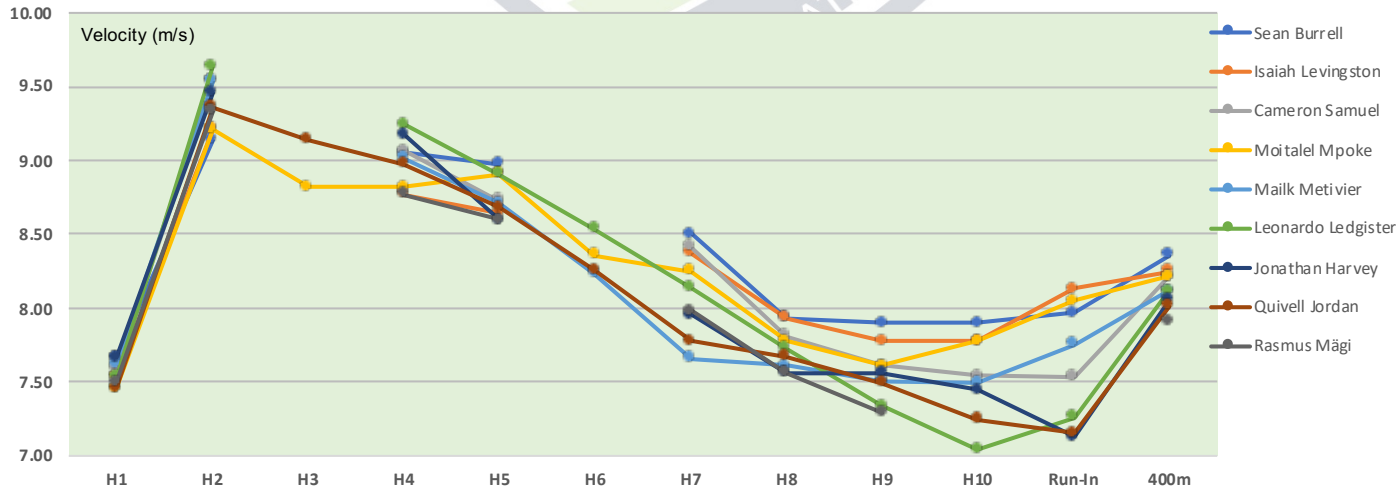
2021 NCAA Championships (Eugene, OR) (TV Analysis)

100m Hurdles

Date: 2021.06.11

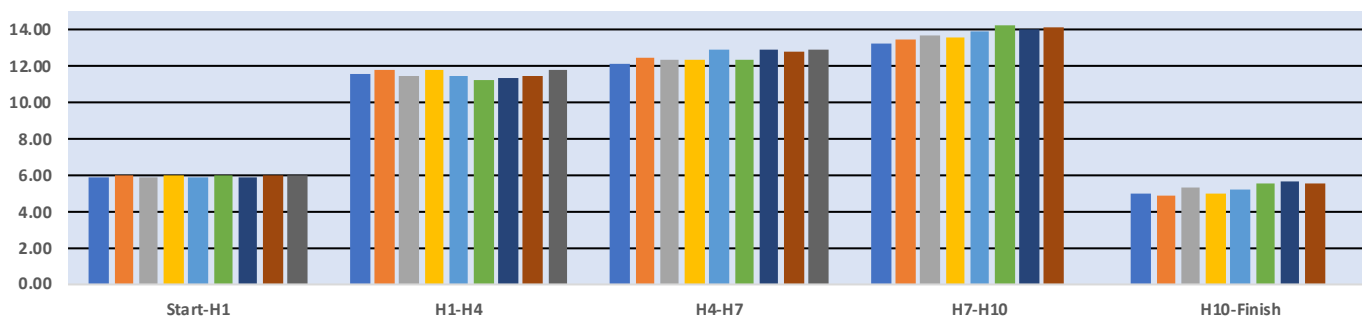
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Burrell, Sean (USA) (2002)	time		5.87	9.70		17.43	21.33		29.56	33.97	38.40	42.83		47.85	8 / 1			
	reaction time	0.194																
	interval			3.83		7.73	3.90		8.23	4.41	4.43	4.43	5.02	WJR		11.56	12.13	13.27
	velocity		7.67	9.14		9.06	8.97		8.51	7.94	7.90	7.90	7.97	8.36		9.08	8.66	7.91
Levingston, Isaiah (USA) (1998)	time		5.97	9.77		17.75	21.80		30.16	34.57	39.07	43.57		48.49	9 / 2			
	reaction time	0.233																
	interval			3.80		7.98	4.05		8.36	4.41	4.50	4.50	4.92	PB		11.78	12.41	13.41
	velocity		7.54	9.21		8.77	8.64		8.37	7.94	7.78	7.48	8.13	8.25		8.91	8.46	7.83
Samuel, Cameron (USA) (1999)	time		5.93	9.60		17.32	21.33		29.65	34.13	38.73	43.37		48.68	7 / 3			
	reaction time	0.201																
	interval			3.67		7.72	4.01		8.32	4.48	4.60	4.64	5.31	PB		11.39	12.33	13.72
	velocity		7.59	9.54		9.07	8.73		8.41	7.81	7.61	7.54	7.53	8.22		9.22	8.52	7.65
Mpoke, Moitalel (KEN) (2001)	time		6.03	9.83	13.80	17.77	21.70	25.89	30.13	34.63	39.23	43.73		48.70	6 / 4			
	reaction time	0.267																
	interval			3.80		3.97	3.93	4.19	4.24	4.50	4.60	4.50	4.97	PB		11.74	12.36	13.60
	velocity		7.46	9.21	8.82	8.82	8.91	8.36	8.25	7.78	7.61	7.78	8.05	8.21		8.94	8.50	7.72
Metivier, Malik (CAN) (1998)	time		5.90	9.57		17.33	21.35	25.60	30.17	34.77	39.43	44.10		49.26	4 / 5			
	reaction time	0.144																
	interval			3.67		7.76	4.02	4.25	4.57	4.60	4.66	4.67	5.16	PB		11.43	12.84	13.93
	velocity		7.63	9.54		9.02	8.71	8.24	7.66	7.61	7.51	7.49	7.75	8.12		9.19	8.18	7.54
Ledgister, Leonardo (JAM) (1999)	time		5.97	9.60		17.17	21.10	25.20	29.50	34.03	38.80	43.77		49.28	3 / 6			
	reaction time	0.228																
	interval			3.63		7.57	3.93	4.10	4.30	4.53	4.77	4.97	5.51			11.20	12.33	14.27
	velocity		7.54	9.64		9.25	8.91	8.54	8.14	7.73	7.34	7.04	7.26	8.12		9.38	8.52	7.36
Harvey, Jonathan (USA) (1997)	time		5.87	9.57		17.20	21.27		30.07	34.70	39.33	44.03		49.64	2 / 7			
	reaction time	0.149																
	interval			3.70		7.63	4.07		8.80	4.63	4.63	4.70	5.61	PB		11.33	12.87	13.96
	velocity		7.67	9.46		9.17	8.60		7.95	7.56	7.56	7.45	7.13	8.06		9.27	8.16	7.52
Brockman, Charles (USA) (1999)	time		6.03	9.77	13.60	17.50	21.53	25.77	30.27	34.83	39.50	44.33		49.92	5 / 8			
	reaction time	0.190																
	interval			3.74		3.83	3.90	4.03	4.24	4.50	4.56	4.67	4.83	5.59		11.47	12.77	14.06
	velocity		7.46	9.36	9.14	8.97	8.68	8.25	7.78	7.68	7.49	7.25	7.16	8.01		9.15	8.22	7.47
Jordan, Quivell (USA) (1999)	time		6.00	9.75		17.73	21.80		30.57	35.20	40.00			50.54	1 / 9			
	reaction time	0.166																
	interval			3.75		7.98	4.07		8.77	4.63	4.80					11.73	12.84	
	velocity		7.50	9.33		8.77	8.60		7.98	7.56	7.29			7.91		8.95	8.18	
	H1 lead leg	L	21	13			14			15	15			78				



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=bQDE6iL_Nmmg

2021 Bislett Night of Highlights (Oslo, NOR) (TV Analysis) (300m Hurdles)

Men's 300m Hurdles		Date 2021.06.04											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	6.12	9.60	13.16	16.78	20.60	24.52	28.58					33.26	7 / 1				
	reaction time		3.48	3.56	3.62	3.82	3.92	4.06				4.68	WB PB		10.66	11.80		
	interval	8.17	10.06	9.83	9.67	9.16	8.93	8.62				8.55	9.02		9.85	8.90		
	velocity																	
H1 lead leg	L	23	13	13	13	13	13	13				17	118					
	strides																	

2020 Impossible Games (Oslo, NOR) (TV Analysis) (300m Hurdles)

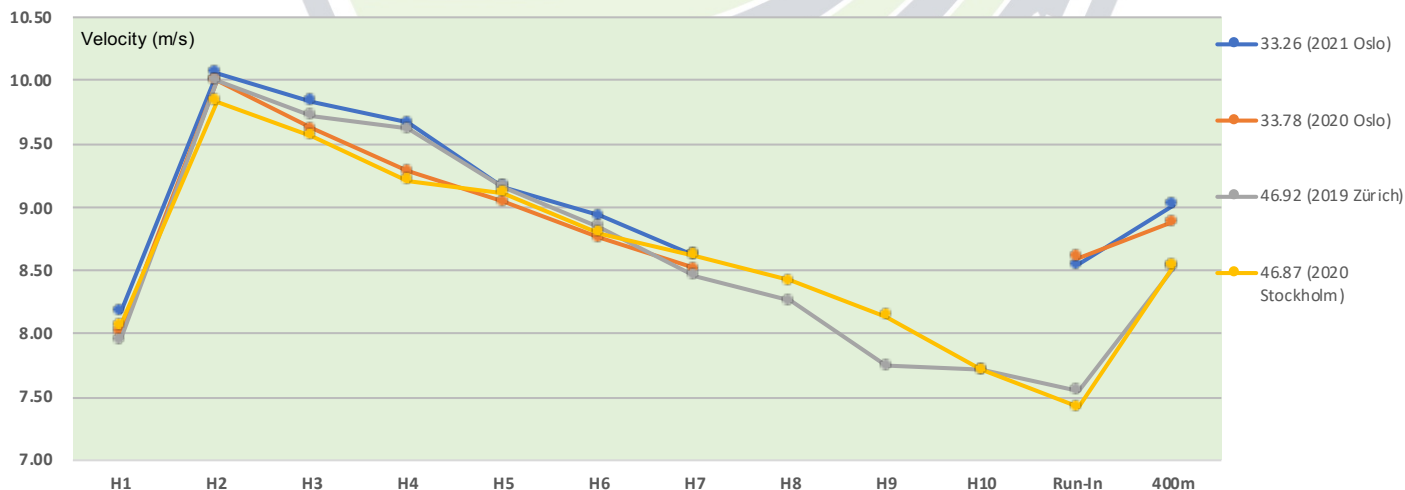
Men's 300m Hurdles		Date 2020.06.11											FINAL				
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Warholm, Karsten (NOR) (1996)	time	6.24	9.74	13.38	17.15	21.02	25.02	29.13					33.78	7 / 1			
	reaction time	0.182	interval	3.50	3.64	3.77	3.87	4.00	4.11	★	★		4.65	WB PB	10.91	11.98	
	velocity	8.01	10.00	9.62	9.28	9.04	8.75	8.52				8.60	8.88		9.62	8.76	
H1 lead leg	L	20	13	13	13	13	13	13				16.5	114.5				
	strides																

2019 Weltklasse (Zürich, SUI) (TV Analysis)

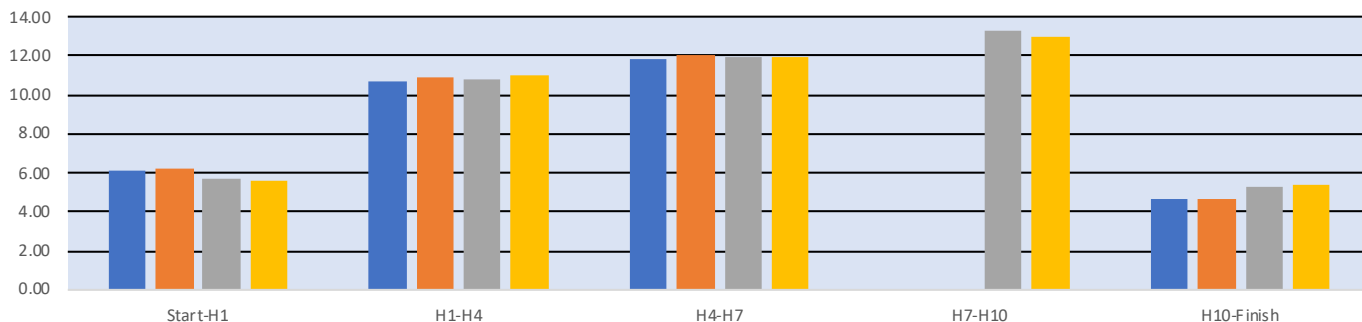
Men's 400m Hurdles		Date 2019.08.29											FINAL					
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10	
Warholm, Karsten (NOR) (1996)	time	5.66	9.16	12.76	16.40	20.22	24.18	28.32	32.56	37.08	41.62		46.92	7 / 1				
	reaction time	0.140										5.30	AR PB			10.74	11.92	13.30
	interval		3.50	3.60	3.64	3.82	3.96	4.14	4.24	4.52	4.54	7.55	8.53			9.78	8.81	7.89
	velocity	7.95	10.00	9.72	9.62	9.16	8.84	8.45	8.25	7.74	7.71	18.2	159.2					
	H1 lead leg	L	20	13	13	13	13	13	13	15	15							

2020 Bauhaus Galan (Stockholm, SWE) (TV Analysis)

Men's 400m Hurdles		Date 2020.08.23											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	5.58	9.14	12.80	16.60	20.44	24.42	28.48	32.64	36.94	41.48		46.87	8 / 1					
	reaction time	0.161										5.39	AR PB			11.02	11.88	13.00	
	interval		3.56	3.66	3.80	3.84	3.98	4.06	4.16	4.30	4.54	7.42	8.53			9.53	8.84	8.08	
	velocity	8.06	9.83	9.56	9.21	9.11	8.79	8.62	8.41	8.14	7.71	18	157						
H1 lead leg	L	20	13	13	13	13	13	13	13	13	13	15							
	strides																		



Time Intervals (s)

Hurdle Phases**2021 Bislett Night of Highlights (Oslo, NOR)**

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=NivYikNOI0&t=2s>**2019 Weltklasse (Zürich, SUI)**

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 50fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=JdYoaU0-HEc>**2020 Bauhaus Galan (Stockholm, SWE)**

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=NNmyqWf1x-g>**2020 Golden Gala Pietro Mennea (Rome, ITA)**

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 50fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=Sq4lpzQFIOE>

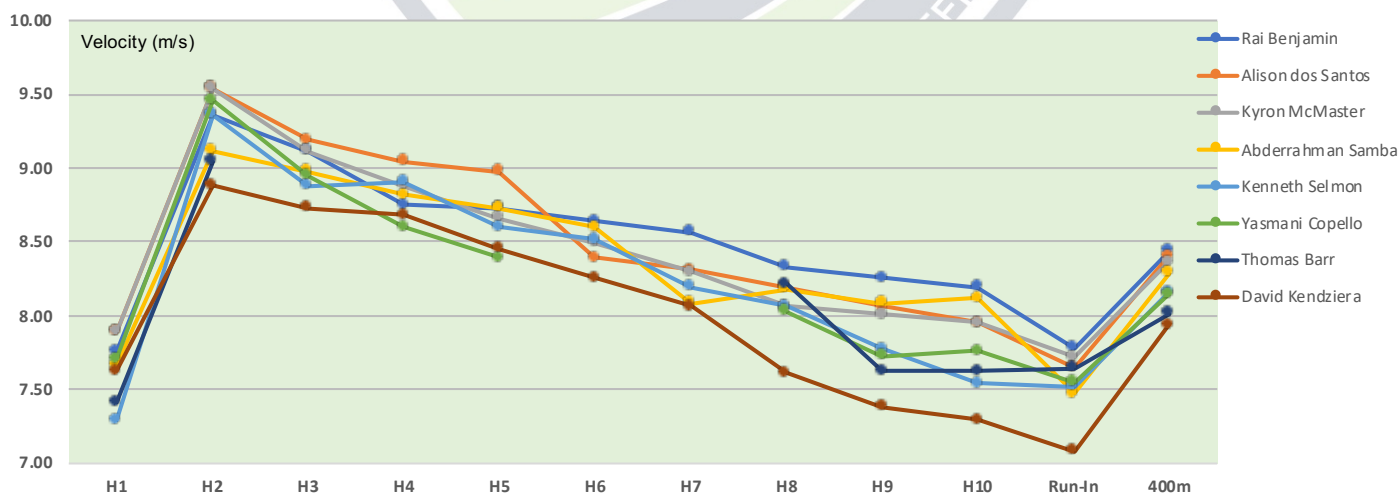
2021 Doha Diamond League (Doha, QAT) (TV Analysis)

Men's 400m Hurdles

Date 2021.05.28

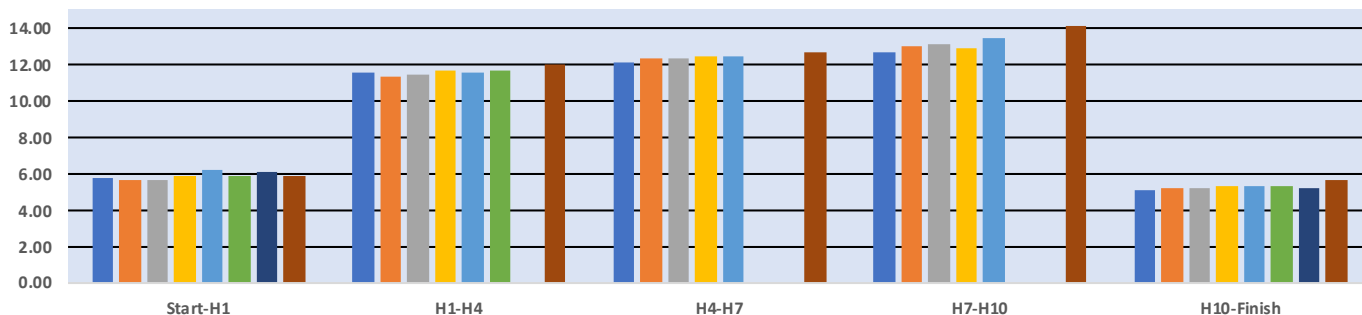
FINAL

				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Benjamin, Rai (USA) (1997)	time			5.80	9.54	13.38	17.38	21.39	25.44	29.53	33.73	37.97	42.24		47.38	5 / 1			
	reaction time	0.203	interval		3.74	3.84	4.00	4.01	4.05	4.09	4.20	4.24	4.27	5.14			11.58	12.15	12.71
	H1 lead leg	R	velocity	7.76	9.36	9.11	8.75	8.73	8.64	8.56	8.33	8.25	8.20	7.78	8.44		9.07	8.64	8.26
			strides	20	13	13	13		13	13	13	13	13	16.2	140.2				
dos Santos, Alison (BRA) (2000)	time			5.70	9.37	13.18	17.05	20.95	25.12	29.33	33.60	37.94	42.34		47.57	6 / 2			
	reaction time	0.187	interval		3.67	3.81	3.87	3.90	4.17	4.21	4.27	4.34	4.40	5.23	AR PB		11.35	12.28	13.01
	H1 lead leg	L	velocity	7.89	9.54	9.19	9.04	8.97	8.39	8.31	8.20	8.06	7.95	7.65	8.41		9.25	8.55	8.07
			strides	20	13	13	12	12	13	13	13	13	13	16.2	151.2				
McMaster, Kyrn (IVB) (1997)	time			5.70	9.37	13.21	17.15	21.19	25.31	29.53	33.87	38.24	42.64		47.82	3 / 3			
	reaction time	0.199	interval		3.67	3.84	3.94	4.04	4.12	4.22	4.34	4.37	4.40	5.18			11.45	12.38	13.11
	H1 lead leg	R	velocity	7.89	9.54	9.11	8.88	8.66	8.50	8.29	8.06	8.01	7.95	7.72	8.36		9.17	8.48	8.01
			strides	20	13	13	13		13	13	14	14	14	17	144				
Samba, Abderrahman (QAT) (1995)	time			5.87	9.71	13.61	17.58	21.59	25.66	29.99	34.27	38.60	42.91		48.26	4 / 4			
	reaction time	0.153	interval		3.84	3.90	3.97	4.01	4.07	4.33	4.28	4.33	4.31	5.35			11.71	12.41	12.92
	H1 lead leg	R	velocity	7.67	9.11	8.97	8.82	8.73	8.60	8.08	8.18	8.08	8.12	7.48	8.29		8.97	8.46	8.13
			strides	21	13	13	13		13	13	13	14	14	17	144				
Selmon, Kenneth (USA) (1996)	time			6.17	9.91	13.85	17.78	21.85	25.96	30.23	34.57	39.07	43.71		49.03	7 / 5			
	reaction time	0.314	interval		3.74	3.94	3.93	4.07	4.11	4.27	4.34	4.50	4.64	5.32			11.61	12.45	13.48
	H1 lead leg	R	velocity	7.29	9.36	8.88	8.91	8.60	8.52	8.20	8.06	7.78	7.54	7.52	8.16		9.04	8.43	7.79
			strides	21	13	13	13		13	13	13	14	14	127					
Copello, Yasmani (TUR) (1987)	time			5.84	9.54	13.45	17.52	21.69			34.77	39.30	43.81		49.11	2 / 6			
	reaction time	0.203	interval		3.70	3.91	4.07	4.17			13.08	4.53	4.51	5.30			11.68		
	H1 lead leg	R	velocity	7.71	9.46	8.95	8.60	8.39			8.03	7.73	7.76	7.55	8.14		8.99		
			strides	20	13	13	13					14	14	17.5	104.5				
Barr, Thomas (IRL) (1992)	time			6.07	9.94						35.50	40.09	44.68		49.91	1 / 7			
	reaction time	0.204	interval		3.87						25.56	4.59	4.59	5.23					
	H1 lead leg	L	velocity	7.41	9.04						8.22	7.63	7.63	7.65	8.01				
			strides	20	13							14	14	61					
Kendziera, David (USA) (1994)	time			5.90	9.84	13.85	17.88	22.02	26.26	30.60	35.20	39.94	44.74		50.39	8 / 8			
	reaction time	0.197	interval		3.94	4.01	4.03	4.14	4.24	4.34	4.60	4.74	4.80	5.65			11.98	12.72	14.14
	H1 lead leg	R	velocity	7.63	8.88	8.73	8.68	8.45	8.25	8.06	7.61	7.38	7.29	7.08	7.94		8.76	8.25	7.43
			strides	20	13	13	13	13	13	13	14	14	14	140					



