

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

Men's 400m Hurdles

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Women's 400m Hurdles

Top 10 Times	87
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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	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 (2024) - Athlete First: 2021 year end hurdle report					
date	3-Aug	time	2.46	3.50	4.48	5.48	6.48	7.48	8.48	9.50	10.50	11.56	13.01	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	2.46	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	1.04	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

Biomechanical Analysis

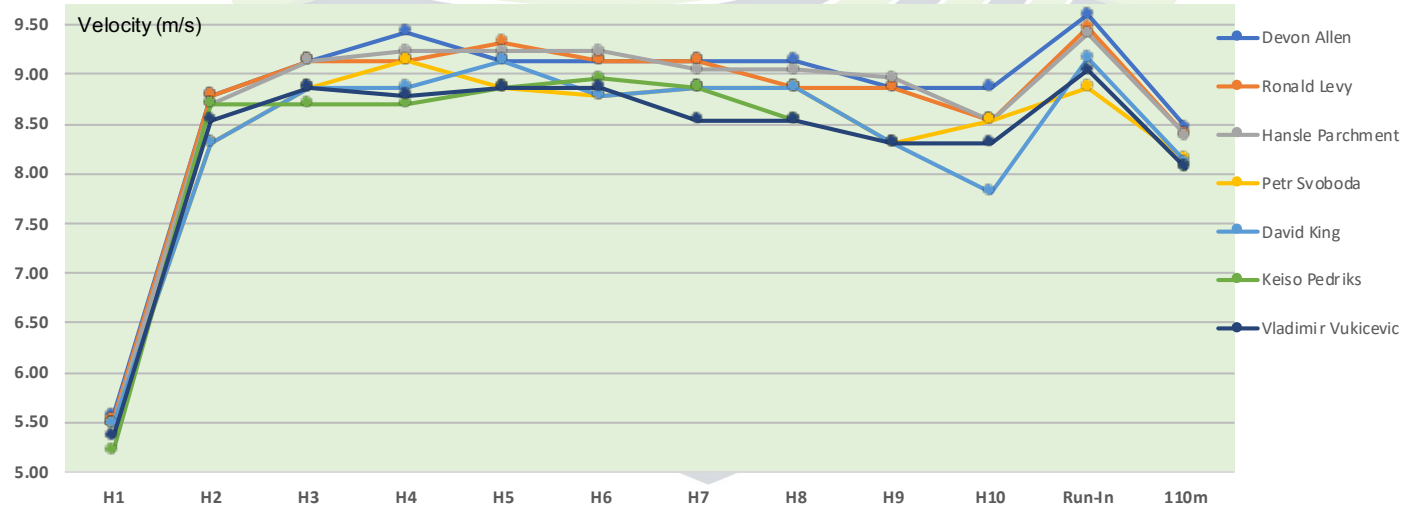
2021 Boris Hanžeković Memorial (Zagreb, CRO) (TV Analysis)

110m Hurdles

Date: 2021.09.14 Wind: 0.7 m/s

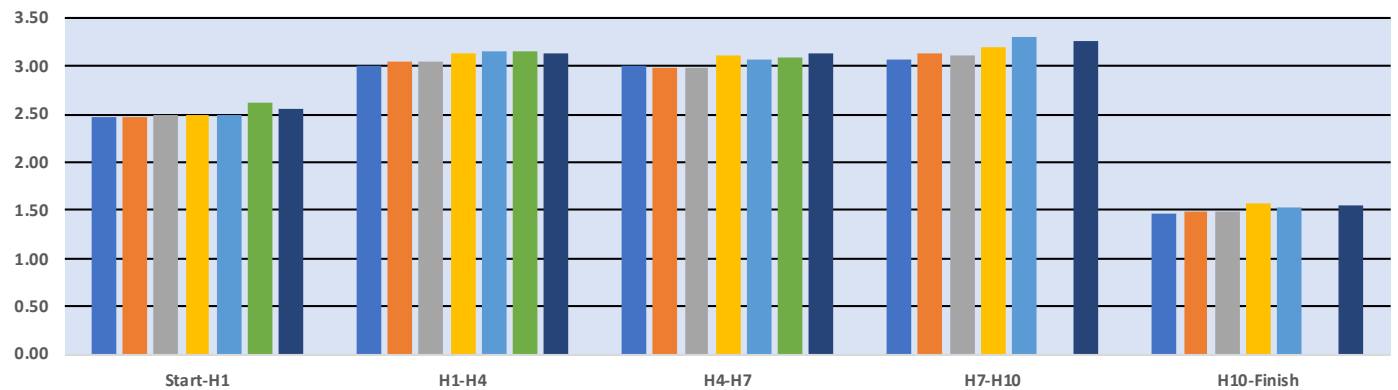
FINAL

		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			
	reaction time	0.126													3.01	3.00	3.06
	interval		1.04	1.00	0.97	1.00	1.00	1.00	1.00	1.03	1.03	1.46	PB		9.11	9.14	8.96
	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			
	reaction time	0.156													3.04	2.98	3.13
	interval		1.04	1.00	1.00	0.98	1.00	1.00	1.03	1.03	1.07	1.48			9.02	9.20	8.76
	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			
	reaction time	0.141													3.04	2.99	3.10
	interval		1.05	1.00	0.99	0.99	0.99	1.01	1.01	1.02	1.07	1.49			9.02	9.17	8.85
	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			
	reaction time	0.167													3.13	3.10	3.20
	interval		1.10	1.03	1.00	1.03	1.04	1.03	1.03	1.10	1.07	1.58			8.76	8.85	8.57
	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			
	reaction time	0.140													3.16	3.07	3.30
	interval		1.10	1.03	1.03	1.00	1.04	1.03	1.03	1.10	1.17	1.53			8.68	8.93	8.31
	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			
	reaction time	0.182													3.15	3.08	
	interval		1.05	1.05	1.05	1.03	1.02	1.03	1.07			PB			8.70	8.90	
	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			
	reaction time	0.136													3.14	3.13	3.27
	interval		1.07	1.03	1.04	1.03	1.03	1.07	1.07	1.10	1.10	1.55			8.73	8.76	8.39
	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)

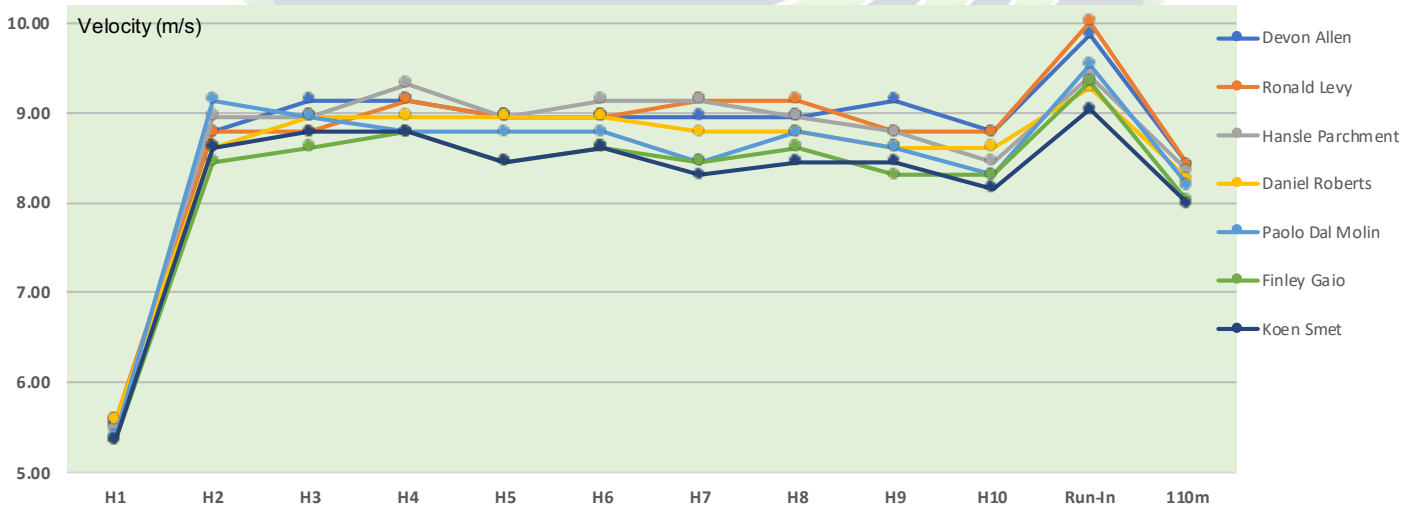
110m Hurdles

Date: 2021.09.09

Wind: 0.6 m/s

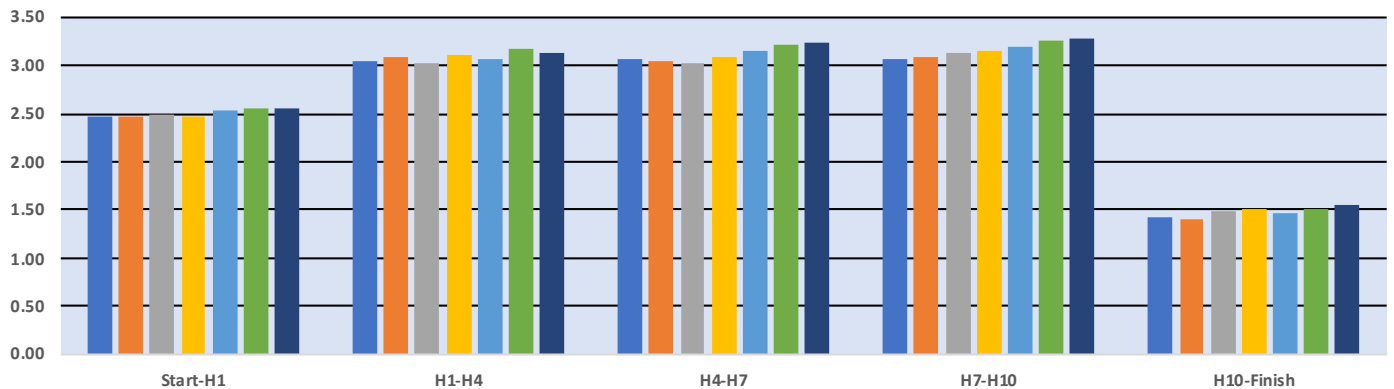
FINAL

		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													3.04	3.06	3.06
	interval		1.04	1.00	1.00	1.02	1.02	1.02	1.02	1.00	1.04	1.42			9.02	8.96	8.96
	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				
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													3.08	3.04	3.08
	interval		1.04	1.04	1.00	1.02	1.02	1.00	1.00	1.04	1.04	1.40			8.90	9.02	8.90
	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				
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													3.02	3.02	3.14
	interval		1.02	1.02	0.98	1.02	1.00	1.00	1.02	1.04	1.08	1.49			9.08	9.08	8.73
	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				
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													3.10	3.08	3.16
	interval		1.06	1.02	1.02	1.02	1.02	1.04	1.04	1.06	1.06	1.51			8.85	8.90	8.68
	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				
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													3.06	3.16	3.20
	interval		1.00	1.02	1.04	1.04	1.04	1.08	1.04	1.06	1.10	1.47			8.96	8.68	8.57
	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				
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													3.18	3.22	3.26
	interval		1.08	1.06	1.04	1.08	1.06	1.08	1.06	1.10	1.10	1.50			8.62	8.52	8.41
	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				
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													3.14	3.24	3.28
	interval		1.06	1.04	1.04	1.08	1.06	1.10	1.08	1.08	1.12	1.55			8.73	8.46	8.36
	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				



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)