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=SqvYbwH11HA>

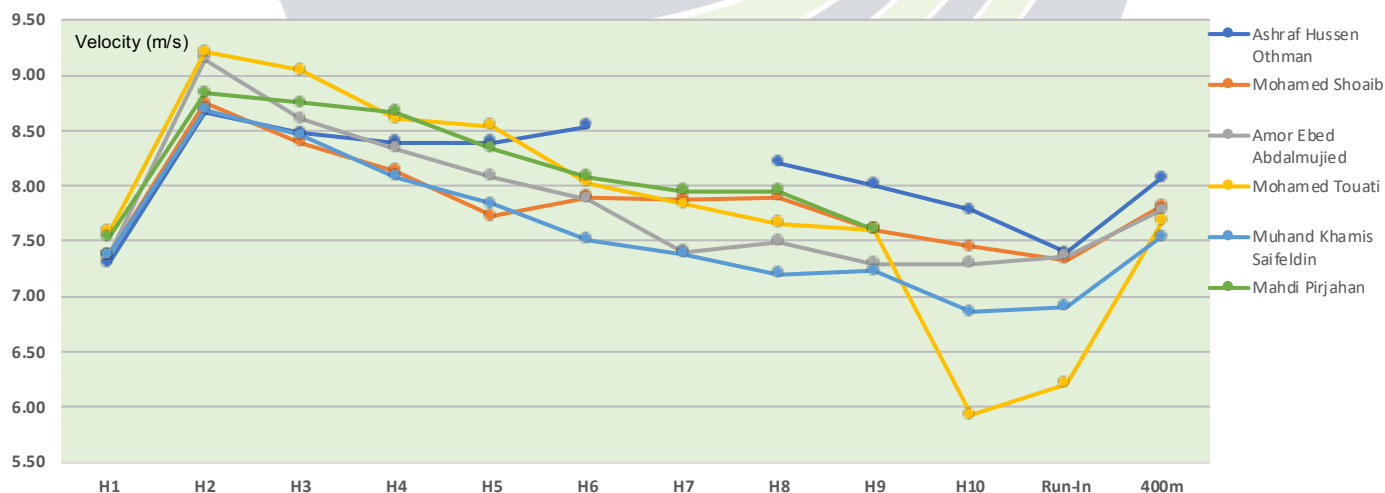
2021 Doha Diamond League (Doha, QAT) (TV Analysis)

Men's 400m Hurdles

Date 2021.05.28

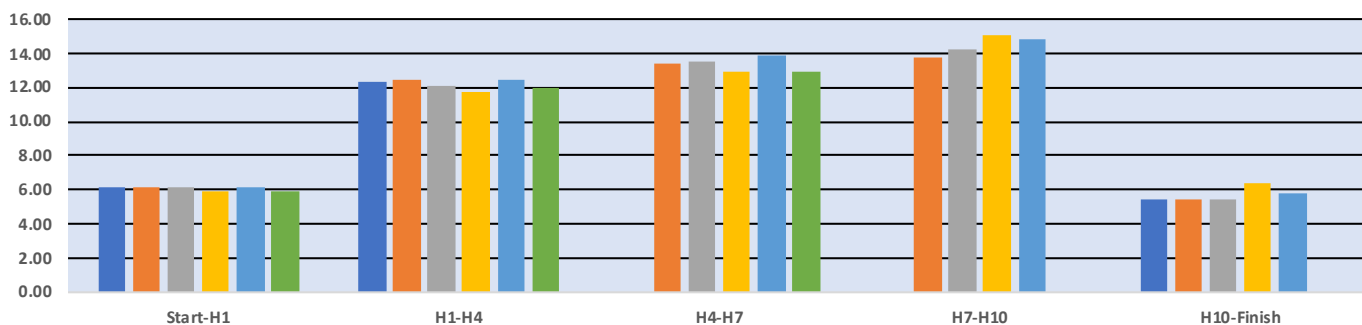
B FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Othman, Ashraf Hussen (QAT) (2001)	time		6.16	10.20	14.33	18.50	22.67	26.77		35.30	39.67	44.17		49.58	5 / 1			
	reaction time	0.171								8.53	4.37	4.50	5.41	PB		12.34		
	interval velocity		7.31	8.66	8.47	8.39	8.39	8.54		8.21	8.01	7.78	7.39	8.07		8.51		
	H1 lead leg	R	22	14	14	14	14	14			15	15	18	140				
Shoaib, Mohamed (SUD) (1995)	time		6.10	10.10	14.27	18.57	23.10	27.53	31.97	36.40	41.00	45.70		51.16	8 / 2			
	reaction time	0.191								4.43	4.43	4.60	5.46			12.47	13.40	13.73
	interval velocity		7.38	8.75	8.39	8.14	7.73	7.90	7.88	7.90	7.61	7.45	7.33	7.82		8.42	7.84	7.65
	H1 lead leg	R	21	13	13	14	14	14		14	14	14	17.2	148.2				
Abdalmujied, Amor Ebed (QAT) (2000)	time		6.10	9.93	14.00	18.20	22.53	26.97	31.70	36.37	41.17	45.97		51.40	3 / 3			
	reaction time	0.168								4.67	4.80	4.80	5.43	PB		12.10	13.50	14.27
	interval velocity		7.38	8.94	8.60	8.33	8.08	7.88	7.40	7.49	7.29	7.29	7.37	7.78		8.68	7.78	7.36
	H1 lead leg	L	22	14	14	14	14	14		15	15	15	18.7	155.7				
Touati, Mohamed (TUN) (1998)	time		5.93	9.73	13.60	17.67	21.77	26.13	30.60	35.17	39.77	45.67		52.11	6 / 4			
	reaction time	0.155								4.57	4.60	5.90	6.44			11.74	12.93	15.07
	interval velocity		7.59	9.21	9.04	8.60	8.54	8.03	7.83	7.66	7.61	5.93	6.21	7.68		8.94	8.12	6.97
	H1 lead leg	L	21	14	13	14	14	14	14	14	14	16	18	166				
Saifeldin, Muhand Khamis (QAT) (1998)	time		6.10	10.13	14.27	18.60	23.07	27.73	32.47	37.33	42.17	47.27		53.06	4 / 5			
	reaction time	0.127								4.86	4.84	5.10	5.79			12.50	13.87	14.80
	interval velocity		7.38	8.68	8.45	8.08	7.83	7.51	7.38	7.20	7.23	6.86	6.91	7.54		8.40	7.57	7.09
	H1 lead leg	L	22	14	14	14	14	14		14	14	15	135					
Pirjahan, Mahdi (IRI) (1999)	time		5.97	9.93	13.93	17.97	22.17	26.50	30.90	35.30	39.90			dnf	7 / --			
	reaction time	0.138								4.40	4.40	4.60				12.00	12.93	
	interval velocity		7.54	8.84	8.75	8.66	8.33	8.08	7.95	7.95	7.61					8.75	8.12	
	H1 lead leg	L	20	14	13	13	13	13	13	13	13			125				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 854 x 480 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=0VpqrIub14A>

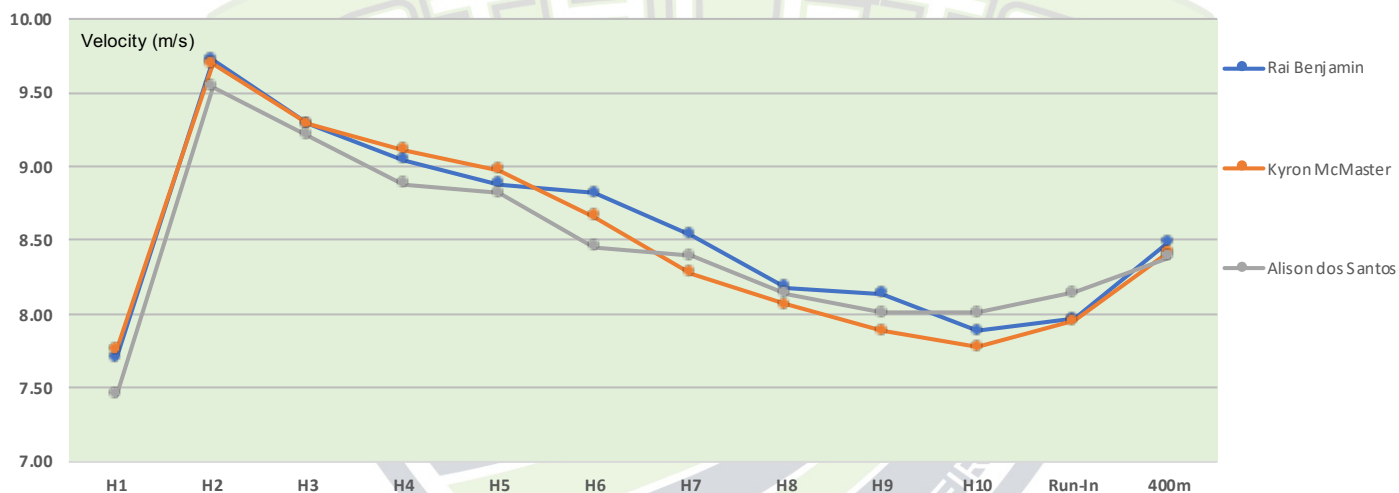
2021 USATF Golden Games (Walnut, CA) (TV Analysis)

Men's 400m Hurdles

Date 2021.05.09

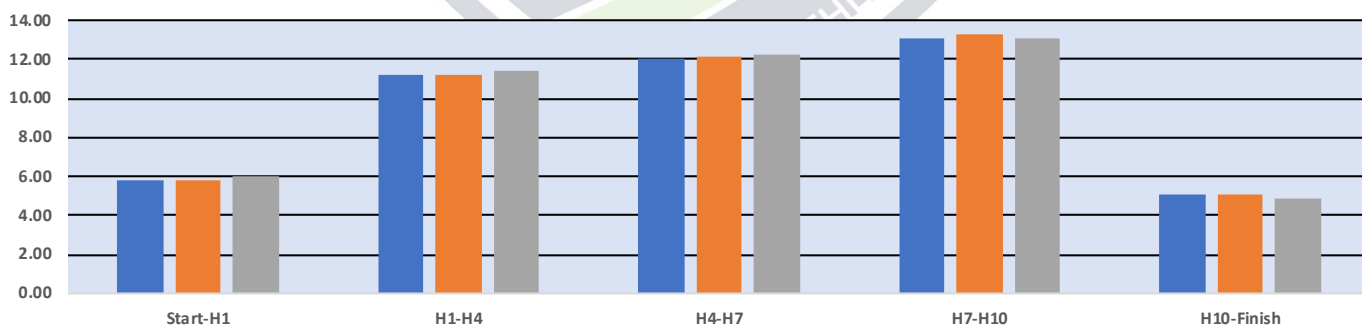
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Benjamin, Rai (USA) (1997)	time	5.84	9.44	13.21	17.08	21.02	24.99	29.09	33.37	37.67	42.11		47.13	5 / 1			
	reaction time											5.02			11.24	12.01	13.02
	interval velocity	7.71	3.60	3.77	3.87	3.94	3.97	4.10	4.28	4.30	4.44				9.34	8.74	8.06
	H1 lead leg R	20	13	13	13	13	13	13	13	13	13	16	153				
McMaster, Kyron (IVB) (1997)	time	5.80	9.41	13.18	17.02	20.92	24.96	29.19	33.53	37.97	42.47		47.50	6 / 2			
	reaction time											5.03			11.22	12.17	13.28
	interval velocity	7.76	3.61	3.77	3.84	3.90	4.04	4.23	4.34	4.44	4.50				9.36	8.63	7.91
	H1 lead leg R	20	13	13	13	13	13	13	14	14	14	16.7	156.7				
dos Santos, Alison (BRA) (2000)	time	6.04	9.71	13.51	17.45	21.42	25.56	29.73	34.03	38.40	42.77		47.68	4 / 3			
	reaction time											4.91			11.41	12.28	13.04
	interval velocity	7.45	3.67	3.80	3.94	3.97	4.14	4.17	4.30	4.37	4.37				9.20	8.55	8.05
	H1 lead leg L	20	13	13	12	12	13	13	13	13	13	16.2	151.2				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=AwvkXF0nHR8>

Women's 400m Hurdles

2021 Top 10 Times - Women's 400m Hurdles

McLaughlin, Sydney (USA) (1999)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)																	
date	4-Aug	time	6.16	10.16	14.24	18.36	22.64	27.00	31.56	36.32	41.20	46.04					
reaction time	0.163	interval		4.00	4.08	4.12	4.28	4.36	4.56	4.76	4.88	4.84	5.42			12.20	13.20
		velocity	7.31	8.75	8.58	8.50	8.18	8.03	7.68	7.35	7.17	7.23	7.38	7.77		8.61	7.95
H1 lead leg	R	strides	22	14	14	14	14	14	14	15	16	15	18.5	170.5			7.25
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 - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)																	
date	4-Aug	time	6.04	9.92	13.92	18.08	22.44	26.84	31.36	36.04	40.88	45.84					
reaction time	0.200	interval		3.88	4.00	4.16	4.36	4.40	4.52	4.68	4.84	4.96	5.74			12.04	13.28
		velocity	7.45	9.02	8.75	8.41	8.03	7.95	7.74	7.48	7.23	7.06	6.97	7.75		8.72	7.91
H1 lead leg	R	strides	22	14	14	15	15	15	15	15	16	16	19	176			7.25
McLaughlin, Sydney (USA) (1999)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2020 USA Olympic Trials (Eugene, OR) (TV Analysis)																	
date	27-Jun	time	6.11	10.14	14.36	18.60	23.04	27.59	32.24	36.91	41.64	46.46					
reaction time	0.194	interval		4.03	4.22	4.24	4.44	4.55	4.65	4.67	4.73	4.82	5.44			12.49	13.64
		velocity	7.36	8.68	8.29	8.25	7.88	7.69	7.53	7.49	7.40	7.26	7.35	7.71		8.41	7.70
H1 lead leg	R	strides	22	14	14	14	14	15	15	15	15	15	18.2	171.2			7.38
Bol, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)																	
date	4-Aug	time	6.28	10.26	14.28	18.36	22.56	26.96	31.60	36.28	41.16	46.16					
reaction time	0.165	interval		3.98	4.02	4.08	4.20	4.40	4.64	4.68	4.88	5.00	5.87			12.08	13.24
		velocity	7.17	8.79	8.71	8.58	8.33	7.95	7.54	7.48	7.17	7.00	6.81	7.69		8.69	7.93
H1 lead leg	L	strides	22	15	15	15	15	15	15	15	15	15	19	176			7.21
Bol, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2021 Bauhaus Galan (Stockholm, SWE) (TV Analysis)																	
date	4-Jul	time	6.24	10.24	14.26	18.45	22.78	27.31	31.96	36.72	41.58	46.60					
reaction time	0.195	interval		4.00	4.02	4.19	4.33	4.53	4.65	4.76	4.86	5.02	5.77			12.21	13.51
		velocity	7.21	8.75	8.71	8.35	8.08	7.73	7.53	7.35	7.20	6.97	6.93	7.64		8.60	7.77
H1 lead leg	L	strides		15	15	15	15	15	15	15	15	15	19	154			7.17
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 - 2021 Bauhaus Galan (Stockholm, SWE) (TV Analysis)																	
date	4-Jul	time	6.18	10.28	14.42	18.78	23.28	27.72	32.26	36.92	41.72	46.72					
reaction time	0.200	interval		4.10	4.14	4.36	4.50	4.44	4.54	4.66	4.80	5.00	5.67			12.60	13.48
		velocity	7.28	8.54	8.45	8.03	7.78	7.88	7.71	7.51	7.29	7.00	7.05	7.64		8.33	7.79
H1 lead leg	R	strides		15	15	15	15	15	15	15	16	16	19.7	156.7			7.26
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 - 2020 USA Olympic Trials (Eugene, OR) (TV Analysis)																	
date	27-Jun	time	6.08	10.03	14.21	18.52	22.95	27.48	32.04	36.70	41.58	46.53					
reaction time	0.167	interval		3.95	4.18	4.31	4.43	4.53	4.56	4.66	4.88	4.95	5.89			12.44	13.52
		velocity	7.40	8.86	8.37	8.12	7.90	7.73	7.68	7.51	7.17	7.07	6.79	7.63		8.44	7.77
H1 lead leg	R	strides	22	15	15	15	15	15	15	15	16	16	19	178			7.25
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 - 2021 Prefontaine Classic (Eugene, OR) (TV Analysis)																	
date	21-Aug	time	6.12	10.06	14.12	18.28	22.64	27.12	31.84	36.66	41.64	46.76					
reaction time	0.164	interval		3.94	4.06	4.16	4.36	4.48	4.72	4.82	4.98	5.12	6.01			12.16	13.56
		velocity	7.35	8.88	8.62	8.41	8.03	7.81	7.42	7.26	7.03	6.84	6.66	7.58		8.63	7.74
H1 lead leg	R	strides	23	15	15	15	15	15	15	15	16	16	19.2	179.2			7.04
Bol, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2021 Weltklasse (Zürich, SUI) (TV Analysis)																	
date	9-Sep	time	6.36	10.40		18.88	23.24	27.80	32.52	37.24	42.16	47.20					
reaction time	0.172	interval		4.04		8.48	4.36	4.56	4.72	4.92	5.04	5.60				12.52	13.64
		velocity	7.08	8.66		8.25	8.03	7.68	7.42	7.11	6.94	7.14	7.58			8.39	7.70
H1 lead leg	L	strides	22	15		15	15	15	15	15	15	15	18.7	145.7			7.15
Bol, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2021 István Gyulai Memorial (Székesfehérvár, HUN) (TV Analysis)																	
date	6-Jul	time	6.40	10.41	14.56	18.77	23.02	27.49	32.20	36.97	41.97	47.14					
reaction time	0.247	interval		4.01	4.15	4.21	4.25	4.47	4.71	4.77	5.00	5.17	5.67			12.37	13.43
		velocity	7.03	8.73	8.43	8.31	8.24	7.83	7.43	7.34	7.00	6.77	7.05	7.57		8.49	7.82
H1 lead leg	L	strides	22	15	15	15	15	15	15	15	15	15	19.2	161.2			7.03
McLaughlin, Sydney (USA) (1999)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2021 Music City Track Carnival (Nashville, TN) (TV Analysis)																	
date	6-Jun	time	6.34	10.64	14.88	19.07	23.45	27.92	32.53	37.34	42.44	47.48					
reaction time		interval		4.30	4.24	4.19	4.38	4.47	4.61	4.81	5.10	5.04	5.35			12.73	13.46
		velocity	7.10	8.14	8.25	8.35	7.99	7.83	7.59	7.28	6.86	6.94	7.48	7.57		8.25	7.80
H1 lead leg	R	strides	22	15	14	14	14	14	15	16	16	16	18.5	158.5			7.02
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 - 2021 István Gyulai Memorial (Székesfehérvár, HUN) (TV Analysis)																	
date	6-Jul	time	6.40	10.58	14.78	19.04	23.39	27.83	32.42	37.23	42.12	47.21					
reaction time	0.339	interval		4.18	4.20	4.26	4.35	4.44	4.59	4.81	4.89	5.09	5.64			12.64	13.38
		velocity	7.03	8.37	8.33	8.22	8.05	7.88	7.63	7.28	7.16	6.88	7.09	7.57		8.31	7.85
H1 lead leg	R	strides	22	15	15	15	15	15	15	16	16	16	19.5	164.5			7.10
Ryzykova, Anna (UKR) (1989)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2021 Bauhaus Galan (Stockholm, SWE) (TV Analysis)																	
date	4-Jul	time	6.34	10.30	14.36		22.84	27.42	32.12	36.88	41.78	47.02					
reaction time	0.183	interval		3.96	4.06		8.48	4.58	4.70	4.76	4.90	5.24	5.94				14.90
		velocity	7.10	8.84	8.62		8.25	7.64	7.45	7.35	7.14	6.68	6.73	7.55			7.05
H1 lead leg	R	strides	22	14	14		15	15	15	15	15	16	19.2	145.2			