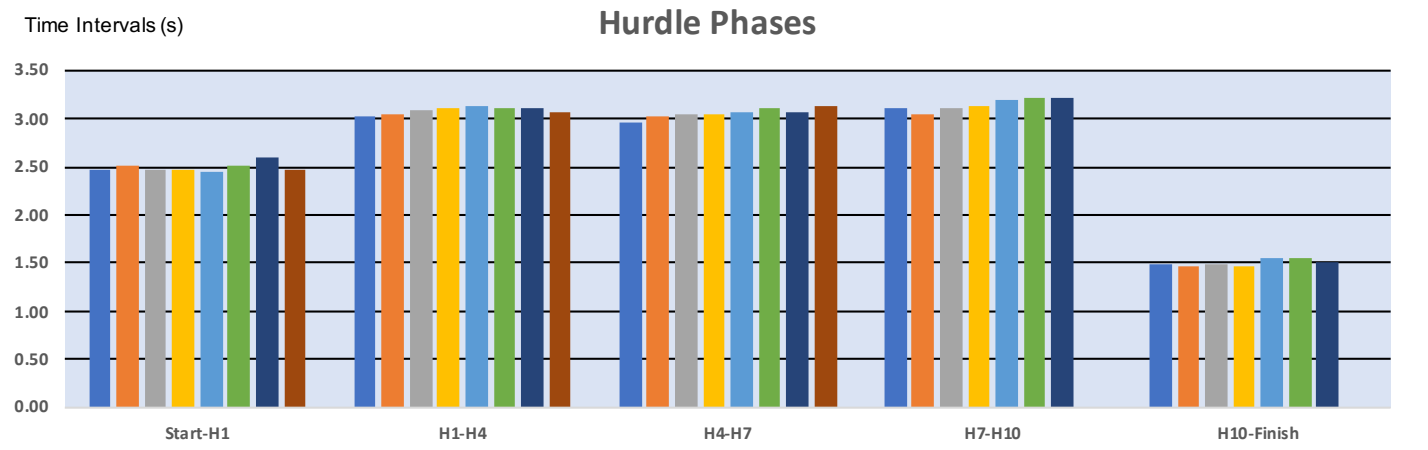
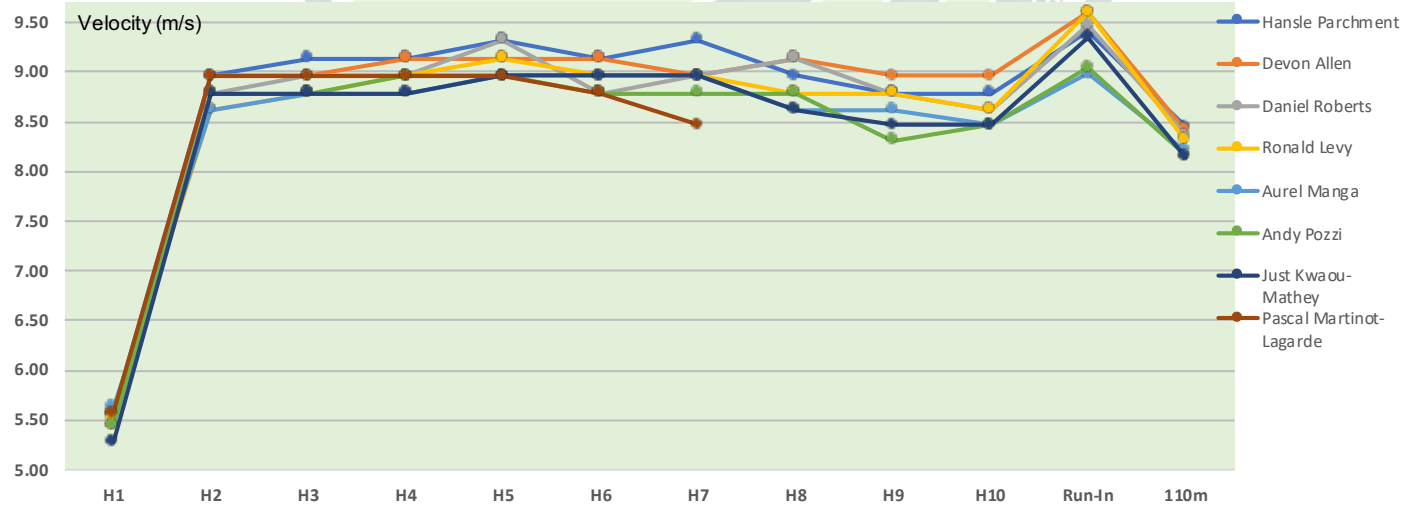
110m Hurdles

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													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
	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				
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													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
	velocity	5.44	8.96	8.96	9.14	9.14	9.14	8.96	9.14	8.96	8.96	9.60	8.41				
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													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
	velocity	5.58	8.79	8.96	8.96	9.33	8.79	8.96	9.14	8.79	8.62	9.47	8.36				
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													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
	velocity	5.53	8.62	8.79	8.96	9.14	8.96	8.96	8.79	8.79	8.62	9.60	8.31				
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													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
	velocity	5.62	8.62	8.79	8.79	8.96	8.96	8.96	8.62	8.62	8.46	8.99	8.21				
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													3.10	3.10	3.22
	interval	7 steps	1.04	1.04	1.02	1.02	1.04	1.04	1.10	1.08	1.55				8.85	8.85	8.52
	velocity	5.44	8.79	8.79	8.96	8.96	8.79	8.79	8.79	8.31	8.46	9.05	8.15				
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													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	1.50				8.79	8.96	8.52
	velocity	5.28	8.79	8.79	8.79	8.96	8.96	8.96	8.62	8.46	8.46	9.35	8.15				
Martinot-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	8.79	8.46									



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: https://www.youtube.com/watch?v=I-Q-OmB5Kl_m4

2021 Athletissima (Lausanne, SUI) (TV Analysis)

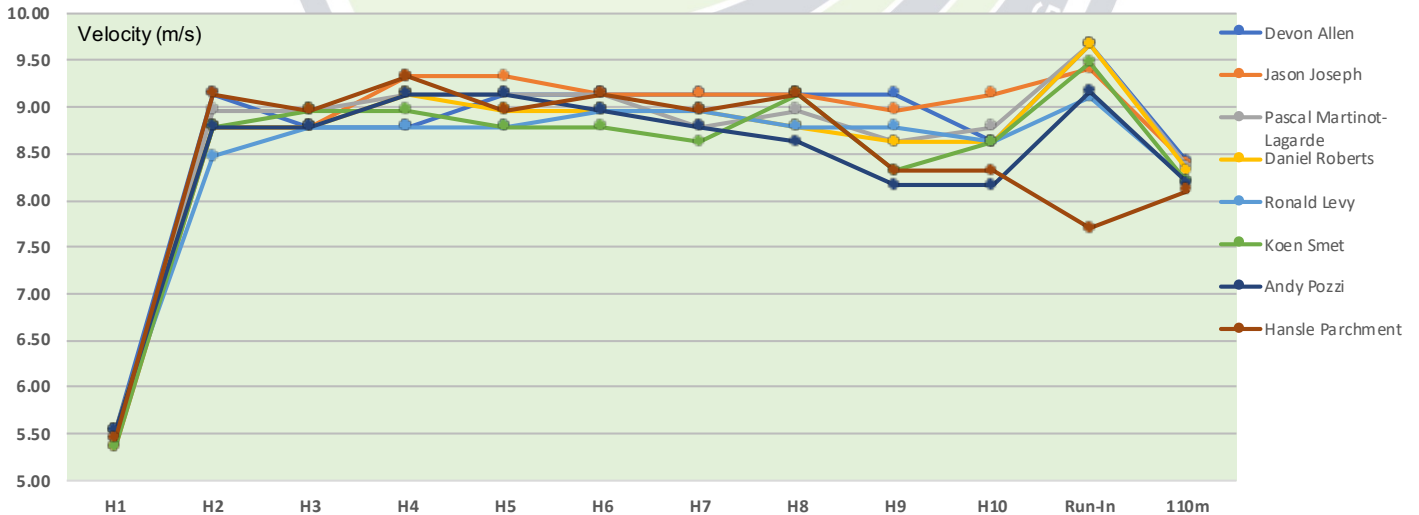
110m Hurdles

Date: 2021.08.26

Wind: 2.5 m/s

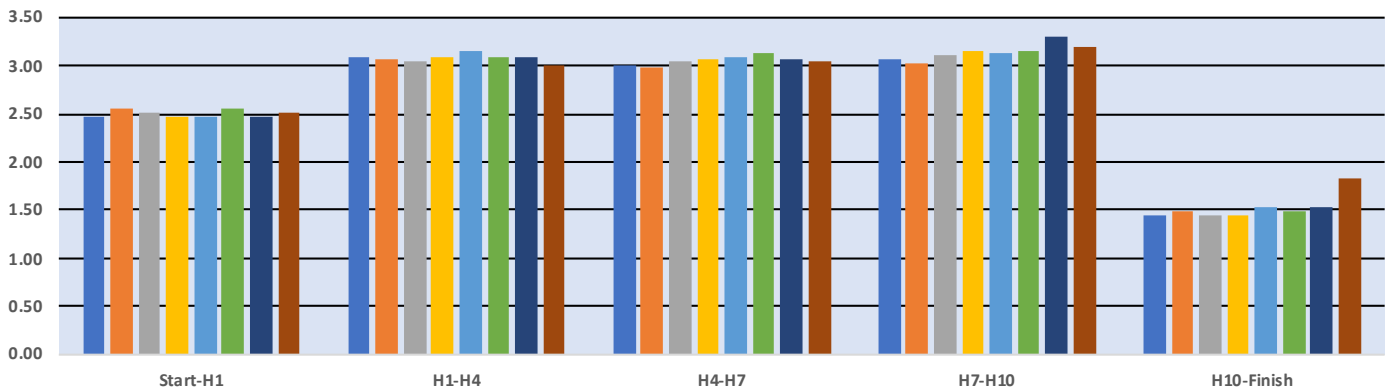
FINAL

		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															
	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
	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
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															
	interval		7 steps	1.04	1.04	0.98	0.98	1.00	1.00	1.02	1.00	1.49			3.06	2.98	3.02
	velocity	5.36	8.79	8.79	9.33	9.33	9.14	9.14	9.14	8.96	9.14	9.41	8.39		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															
	interval		7 steps	1.02	1.02	1.00	1.00	1.00	1.04	1.02	1.06	1.04	1.45		3.04	3.04	3.12
	velocity	5.44	8.96	8.96	9.14	9.14	9.14	8.79	8.96	8.62	8.79	9.67	8.35		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															
	interval		1.04	1.04	1.00	1.02	1.02	1.02	1.04	1.06	1.06	1.45			3.08	3.06	3.16
	velocity	5.53	8.79	8.79	9.14	8.96	8.96	8.96	8.79	8.62	8.62	9.67	8.31		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															
	interval		7 steps	1.08	1.04	1.04	1.02	1.02	1.04	1.04	1.06	1.54			3.16	3.08	3.14
	velocity	5.53	8.46	8.79	8.79	8.79	8.96	8.96	8.79	8.79	8.62	9.10	8.21		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															
	interval		1.04	1.02	1.02	1.04	1.04	1.06	1.00	1.10	1.06	1.48			3.08	3.14	3.16
	velocity	5.36	8.79	8.96	8.96	8.79	8.79	8.62	9.14	8.31	8.62	9.47	8.20		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															
	interval		7 steps	1.04	1.04	1.00	1.00	1.02	1.04	1.06	1.12	1.12	1.53		3.08	3.06	3.30
	velocity	5.53	8.79	8.79	9.14	9.14	8.96	8.79	8.62	8.16	8.16	9.16	8.18		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															
	interval		7 steps	1.00	1.02	0.98	1.02	1.00	1.02	1.00	1.10	1.10	1.82		3.00	3.04	3.20
	velocity	5.44	9.14	8.96	9.33	8.96	9.14	8.96	9.14	8.31	8.31	7.70	8.10		9.14	9.02	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=QGOvkoiEs8U>