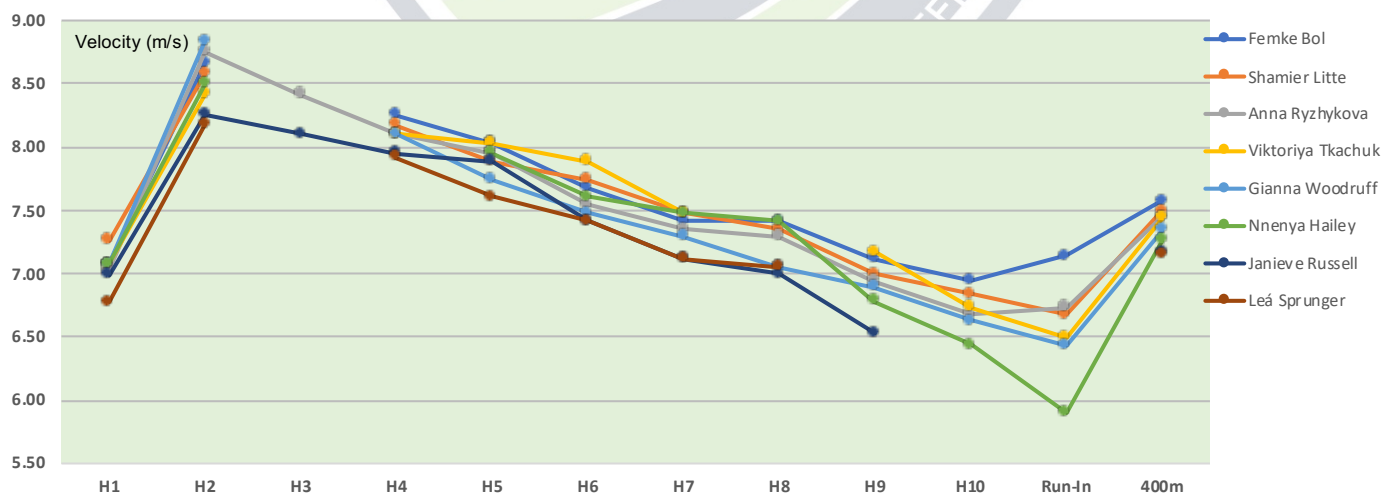
2021 Weltklasse (Zürich, SUI) (TV Analysis)

Women's 400m Hurdles

Date 2021.09.09

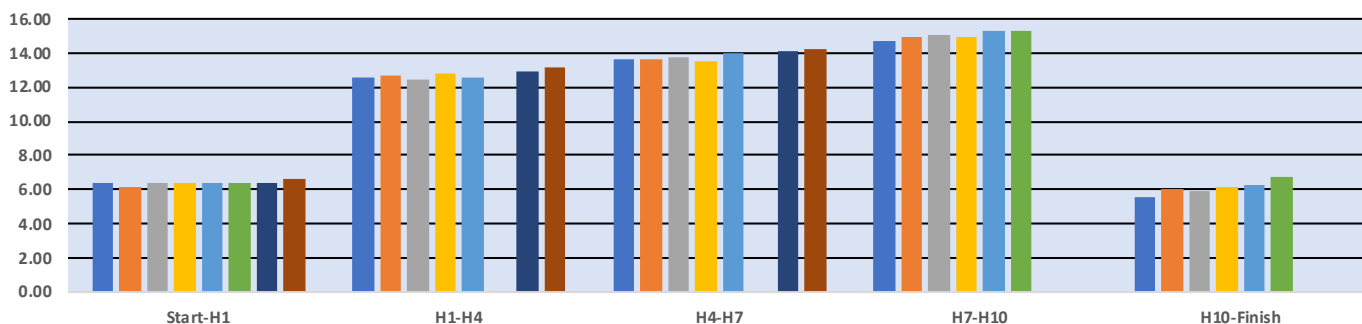
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.36	10.40		18.88	23.24	27.80	32.52	37.24	42.16	47.20		52.80	4 / 1			
reaction time	0.172	interval		4.04		8.48	4.36	4.56	4.72	4.72	4.92	5.04	5.60			12.52	13.64	14.68
		velocity	7.08	8.66		8.25	8.03	7.68	7.42	7.42	7.11	6.94	7.14	7.58		8.39	7.70	7.15
H1 lead leg	L	strides	22	15			15	15	15	15	15	15	18.7	145.7				
Little, Shamier (USA) (1995)	time		6.20	10.28		18.84	23.28	27.80	32.48	37.24	42.24	47.36		53.35	3 / 2			
reaction time	0.165	interval		4.08		8.56	4.44	4.52	4.68	4.76	5.00	5.12	5.99			12.64	13.64	14.88
		velocity	7.26	8.58		8.18	7.88	7.74	7.48	7.35	7.00	6.84	6.68	7.50		8.31	7.70	7.06
H1 lead leg	R	strides	22	15			15	15	15	16	16	16	20	150				
Ryzhykova, Anna (UKR) (1989)	time		6.40	10.40	14.56	18.88	23.28	27.92	32.68	37.48	42.52	47.76		53.70	5 / 3			
reaction time	0.160	interval		4.00	4.16	4.32	4.40	4.64	4.76	4.80	5.04	5.24	5.94			12.48	13.80	15.08
		velocity	7.03	8.75	8.41	8.10	7.95	7.54	7.35	7.29	6.94	6.68	6.73	7.45		8.41	7.61	6.96
H1 lead leg	R	strides	22	14	14	14	14	15	15	15	15	16	19.2	173.2				
Tkachuk, Viktoriya (UKR) (1994)	time		6.36	10.52		19.16	23.52	27.96	32.64		42.40	47.60		53.76	7 / 4			
reaction time	0.192	interval		4.16		8.64	4.36	4.44	4.68		9.76	5.20	6.16	PB		12.80	13.48	14.96
		velocity	7.08	8.41		8.10	8.03	7.88	7.48		7.17	6.73	6.49	7.44		8.20	7.79	7.02
H1 lead leg	L	strides	20	18			15	15	15		16	16	20	135				
Woodruff, Gianna (PAN) (1993)	time		6.36	10.32		18.96	23.48	28.16	32.96	37.92	43.00	48.28		54.50	2 / 5			
reaction time	0.192	interval		3.96		8.64	4.52	4.68	4.80	4.96	5.08	5.28	6.22			12.60	14.00	15.32
		velocity	7.08	8.84		8.10	7.74	7.48	7.29	7.06	6.89	6.63	6.43	7.34		8.33	7.50	6.85
H1 lead leg	L	strides	23	15			15	15	15		16	16	19.2	134.2				
Hailey, Nnenna (USA) (1994)	time		6.36	10.48		23.68	28.28	32.96	37.68	42.84	48.28			55.06	1 / 6			
reaction time	0.183	interval		4.12		13.20	4.60	4.68	4.72	5.16	5.44		6.78					15.32
		velocity	7.08	8.50		7.95	7.61	7.48	7.42	6.78	6.43	5.90	7.26					6.85
H1 lead leg	L	strides	23	16			17	17		18	18	23	132					
Russell, Janieve (JAM) (1993)	time		6.44	10.68	15.00	19.40	23.84	28.56	33.48	38.48	43.84			55.74	6 / 7			
reaction time	0.145	interval		4.24	4.32	4.40	4.44	4.72	4.92	5.00	5.36					12.96	14.08	
		velocity	6.99	8.25	8.10	7.95	7.88	7.42	7.11	7.00	6.53			7.18		8.10	7.46	
H1 lead leg	R	strides	23	15	15	15	15	16	16	16	17			148				
Sprunger, Leá (SUI) (1990)	time		6.64	10.92		19.76	24.36	29.08	34.00	38.96				55.87	8 / 8			
reaction time	0.155	interval		4.28		8.84	4.60	4.72	4.92	4.96						13.12	14.24	
		velocity	6.78	8.18		7.92	7.61	7.42	7.11	7.06				7.16		8.00	7.37	
H1 lead leg	R	strides	23	15			15	15	15		15			98				



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=CWE1Rq7998Y>

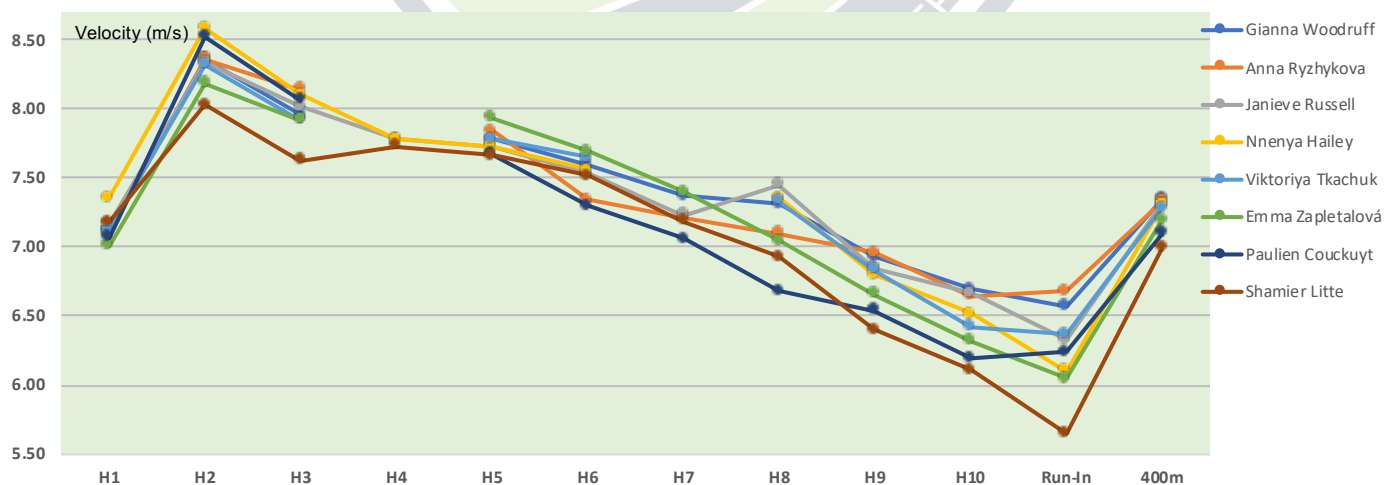
2021 Meeting de Paris (Paris, FRA) (TV Analysis)

Women's 400m Hurdles

Date 2021.08.28

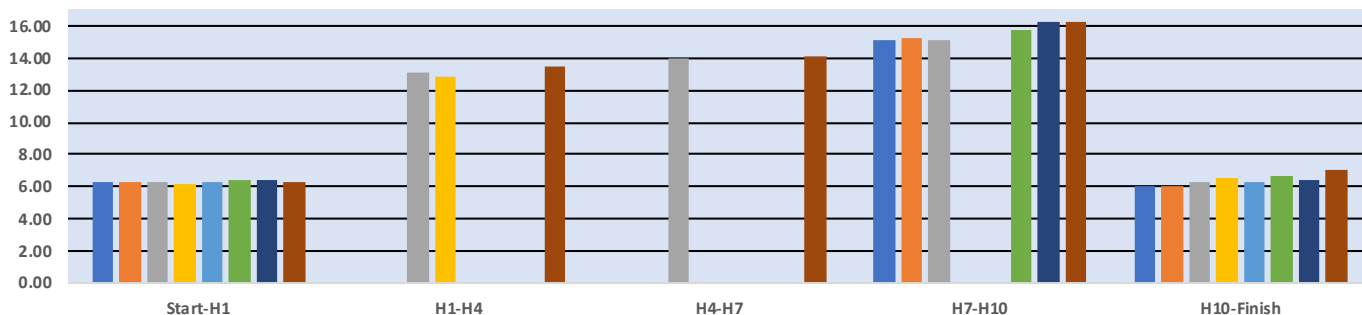
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Woodruff, Gianna (PAN) (1993)	time		6.33	10.52	14.92		23.92	28.53	33.28	38.07	43.12	48.35		54.44	7 / 1			
	reaction time	0.206					9.00	4.61	4.75	4.79	5.05	5.23	6.09					15.07
	interval			4.19	4.40		7.78	7.59	7.37	7.31	6.93	6.69	6.57	7.35				6.97
	velocity		7.11	8.35	7.95													
Ryzhykova, Anna (UKR) (1989)	time		6.33	10.52	14.82		23.75	28.52	33.37	38.30	43.33	48.60		54.59	6 / 2			
	reaction time	0.175					8.93	4.77	4.85	4.93	5.03	5.27	5.99					15.23
	interval			4.19	4.30		7.84	7.34	7.22	7.10	6.96	6.64	6.68	7.33				6.89
	velocity		7.11	8.35	8.14													
Russell, Janieve (JAM) (1993)	time		6.28	10.48	14.85	19.35	23.88	28.53	33.37	38.07	43.18	48.43		54.75	4 / 3			
	reaction time	0.162					4.53	4.65	4.84	4.70	5.11	5.25	6.32			13.07	14.02	15.06
	interval			4.20	4.37	4.50	7.73	7.53	7.23	7.45	6.85	6.67	6.33	7.31		8.03	7.49	6.97
	velocity		7.17	8.33	8.01	7.78	7.73	7.53	7.23	7.45	6.85	6.67	6.33	7.31				
Hailey, Nnenna (USA) (1994)	time		6.12	10.20	14.52	19.02	23.55	28.18		37.70	42.85	48.22		54.78	1 / 4			
	reaction time	0.187					4.53	4.63		9.52	5.15	5.37	6.56			12.90		
	interval			4.08	4.32	4.50	7.73	7.56		7.35	6.80	6.52	6.10	7.30		8.14		
	velocity		7.35	8.58	8.10	7.78	7.73	7.56		7.35	6.80	6.52	6.10	7.30				
Tkachuk, Viktoriya (UKR) (1994)	time		6.32	10.53	14.95		23.95	28.53		38.08	43.20	48.65		54.93	3 / 5			
	reaction time	0.228					9.00	4.58		9.55	5.12	5.45	6.28					
	interval			4.21	4.42		7.78	7.64		7.33	6.84	6.42	6.37	7.28				
	velocity		7.12	8.31	7.92		7.78	7.64		7.33	6.84	6.42	6.37	7.28				
Zapletalová, Emma (SVK) (2000)	time		6.42	10.70	15.12		23.95	28.50	33.23	38.20	43.46	49.00		55.61	8 / 6			
	reaction time	0.138					8.83	4.55	4.73	4.97	5.26	5.54	6.61					15.77
	interval			4.28	4.42		7.93	7.69	7.40	7.04	6.65	6.32	6.05	7.19				6.66
	velocity		7.01	8.18	7.92		7.93	7.69	7.40	7.04	6.65	6.32	6.05	7.19				
Couckuyt, Paulien (BEL) (1997)	time		6.37	10.48	14.82		23.95	28.75	33.71	38.95	44.30	49.95		56.36	2 / 7			
	reaction time	0.169					9.13	4.80	4.96	5.24	5.35	5.65	6.41					16.24
	interval			4.11	4.34		7.67	7.29	7.06	6.68	6.54	6.19	6.24	7.10				6.47
	velocity		7.06	8.52	8.06		7.67	7.29	7.06	6.68	6.54	6.19	6.24	7.10				
Little, Shamier (USA) (1995)	time		6.27	10.63	15.22	19.75	24.32	28.98	33.85	38.90	44.37	50.10		57.18	5 / 8			
	reaction time	0.222					4.57	4.66	4.87	5.05	5.47	5.73	7.08			13.48	14.10	16.25
	interval			4.36	4.59	4.53	7.66	7.51	7.19	6.93	6.40	6.11	5.65	7.00		7.79	7.45	6.46
	velocity		7.18	8.03	7.63	7.73	7.66	7.51	7.19	6.93	6.40	6.11	5.65	7.00				
H1 lead leg	time																	
	interval																	
	velocity																	
	strides																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 60fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=vs6t6DFk6QI>

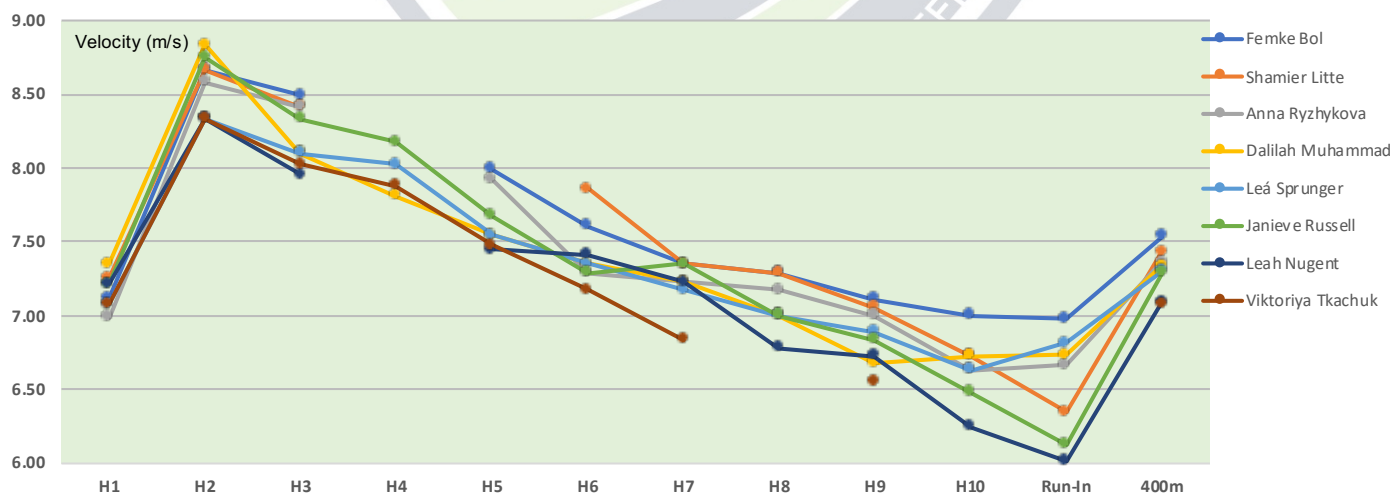
2021 Athletissima (Lausanne, SUI) (TV Analysis)

Women's 400m Hurdles

Date 2021.08.26

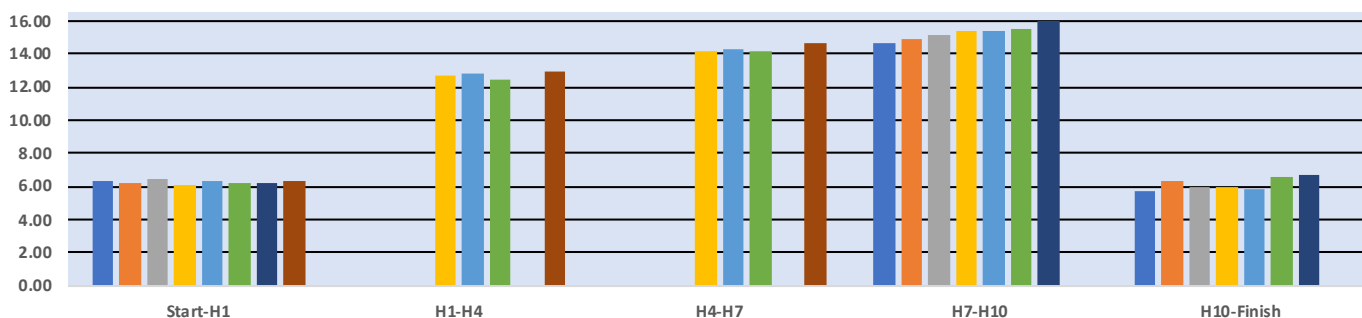
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.32	10.36	14.48		23.24	27.84	32.60	37.40	42.32	47.32		53.05	4 / 1			
	reaction time	0.186																
	interval			4.04	4.12		8.76	4.60	4.76	4.80	4.92	5.00	5.73					14.72
	velocity		7.12	8.66	8.50		7.99	7.61	7.35	7.29	7.11	7.00	6.98	7.54				7.13
	H1 lead leg	L																
	strides		22	15	15			15	15	15	15	15	15	18.7				
														145.7				
Little, Shamier (USA) (1995)	time		6.20	10.24	14.40			27.76	32.52	37.32	42.28	47.48		53.78	3 / 2			
	reaction time	0.202																
	interval			4.04	4.16			13.36	4.76	4.80	4.96	5.20	6.30					14.96
	velocity		7.26	8.66	8.41			7.86	7.35	7.29	7.06	6.73	6.35	7.44				7.02
	H1 lead leg	R																
	strides		23	15	15				16	16	16	17	20	138				
Ryzhykova, Anna (UKR) (1989)	time		6.44	10.52	14.68		23.52	28.32	33.16	38.04	43.04	48.32		54.32	2 / 3			
	reaction time	0.162																
	interval			4.08	4.16		8.84	4.80	4.84	4.88	5.00	5.28	6.00					15.16
	velocity		6.99	8.58	8.41		7.92	7.29	7.23	7.17	7.00	6.63	6.67	7.36				6.93
	H1 lead leg	R																
	strides		22	14	14			15	15	15	15	16	19	145				
Muhammad, Dalilah (USA) (1990)	time		6.12	10.08	14.40	18.88	23.52	28.28	33.12	38.12	43.36	48.56		54.50	5 / 4			
	reaction time	0.189																
	interval			3.96	4.32	4.48	4.64	4.76	4.84	5.00	5.24	5.20	5.94			12.76	14.24	15.44
	velocity		7.35	8.84	8.10	7.81	7.54	7.35	7.23	7.00	6.68	6.73	6.73	7.34		8.23	7.37	6.80
	H1 lead leg	R																
	strides		22	15	15	15	15	15	15	15	16	16	19	178				
Sprunger, Leá (SUI) (1990)	time		6.36	10.56	14.88	19.24	23.88	28.64	33.52	38.52	43.60	48.88		54.75	7 / 5			
	reaction time	0.176																
	interval			4.20	4.32	4.36	4.64	4.76	4.88	5.00	5.08	5.28	5.87			12.88	14.28	15.36
	velocity		7.08	8.33	8.10	8.03	7.54	7.35	7.17	7.00	6.89	6.63	6.81	7.31		8.15	7.35	6.84
	H1 lead leg	R																
	strides		21	14	14	14	14	15	15	15	15	15	18	170				
Russell, Janieve (JAM) (1993)	time		6.24	10.24	14.44	18.72	23.28	28.08	32.84	37.84	42.96	48.36		54.89	6 / 6			
	reaction time	0.136																
	interval			4.00	4.20	4.28	4.56	4.80	4.76	5.00	5.12	5.40	6.53			12.48	14.12	15.52
	velocity		7.21	8.75	8.33	8.18	7.68	7.29	7.35	7.00	6.84	6.48	6.13	7.29		8.41	7.44	6.77
	H1 lead leg	R																
	strides		23	15	15	15	16	16	16	16	16	17	20	185				
Nugent, Leah (JAM) (1992)	time		6.24	10.44	14.84		24.24	28.96	33.80	38.96	44.16	49.76		56.41	1 / 7			
	reaction time	0.202																
	interval			4.20	4.40		9.40	4.72	4.84	5.16	5.20	5.60	6.65					15.96
	velocity		7.21	8.33	7.95		7.45	7.42	7.23	6.78	6.73	6.25	6.02	7.09				6.58
	H1 lead leg	R																
	strides		22	15	15			15	15	15	15	16	19	147				
Tkachuk, Viktoriya (UKR) (1994)	time		6.36	10.56	14.92	19.36	24.04	28.92	34.04		44.72			56.53	8 / 8			
	reaction time	0.190																
	interval			4.20	4.36	4.44	4.68	4.88	5.12		10.68					13.00	14.68	
	velocity		7.08	8.33	8.03	7.88	7.48	7.17	6.84		6.55					8.08	7.15	
	H1 lead leg	L																
	strides		22	15	15	15	15	16	16	16								