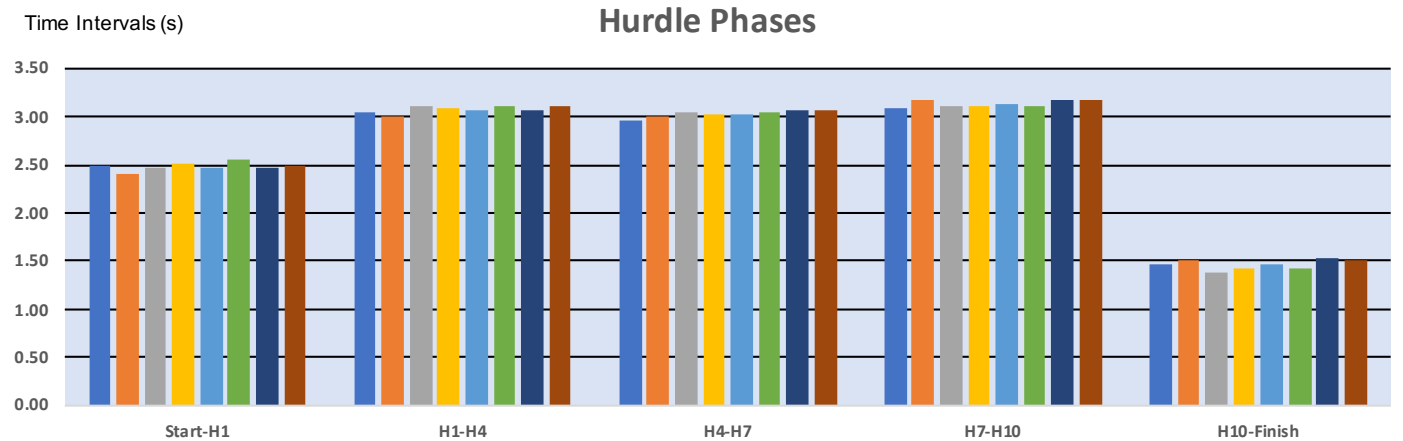
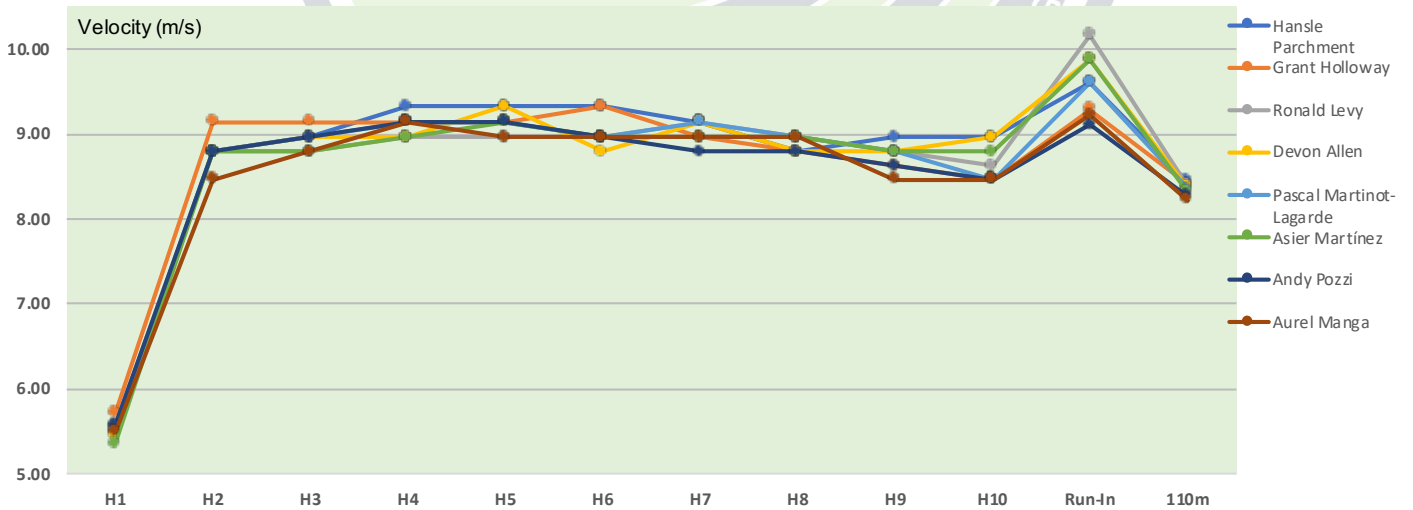
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

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															
	interval	7 steps	1.04	1.02	0.98	0.98	0.98	1.00	1.04	1.02	1.02	1.02	1.46		3.04	2.96	3.08
	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
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															
	interval	7 steps	1.00	1.00	1.00	1.00	0.98	1.02	1.04	1.06	1.08	1.51			3.00	3.00	3.18
	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		9.14	9.14	8.62
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															
	interval	7 steps	1.04	1.04	1.02	1.02	1.02	1.00	1.02	1.04	1.06	1.38			3.10	3.04	3.12
	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		8.85	9.02	8.79
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															
	interval		1.04	1.02	1.02	0.98	1.04	1.00	1.04	1.04	1.02	1.42			3.08	3.02	3.10
	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		8.90	9.08	8.85
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															
	interval	7 steps	1.04	1.02	1.00	1.00	1.02	1.00	1.02	1.04	1.08	1.46			3.06	3.02	3.14
	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		8.96	9.08	8.73
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															
	interval	7 steps	1.04	1.04	1.02	1.00	1.02	1.02	1.02	1.04	1.04	1.42	PB		3.10	3.04	3.10
	velocity	5.36	8.79	8.79	8.96	9.14	8.96	8.96	8.96	8.79	8.79	9.87	8.32		8.85	9.02	8.85
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															
	interval	7 steps	1.04	1.02	1.00	1.00	1.02	1.04	1.04	1.06	1.08	1.54			3.06	3.06	3.18
	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		8.96	8.96	8.62
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															
	interval	7 steps	1.08	1.04	1.00	1.02	1.02	1.02	1.02	1.08	1.08	1.52			3.12	3.06	3.18
	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		8.79	8.96	8.62



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=QGOvkojEs8U>

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

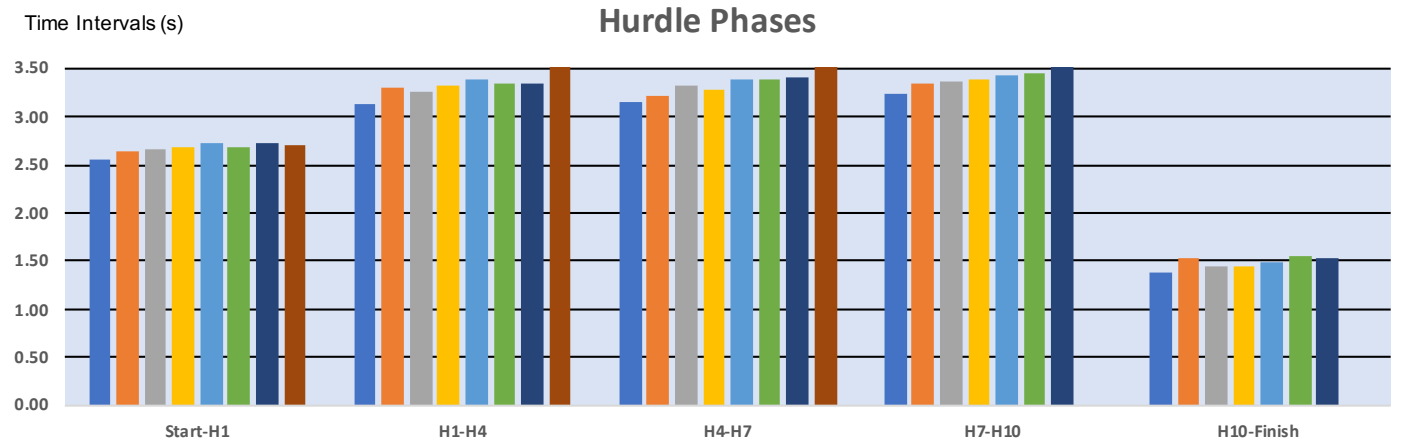
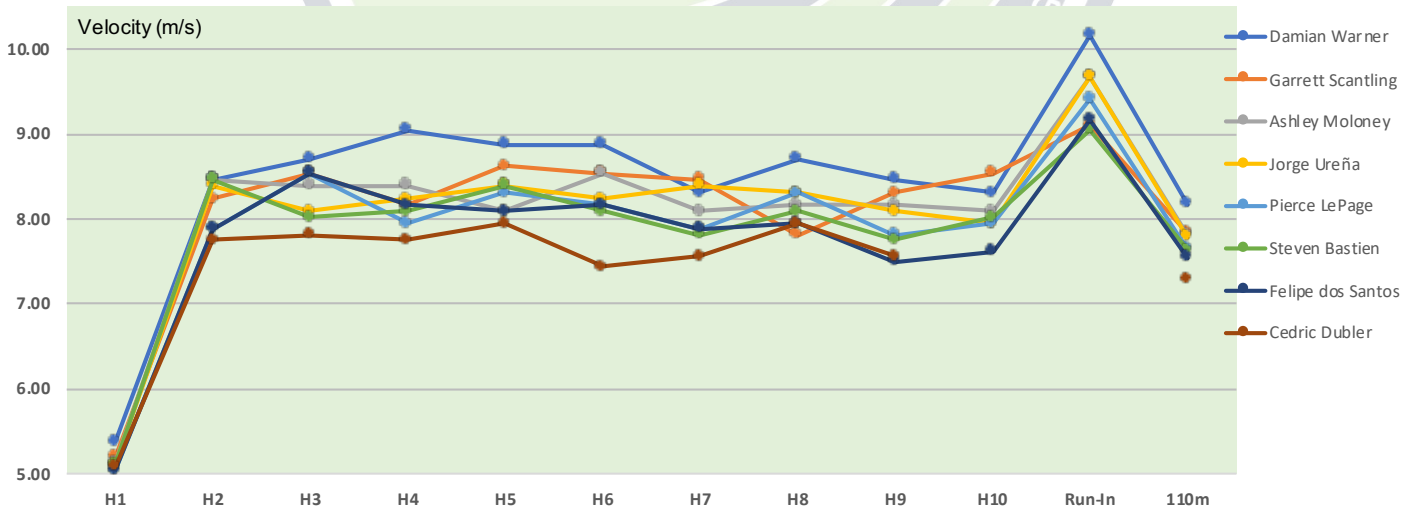
110m Hurdles