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=KtNcnZHVBOE>

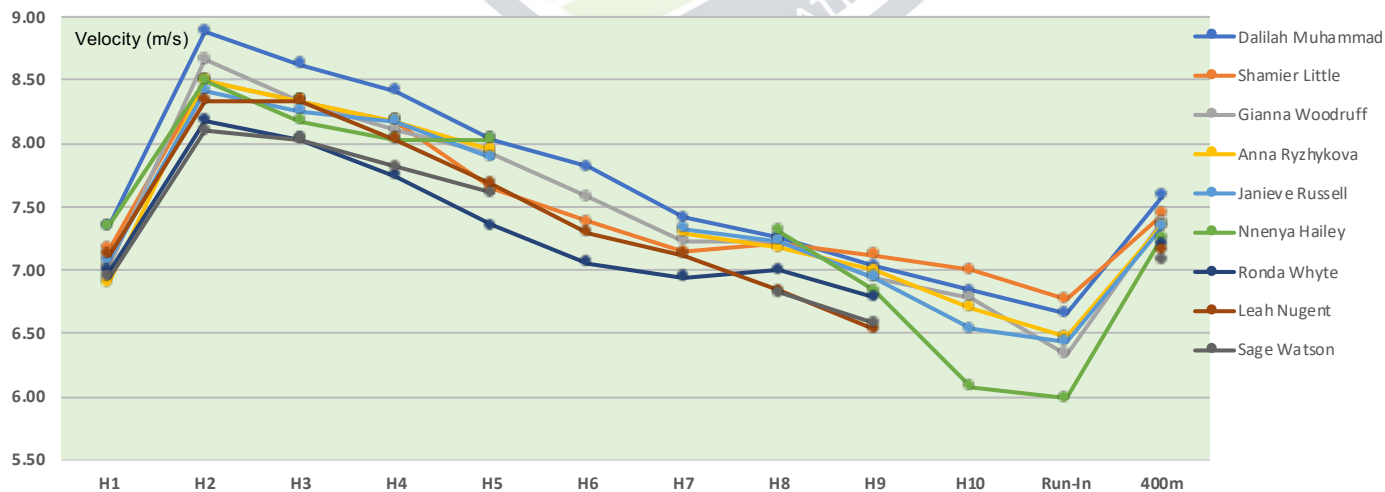
2021 Prefontaine Classic (Eugene, OR) (TV Analysis)

100m Hurdles

Date: 2021.08.21

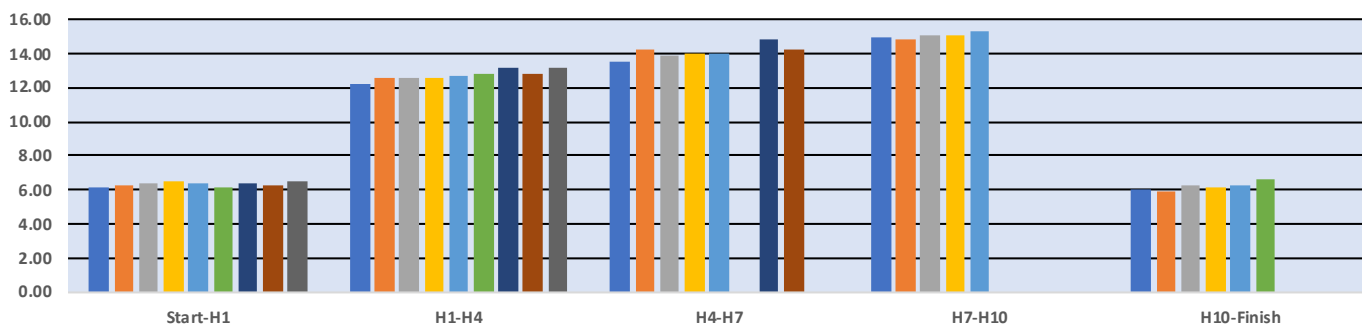
FINAL

			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		6.12	10.06	14.12	18.28	22.64	27.12	31.84	36.66	41.64	46.76		52.77	5 / 1			
	reaction time	0.164																
	interval		7.35	3.94	4.06	4.16	4.36	4.48	4.72	4.82	4.98	5.12	6.01			12.16	13.56	14.92
	velocity		8.88	8.62	8.41	8.03	7.81	7.42	7.26	7.03	6.84	6.66	7.58			8.63	7.74	7.04
Little, Shamier (USA) (1995)	time		6.28	10.40	14.60	18.88	23.46	28.20	33.10	37.96	42.88	47.88		53.79	6 / 2			
	reaction time	0.190																
	interval		7.17	4.12	4.20	4.28	4.58	4.74	4.90	4.86	4.92	5.00	5.91			12.60	14.22	14.78
	velocity		8.50	8.33	8.15	7.64	7.38	7.14	7.20	7.11	7.00	6.77	7.44			8.33	7.38	7.10
Woodruff, Gianna (PAN) (1993)	time		6.40	10.44	14.64	18.96	23.38	28.00	32.84	37.68	42.72	47.88		54.20	8 / 3			
	reaction time	0.249																
	interval		7.03	4.04	4.20	4.32	4.42	4.62	4.84	4.84	5.04	5.16	6.32	NR PB		12.56	13.88	15.04
	velocity		8.66	8.33	8.10	7.92	7.58	7.23	7.23	6.94	6.78	6.33	7.38			8.36	7.56	6.98
Ryzhykova, Anna (UKR) (1989)	time		6.52	10.64	14.84	19.12	23.52		33.12	38.00	43.00	48.22		54.40	3 / 4			
	reaction time	0.162																
	interval		4.12	4.20	4.28	4.40		9.60	4.88	5.00	5.22	6.18				12.60	14.00	15.10
	velocity		6.90	8.50	8.33	8.18	7.95		7.29	7.17	7.00	6.70	7.35			8.33	7.50	6.95
Russell, Janieve (JAM) (1993)	time		6.36	10.52	14.76	19.04	23.48		33.04	37.88	42.92	48.28		54.50	4 / 5			
	reaction time	0.155																
	interval		4.16	4.24	4.28	4.44		9.56	4.84	5.04	5.36	6.22				12.68	14.00	15.24
	velocity		7.08	8.41	8.25	8.18	7.88		7.32	7.23	6.94	6.53	6.43	7.34		8.28	7.50	6.89
Hailey, Nnenna (USA) (1994)	time		6.12	10.24	14.52	18.88	23.24		33.04	37.88	42.92	48.28		54.50	1 / 6			
	reaction time	0.153																
	interval		4.12	4.28	4.36	4.36		9.56	4.84	5.04	5.36	6.22				12.76		
	velocity		7.35	8.50	8.18	8.03	8.03		7.31	6.84	6.08	5.99	7.25			8.23		
Whyte, Ronda (JAM) (1990)	time		6.44	10.72	15.08	19.60	24.36	29.32	34.36	39.36	44.52			55.57	7 / 7			
	reaction time	0.153																
	interval		4.28	4.36	4.52	4.76	4.96	5.04	5.00	5.16						13.16	14.76	
	velocity		6.99	8.18	8.03	7.74	7.35	7.06	6.94	7.00	6.78					7.98	7.11	
Nugent, Leah (JAM) (1992)	time		6.32	10.52	14.72	19.08	23.64	28.44	33.36	38.48	43.84			55.86	9 / 8			
	reaction time	0.228																
	interval		4.20	4.20	4.36	4.56	4.80	4.92	5.12	5.36						12.76	14.28	
	velocity		7.12	8.33	8.33	8.03	7.68	7.29	7.11	6.84	6.53					8.23	7.35	
Watson, Sage (CAN) (1994)	time		6.48	10.80	15.16	19.64	24.24		39.64	44.96				56.52	2 / 9			
	reaction time	0.163																
	interval		4.32	4.36	4.48	4.60		15.40	5.32							13.16		
	velocity		6.94	8.10	8.03	7.81	7.61		6.82	6.58						7.98		



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=bPuf11O2SXk>

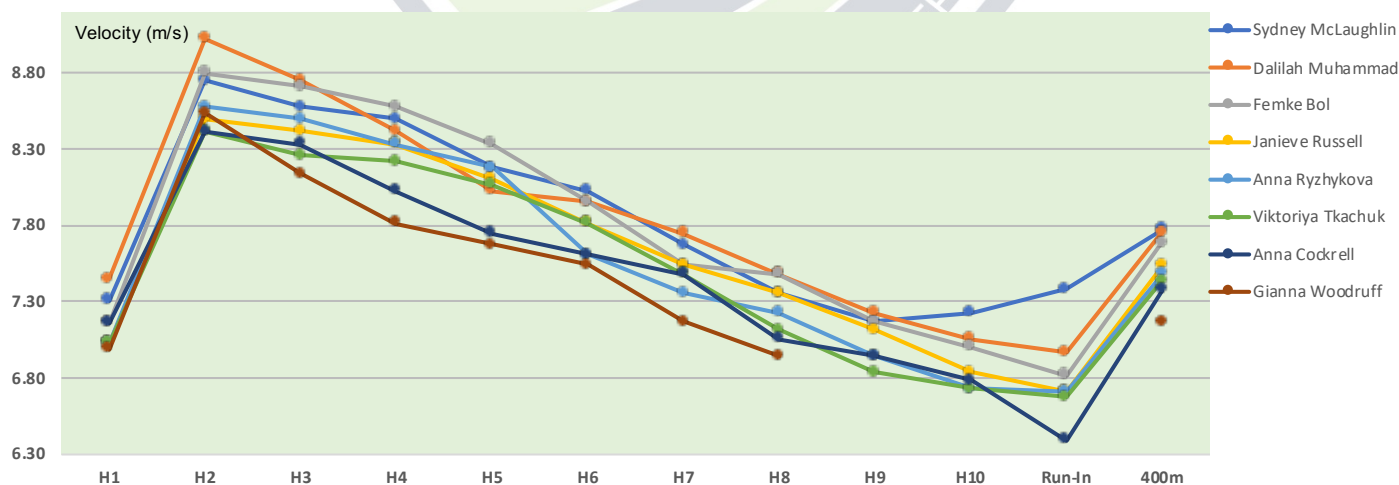
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Women's 400m Hurdles

Date 2021.08.04

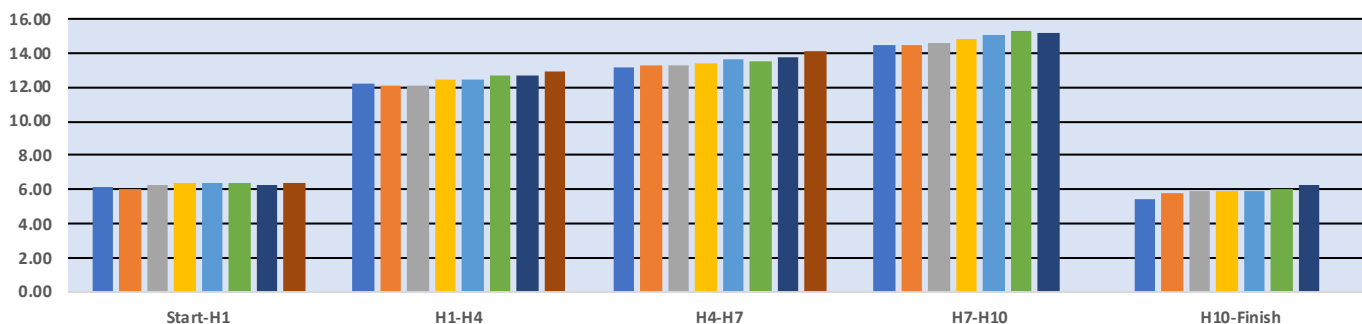
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin, Sydney (USA) (1999)	time		6.16	10.16	14.24	18.36	22.64	27.00	31.56	36.32	41.20	46.04		51.46	4 / 1			
	reaction time	0.163																
	interval			4.00	4.08	4.12	4.28	4.36	4.56	4.76	4.88	4.84	5.42	WR		12.20	13.20	14.48
	velocity		7.31	8.75	8.58	8.50	8.18	8.03	7.68	7.35	7.17	7.23	7.38	7.77		8.61	7.95	7.25
Muhammad, Dalilah (USA) (1990)	time		6.04	9.92	13.92	18.08	22.44	26.84	31.36	36.04	40.88	45.84		51.58	7 / 2			
	reaction time	0.200																
	interval			3.88	4.00	4.16	4.36	4.40	4.52	4.68	4.84	4.96	5.74	PB		12.04	13.28	14.48
	velocity		7.45	9.02	8.75	8.41	8.03	7.95	7.74	7.48	7.23	7.06	6.97	7.75		8.72	7.91	7.25
Bol, Femke (NED) (2000)	time		6.28	10.26	14.28	18.36	22.56	26.96	31.60	36.28	41.16	46.16		52.03	5 / 3			
	reaction time	0.165																
	interval			3.98	4.02	4.08	4.20	4.40	4.64	4.68	4.88	5.00	5.87	AR		12.08	13.24	14.56
	velocity		7.17	8.79	8.71	8.58	8.33	7.95	7.54	7.48	7.17	7.00	6.81	7.69		8.69	7.93	7.21
Russell, Janieve (JAM) (1993)	time		6.40	10.52	14.68	18.88	23.20	27.68	32.32	37.08	42.00	47.12		53.08	6 / 4			
	reaction time	0.136																
	interval			4.12	4.16	4.20	4.32	4.48	4.64	4.76	4.92	5.12	5.96	PB		12.48	13.44	14.80
	velocity		7.03	8.50	8.41	8.33	8.10	7.81	7.54	7.35	7.11	6.84	6.71	7.54		8.41	7.81	7.09
Ryzhykova, Anna (UKR) (1989)	time		6.40	10.48	14.60	18.80	23.08	27.68	32.44	37.28	42.32	47.52		53.48	2 / 5			
	reaction time	0.177																
	interval			4.08	4.12	4.20	4.28	4.40	4.76	4.84	5.04	5.20	5.96			12.40	13.64	15.08
	velocity		7.03	8.58	8.50	8.33	8.18	7.61	7.35	7.23	6.94	6.73	6.71	7.48		8.47	7.70	6.96
Tkachuk, Viktoriya (UKR) (1994)	time		6.40	10.56	14.80	19.06	23.40	27.88	32.56	37.48	42.60	47.80		53.79	3 / 6			
	reaction time	0.206																
	interval			4.16	4.24	4.26	4.34	4.48	4.68	4.92	5.12	5.20	5.99	PB		12.66	13.50	15.24
	velocity		7.03	8.41	8.25	8.22	8.06	7.81	7.48	7.11	6.84	6.73	6.68	7.44		8.29	7.78	6.89
Cockrell, Anna (USA) (1997)	time		6.28	10.44	14.64	19.00	23.52	28.12	32.80	37.76	42.80	47.96		54.22	8 / 7	(no official time given)		
	reaction time																	
	interval			4.16	4.20	4.36	4.52	4.60	4.68	4.96	5.04	5.16	6.26	DQ		12.72	13.80	15.16
	velocity		7.17	8.41	8.33	8.03	7.74	7.61	7.48	7.06	6.94	6.78	6.39	7.38		8.25	7.61	6.93
Woodruff, Gianna (PAN) (1993)	time		6.44	10.54	14.84	19.32	23.88	28.52	33.40	38.44				55.84	9 / 7			
	reaction time	0.235																
	interval			4.10	4.30	4.48	4.56	4.64	4.88	5.04						12.88	14.08	
	velocity		6.99	8.54	8.14	7.81	7.68	7.54	7.17	6.94						8.15	7.46	
	H1 lead leg	R																
	strides		22	14	14	14	14	14	14	15	16	15	18.5	170.5				
	H1 lead leg	R																
	strides		22	14	14	15	15	15	15	15	16	16	19	176				
	H1 lead leg	L																
	strides		22	15	15	15	15	15	15	15	15	15	19	176				
	H1 lead leg	L																
	strides		23	15	15	15	15	15	15	15	16	16	16	128				



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=-BTOqOqSR-k>

2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Women's 400m Hurdles

Date 2021.08.02

Semi-Final 3

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.48	10.60	14.76	19.04	23.40	27.92	32.56	37.32	42.24	47.32		53.91	5 / 1			
	reaction time	0.215											6.59			12.56	13.52	14.76
	interval																	
	velocity		6.94	8.50	8.41	8.18	8.03	7.74	7.54	7.35	7.11	6.89	6.07	7.42		8.36	7.77	7.11
H1 lead leg	L	strides	22	15	15	15	15	15	15	15	15	15	19	176				

Date 2021.08.02

Semi-Final 2

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin, Sydney (USA) (1999)	time		6.20	10.20	14.32	18.52	22.88	27.52	32.24	37.04	42.04	47.20		53.03	5 / 1			
	reaction time	0.204											5.83			12.32	13.72	14.96
	interval																	
	velocity		7.26	8.75	8.50	8.33	8.03	7.54	7.42	7.29	7.00	6.78	6.86	7.54		8.52	7.65	7.02
H1 lead leg	R	strides	22	14	14	14	14	15	15	15	16	16	18.5	173.5				

Date 2021.08.02

Semi-Final 1

			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	10.00	14.08	18.36	22.88	27.40	32.12	37.00	42.04	47.24		53.30	7 / 1			
	reaction time	0.186											6.06			12.32	13.76	15.12
	interval																	
	velocity		7.45	8.84	8.58	8.18	7.74	7.42	7.17	6.94	6.73	6.60	7.50			8.52	7.63	6.94
H1 lead leg	R	strides	22	15	15	15	15	15	15	15	16	16	19	178				

Women's 400m Hurdles

Date 2021.07.31

Heat 5

			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		6.10	10.01	14.25	18.58	23.15	27.93	32.63	37.47	42.64	47.85		53.97	3 / 1			
	reaction time	0.189											6.12			12.48	14.05	15.22
	interval																	
	velocity		7.38	8.95	8.25	8.08	7.66	7.32	7.45	7.23	6.77	6.72	6.54	7.41		8.41	7.47	6.90
H1 lead leg	R	strides	22	15	15	15	15	15	15	15	16	16	19	178				

Date 2021.07.31

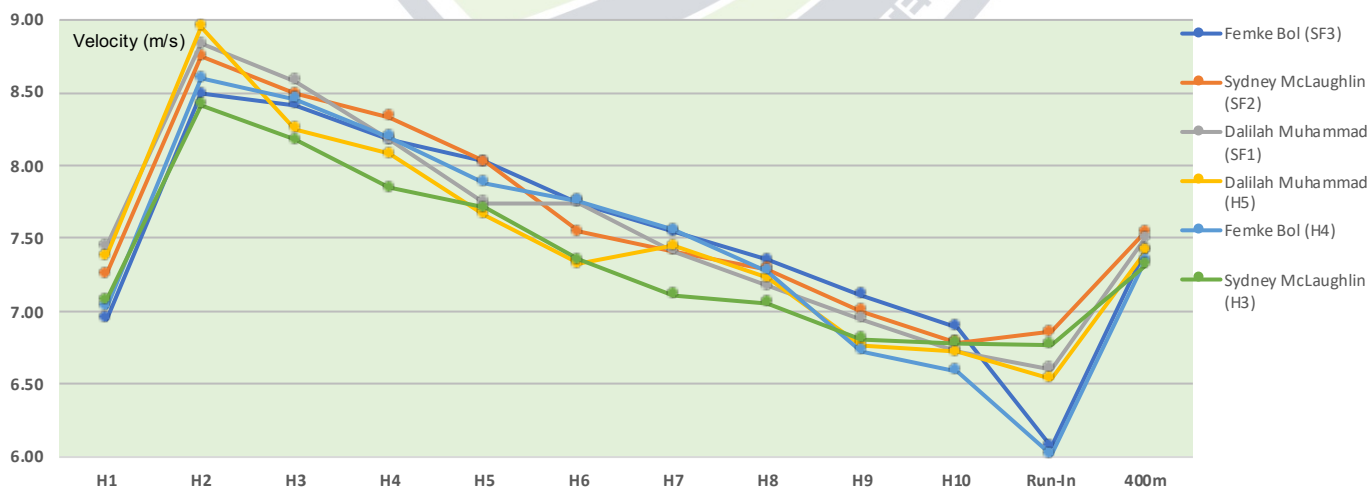
Heat 4

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.40	10.47	14.61	18.88	23.32	27.83	32.46	37.27	42.47	47.78		54.43	8 / 1			
	reaction time	0.194											6.65			12.48	13.58	15.32
	interval																	
	velocity		7.03	8.60	8.45	8.20	7.88	7.76	7.56	7.28	6.73	6.59	6.02	7.35		8.41	7.73	6.85
H1 lead leg	L	strides	22	15	15	15	15	15	15	15	16	16	19	178				