Date: 2021.08.05

Wind: -1.0 m/s

Decathlon - Heat 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10	
Warner, Damian (CAN) (1989)	time	2.55	3.63	4.68	5.69	6.72	7.75	8.85	9.90	10.98	12.08	13.46	13.46	7 / 1				
	reaction time	0.148										1.38	ODB		3.14	3.16	3.23	
	interval		7 steps	1.08	1.05	1.01	1.03	1.03	1.10	1.05	1.08	1.10	10.16	8.17		8.73	8.68	8.49
	velocity		5.38	8.46	8.70	9.05	8.87	8.87	8.31	8.70	8.46	8.31	10.16	8.17				
Scantling, Garrett (USA) (1993)	time	2.64	3.75	4.82	5.94	7.00	8.07	9.15	10.32	11.42	12.49	14.03	14.03	6 / 2				
	reaction time	0.162										1.54			3.30	3.21	3.34	
	interval		7 steps	1.11	1.07	1.12	1.06	1.07	1.08	1.17	1.10	1.07	14.03	7.84		8.31	8.54	8.21
	velocity		5.20	8.23	8.54	8.16	8.62	8.54	8.46	7.81	8.31	8.54	9.10	7.84				
Moloney, Ashley (AUS) (2000)	time	2.67	3.75	4.84	5.93	7.06	8.13	9.26	10.38	11.50	12.63	14.08	14.08	3 / 3				
	reaction time	0.143										1.45	PB		3.26	3.33	3.37	
	interval		7 steps	1.08	1.09	1.09	1.13	1.07	1.13	1.12	1.12	1.13	14.08	7.81		8.41	8.23	8.14
	velocity		5.14	8.46	8.39	8.39	8.09	8.54	8.09	8.16	8.16	8.09	9.67	7.81				
Ureña, Jorge (ESP) (1993)	time	2.68	3.77	4.90	6.01	7.10	8.21	9.30	10.40	11.53	12.68	14.13	14.13	9 / 4				
	reaction time	0.132										1.45			3.33	3.29	3.38	
	interval			1.09	1.13	1.11	1.09	1.11	1.09	1.10	1.13	1.15	14.13	7.78		8.23	8.33	8.11
	velocity		5.12	8.39	8.09	8.23	8.39	8.23	8.39	8.31	8.09	7.95	9.67	7.78				
LePage, Pierce (CAN) (1996)	time	2.72	3.88	4.95	6.10	7.20	8.32	9.48	10.58	11.75	12.90	14.39	14.39	5 / 5				
	reaction time	0.168										1.49			3.38	3.38	3.42	
	interval		7 steps	1.16	1.07	1.15	1.10	1.12	1.16	1.10	1.17	1.15	14.39	7.64		8.11	8.11	8.02
	velocity		5.04	7.88	8.54	7.95	8.31	8.16	7.88	8.31	7.81	7.95	9.41	7.64				
Bastien, Steven (USA) (1994)	time	2.68	3.76	4.90	6.03	7.12	8.25	9.42	10.55	11.73	12.87	14.42	14.42	2 / 6				
	reaction time	0.148										1.55			3.35	3.39	3.45	
	interval		7 steps	1.08	1.14	1.13	1.09	1.13	1.17	1.13	1.18	1.14	14.42	7.63		8.19	8.09	7.95
	velocity		5.12	8.46	8.02	8.09	8.39	8.09	7.81	8.09	7.75	8.02	9.05	7.63				
dos Santos, Felipe (BRA) (1994)	time	2.72	3.88	4.95	6.07	7.20	8.32	9.48	10.63	11.85	13.05	14.58	14.58	8 / 7				
	reaction time	0.172										1.53			3.35	3.41	3.57	
	interval		7 steps	1.16	1.07	1.12	1.13	1.12	1.16	1.15	1.22	1.20	14.58	7.54		8.19	8.04	7.68
	velocity		5.04	7.88	8.54	8.16	8.09	8.16	7.88	7.95	7.49	7.62	9.16	7.54				
Dubler, Cedric (AUS) (1995)	time	2.70	3.88	5.05	6.23	7.38	8.61	9.82	10.97	12.18		15.10	15.10	4 / 8				
	reaction time	0.129										7.28			3.53	3.59		
	interval			1.18	1.17	1.18	1.15	1.23	1.21	1.15	1.21	15.10	7.28		7.77	7.64		
	velocity		5.08	7.75	7.81	7.75	7.95	7.43	7.55	7.95	7.55		7.28					



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field-day-13-morning-session-athletics-tokyo-2020-replays>

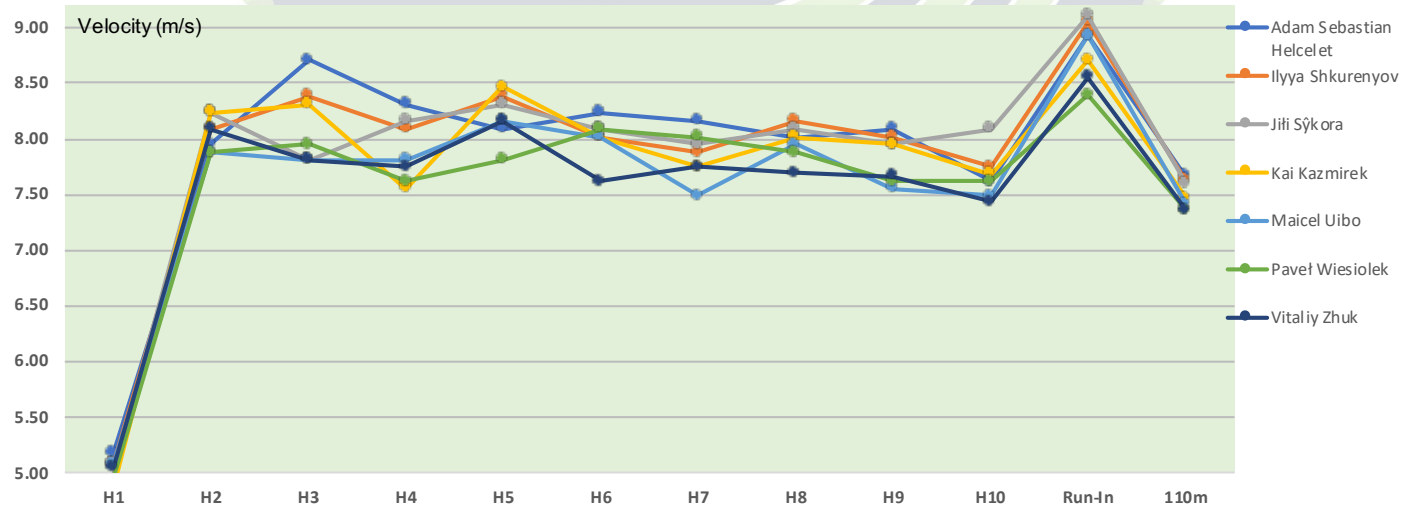
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

110m Hurdles

Date: 2021.08.05 Wind: 0.0 m/s

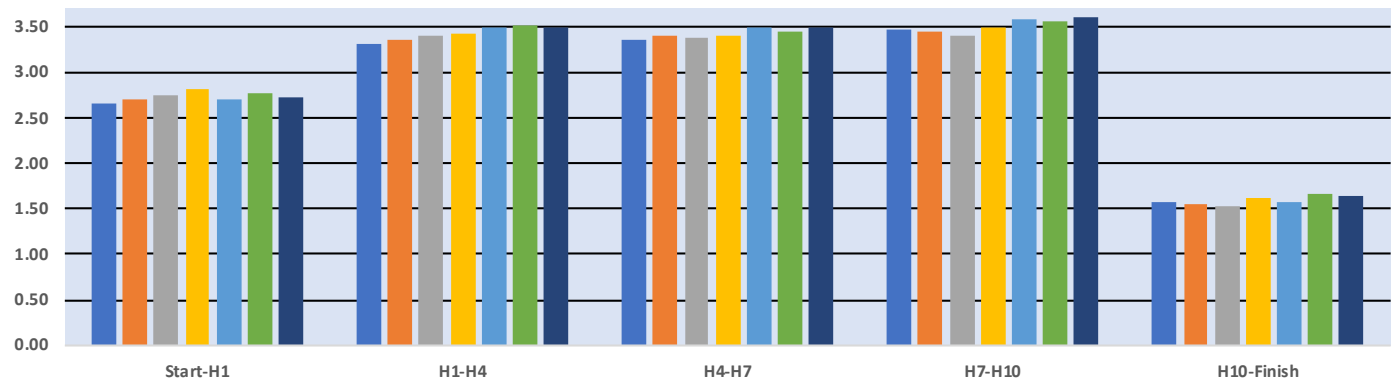
Decathlon - Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Helcelet, Adam Sebastian (CZE) (1991)	time	2.65	3.80	4.85	5.95	7.08	8.19	9.31	10.45	11.58	12.78		14.35	4 / 1			
	reaction time	0.140													3.30	3.36	3.47
	interval velocity	5.18	7.95	8.70	8.31	8.09	8.23	8.16	8.02	8.09	7.62	8.93	7.67		8.31	8.16	7.90
Shkurenkov, Ilya (RUS) (1991)	time	2.70	3.83	4.92	6.05	7.14	8.28	9.44	10.56	11.70	12.88		14.43	2 / 2			
	reaction time	0.174													3.35	3.39	3.44
	interval velocity	5.08	8.09	8.39	8.09	8.39	8.02	7.88	8.16	8.02	7.75	9.05	7.62		8.19	8.09	7.97
Sýkora, Jiří (CZE) (1995)	time	2.75	3.86	5.03	6.15	7.25	8.38	9.53	10.66	11.81	12.94		14.48	8 / 3			
	reaction time	0.160													3.40	3.38	3.41
	interval velocity	4.99	8.23	7.81	8.16	8.31	8.09	7.95	8.09	7.95	8.09	9.10	7.60		8.06	8.11	8.04
Kazmirek, Kai (GER) (1991)	time	2.82	3.93	5.03	6.24	7.32	8.46	9.64	10.78	11.93	13.12		14.73	9 / 4			
	reaction time	0.136													3.42	3.40	3.48
	interval velocity	4.87	8.23	8.31	7.55	8.46	8.02	7.75	8.02	7.95	7.68	8.71	7.47		8.02	8.06	7.88
Uibo, Maicel (EST) (1992)	time	2.70	3.86	5.03	6.20	7.32	8.46	9.68	10.83	12.04	13.26		14.83	5 / 5			
	reaction time	0.162													3.50	3.48	3.58
	interval velocity	5.08	7.88	7.81	7.81	8.16	8.02	7.49	7.95	7.55	7.49	8.93	7.42		7.83	7.88	7.66
Wiesiolek, Paweł (POL) (1991)	time	2.77	3.93	5.08	6.28	7.45	8.58	9.72	10.88	12.08	13.28		14.95	6 / 6			
	reaction time	0.154													3.51	3.44	3.56
	interval velocity	4.95	7.88	7.95	7.62	7.81	8.09	8.02	7.88	7.62	7.62	8.40	7.36		7.81	7.97	7.70
Zhuk, Vitaliy (BLR) (1996)	time	2.72	3.85	5.02	6.20	7.32	8.52	9.70	10.89	12.08	13.31		14.95	3 / 7			
	reaction time	0.146													3.48	3.50	3.61
	interval velocity	5.04	8.09	7.81	7.75	8.16	7.62	7.75	7.69	7.67	7.43	8.55	7.36		7.88	7.83	7.60



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field-day-13-morning-session-athletics-tokyo-2020-replays>