Date 2021.07.31

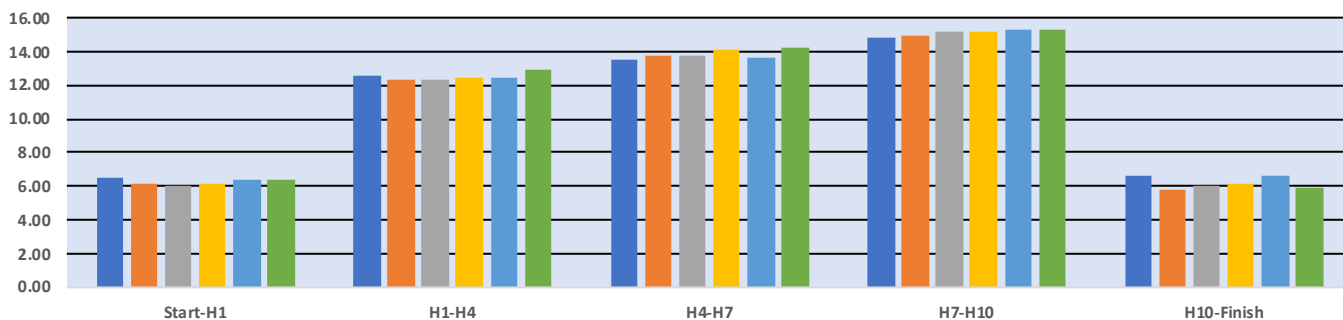
Heat 3

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin, Sydney (USA) (1999)	time		6.36	10.52	14.80	19.26	23.80	28.56	33.48	38.44	43.58	48.74		54.65	5 / 1			
	reaction time	0.176											5.91			12.90	14.22	15.26
	interval																	
	velocity		7.08	8.41	8.18	7.85	7.71	7.35	7.11	7.06	6.81	6.78	6.77	7.32		8.14	7.38	6.88
H1 lead leg	R	strides	22	14	14	14	14	15	15	15	16	16	18.5	173.5				



Time Intervals (s)

Hurdle Phases



Olympic Games - Semi-Finals

Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=9YHpol277Qw>

Olympic Games - Heat 4

Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 24fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=90Q64odYAUU>

Olympic Games - Heat 5

Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 24fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=x5rB-dksvdk>

Olympic Games - Heat 3

Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 24fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=mB1nq0Lz4HY&t=4s>

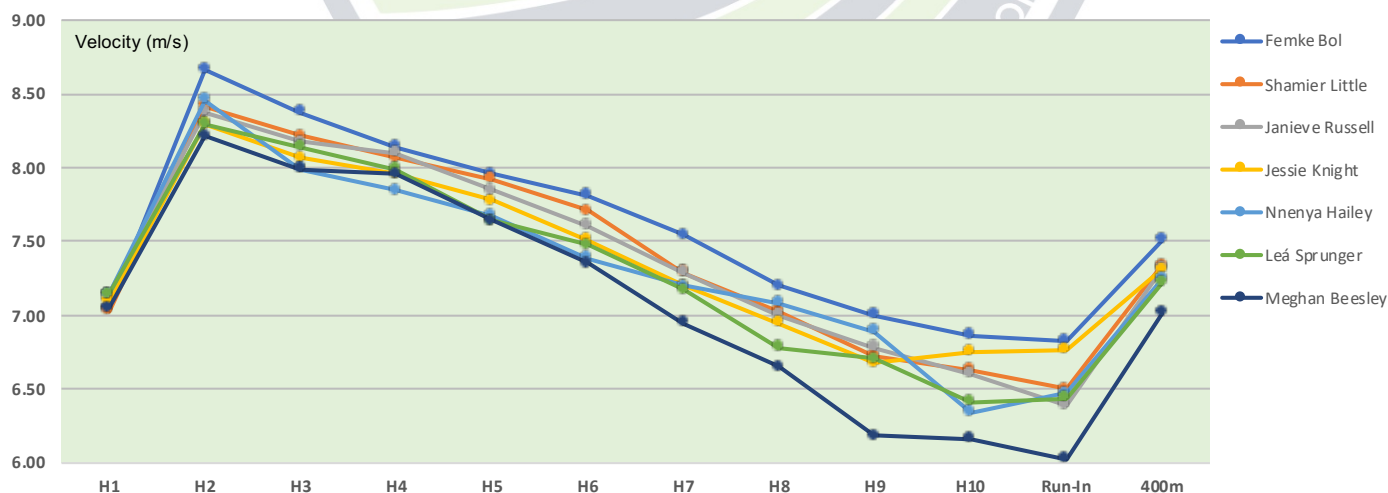
2021 Müller British Grand Prix (Gateshead, GBR) (TV Analysis)

Women's 400m Hurdles

Date 2021.07.13

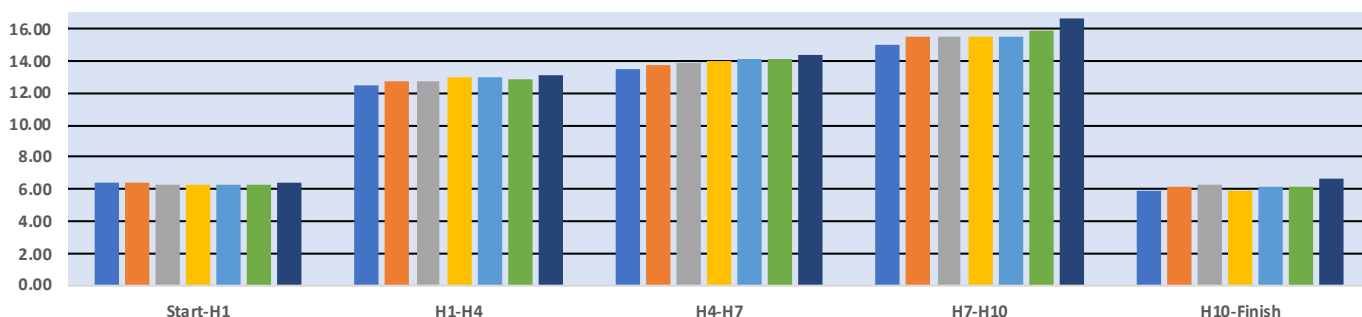
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.38	10.42	14.60	18.90	23.30	27.78	32.42	37.28	42.28	47.38		53.24	5 / 1			
	reaction time	0.214																
	interval		7.05	4.04	4.18	4.30	4.40	4.48	4.64	4.86	5.00	5.10	5.86			12.52	13.52	14.96
	velocity		8.66	8.37	8.14	7.95	7.81	7.54	7.20	7.00	6.86	6.83	7.51			8.39	7.77	7.02
Little, Shamier (USA) (1995)	H1 lead leg	L	22	15	15	15	15	15	15	15	15	15	19	176				
	time		6.40	10.56	14.82	19.16	23.58	28.12	32.92	37.90	43.10	48.38		54.53	4 / 2			
	reaction time	0.196																
	interval		7.03	4.16	4.26	4.34	4.42	4.54	4.80	4.98	5.20	5.28	6.15			12.76	13.76	15.46
Russell, Janieve (JAM) (1993)	velocity		8.41	8.22	8.06	7.92	7.71	7.29	7.03	6.73	6.63	6.50	7.34			8.23	7.63	6.79
	H1 lead leg	R	23	15	15	15	15	15	16	16	16	17	19	182				
	time		6.30	10.48	14.76	19.08	23.54	28.14	32.94	37.94	43.10	48.40		54.66	6 / 3			
	reaction time	0.106																
Knight, Jessie (GBR) (1994)	interval		7.14	4.18	4.28	4.32	4.46	4.60	4.80	5.00	5.16	5.30	6.26			12.78	13.86	15.46
	velocity		8.37	8.18	8.10	7.85	7.61	7.29	7.00	6.78	6.60	6.39	7.32			8.22	7.58	6.79
	H1 lead leg	R	23	15	15	15	15	15	16	16	17	17	20.5	184.5				
	strides																	
Hailey, Nnenna (USA) (1994)	time		6.34	10.56	14.90	19.30	23.80	28.46	33.32	38.36	43.60	48.78		54.69	3 / 4			
	reaction time	0.147																
	interval		7.10	4.22	4.34	4.40	4.50	4.66	4.86	5.04	5.24	5.18	5.91			12.96	14.02	15.46
	velocity		8.29	8.06	7.95	7.78	7.51	7.20	6.94	6.68	6.76	6.77	7.31			8.10	7.49	6.79
Sprunger, Leá (SUI) (1990)	H1 lead leg	R	23	15	15	15	15	15	15	15	16	16	19	179				
	time		6.30	10.44	14.82	19.28	23.84	28.58	33.44	38.38	43.46	48.98		55.16	7 / 5			
	reaction time	0.181																
	interval		7.14	4.14	4.38	4.46	4.56	4.74	4.86	4.94	5.08	5.52	6.18			12.98	14.16	15.54
Beesley, Meghan (GBR) (1989)	velocity		8.45	7.99	7.85	7.68	7.38	7.20	7.09	6.89	6.34	6.47	7.25			8.09	7.42	6.76
	H1 lead leg	L	24	16	16	16	16	16	17	18	17	18	21.7	195.7				
	time		6.30	10.52	14.82	19.20	23.78	28.46	33.34	38.50	43.72	49.18		55.39	8 / 6			
	reaction time	0.123																
Beesley, Meghan (GBR) (1989)	interval		7.14	4.22	4.30	4.38	4.58	4.68	4.88	5.16	5.22	5.46	6.21			12.90	14.14	15.84
	velocity		8.29	8.14	7.99	7.94	7.64	7.48	7.17	6.78	6.70	6.41	6.44	7.22		8.14	7.43	6.63
	H1 lead leg	R	21	14	14	14	14	15	15	15	16	16	19	173				
	strides																	
Beesley, Meghan (GBR) (1989)	time		6.38	10.64	15.02	19.42	24.00	28.76	33.80	39.06	44.72	50.40		57.04	1 / 7			
	reaction time	0.145																
	interval		7.05	4.26	4.38	4.40	4.58	4.76	5.04	5.26	5.66	5.68	6.64			13.04	14.38	16.60
	velocity		8.22	7.99	7.95	7.64	7.35	6.94	6.65	6.18	6.16	6.02	7.01			8.05	7.30	6.33
Beesley, Meghan (GBR) (1989)	H1 lead leg	L	24	16	16	16	16	17	18	18	19	19	23	202				
	strides																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1078 @ 24fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=UDuzOssya0>

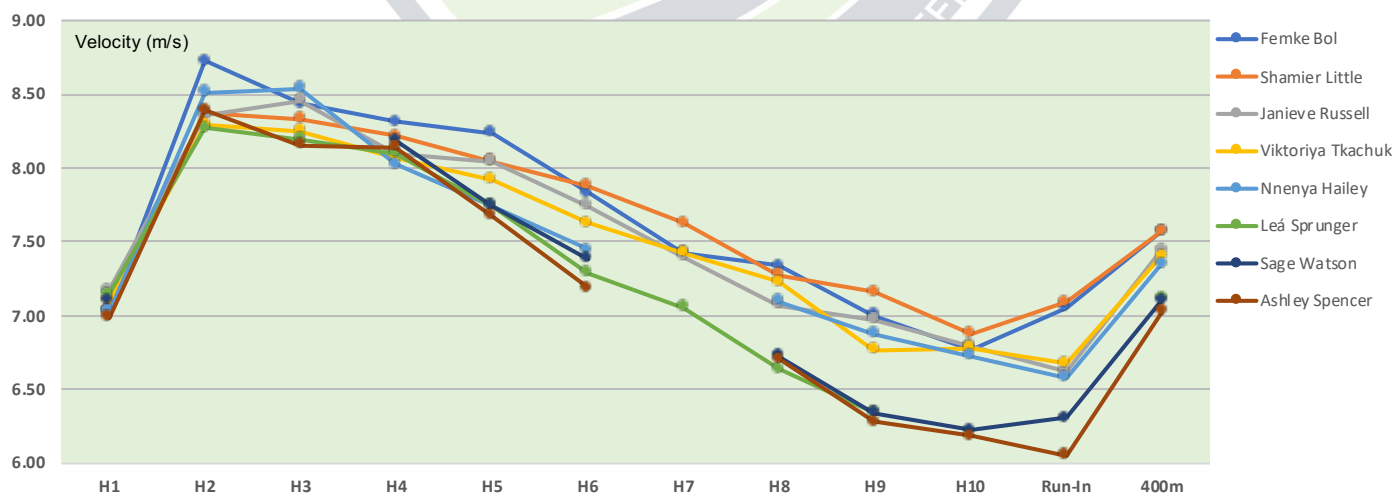
2021 István Gyulai Memorial (Székesfehérvár, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2021.07.06

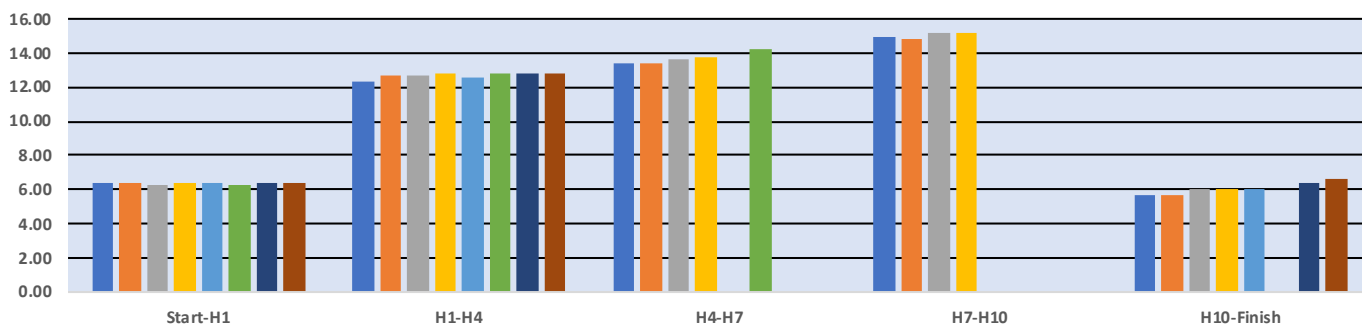
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.40	10.41	14.56	18.77	23.02	27.49	32.20	36.97	41.97	47.14		52.81	5 / 1			
	reaction time	0.247																
	interval			4.01	4.15	4.21	4.25	4.47	4.71	4.77	5.00	5.17	5.67			12.37	13.43	14.94
	velocity		7.03	8.73	8.43	8.31	8.24	7.83	7.43	7.34	7.00	6.77	7.05	7.57		8.49	7.82	7.03
Little, Shamier (USA) (1995)	time		6.40	10.58	14.78	19.04	23.39	27.83	32.42	37.23	42.12	47.21		52.85	6 / 2			
	reaction time	0.339																
	interval			4.18	4.20	4.26	4.35	4.44	4.59	4.81	4.89	5.09	5.64			12.64	13.38	14.79
	velocity		7.03	8.37	8.33	8.22	8.05	7.88	7.63	7.28	7.16	6.88	7.09	7.57		8.31	7.85	7.10
Russell, Janieve (JAM) (1993)	time		6.27	10.46	14.60	18.92	23.27	27.79	32.52	37.47	42.49	47.64		53.68	4 / 3			
	reaction time	0.168																
	interval			4.19	4.14	4.32	4.35	4.52	4.73	4.95	5.02	5.15	6.04			12.65	13.60	15.12
	velocity		7.18	8.35	8.45	8.10	8.05	7.74	7.40	7.07	6.97	6.80	6.62	7.45		8.30	7.72	6.94
Tkachuk, Viktoriya (UKR) (1994)	time		6.34	10.56	14.80	19.14	23.56	28.15	32.86	37.70	42.87	48.03		54.02	8 / 4			
	reaction time	0.260																
	interval			4.22	4.24	4.34	4.42	4.59	4.71	4.84	5.17	5.16	5.99	PB		12.80	13.72	15.17
	velocity		7.10	8.29	8.25	8.06	7.92	7.63	7.43	7.23	6.77	6.78	6.68	7.40		8.20	7.65	6.92
Hailey, Nnenna (USA) (1994)	time		6.40	10.51	14.61	18.97	23.49	28.19		38.05	43.14	48.34		54.42	2 / 5			
	reaction time	0.338																
	interval			4.11	4.10	4.36	4.52	4.70		9.86	5.09	5.20	6.08			12.57		
	velocity		7.03	8.52	8.54	8.03	7.74	7.45		7.10	6.88	6.73	6.58	7.35		8.35		
Sprunger, Leá (SUI) (1990)	time		6.30	10.53	14.80	19.12	23.64	28.44	33.40	38.67	44.19			56.24	7 / 6			
	reaction time	0.224																
	interval			4.23	4.27	4.32	4.52	4.80	4.96	5.27	5.52					12.82	14.28	
	velocity		7.14	8.27	8.20	8.10	7.74	7.29	7.06	6.64	6.34			7.11		8.19	7.35	
Watson, Sage (CAN) (1994)	time		6.34			19.17	23.69	28.43		38.84	44.36	49.98		56.32	1 / 7			
	reaction time	0.167																
	interval					12.83	4.52	4.74		10.41	5.52	5.62	6.34			12.83		
	velocity		7.10			8.18	7.74	7.38		6.72	6.34	6.23	6.31	7.10		8.18		
Spencer, Ashley (USA) (1993)	time		6.44	10.61	14.90	19.20	23.76	28.63		39.07	44.64	50.30		56.91	3 / 8			
	reaction time	0.204																
	interval			4.17	4.29	4.30	4.56	4.87		10.44	5.57	5.66	6.61			12.76		
	velocity		6.99	8.39	8.16	8.14	7.68	7.19		6.70	6.28	6.18	6.05	7.03		8.23		
H1 lead leg	time																	
	interval																	
	velocity																	
	strides																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 60fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=zFVRA0B8Rlw>

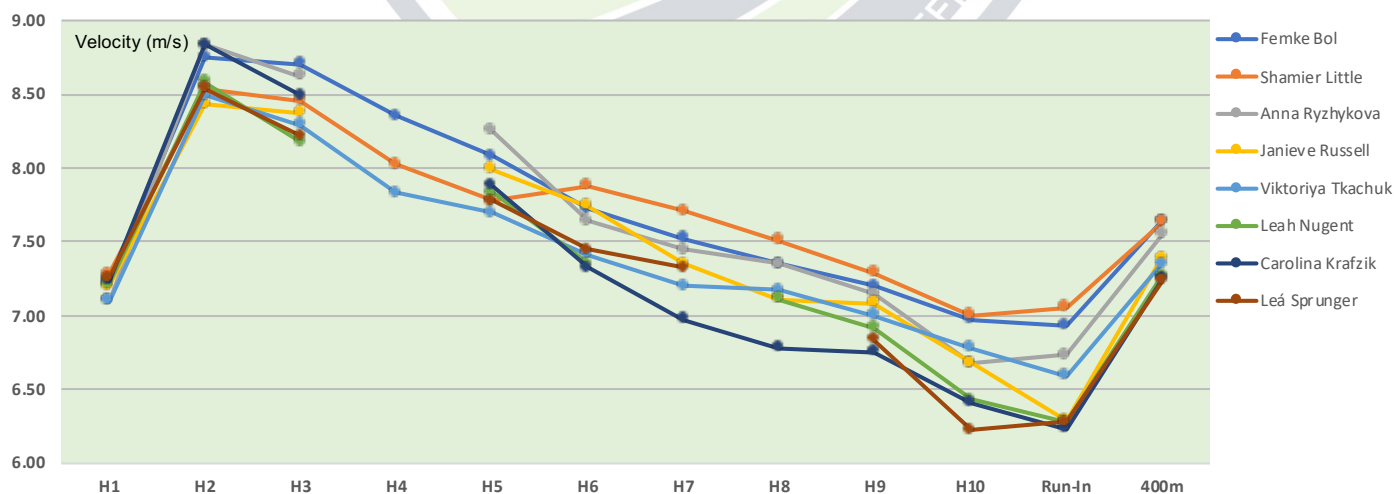
2021 Bauhaus Galan (Stockholm, SWE) (TV Analysis)