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

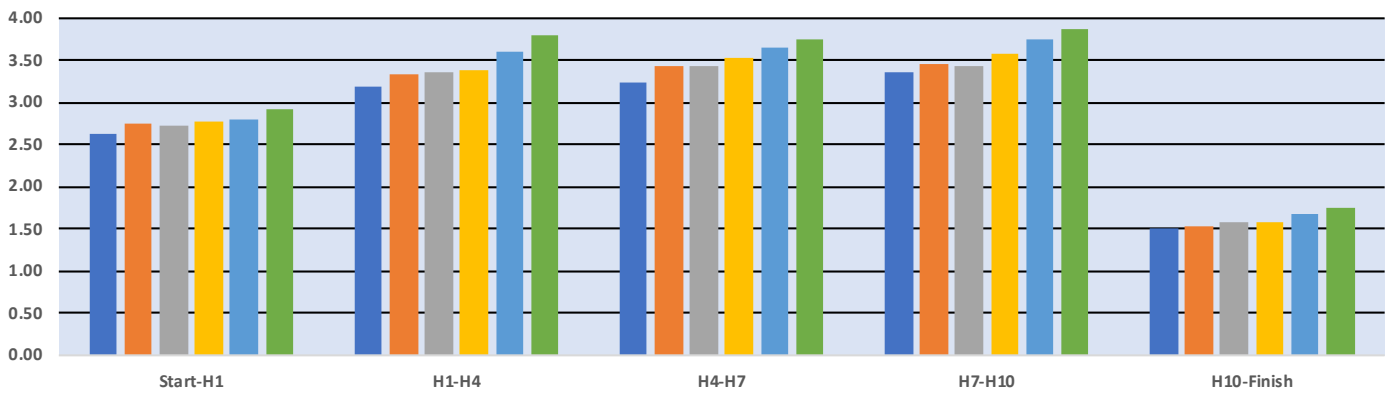
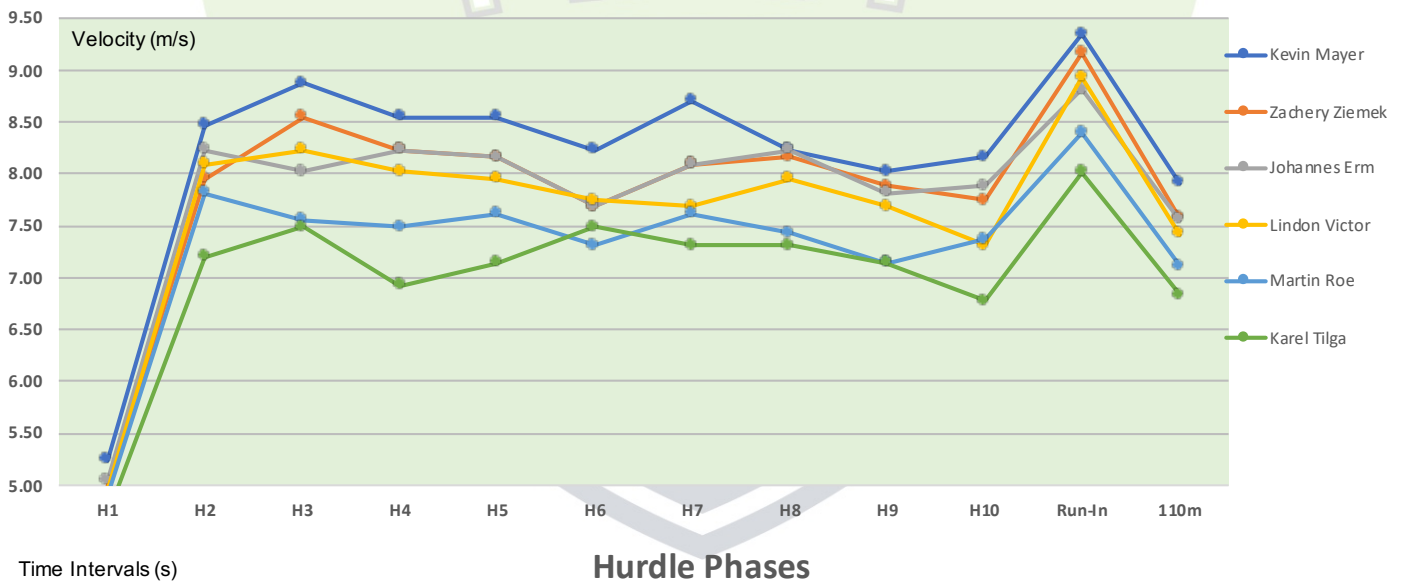
110m Hurdles

Date: 2021.08.05

Wind: 0.1 m/s

Decathlon - Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Mayer, Kevin (FRA) (1992)	time	2.62	3.70	4.73	5.80	6.87	7.98	9.03	10.14	11.28	12.40	13.90	13.90	3 / 1	3.18	3.23	3.37
	reaction time	0.137													8.62	8.49	8.14
	interval	7 steps	1.08	1.03	1.07	1.07	1.11	1.05	1.11	1.14	1.12	1.50					
	velocity	5.24	8.46	8.87	8.54	8.54	8.23	8.70	8.23	8.02	8.16	9.35	7.91				
Ziemek, Zachery (USA) (1993)	time	2.75	3.90	4.97	6.08	7.20	8.39	9.52	10.64	11.80	12.98	14.51	14.51	6 / 2	3.33	3.44	3.46
	reaction time	0.181													8.23	7.97	7.92
	interval	7 steps	1.15	1.07	1.11	1.12	1.19	1.13	1.12	1.16	1.18	1.53					
	velocity	4.99	7.95	8.54	8.23	8.16	7.68	8.09	8.16	7.88	7.75	9.16	7.58				
Erm, Johannes (EST) (1998)	time	2.72	3.83	4.97	6.08	7.20	8.39	9.52	10.63	11.80	12.96	14.55	14.55	4 / 3	3.36	3.44	3.44
	reaction time	0.155													8.16	7.97	7.97
	interval	7 steps	1.11	1.14	1.11	1.12	1.19	1.13	1.11	1.17	1.16	1.59					
	velocity	5.04	8.23	8.02	8.23	8.16	7.68	8.09	8.23	7.81	7.88	8.82	7.56				
Victor, Lindon (GRN) (1993)	time	2.77	3.90	5.01	6.15	7.30	8.48	9.67	10.82	12.01	13.26	14.83	14.83	5 / 4	3.38	3.52	3.59
	reaction time	0.174													8.11	7.79	7.64
	interval	7 steps	1.13	1.11	1.14	1.15	1.18	1.19	1.15	1.19	1.25	1.57					
	velocity	4.95	8.09	8.23	8.02	7.95	7.75	7.68	7.95	7.68	7.31	8.93	7.42				
Roe, Martin (NOR) (1992)	time	2.80	3.97	5.18	6.40	7.60	8.85	10.05	11.28	12.56	13.80	15.47	15.47	8 / 5	3.60	3.65	3.75
	reaction time	0.144													7.62	7.51	7.31
	interval	7 steps	1.17	1.21	1.22	1.20	1.25	1.20	1.23	1.28	1.24	1.67					
	velocity	4.90	7.81	7.55	7.49	7.62	7.31	7.62	7.43	7.14	7.37	8.40	7.11				
Tilga, Karel (EST) (1998)	time	2.91	4.18	5.40	6.72	8.00	9.22	10.47	11.72	13.00	14.35	16.10	16.10	7 / 6	3.81	3.75	3.88
	reaction time	0.187													7.20	7.31	7.07
	interval	7 steps	1.27	1.22	1.32	1.28	1.22	1.25	1.25	1.28	1.35	1.75					
	velocity	4.71	7.20	7.49	6.92	7.14	7.49	7.31	7.31	7.14	6.77	8.01	6.83				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field-day-13-morning-session-athletics-tokyo-2020-replays>

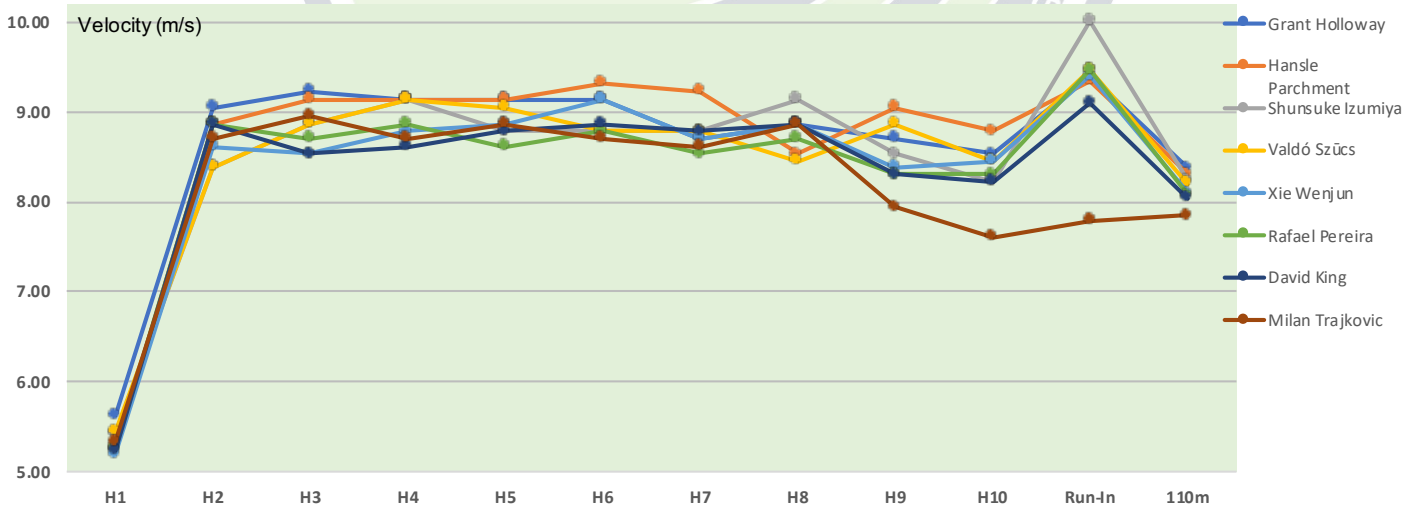
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

110m Hurdles

Date: 2021.08.04 Wind: -0.1 m/s

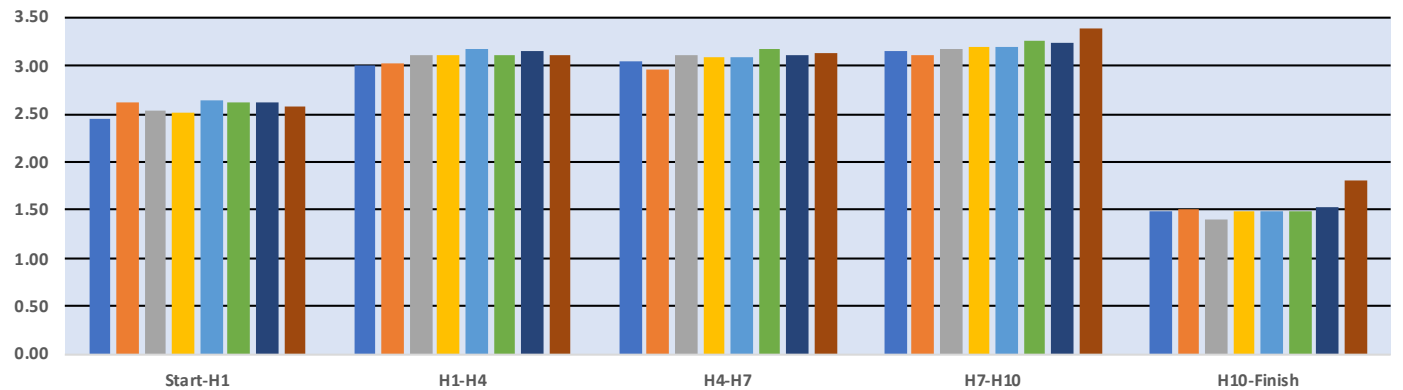
Semi-Final 3

		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	2.44	3.45	4.44	5.44	6.44	7.44	8.49	9.52	10.57	11.64		13.13	4 / 1			
	reaction time	0.130													3.00	3.05	3.15
	interval	7 steps	1.01	0.99	1.00	1.00	1.00	1.00	1.05	1.03	1.05	1.07	1.49		9.14	8.99	8.70
	velocity	5.62	9.05	9.23	9.14	9.14	9.14	8.70	8.87	8.70	8.54	9.41	8.38				
Parchment, Hansle (JAM) (1990)	time	2.61	3.64	4.64	5.64	6.64	7.62	8.61	9.68	10.69	11.73		13.23	6 / 2			
	reaction time	0.145													3.03	2.97	3.12
	interval	7 steps	1.03	1.00	1.00	1.00	0.98	0.99	1.07	1.01	1.04	1.50			9.05	9.23	8.79
	velocity	5.26	8.87	9.14	9.14	9.14	9.33	9.23	8.54	9.05	8.79	9.35	8.31				
Izumiya, Shunsuke (JPN) (2000)	time	2.53	3.62	4.65	5.65	6.69	7.73	8.77	9.77	10.84	11.95		13.35	7 / 3			
	reaction time	0.141													3.12	3.12	3.18
	interval	7 steps	1.09	1.03	1.00	1.04	1.04	1.04	1.00	1.07	1.11	1.40			8.79	8.79	8.62
	velocity	5.42	8.39	8.87	9.14	8.79	8.79	8.79	9.14	8.54	8.23	10.01	8.24				
Szűcs, Valdó (HUN) (1995)	time	2.52	3.61	4.64	5.64	6.65	7.69	8.73	9.81	10.84	11.92		13.40	9 / 4			
	reaction time	0.140													3.12	3.09	3.19
	interval	7 steps	1.09	1.03	1.00	1.01	1.04	1.04	1.08	1.03	1.08	1.48			8.79	8.87	8.60
	velocity	5.44	8.39	8.87	9.14	9.05	8.79	8.79	8.46	8.87	8.46	9.47	8.21				
Xie Wenjun (CHN) (1990)	time	2.64	3.70	4.77	5.81	6.84	7.84	8.89	9.92	11.01	12.09		13.58	8 / 5			
	reaction time	0.154													3.17	3.08	3.20
	interval		1.06	1.07	1.04	1.03	1.00	1.05	1.03	1.09	1.08	1.49			8.65	8.90	8.57
	velocity	5.20	8.62	8.54	8.79	8.87	9.14	8.70	8.87	8.39	8.46	9.41	8.10				
Pereira, Rafael (BRA) (1997)	time	2.61	3.64	4.69	5.72	6.78	7.82	8.89	9.94	11.04	12.14		13.62	5 / 6			
	reaction time	0.154													3.11	3.17	3.25
	interval		1.03	1.05	1.03	1.06	1.04	1.07	1.05	1.10	1.10	1.48			8.82	8.65	8.44
	velocity	5.26	8.87	8.70	8.87	8.62	8.79	8.54	8.70	8.31	8.31	9.47	8.08				
King, David (GBR) (1994)	time	2.62	3.65	4.72	5.78	6.82	7.85	8.89	9.92	11.02	12.13		13.67	2 / 7			
	reaction time	0.141													3.16	3.11	3.24
	interval	7 steps	1.03	1.07	1.06	1.04	1.03	1.04	1.03	1.10	1.11	1.54			8.68	8.82	8.46
	velocity	5.24	8.87	8.54	8.62	8.79	8.87	8.79	8.87	8.31	8.23	9.10	8.05				
Trajkovic, Milan (CYP) (1992)	time	2.57	3.62	4.64	5.69	6.72	7.77	8.83	9.86	11.01	12.21		14.01	3 / 8			
	reaction time	0.147													3.12	3.14	3.38
	interval	7 steps	1.05	1.02	1.05	1.03	1.05	1.06	1.03	1.15	1.20	1.80			8.79	8.73	8.11
	velocity	5.34	8.70	8.96	8.70	8.87	8.70	8.62	8.87	7.95	7.62	7.79	7.85				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field-day-12-morning-session-athletics-tokyo-2020-replays>

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

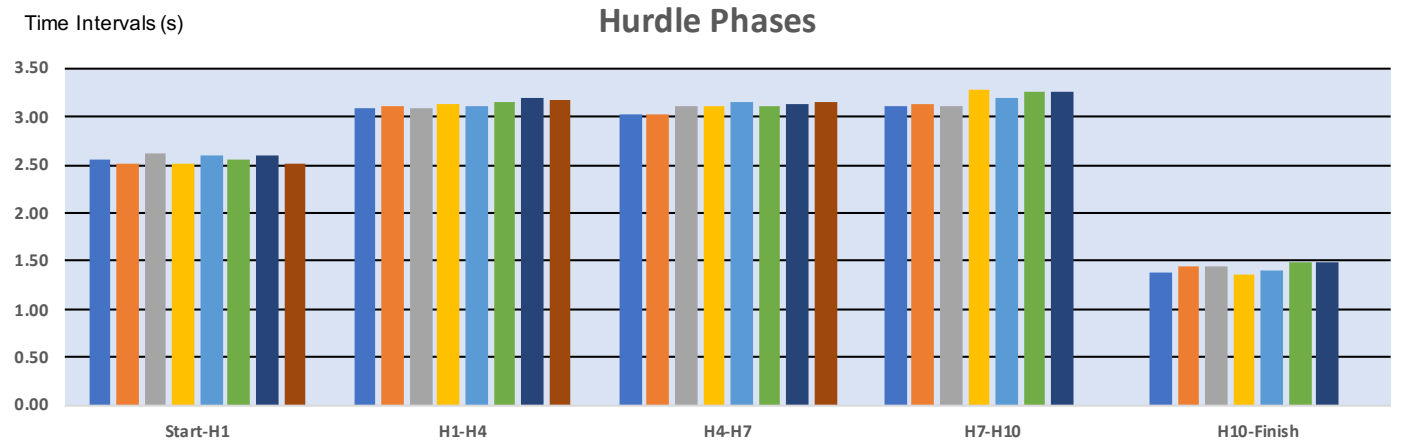
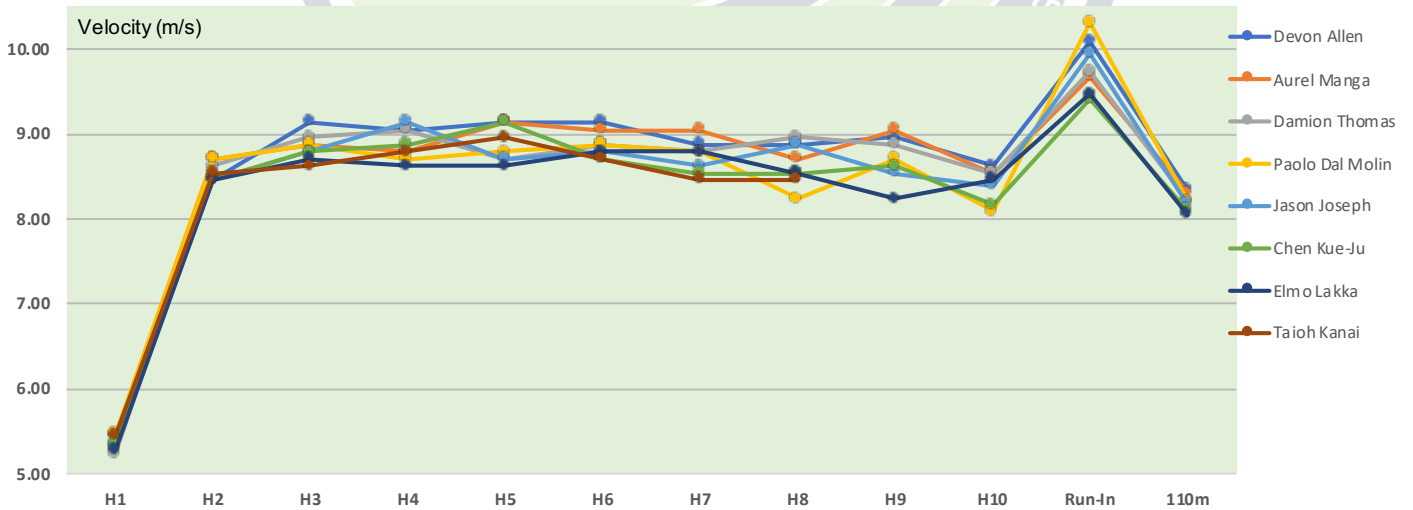
110m Hurdles

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	2.56	3.64	4.64	5.65	6.65	7.65	8.68	9.71	10.73	11.79	13.18		5 / 1			
	reaction time	0.121													3.09	3.03	3.11
	interval		1.08	1.00	1.01	1.00	1.00	1.03	1.03	1.02	1.06	1.39			8.87	9.05	8.82
	velocity	5.36	8.46	9.14	9.05	9.14	9.14	8.87	8.87	8.96	8.62	10.09	8.35				
Manga, Aurel (FRA) (1992)	time	2.52	3.57	4.60	5.64	6.64	7.65	8.66	9.71	10.72	11.79	13.24		6 / 2			
	reaction time	0.151													3.12	3.02	3.13
	interval		7 steps 1.05	1.03	1.04	1.00	1.01	1.01	1.05	1.01	1.07	1.45			8.79	9.08	8.76
	velocity	5.44	8.70	8.87	8.79	9.14	9.05	9.05	8.70	9.05	8.54	9.67	8.31				
Thomas, Damion (JAM) (1999)	time	2.62	3.68	4.70	5.71	6.76	7.79	8.83	9.85	10.88	11.95	13.39		8 / 3			
	reaction time	0.135													3.09	3.12	3.12
	interval		7 steps 1.06	1.02	1.01	1.05	1.03	1.04	1.02	1.03	1.07	1.44			8.87	8.79	8.79
	velocity	5.24	8.62	8.96	9.05	8.70	8.87	8.79	8.96	8.87	8.54	9.74	8.22				
Dal Molin, Paolo (ITA) (1987)	time	2.51	3.56	4.59	5.64	6.68	7.71	8.75	9.86	10.91	12.04	13.40		9 / 4			
	reaction time	0.133													3.13	3.11	3.29
	interval		7 steps 1.05	1.03	1.05	1.04	1.03	1.04	1.11	1.05	1.13	1.36			8.76	8.82	8.33
	velocity	5.47	8.70	8.87	8.70	8.79	8.87	8.79	8.23	8.70	8.09	10.31	8.21				
Joseph, Jason (SUI) (1998)	time	2.59	3.67	4.71	5.71	6.76	7.80	8.86	9.89	10.96	12.05	13.46		4 / 5			
	reaction time	0.135													3.12	3.15	3.19
	interval		7 steps 1.08	1.04	1.00	1.05	1.04	1.06	1.03	1.07	1.09	1.41			8.79	8.70	8.60
	velocity	5.30	8.46	8.79	9.14	8.70	8.79	8.62	8.87	8.54	8.39	9.94	8.17				
Chen Kue-Ju (TPE) (1993)	time	2.56	3.64	4.68	5.71	6.71	7.76	8.83	9.90	10.96	12.08	13.57		2 / 6			
	reaction time	0.146													3.15	3.12	3.25
	interval		7 steps 1.08	1.04	1.03	1.00	1.05	1.07	1.07	1.06	1.12	1.49			8.70	8.79	8.44
	velocity	5.36	8.46	8.79	8.87	9.14	8.70	8.54	8.54	8.62	8.16	9.41	8.11				
Lakka, Elmo (FIN) (1993)	time	2.60	3.68	4.73	5.79	6.85	7.89	8.93	10.00	11.11	12.19	13.67		3 / 7			
	reaction time	0.139													3.19	3.14	3.26
	interval		7 steps 1.08	1.05	1.06	1.06	1.04	1.04	1.07	1.11	1.08	1.48			8.60	8.73	8.41
	velocity	5.28	8.46	8.70	8.62	8.62	8.79	8.79	8.54	8.23	8.46	9.47	8.05				
Kanai, Taioh (JPN) (1995)	time	2.52	3.59	4.65	5.69	6.71	7.76	8.84	9.92			26.11		7 / 8			
	reaction time	0.127													3.17	3.15	
	interval		7 steps 1.07	1.06	1.04	1.02	1.05	1.08	1.08			4.21			8.65	8.70	
	velocity	5.44	8.54	8.62	8.79	8.96	8.70	8.46	8.46								



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field-day-12-morning-session-athletics-tokyo-2020-replays>