Women's 400m Hurdles

Date 2021.07.04

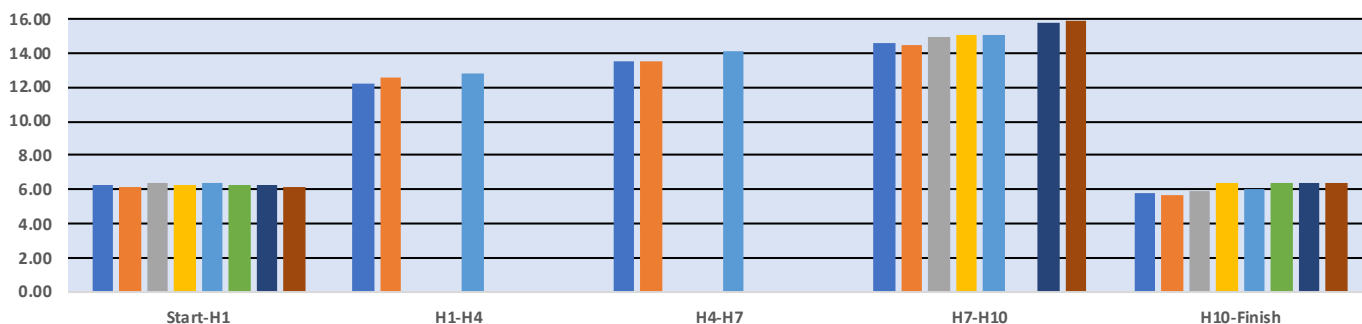
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.24	10.24	14.26	18.45	22.78	27.31	31.96	36.72	41.58	46.60		52.37	5 / 1			
	reaction time	0.195																
	interval		7.21	4.00	4.02	4.19	4.33	4.53	4.65	4.76	4.86	5.02	5.77	NR PB		12.21	13.51	14.64
	velocity			8.75	8.71	8.35	8.08	7.73	7.53	7.35	7.20	6.97	6.93	7.64		8.60	7.77	7.17
	H1 lead leg	L		15	15	15	15	15	15	15	15	15	19	154				
Little, Shamier (USA) (1995)	time		6.18	10.28	14.42	18.78	23.28	27.72	32.26	36.92	41.72	46.72		52.39	6 / 2			
	reaction time	0.200																
	interval		7.28	4.10	4.14	4.36	4.50	4.44	4.54	4.66	4.80	5.00	5.67	PB		12.60	13.48	14.46
	velocity			8.54	8.45	8.03	7.78	7.88	7.71	7.51	7.29	7.00	7.05	7.64		8.33	7.79	7.26
	H1 lead leg	R		15	15	15	15	15	15	15	16	16	19.7	156.7				
Ryzhykova, Anna (UKR) (1989)	time		6.34	10.30	14.36		22.84	27.42	32.12	36.88	41.78	47.02		52.96	3 / 3			
	reaction time	0.183																
	interval			3.96	4.06		8.48	4.58	4.70	4.76	4.90	5.24	5.94	NR PB				14.90
	velocity		7.10	8.84	8.62		8.25	7.64	7.45	7.35	7.14	6.68	6.73	7.55				7.05
	H1 lead leg	R	22	14	14			15	15	15	15	16	19.2	145.2				
Russell, Janieve (JAM) (1993)	time		6.25	10.40	14.58		23.34	27.86	32.62	37.54	42.48	47.72		54.08	4 / 4			
	reaction time	0.151																
	interval			4.15	4.18		8.76	4.52	4.76	4.92	4.94	5.24	6.36					15.10
	velocity		7.20	8.43	8.37		7.99	7.74	7.35	7.11	7.09	6.68	6.29	7.40				6.95
	H1 lead leg	R		15	15			15	16	16	16	16	20	129				
Tkachuk, Viktoriya (UKR) (1994)	time		6.34	10.46	14.68	19.15	23.70	28.42	33.28	38.16	43.16	48.32		54.39	7 / 5			
	reaction time	0.254																
	interval			4.12	4.22	4.47	4.55	4.72	4.86	4.88	5.00	5.16	6.07	PB		12.81	14.13	15.04
	velocity		7.10	8.50	8.29	7.83	7.69	7.42	7.20	7.17	7.00	6.78	6.59	7.35		8.20	7.43	6.98
	H1 lead leg	L		15	15	15	15	15	16	16	16	16	19.2	158.2				
Nugent, Leah (JAM) (1992)	time		6.24	10.32	14.60		23.54	28.30		38.14	43.20	48.64		55.01	1 / 6			
	reaction time	0.193																
	interval			4.08	4.28		8.94	4.76		9.84	5.06	5.44	6.37					
	velocity		7.21	8.58	8.18		7.83	7.35		7.11	6.92	6.43	6.28	7.27				
	H1 lead leg	R		14	14			15			15	16	19	93				
Krafzik, Carolina (GER) (1995)	time		6.22	10.18	14.30		23.18	27.96	32.98	38.14	43.32	48.78		55.20	2 / 7			
	reaction time	0.187																
	interval			3.96	4.12		8.88	4.78	5.02	5.16	5.18	5.46	6.42					15.80
	velocity		7.23	8.84	8.50		7.88	7.32	6.97	6.78	6.76	6.41	6.23	7.25				6.65
	H1 lead leg	L	22	15	15			16	17	17	17	19	21.7	159.7				
Sprunger, Leá (SUI) (1990)	time		6.20	10.30	14.56		23.56	28.26	33.04		43.28	48.90		55.27	8 / 8			
	reaction time	0.186																
	interval			4.10	4.26		9.00	4.70	4.78		10.24	5.62	6.37					15.86
	velocity		7.26	8.54	8.22		7.78	7.45	7.32		6.84	6.23	6.28	7.24				6.62
	H1 lead leg	R		15	14			15	15	15		16		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=ngnN5kWBxJk>

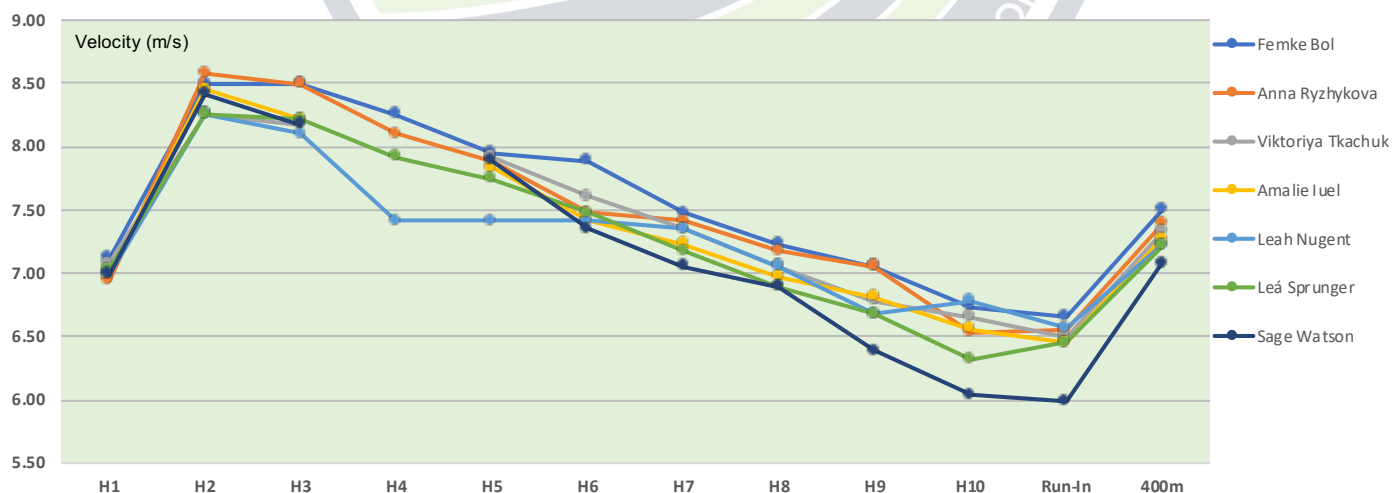
2021 Bislett Games (Oslo, NOR) (TV Analysis)

Women's 400m Hurdles

Date 2021.07.01

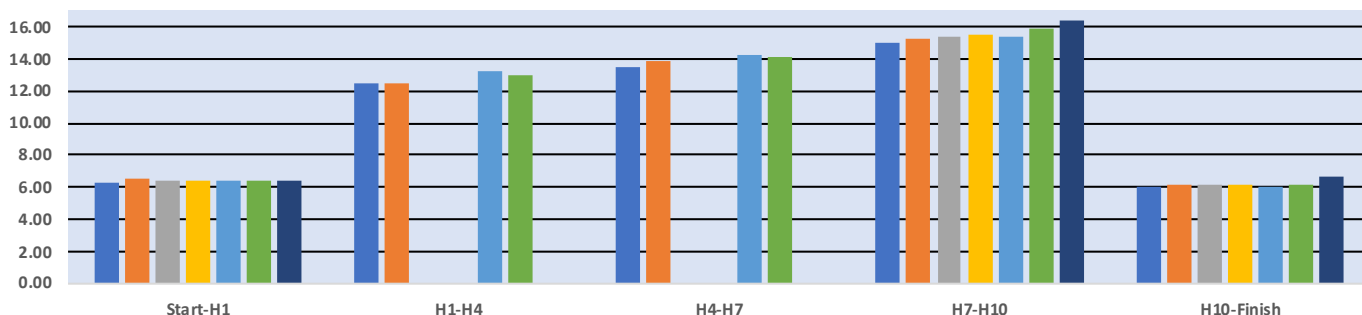
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.32	10.44	14.56	18.80	23.20	27.64	32.32	37.16	42.12	47.32		53.33	4 / 1			
	reaction time	0.199																
	interval		7.12	4.12	4.12	4.24	4.40	4.44	4.68	4.84	4.96	5.20	6.01	NR PB		12.48	13.52	15.00
	velocity		7.12	8.50	8.50	8.25	7.95	7.88	7.48	7.23	7.06	6.73	6.66	7.50		8.41	7.77	7.00
Ryzhykova, Anna (UKR) (1989)	time		6.48	10.56	14.68	19.00	23.44	28.12	32.84	37.72	42.68	48.04		54.15	5 / 2			
	reaction time	0.185																
	interval		6.94	4.08	4.12	4.32	4.44	4.68	4.72	4.88	4.96	5.36	6.11	PB		12.52	13.84	15.20
	velocity		6.94	8.58	8.50	8.10	7.88	7.48	7.42	7.17	7.06	6.53	6.55	7.39		8.39	7.59	6.91
Tkachuk, Viktoriya (UKR) (1994)	time		6.36	10.60	14.88	19.00	23.72	28.32	33.08	38.04	43.20	48.46		54.62	2 / 3			
	reaction time	0.250																
	interval		6.36	4.24	4.28	4.84	4.60	4.76	4.96	5.16	5.26	6.16	6.16	7.32				15.38
	velocity		7.08	8.25	8.18	7.92	7.61	7.35	7.06	6.78	6.65	6.49	6.49	7.32				6.83
Luel, Amalie (NOR) (1994)	time		6.44	10.58	14.84	19.00	23.78	28.50	33.34	38.36	43.50	48.84		55.04	7 / 4			
	reaction time	0.150																
	interval		6.44	4.14	4.26	4.72	4.72	4.72	4.88	5.02	5.14	5.34	6.20					15.50
	velocity		6.99	8.45	8.22	7.83	7.42	7.23	6.97	6.81	6.55	6.45	7.27					6.77
Nugent, Leah (JAM) (1992)	time		6.44	10.68	15.00	19.72	24.44	29.16	33.92	38.88	44.12	49.28		55.37	3 / 5			
	reaction time	0.233																
	interval		6.44	4.24	4.32	4.72	4.72	4.72	4.88	5.08	5.24	5.16	6.09			13.28	14.20	15.36
	velocity		6.99	8.25	8.10	7.42	7.42	7.42	7.35	7.06	6.68	6.78	6.57	7.22		7.91	7.39	6.84
Sprunger, Leá (SUI) (1990)	time		6.40	10.64	14.90	19.32	23.84	28.52	33.40	38.48	43.72	49.26		55.46	6 / 6			
	reaction time	0.152																
	interval		6.40	4.24	4.26	4.42	4.52	4.68	4.88	5.08	5.24	5.54	6.20			12.92	14.08	15.86
	velocity		7.03	8.25	8.22	7.92	7.74	7.48	7.17	6.89	6.68	6.32	6.45	7.21		8.13	7.46	6.62
Watson, Sage (CAN) (1994)	time		6.44	10.60	14.88	19.00	23.76	28.52	33.48	38.56	44.04	49.84		56.52	8 / 7			
	reaction time	0.204																
	interval		6.44	4.16	4.28	4.88	4.76	4.96	5.08	5.48	5.80	6.68	6.68					16.36
	velocity		6.99	8.41	8.18	7.88	7.35	7.06	6.89	6.39	6.03	5.99	7.08					6.42
Watson, Sage (CAN) (1994)	time		6.44	10.60	14.88	19.00	23.76	28.52	33.48	38.56	44.04	49.84		56.52	8 / 7			
	reaction time	0.204																
	interval		6.44	4.16	4.28	4.88	4.76	4.96	5.08	5.48	5.80	6.68	6.68					16.36
	velocity		6.99	8.41	8.18	7.88	7.35	7.06	6.89	6.39	6.03	5.99	7.08					6.42
Watson, Sage (CAN) (1994)	time		6.44	10.60	14.88	19.00	23.76	28.52	33.48	38.56	44.04	49.84		56.52	8 / 7			
	reaction time	0.204																
	interval		6.44	4.16	4.28	4.88	4.76	4.96	5.08	5.48	5.80	6.68	6.68					16.36
	velocity		6.99	8.41	8.18	7.88	7.35	7.06	6.89	6.39	6.03	5.99	7.08					6.42
Watson, Sage (CAN) (1994)	time		6.44	10.60	14.88	19.00	23.76	28.52	33.48	38.56	44.04	49.84		56.52	8 / 7			
	reaction time	0.204																
	interval		6.44	4.16	4.28	4.88	4.76	4.96	5.08	5.48	5.80	6.68	6.68					16.36
	velocity		6.99	8.41	8.18	7.88	7.35	7.06	6.89	6.39	6.03	5.99	7.08					6.42
Watson, Sage (CAN) (1994)	time		6.44	10.60	14.88	19.00	23.76	28.52	33.48	38.56	44.04	49.84		56.52	8 / 7			
	reaction time	0.204																
	interval		6.44	4.16	4.28	4.88	4.76	4.96	5.08	5.48	5.80	6.68	6.68					16.36
	velocity		6.99	8.41	8.18	7.88	7.35	7.06	6.89	6.39	6.03	5.99	7.08					6.42



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=R3BXj5glouA>

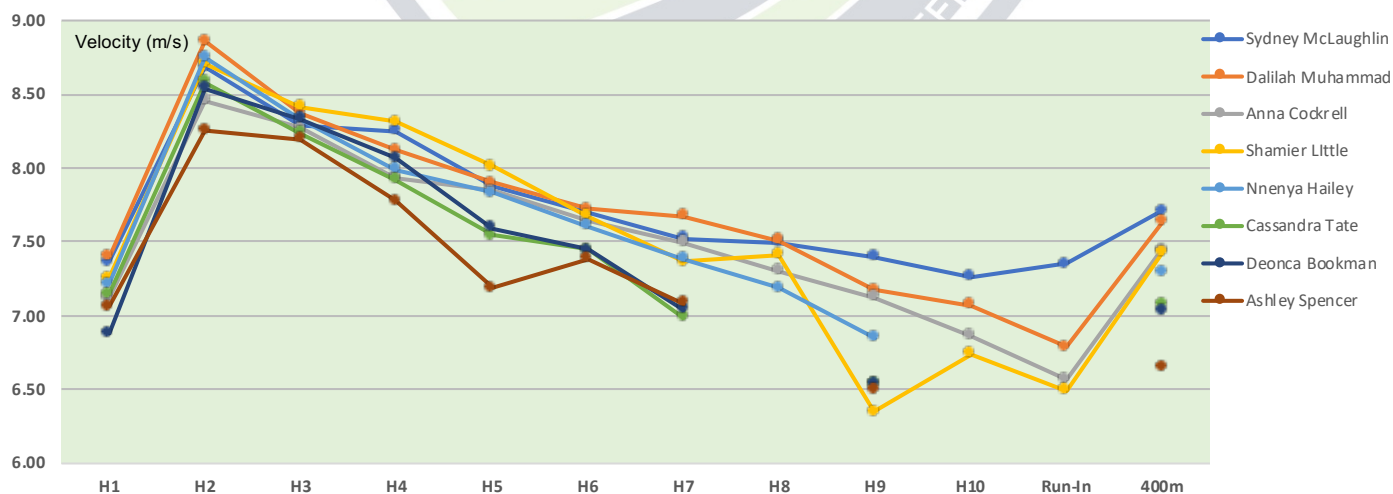
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Women's 400m Hurdles

Date 2021.06.27

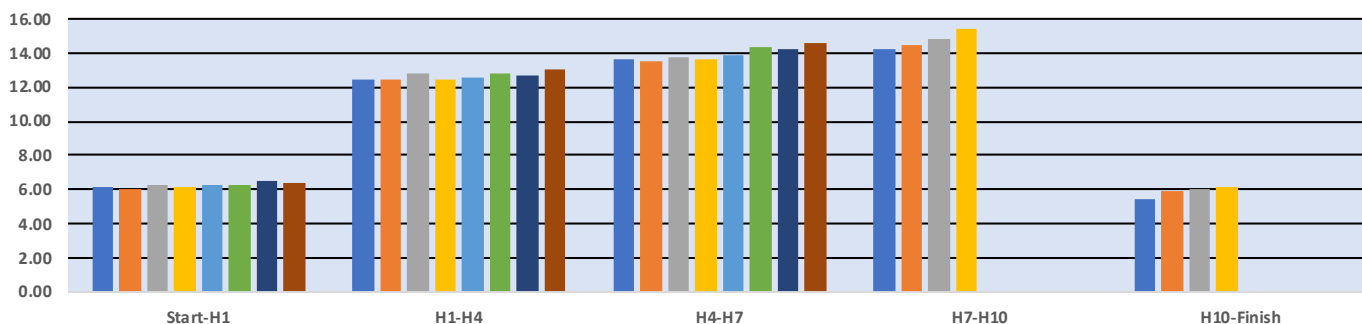
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin, Sydney (USA) (1999)	time		6.11	10.14	14.36	18.60	23.04	27.59	32.24	36.91	41.64	46.46		51.90	6 / 1			
	reaction time	0.194																
	interval			4.03	4.22	4.24	4.44	4.55	4.65	4.67	4.73	4.82	5.44	WR		12.49	13.64	14.22
	velocity		7.36	8.68	8.29	8.25	7.88	7.69	7.53	7.49	7.40	7.26	7.35	7.71		8.41	7.70	7.38
Muhammad, Dalilah (USA) (1990)	time		6.08	10.03	14.21	18.52	22.95	27.48	32.04	36.70	41.58	46.53		52.42	7 / 2			
	reaction time	0.167																
	interval			3.95	4.18	4.31	4.43	4.53	4.56	4.66	4.88	4.95	5.89			12.44	13.52	14.49
	velocity		7.40	8.86	8.37	8.12	7.90	7.73	7.68	7.51	7.17	7.07	6.79	7.63		8.44	7.77	7.25
Cockrell, Anna (USA) (1997)	time		6.32	10.46	14.69	19.10	23.56	28.14	32.81	37.60	42.51	47.61		53.70	9 / 3			
	reaction time	0.201																
	interval			4.14	4.23	4.41	4.46	4.58	4.67	4.79	4.91	5.10	6.09	PB		12.78	13.71	14.80
	velocity		7.12	8.45	8.27	7.94	7.85	7.64	7.49	7.31	7.13	6.86	6.57	7.45		8.22	7.66	7.09
Little, Shamier (USA) (1995)	time		6.20	10.22	14.38	18.59	22.96	27.52	32.27	36.99	42.50	47.69		53.85	5 / 4			
	reaction time	0.213																
	interval			4.02	4.16	4.21	4.37	4.56	4.75	4.72	5.51	5.19	6.16			12.39	13.68	15.42
	velocity		7.26	8.71	8.41	8.31	8.01	7.68	7.37	7.42	6.35	6.74	6.49	7.43		8.47	7.68	6.81
Hailey, Nnenna (USA) (1994)	time		6.24	10.24	14.44	18.82	23.29	27.89	32.63	37.50	42.61			54.79	8 / 5			
	reaction time	0.251																
	interval			4.00	4.20	4.38	4.47	4.60	4.74	4.87	5.11			DQ		12.58	13.81	
	velocity		7.21	8.75	8.33	7.99	7.83	7.61	7.38	7.19	6.85			7.30		8.35	7.60	
Tate, Cassandra (USA) (1990)	time		6.30	10.38	14.63	19.05	23.69	28.39	33.40		44.11			56.51	4 / 6			
	reaction time	0.194																
	interval			4.08	4.25	4.42	4.64	4.70	5.01		10.71			7.08		12.75	14.35	
	velocity		7.14	8.58	8.24	7.92	7.54	7.45	6.99		6.54			7.3		8.24	7.32	
Bookman, Deonca (USA) (1995)	time		6.54	10.64	14.84	19.18	23.79	28.49	33.46		44.17			56.90	2 / 7			
	reaction time	0.349																
	interval			4.10	4.20	4.34	4.61	4.70	4.97		10.71			7.03		12.64	14.28	
	velocity		6.88	8.54	8.33	8.06	7.59	7.45	7.04		6.54			83		8.31	7.35	
Spencer, Ashley (USA) (1993)	time		6.37	10.61	14.88	19.38	24.25	28.99	33.93		44.71			60.19	3 / 8			
	reaction time	0.222																
	interval			4.24	4.27	4.50	4.87	4.74	4.94		10.78			6.65		13.01	14.55	
	velocity		7.06	8.25	8.20	7.78	7.19	7.38	7.09		6.49			75		8.07	7.22	



Time Intervals (s)

Hurdle Phases



1st-4th Place

Source: Athlete Tracking (2021.06.28). Women's 400mH - Unofficial Split Times.

Retrieved from <https://twitter.com/athletrack/status/1409736538364260357?s=21>

5th-8th Place

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=YiZ62VM5bqA>

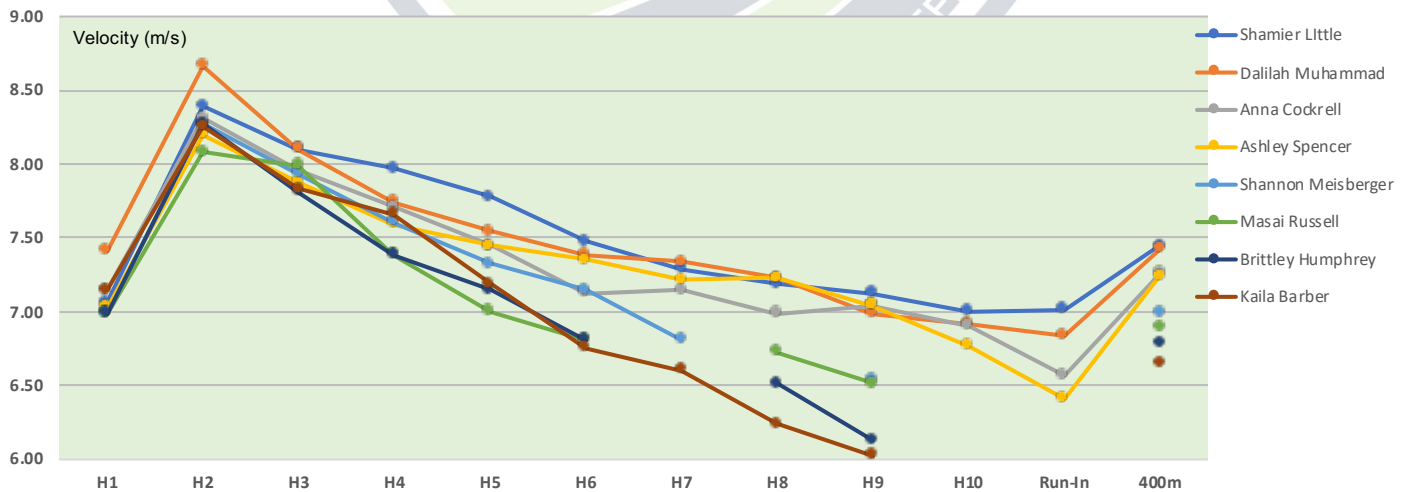
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Women's 400m Hurdles

Date 2021.06.26

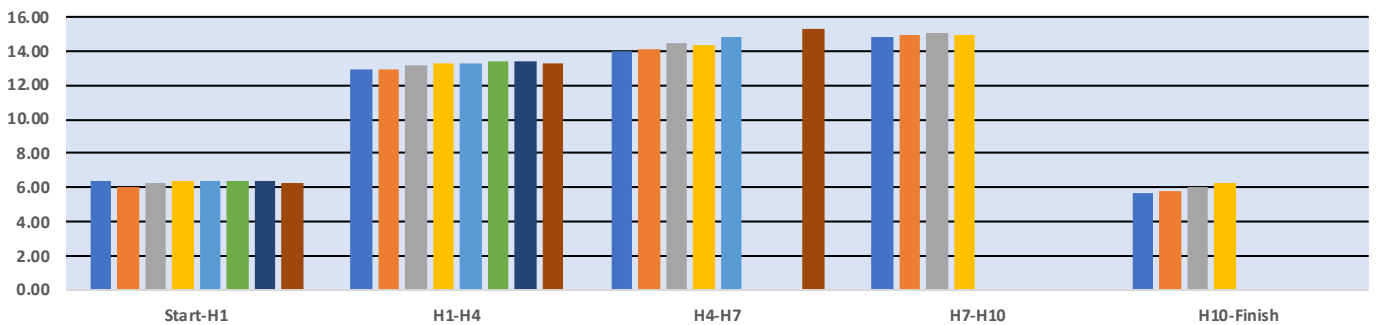
Semi-Final 2

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Little, Shamier (USA) (1995)	time		6.37	10.54	14.86	19.25	23.75	28.43	33.23	38.10	43.01	48.01		53.71	5 / 1			
	reaction time	0.222																
	interval			4.17	4.32	4.39	4.50	4.68	4.80	4.87	4.91	5.00	5.70			12.88	13.98	14.78
	velocity		7.06	8.39	8.10	7.97	7.78	7.48	7.29	7.19	7.13	7.00	7.02	7.45		8.15	7.51	7.10
	H1 lead leg	R			15	15	15	15	16	16	16	16	16	19	159			
Muhammad, Dalilah (USA) (1990)	time		6.07	10.11	14.43	18.95	23.59	28.33	33.10	37.94	42.95	48.01		53.86	6 / 2			
	reaction time	0.174																
	interval			4.04	4.32	4.52	4.64	4.74	4.77	4.84	5.01	5.06	5.85			12.88	14.15	14.91
	velocity		7.41	8.66	8.10	7.74	7.54	7.38	7.34	7.23	6.99	6.92	6.84	7.43		8.15	7.42	7.04
	H1 lead leg	R		22	15	15	15	15	15	15	16	16	16	18.7	177.7			
Cockrell, Anna (USA) (1997)	time		6.30	10.51	14.91	19.45	24.15	29.06	33.97	38.97	43.94	49.01		55.10	8 / 3			
	reaction time	0.177																
	interval			4.21	4.40	4.54	4.70	4.91	4.90	5.01	4.97	5.07	6.09			13.15	14.51	15.05
	velocity		7.14	8.31	7.95	7.71	7.45	7.13	7.14	6.99	7.04	6.90	6.57	7.26		7.98	7.24	6.98
	H1 lead leg	L			15	15	15	16	15	16	16	16		139				
Spencer, Ashley (USA) (1993)	time		6.40	10.67	15.11	19.72	24.42	29.18	34.03	38.87	43.84	49.01		55.25	7 / 4			
	reaction time	0.208																
	interval			4.27	4.44	4.61	4.70	4.76	4.85	4.84	4.97	5.17	6.24			13.32	14.31	14.98
	velocity		7.03	8.20	7.88	7.59	7.45	7.35	7.22	7.23	7.04	6.77	6.41	7.24		7.88	7.34	7.01
	H1 lead leg	L		22	15	15	15	15	15	15	15	15		142				
Meisberger, Shannon (USA) (1999)	time		6.44	10.67	15.08	19.68	24.46	29.36	34.50		45.21			57.22	9 / 5			
	reaction time	0.260									10.71							
	interval			4.23	4.41	4.60	4.78	4.90	5.14							13.24	14.82	
	velocity		6.99	8.27	7.94	7.61	7.32	7.14	6.81		6.54			6.99		7.93	7.09	
	H1 lead leg	L			15	15	15	16	16	17	17			111				
Russell, Masai (USA) (2000)	time		6.44	10.77	15.15	19.89	24.89	30.03		40.44	45.81			58.00	3 / 6			
	reaction time	0.332									10.41	5.37						
	interval			4.33	4.38	4.74	5.00	5.14								13.45		
	velocity		6.99	8.08	7.99	7.38	7.00	6.81		6.72	6.52			6.90		7.81		
	H1 lead leg	R			16	16	16	16			17			81				
Humphrey, Brittley (USA) (1998)	time		6.44	10.67	15.15	19.89	24.79	29.93		40.67	46.38			58.95	2 / 7			
	reaction time	0.190									10.74	5.71						
	interval			4.23	4.48	4.74	4.90	5.14								13.45		
	velocity		6.99	8.27	7.81	7.38	7.14	6.81		6.52	6.13			6.79		7.81		
	H1 lead leg	L			15	15	15	15			17			77				
Barber, Kaila (USA) (1993)	time		6.30	10.54	15.01	19.58	24.45	29.63	34.93	40.54	46.35			60.14	4 / 8			
	reaction time	0.174									5.81							
	interval			4.24	4.47	4.57	4.87	5.18	5.30	5.61						13.28	15.35	
	velocity		7.14	8.25	7.83	7.66	7.19	6.76	6.60	6.24	6.02			6.65		7.91	6.84	
	H1 lead leg	R			16	16	16	16		17	18			99				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=SMwV6be719A>

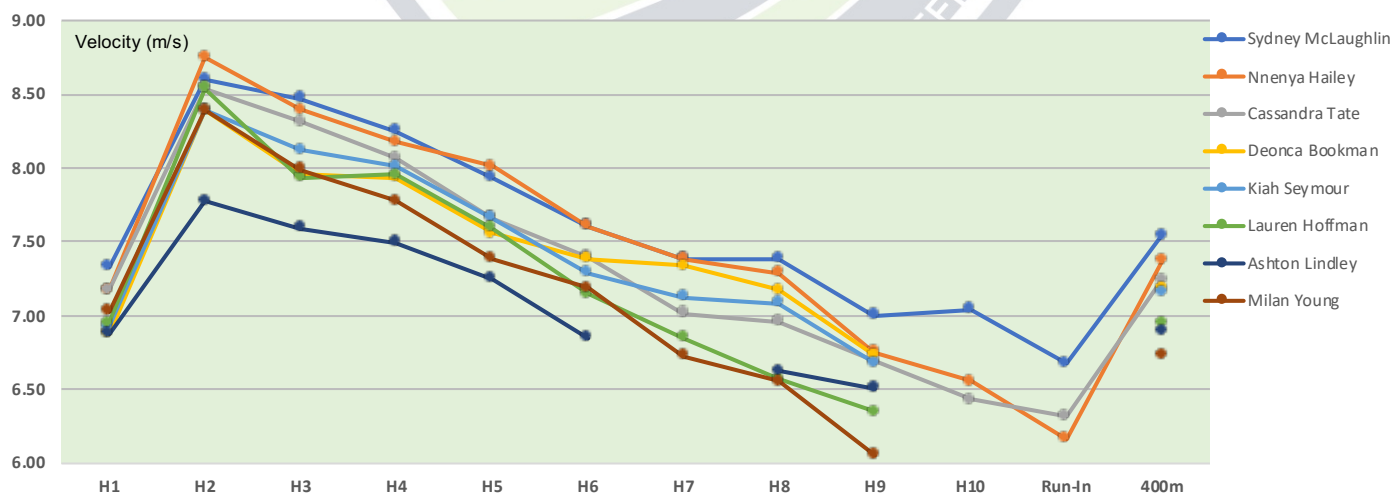
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Women's 400m Hurdles

Date 2021.06.26

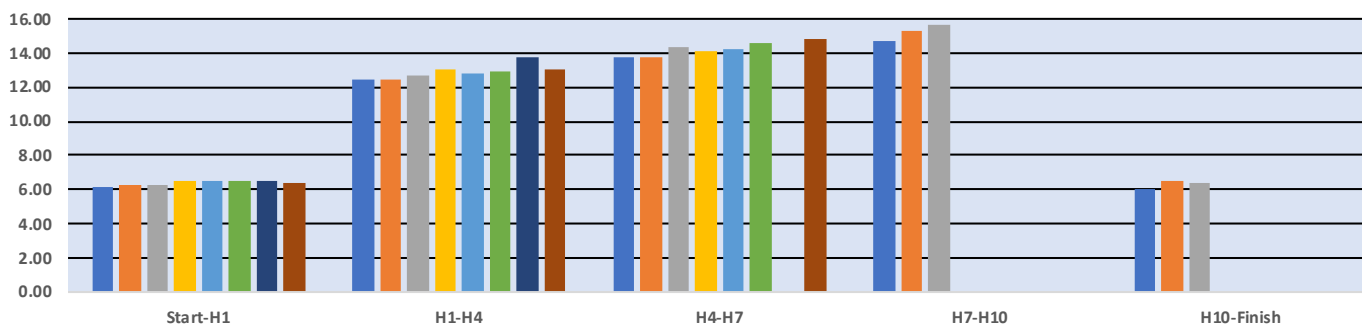
Semi-Final 1

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin, Sydney (USA) (1999)	time		6.14	10.21	14.34	18.58	22.99	27.59	32.33	37.07	42.07	47.04		53.03	5 / 1			
	reaction time	0.227																
	interval		7.33	8.60	8.47	8.25	7.94	7.61	7.38	7.38	7.00	4.97	5.99			12.44	13.75	14.71
	velocity													7.54		8.44	7.64	7.14
	strides		22	14	14	14	14	15	15	15	16	15	18.2	172.2				
Hailey, Nnenna (USA) (1994)	time		6.27	10.27	14.44	18.72	23.09	27.69	32.43	37.23	42.41	47.75		54.24	8 / 2			
	reaction time	0.266																
	interval		7.18	8.75	8.39	8.18	8.01	7.61	7.38	7.29	6.76	6.55	6.16	7.37		12.45	13.71	15.32
	velocity													7.37		8.43	7.66	6.85
	strides		16	16	16	15	16	17	17	17	18	18	22.5	172.5				
Tate, Cassandra (USA) (1990)	time		6.27	10.37	14.58	18.92	23.49	28.22	33.21	38.24	43.47	48.91		55.24	6 / 3			
	reaction time	0.211																
	interval		7.18	8.54	8.31	8.06	7.66	7.40	7.01	6.96	6.69	6.43	6.32	7.24		12.65	14.29	15.70
	velocity													157		8.30	7.35	6.69
	strides		22	14	14	14	15	15	16	15	16	16						
Bookman, Deonca (USA) (1995)	time		6.54	10.71	15.11	19.52	24.15	28.89	33.66	38.54	43.74			55.66	9 / 4			
	reaction time	0.338																
	interval		6.88	8.39	7.95	7.94	7.56	7.38	7.34	7.17	6.73			7.19		12.98	14.14	
	velocity													155		8.09	7.43	
	strides		17	17	17	17	17	17	17	17	18	18						
Seymour, Kiah (USA) (1994)	time		6.50	10.67	14.98	19.35	23.92	28.72	33.63	38.57	43.81			55.84	7 / 5			
	reaction time	0.204																
	interval		6.92	8.39	8.12	8.01	7.66	7.29	7.13	7.09	6.68			7.16		12.85	14.28	
	velocity													157		8.17	7.35	
	strides		24	16	16	16	16		17	17	17	18						
Hoffman, Lauren (USA) (1999)	time		6.47	10.57	14.98	19.38	23.99	28.89	34.00	39.33	44.84			57.59	3 / 6			
	reaction time	0.224																
	interval		6.96	8.54	7.94	7.95	7.59	7.14	6.85	6.57	6.35			6.95		12.91	14.62	
	velocity													116		8.13	7.18	
	strides			15	16	16	16		17	18	18							
Lindley, Ashton (USA) (2002)	time		6.54	11.04	15.65	20.32	25.15	30.26		40.83	46.21			58.04	2 / 7			
	reaction time	0.288																
	interval		6.88	4.50	4.61	4.67	4.83	5.11		10.57	5.38			6.89		13.78		
	velocity									6.62	6.51			81		7.62		
	strides			16	16	16	16				17							
Young, Milan (USA) (1999)	time		6.40	10.57	14.95	19.45	24.19	29.06	34.26	39.60	45.38			59.39	4 / 8			
	reaction time	0.187																
	interval		7.03	8.39	7.99	7.78	7.38	7.19	6.73	6.55	6.06			6.74		13.05	14.81	
	velocity													131		8.05	7.09	
	strides		22	15	15	15	15		16	16	17							



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=ZMxyKQ1hg18>

2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Women's 400m Hurdles

Date 2021.06.25

Heat 4

		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	6.03	10.06	14.40	18.80	23.40	28.13	33.10	38.30	43.60	49.03		55.51	3 / 1			
	reaction time	0.184															
	interval		4.03	4.34	4.40	4.60	4.73	4.97	5.20	5.30	5.43	6.48			12.77	14.30	15.93
	velocity		7.46	8.68	8.06	7.95	7.61	7.40	6.73	6.60	6.45	6.17	7.21		8.22	7.34	6.59
	H1 lead leg	R															
	strides	22	15	15	15	15	15	15	15	16	16	19	178				

Date 2021.06.25

Heat 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Tate, Cassandra (USA) (1990)	time	6.36	10.43	14.80	19.36	24.00	28.70	33.60	38.90	44.26	49.75		56.11	2 / 1			
	reaction time	0.230															
	interval		4.07	4.37	4.56	4.64	4.70	4.90	5.30	5.36	5.49	6.36			13.00	14.24	16.15
	velocity		7.08	8.60	8.01	7.68	7.54	7.14	6.60	6.53	6.38	6.29	7.13		8.08	7.37	6.50
	H1 lead leg	R															
	strides		14	14	15	15	15	15	16	16	16	19.2	155.2				
Cockrell, Anna (USA) (1997)	time	6.40	10.70	15.20	19.73	24.50	29.46	34.70	39.73	44.90	50.26		56.83	7 / 2			
	reaction time	0.196															
	interval		4.30	4.50	4.53	4.77	4.96	5.24	5.03	5.17	5.36	6.57			13.33	14.97	15.56
	velocity		7.03	8.14	7.78	7.73	7.34	7.06	6.68	6.96	6.77	6.53	6.09	7.04	7.88	7.01	6.75
	H1 lead leg	L															
	strides	22	15	15	15	15	15	16	15	16	16	20	180				

Date 2021.06.25

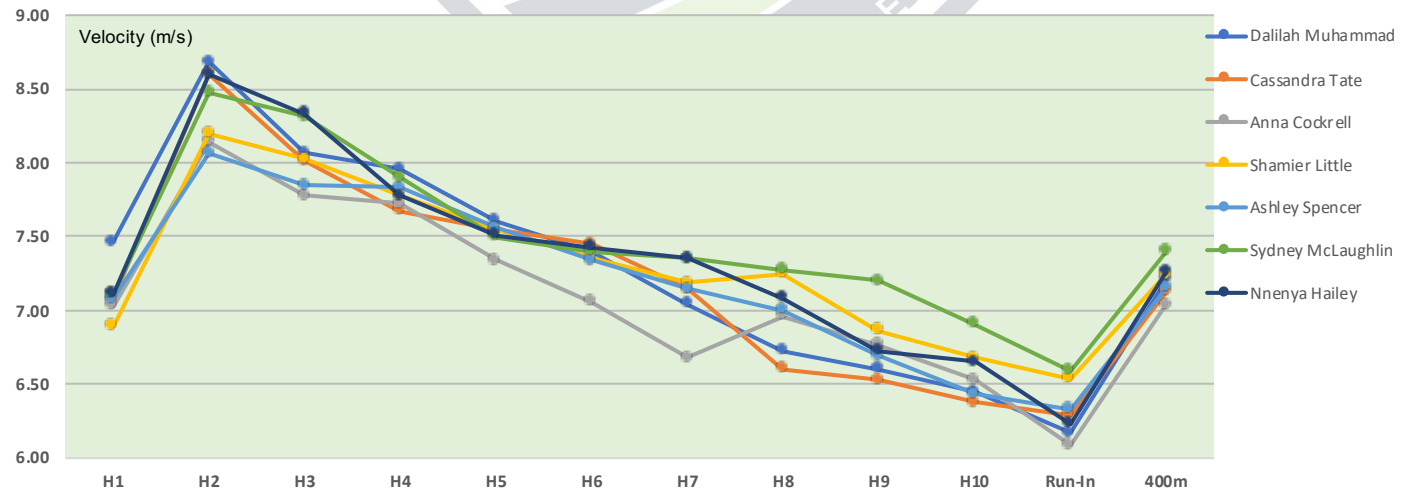
Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Little, Shamier (USA) (1995)	time	6.53	10.80	15.16	19.66	24.30	29.06	33.93	38.76	43.86	49.10		55.22	7 / 1			
	reaction time	0.301															
	interval		4.27	4.36	4.50	4.64	4.76	4.87	4.83	5.10	5.24	6.12			13.13	14.27	15.17
	velocity		6.89	8.20	8.03	7.78	7.54	7.35	7.19	7.25	6.86	6.68	6.54	7.24	8.00	7.36	6.92
	H1 lead leg	R															
	strides	23	15	15	15	16	16	16	16	16	16	19	183				
Spencer, Ashley (USA) (1993)	time	6.36	10.70	15.16	19.63	24.26	29.03	33.93	38.93	44.16	49.60		55.92	8 / 2			
	reaction time	0.182															
	interval		4.34	4.46	4.47	4.63	4.77	4.90	5.00	5.23	5.44	6.32			13.27	14.30	15.67
	velocity		7.08	8.06	7.85	7.83	7.56	7.34	7.14	7.00	6.69	6.43	6.33	7.15	7.91	7.34	6.70
	H1 lead leg	L															
	strides	22	15	15	15	15	15	15	15	15	15	18	175				

Date 2021.06.25

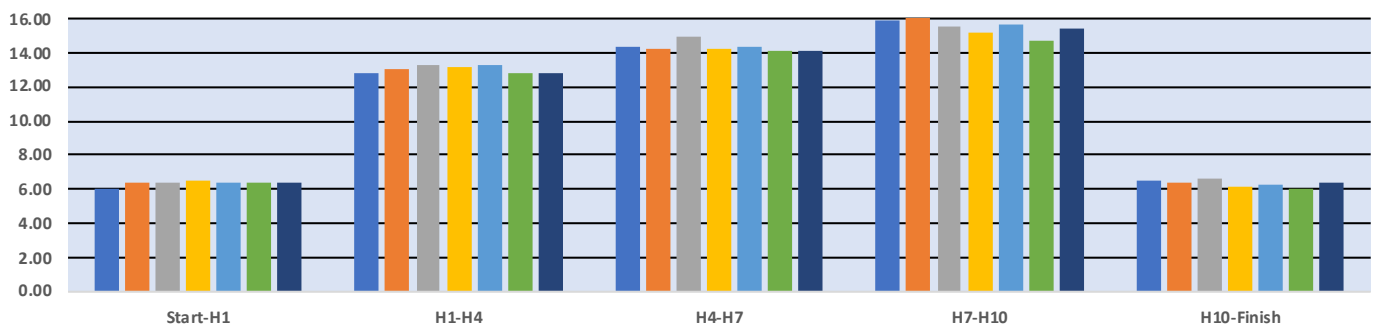
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin, Sydney (USA) (1999)	time	6.33	10.46	14.67	19.10	23.77	28.50	33.26	38.07	42.93	48.00		54.07	5 / 1			
	reaction time	0.255															
	interval		4.13	4.21	4.43	4.67	4.73	4.76	4.81	4.86	5.07	6.07			12.77	14.16	14.74
	velocity		7.11	8.47	8.31	7.90	7.49	7.40	7.35	7.28	7.20	6.90	6.59	7.40	8.22	7.42	7.12
	H1 lead leg	R															
	strides	22	14	14	15	15	15	15	15	15	16	18.2	174.2				
Hailey, Nnenna (USA) (1994)	time	6.33	10.40	14.60	19.10	23.76	28.47	33.23	38.17	43.37	48.63		55.05	8 / 2			
	reaction time	0.291															
	interval		4.07	4.20	4.50	4.66	4.71	4.76	4.94	5.20	5.26	6.42			12.77	14.13	15.40
	velocity		7.11	8.60	8.33	7.78	7.51	7.43	7.35	7.09	6.73	6.65	6.23	7.27	8.22	7.43	6.82
	H1 lead leg	L															
	strides		16	16	17	17	17	17	17	18	18	22.2	175.2				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=QhAEK8AeHsk&t=95s>