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

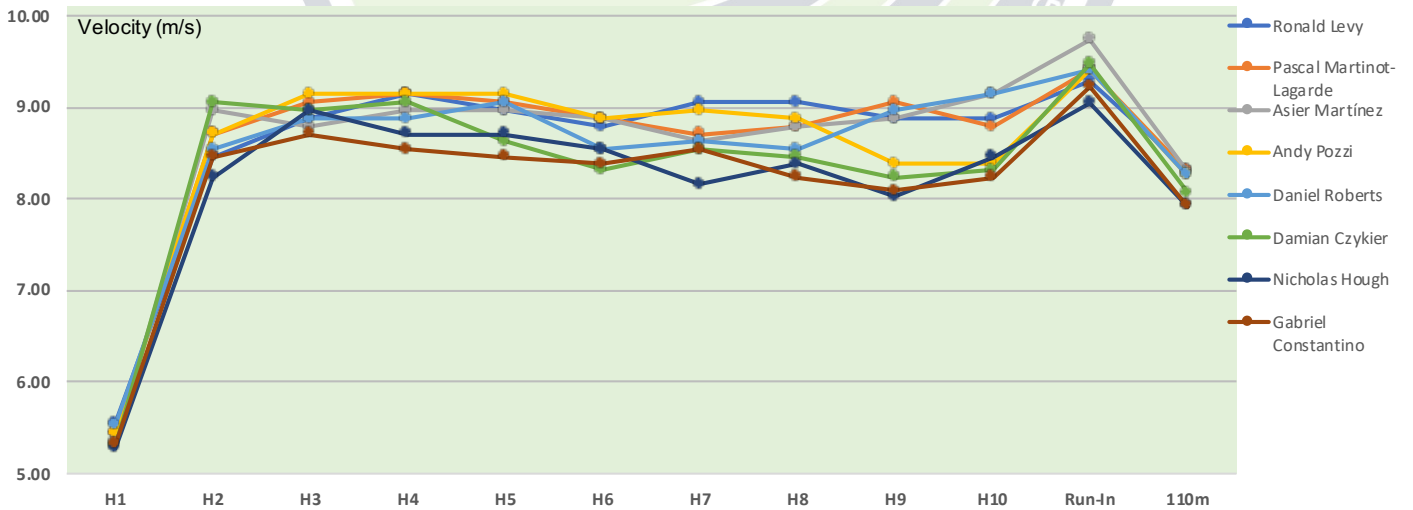
110m Hurdles

Date: 2021.08.04

Wind: 0.3 m/s

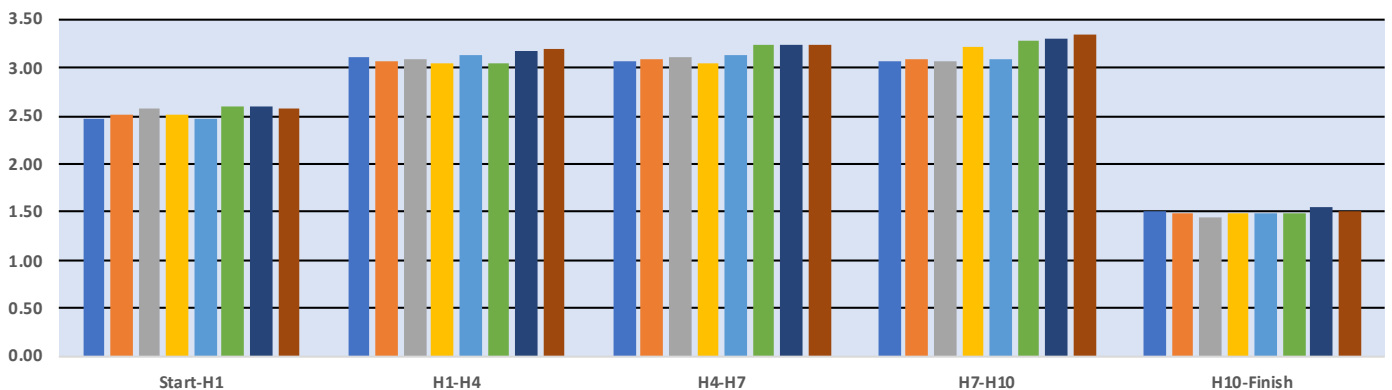
Semi-Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Levy, Ronald (JAM) (1992)	time	2.47	3.55	4.58	5.58	6.60	7.64	8.65	9.66	10.69	11.72	13.23	13.23	7 / 1			
	reaction time	0.154													3.11	3.07	3.07
	interval	7 steps	1.08	1.03	1.00	1.02	1.04	1.01	1.01	1.03	1.03	1.51			8.82	8.93	8.93
	velocity	5.55	8.46	8.87	9.14	8.96	8.79	9.05	9.05	8.87	8.87	9.28	8.31				
Martinot-Lagarde, Pascal (FRA) (1991)	time	2.52	3.57	4.58	5.58	6.59	7.62	8.67	9.71	10.72	11.76		13.25	4 / 2			
	reaction time	0.155													3.06	3.09	3.09
	interval	7 steps	1.05	1.01	1.00	1.01	1.03	1.05	1.04	1.01	1.04	1.49			8.96	8.87	8.87
	velocity	5.44	8.70	9.05	9.14	9.05	8.87	8.70	8.79	9.05	8.79	9.41	8.30				
Martinez, Asier (ESP) (2000)	time	2.57	3.59	4.63	5.65	6.67	7.70	8.76	9.80	10.83	11.83		13.27	6 / 3			
	reaction time	0.150													3.08	3.11	3.07
	interval	7 steps	1.02	1.04	1.02	1.02	1.03	1.06	1.04	1.03	1.00	1.44	PB		8.90	8.82	8.93
	velocity	5.34	8.96	8.79	8.96	8.96	8.87	8.62	8.79	8.87	9.14	9.74	8.29				
Pozzi, Andy (GBR) (1992)	time	2.52	3.57	4.57	5.57	6.57	7.60	8.62	9.65	10.74	11.83		13.32	8 / 4			
	reaction time	0.148													3.05	3.05	3.21
	interval	7 steps	1.05	1.00	1.00	1.00	1.03	1.02	1.03	1.09	1.09	1.49			8.99	8.99	8.54
	velocity	5.44	8.70	9.14	9.14	9.14	8.87	8.96	8.87	8.39	8.39	9.41	8.26				
Roberts, Daniel (USA) (1997)	time	2.48	3.55	4.58	5.61	6.62	7.69	8.75	9.82	10.84	11.84		13.33	5 / 5			
	reaction time	0.195													3.13	3.14	3.09
	interval	7 steps	1.07	1.03	1.03	1.01	1.07	1.06	1.07	1.02	1.00	1.49			8.76	8.73	8.87
	velocity	5.53	8.54	8.87	8.87	9.05	8.54	8.62	8.54	8.96	9.14	9.41	8.25				
Czykier, Damian (POL) (1992)	time	2.59	3.60	4.62	5.63	6.69	7.79	8.86	9.94	11.05	12.15		13.63	2 / 6			
	reaction time	0.152													3.04	3.23	3.29
	interval	7 steps	1.01	1.02	1.01	1.06	1.10	1.07	1.08	1.11	1.10	1.48			9.02	8.49	8.33
	velocity	5.30	9.05	8.96	9.05	8.62	8.31	8.54	8.46	8.23	8.31	9.47	8.07				
Hough, Nicholas (AUS) (1993)	time	2.60	3.71	4.73	5.78	6.83	7.90	9.02	10.11	11.25	12.33		13.88	9 / 7			
	reaction time	0.163													3.18	3.24	3.31
	interval	7 steps	1.11	1.02	1.05	1.05	1.07	1.12	1.09	1.14	1.08	1.55			8.62	8.46	8.28
	velocity	5.28	8.23	8.96	8.70	8.70	8.54	8.16	8.39	8.02	8.46	9.05	7.93				
Constantino, Gabriel (BRA) (1995)	time	2.58	3.66	4.71	5.78	6.86	7.95	9.02	10.13	11.26	12.37		13.89	3 / 8			
	reaction time	0.159													3.20	3.24	3.35
	interval	7 steps	1.08	1.05	1.07	1.08	1.09	1.07	1.11	1.13	1.11	1.52			8.57	8.46	8.19
	velocity	5.32	8.46	8.70	8.54	8.46	8.39	8.54	8.23	8.09	8.23	9.22	7.92				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field/day-12-morning-session-athletics-tokyo-2020-replays>