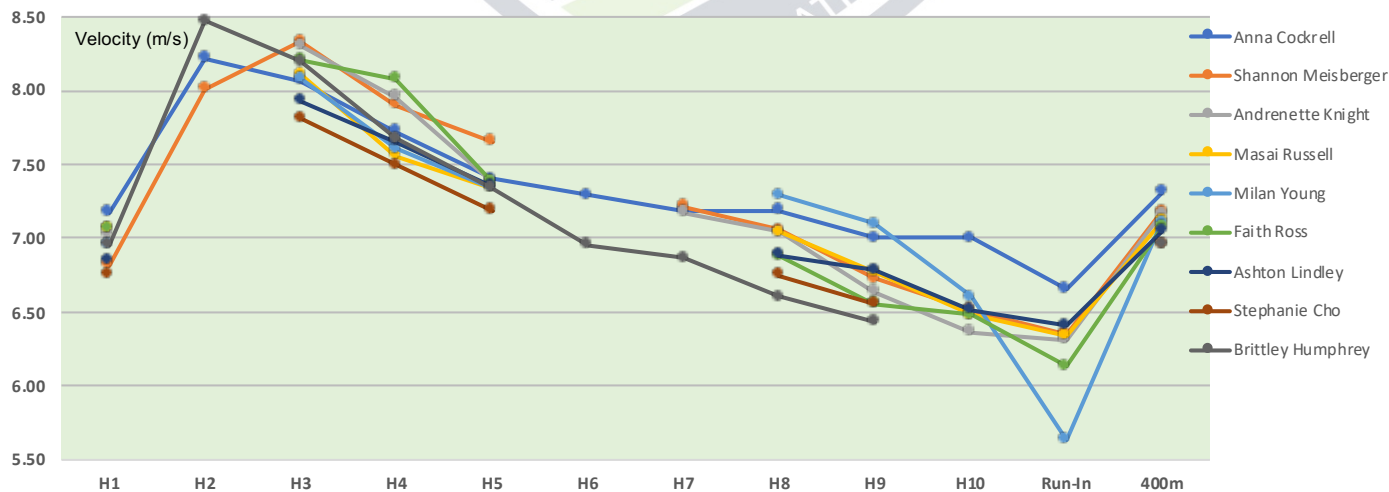
2021 NCAA Championships (Eugene, OR) (TV Analysis)

100m Hurdles

Date: 2021.06.12

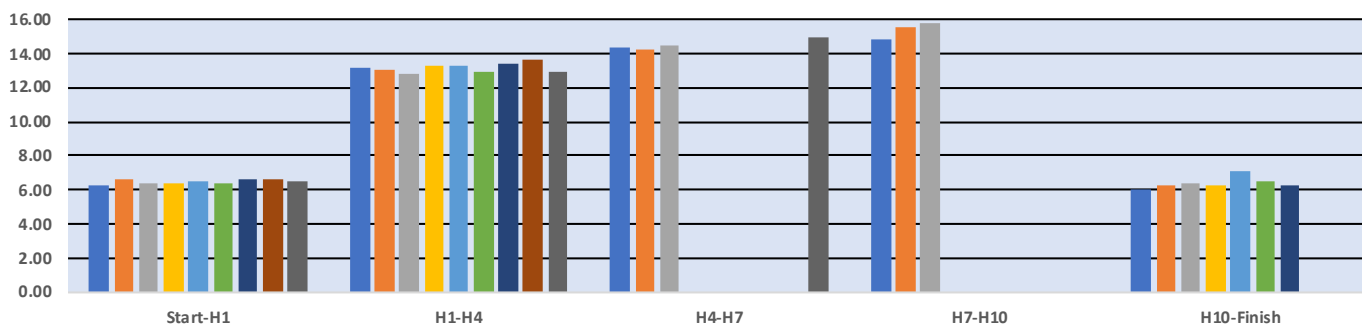
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Cockrell, Anna (USA) (1997)	time		6.27	10.53	14.87	19.40	24.13	28.93	33.80	38.67	43.67	48.67		54.68	6 / 1			
	reaction time	0.166																
	interval		7.18	4.26	4.34	4.53	4.73	4.80	4.87	4.87	5.00	5.00	6.01	PB		13.13	14.40	14.87
	velocity		8.22	8.06	8.06	7.73	7.40	7.29	7.19	7.19	7.00	7.00	6.66	7.32		8.00	7.29	7.06
Meisberger, Shannon (USA) (1999)	time		6.60	10.97	15.17	19.60	24.17		33.87	38.83	44.03	49.40		55.70	8 / 2			
	reaction time	0.275																
	interval		6.82	4.37	4.20	4.43	4.57		9.70	4.96	5.20	5.37	6.30	PB		13.00	14.27	15.53
	velocity		8.01	8.33	7.90	7.66			7.22	7.06	6.73	6.52	6.35	7.18		8.08	7.36	6.76
Knight, Andrenette (JAM) (1996)	time		6.40		14.83	19.23	23.97		33.73	38.70	43.97	49.47		55.81	4 / 3			
	reaction time	0.178																
	interval				8.43	4.40	4.74		9.76	4.97	5.27	5.50	6.34			12.83	14.50	15.74
	velocity		7.03		8.30	7.95	7.38		7.17	7.04	6.64	6.36	6.31	7.17		8.18	7.24	6.67
Russell, Masai (USA) (2000)	time		6.37		15.00	19.63	24.40			39.30	44.47	49.87		56.18	5 / 4			
	reaction time	0.335																
	interval				8.63	4.63	4.77			14.90	5.17	5.40	6.31	PB		13.26		
	velocity		7.06		8.11	7.56	7.34			7.05	6.77	6.48	6.34	7.12		7.92		
Young, Milan (USA) (1999)	time		6.47		15.13	19.73	24.50			38.90	43.83	49.13		56.23	9 / 5			
	reaction time	0.218																
	interval				8.66	4.60	4.77			14.40	4.93	5.30	7.10			13.26		
	velocity		6.96		8.08	7.61	7.34			7.29	7.10	6.60	5.63	7.11		7.92		
Ross, Faith (USA) (1998)	time		6.37		14.90	19.23	23.97			39.23	44.57	49.97		56.49	3 / 6			
	reaction time	0.227																
	interval				8.53	4.33	4.74			15.26	5.34	5.40	6.52	PB		12.86		
	velocity		7.06		8.21	8.08	7.38			6.88	6.55	6.48	6.13	7.08		8.16		
Lindley, Ashton (USA) (2002)	time		6.57		15.40	19.97	24.73			39.97	45.13	50.50		56.74	2 / 7			
	reaction time	0.213																
	interval				8.83	4.57	4.76			15.24	5.16	5.37	6.24	PB		13.40		
	velocity		6.85		7.93	7.66	7.35			6.89	6.78	6.52	6.41	7.05		7.84		
Cho, Stephanie (CAN) (1997)	time		6.67		15.63	20.30	25.17			40.73	46.07			57.48	1 / 8			
	reaction time	0.298																
	interval				8.96	4.67	4.87			15.56	5.34			PB		13.63		
	velocity		6.75		7.81	7.49	7.19			6.75	6.55			6.96		7.70		
Humphrey, Brittley (USA) (1998)	time		6.47	10.60	14.87	19.43	24.20	29.23	34.33	39.63	45.07			57.51	7 / 9			
	reaction time	0.177																
	interval			4.13	4.27	4.56	4.77	5.03	5.10	5.30	5.44					12.96	14.90	
	velocity		6.96	8.47	8.20	7.68	7.34	6.96	6.86	6.60	6.43			6.96		8.10	7.05	
	H1 lead leg	L	23	15	15	15	15	16	16	16	16			147				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 24fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=9ImRZ3Vlomg>

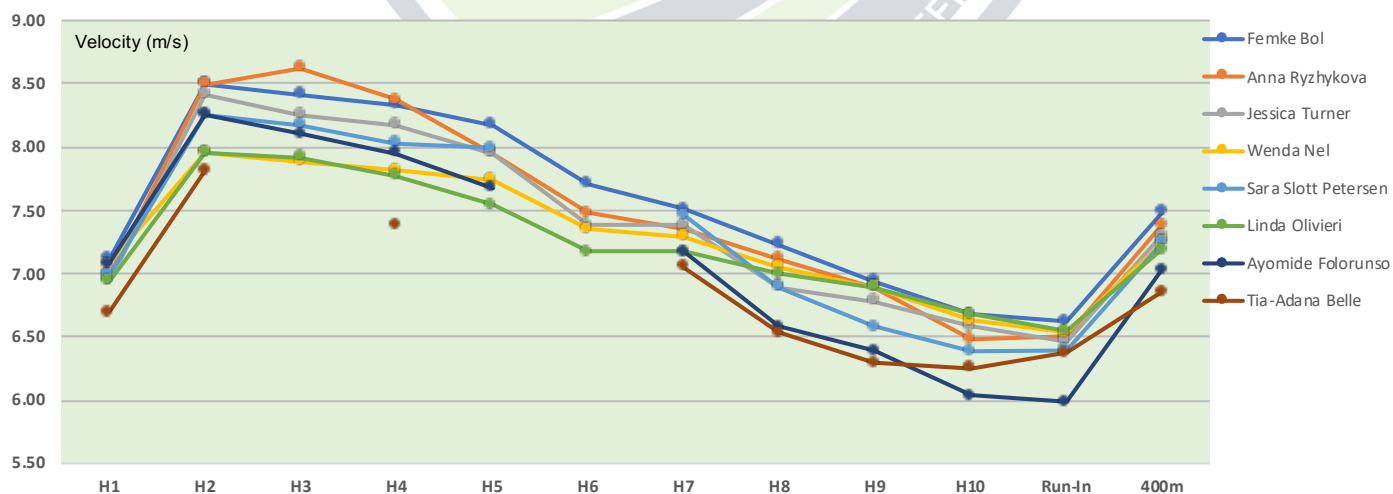
2021 Golden Gala Pietro Mennea (Florence, ITA) (TV Analysis)

Women's 400m Hurdles

Date 2021.06.10

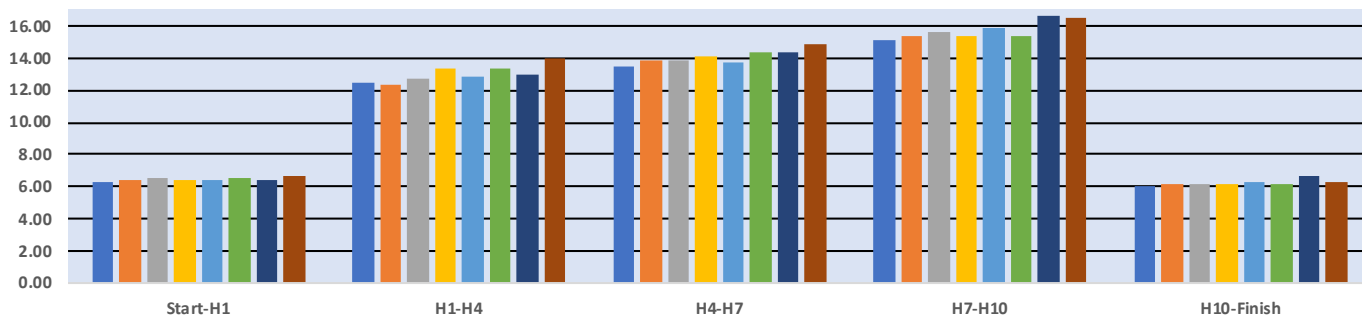
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.32	10.44	14.60	18.80	23.08	27.62	32.28	37.12	42.16	47.40		53.44	4 / 1			
	reaction time	0.209																
	interval		4.12	4.16	4.20	4.28	4.54	4.66	4.84	5.04	5.24	6.04		NR PB		12.48	13.48	15.12
	velocity		7.12	8.50	8.41	8.33	8.18	7.71	7.51	7.23	6.94	6.68	6.62	7.49		8.41	7.79	6.94
Ryzhykova, Anna (UKR) (1989)	time		6.44	10.56	14.62	18.80	23.20	27.88	32.64	37.56	42.64	48.04		54.19	5 / 2			
	reaction time	0.182																
	interval		4.12	4.06	4.18	4.40	4.68	4.76	4.92	5.08	5.40	6.15		PB		12.36	13.84	15.40
	velocity		6.99	8.50	8.62	8.37	7.95	7.48	7.35	7.11	6.89	6.48	6.50	7.38		8.50	7.59	6.82
Turner, Jessica (GBR) (1995)	time		6.48	10.64	14.88	19.16	23.56	28.30	33.04	38.12	43.28	48.60		54.79	6 / 3			
	reaction time	0.199																
	interval		4.16	4.24	4.28	4.40	4.74	4.74	5.08	5.16	5.32	6.19				12.68	13.88	15.56
	velocity		6.94	8.41	8.25	8.18	7.95	7.38	7.38	6.89	6.78	6.58	6.46	7.30		8.28	7.56	6.75
Nel, Wenda (RSA) (1988)	time		6.36	10.76	15.20	19.68	24.20	28.96	33.76	38.72	43.80	49.08		55.20	8 / 4			
	reaction time	0.182																
	interval		4.40	4.44	4.48	4.52	4.76	4.80	5.08	5.32	5.48	6.25				13.32	14.08	15.32
	velocity		7.08	7.95	7.88	7.81	7.74	7.35	7.29	7.06	6.89	6.63	6.54	7.25		7.88	7.46	6.85
Petersen, Sara Slott (DEN) (1987)	time		6.44	10.68	14.96	19.32	23.70		33.08	38.16	43.48	48.96		55.21	2 / 5			
	reaction time	0.144																
	interval		4.24	4.28	4.36	4.38			9.38	5.08	5.32	5.48	6.25			12.88	13.76	15.88
	velocity		6.99	8.25	8.18	8.03	7.99		7.46	6.89	6.58	6.39	6.40	7.25		8.15	7.63	6.61
Olivieri, Linda (ITA) (1998)	time		6.48	10.88	15.30	19.80	24.44	29.32	34.20	39.20	44.28	49.52		55.63	7 / 6			
	reaction time	0.134																
	interval		4.40	4.42	4.50	4.64	4.88	4.88	5.00	5.08	5.24	6.11		PB		13.32	14.40	15.32
	velocity		6.94	7.95	7.92	7.78	7.54	7.17	7.17	7.00	6.89	6.68	6.55	7.19		7.88	7.29	6.85
Folorunso, Ayomide (ITA) (1996)	time		6.36	10.60	14.92	19.32	23.88		33.64	38.96	44.44	50.24		56.92	3 / 7			
	reaction time	0.193																
	interval		4.24	4.32	4.40	4.56			9.76	5.32	5.48	5.80	6.68			12.96	14.32	16.60
	velocity		7.08	8.25	8.10	7.95	7.68		7.17	6.58	6.39	6.03	5.99	7.03		8.10	7.33	6.33
Belle, Tia-Adana (BAR) (1996)	time		6.72	11.20		20.68			35.56	40.92	46.48	52.08		58.36	1 / 8			
	reaction time	0.172																
	interval		4.48			9.48			14.88	5.36	5.56	5.60	6.28			13.96	14.88	16.52
	velocity		6.70	7.81		7.38			7.06	6.53	6.29	6.25	6.37	6.85		7.52	7.06	6.36
	H1 lead leg	R	24	16					17	17	17	17		91				



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=YVuMDueaxHc>

Biomechanical Analysis

2021 Music City Track Carnival (Nashville, TN) (TV Analysis)

Women's 400m Hurdles

Date 2021.06.06

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin, Sydney (USA) (1999)	time	6.34	10.64	14.88	19.07	23.45	27.92	32.53	37.34	42.44	47.48		52.83	5 / 1			
	reaction time																
	interval		4.30	4.24	4.19	4.38	4.47	4.61	4.81	5.10	5.04	5.35			12.73	13.46	14.95
	velocity	7.10	8.14	8.25	8.35	7.99	7.83	7.59	7.28	6.86	6.94	7.48	7.57		8.25	7.80	7.02
	H1 lead leg	R															
	strides	22	15	14	14	14	14	15		16	16	18.5	158.5				

2019 IAAF World Championships (Doha, QAT)

Date 2021.06.06

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin, Sydney (USA) (1999)	time	6.27	10.27	14.38	18.65	22.98	27.42	31.96	36.73	41.57	46.58		52.23	4 / 2			
	reaction time	0.161															
	interval		4.00	4.11	4.27	4.33	4.44	4.54	4.77	4.84	5.01	5.65	PB		12.38	13.31	14.62
	velocity	7.18	8.75	8.52	8.20	8.08	7.88	7.71	7.34	7.23	6.99	7.08	7.66		8.48	7.89	7.18
	H1 lead leg	R															
	strides	23	15	15	15	15	15	15	16	16	16	19.2	180.2				

2018 South Eastern Conference Championships (Knoxville, TN) (TV Analysis)

Date 2018.05.13

FINAL

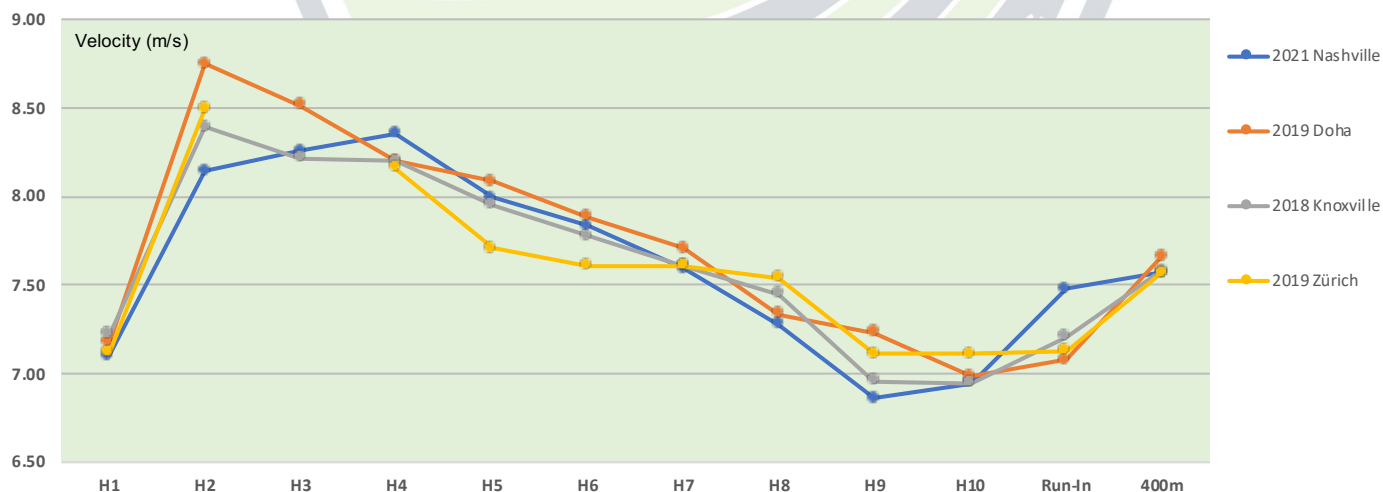
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin, Sydney (USA) (1999)	time	6.23	10.40	14.66	18.93	23.33	27.83	32.43	37.13	42.16	47.20		52.75	5 / 1			
	reaction time																
	interval		4.17	4.26	4.27	4.40	4.50	4.60	4.70	5.03	5.04	5.55	WJR PB		12.70	13.50	14.77
	velocity	7.22	8.39	8.22	8.20	7.95	7.78	7.61	7.45	6.96	6.94	7.21	7.58		8.27	7.78	7.11
	H1 lead leg	R															
	strides		15	15	15	15	15	15	15	16	16	18.5	155.5				

2019 Weltklasse (Zürich, SUI) (TV Analysis)

Date 2018.05.13

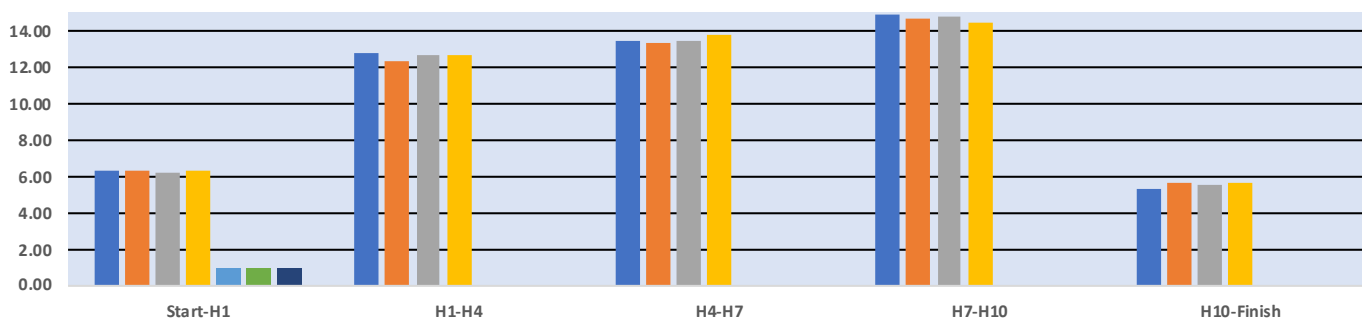
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin, Sydney (USA) (1999)	time	6.32	10.44		19.02	23.56	28.16	32.76	37.40	42.32	47.24		52.85	3 / 1			
	reaction time	0.147															
	interval		4.12		8.58	4.54	4.60	4.60	4.64	4.92	4.92	5.61			12.70	13.74	14.48
	velocity	7.12	8.50		8.16	7.71	7.61	7.61	7.54	7.11	7.11	7.13	7.57		8.27	7.64	7.25
	H1 lead leg	R															
	strides	23	15			15	15	15	15	16	16	19	149				



Time Intervals (s)

Hurdle Phases



2021 ATL Music City Track Carnival

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=Xti0evM1wUo>

2019 IAAF World Championships (Doha, QAT)

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: https://www.youtube.com/watch?v=ZAz0GS_4QTY