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

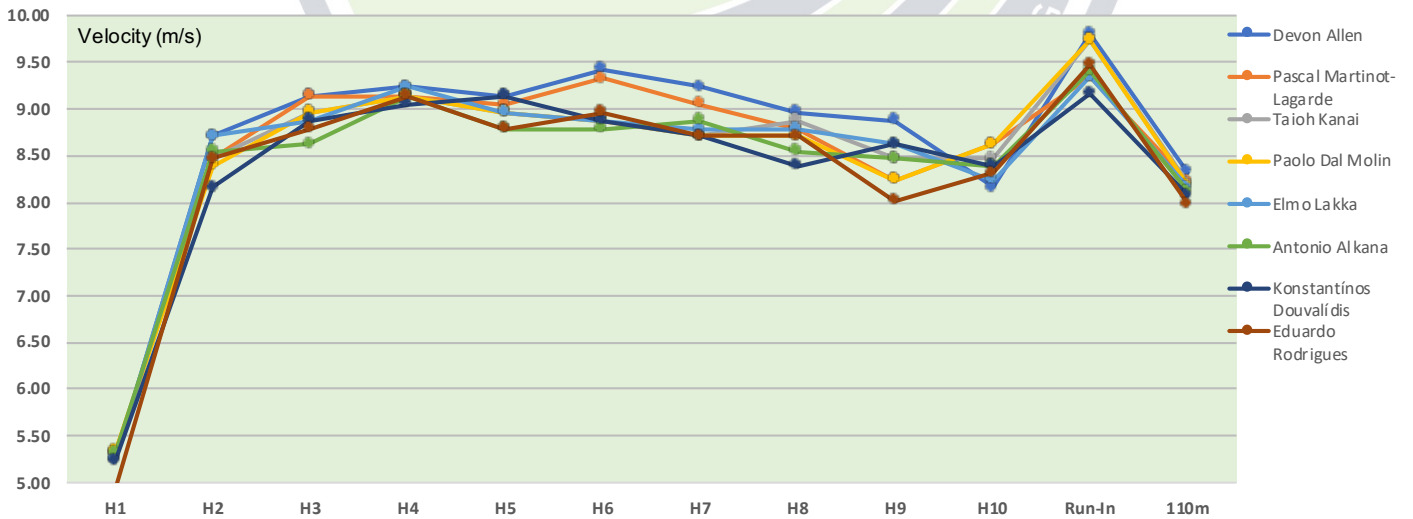
110m Hurdles

Date: 2021.08.03

Wind: -0.1 m/s

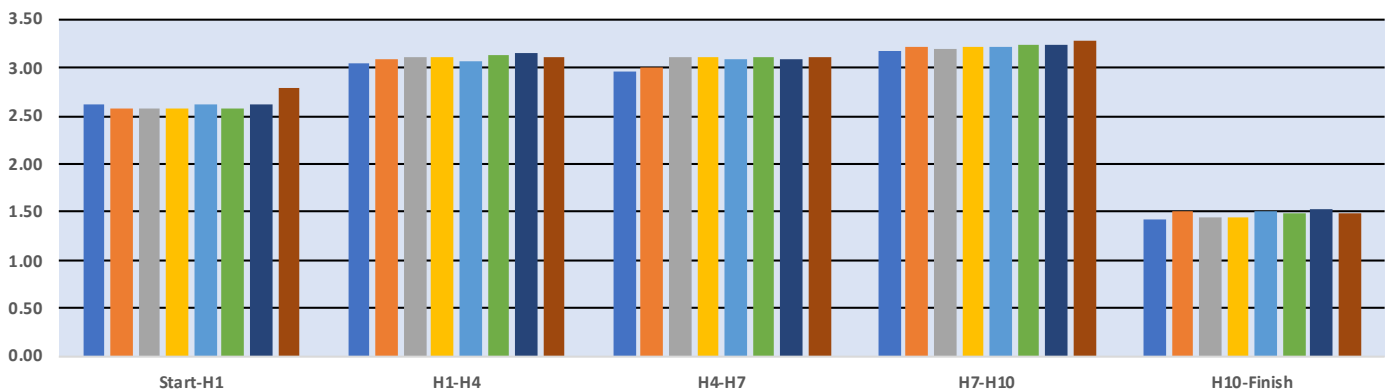
Heat 5

		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	2.61	3.66	4.66	5.65	6.65	7.62	8.61	9.63	10.66	11.78	13.21	13.21	5 / 1			
	reaction time	0.146													3.04	2.96	3.17
	interval		1.05	1.00	0.99	1.00	0.97	0.99	1.02	1.03	1.12	1.43			9.02	9.26	8.65
	velocity	5.26	8.70	9.14	9.23	9.14	9.42	9.23	8.96	8.87	8.16	9.80	8.33				
Martinot-Lagarde, Pascal (FRA) (1991)	time	2.58	3.66	4.66	5.66	6.67	7.65	8.66	9.70	10.81	11.87		13.37	3 / 2			
	reaction time	0.155													3.08	3.00	3.21
	interval		1.08	1.00	1.00	1.01	0.98	1.01	1.04	1.11	1.06	1.50			8.90	9.14	8.54
	velocity	5.32	8.46	9.14	9.14	9.05	9.33	9.05	8.79	8.23	8.62	9.35	8.23				
Kanai, Taioh (JPN) (1995)	time	2.58	3.66	4.68	5.68	6.70	7.73	8.78	9.81	10.89	11.97		13.41	7 / 3			
	reaction time	0.148													3.10	3.10	3.19
	interval		1.08	1.02	1.00	1.02	1.03	1.05	1.03	1.08	1.08	1.44			8.85	8.85	8.60
	velocity	5.32	8.46	8.96	9.14	8.96	8.87	8.70	8.87	8.46	8.46	9.74	8.20				
Dal Molin, Paolo (ITA) (1987)	time	2.57	3.66	4.68	5.68	6.70	7.73	8.78	9.83	10.94	12.00		13.44	8 / 4			
	reaction time	0.151													3.11	3.10	3.22
	interval		1.09	1.02	1.00	1.02	1.03	1.05	1.05	1.11	1.06	1.44			8.82	8.85	8.52
	velocity	5.34	8.39	8.96	9.14	8.96	8.87	8.70	8.70	8.23	8.62	9.74	8.18				
Lakka, Elmo (FIN) (1993)	time	2.61	3.66	4.69	5.68	6.70	7.73	8.77	9.81	10.87	11.98		13.48	6 / 5			
	reaction time	0.145													3.07	3.09	3.21
	interval		1.05	1.03	0.99	1.02	1.03	1.04	1.04	1.06	1.11	1.50			8.93	8.87	8.54
	velocity	5.26	8.70	8.87	9.23	8.96	8.87	8.79	8.79	8.62	8.23	9.35	8.16				
Alkana, Antonio (RSA) (1990)	time	2.58	3.65	4.71	5.71	6.75	7.79	8.82	9.89	10.97	12.06		13.55	4 / 6			
	reaction time	0.118													3.13	3.11	3.24
	interval		1.07	1.06	1.00	1.04	1.04	1.03	1.07	1.08	1.09	1.49			8.76	8.82	8.46
	velocity	5.32	8.54	8.62	9.14	8.79	8.79	8.87	8.54	8.46	8.39	9.41	8.12				
Douvalidis, Konstantinos (GRE) (198)	time	2.62	3.74	4.77	5.78	6.78	7.81	8.86	9.95	11.01	12.10		13.63	2 / 7			
	reaction time	0.128													3.16	3.08	3.24
	interval		1.12	1.03	1.01	1.00	1.03	1.05	1.09	1.06	1.09	1.53			8.68	8.90	8.46
	velocity	5.24	8.16	8.87	9.05	9.14	8.87	8.70	8.39	8.62	8.39	9.16	8.07				
Rodrigues, Eduardo (BRA) (1995)	time	2.78	3.86	4.90	5.90	6.94	7.96	9.01	10.06	11.20	12.30		13.78	9 / 8			
	reaction time	0.163													3.12	3.11	3.29
	interval		1.08	1.04	1.00	1.04	1.02	1.05	1.05	1.14	1.10	1.48			8.79	8.82	8.33
	velocity	4.94	8.46	8.79	9.14	8.79	8.96	8.70	8.70	8.02	8.31	9.47	7.98				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field-day-11-evening-session-athletics-tokyo-2020-replays>

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

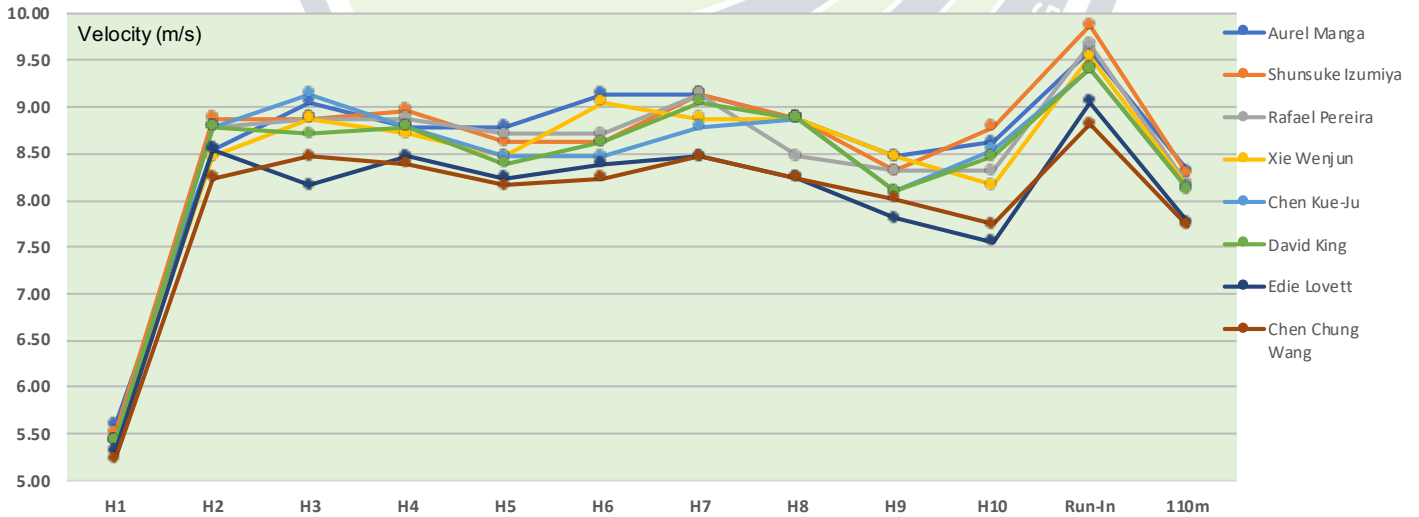
110m Hurdles

Date: 2021.08.03

Wind: -0.2 m/s

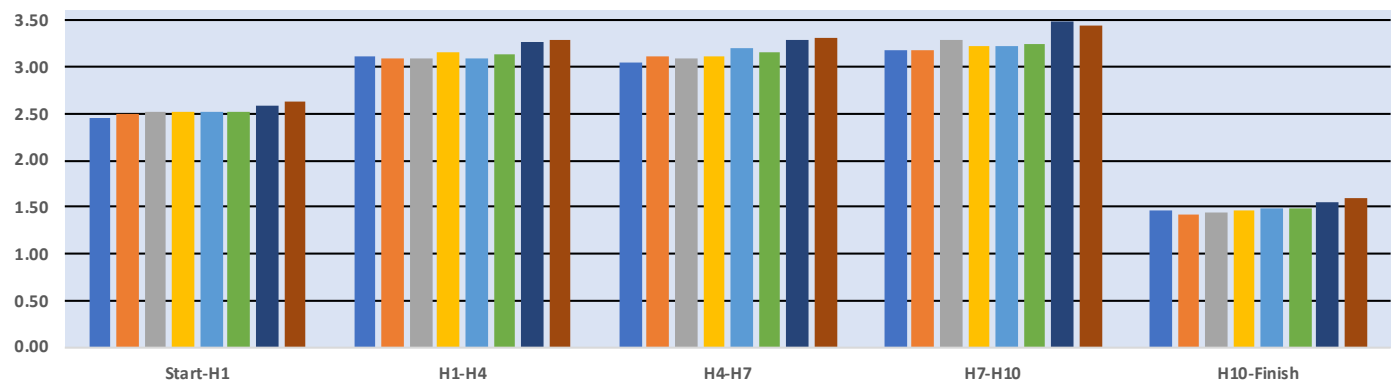
Heat 4

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Manga, Aurel (FRA) (1992)	time	2.45	3.52	4.53	5.57	6.61	7.61	8.61	9.64	10.72	11.78	13.24	13.24	8 / 1			
	reaction time	0.154											=PB		3.12	3.04	3.17
	interval		7 steps	1.07	1.01	1.04	1.04	1.00	1.00	1.03	1.08	1.06	1.46			8.79	9.02
velocity		5.60	8.54	9.05	8.79	8.79	9.14	9.14	8.87	8.46	8.62	9.60	8.31				
Izumiya, Shunsuke (JPN) (2000)	time	2.49	3.52	4.55	5.57	6.63	7.69	8.69	9.72	10.82	11.86		13.28	6 / 2			
	reaction time	0.122													3.08	3.12	3.17
	interval		7 steps	1.03	1.03	1.02	1.06	1.06	1.00	1.03	1.10	1.04	1.42			8.90	8.79
velocity		5.51	8.87	8.87	8.96	8.62	8.62	9.14	8.87	8.31	8.79	9.87	8.28				
Pereira, Rafael (BRA) (1997)	time	2.53	3.57	4.60	5.63	6.68	7.73	8.73	9.81	10.91	12.01		13.46	4 / 3			
	reaction time	0.145													3.10	3.10	3.28
	interval			1.04	1.03	1.03	1.05	1.05	1.00	1.08	1.10	1.10	1.45			8.85	8.85
velocity		5.42	8.79	8.87	8.87	8.70	8.70	9.14	8.46	8.31	8.31	9.67	8.17				
Xie Wenjun (CHN) (1990)	time	2.53	3.61	4.64	5.69	6.77	7.78	8.81	9.84	10.92	12.04		13.51	2 / 4			
	reaction time	0.147													3.16	3.12	3.23
	interval			1.08	1.03	1.05	1.08	1.01	1.03	1.03	1.08	1.12	1.47			8.68	8.79
velocity		5.42	8.46	8.87	8.70	8.46	9.05	8.87	8.87	8.46	8.16	9.54	8.14				
Chen Kue-Ju (TPE) (1993)	time	2.53	3.57	4.57	5.61	6.69	7.77	8.81	9.84	10.97	12.04		13.53	3 / 5			
	reaction time	0.161													3.08	3.20	3.23
	interval		7 steps	1.04	1.00	1.04	1.08	1.08	1.04	1.03	1.13	1.07	1.49			8.90	8.57
velocity		5.42	8.79	9.14	8.79	8.46	8.46	8.79	8.87	8.09	8.54	9.41	8.13				
King, David (GBR) (1994)	time	2.53	3.57	4.62	5.66	6.75	7.81	8.82	9.85	10.98	12.06		13.55	1 / 6			
	reaction time	0.111													3.13	3.16	3.24
	interval		7 steps	1.04	1.05	1.04	1.09	1.06	1.01	1.03	1.13	1.08	1.49			8.76	8.68
velocity		5.42	8.79	8.70	8.79	8.39	8.62	9.05	8.87	8.09	8.46	9.41	8.12				
Lovett, Eddie (ISV) (1992)	time	2.58	3.65	4.77	5.85	6.96	8.05	9.13	10.24	11.41	12.62		14.17	9 / 7			
	reaction time	0.132													3.27	3.28	3.49
	interval			1.07	1.12	1.08	1.11	1.09	1.08	1.11	1.17	1.21	1.55			8.39	8.36
velocity		5.32	8.54	8.16	8.46	8.23	8.39	8.46	8.23	7.81	7.55	9.05	7.76				
Chan Chung Wang (NKG) (1991)	time	2.62	3.73	4.81	5.90	7.02	8.13	9.21	10.32	11.46	12.64		14.23	7 / 8			
	reaction time	0.149													3.28	3.31	3.43
	interval		7 steps	1.11	1.08	1.09	1.12	1.11	1.08	1.11	1.14	1.18	1.59			8.36	8.28
velocity		5.24	8.23	8.46	8.39	8.16	8.23	8.46	8.23	8.02	7.75	8.82	7.73				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field/day-11-evening-session-athletics-tokyo-2020-replays>

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

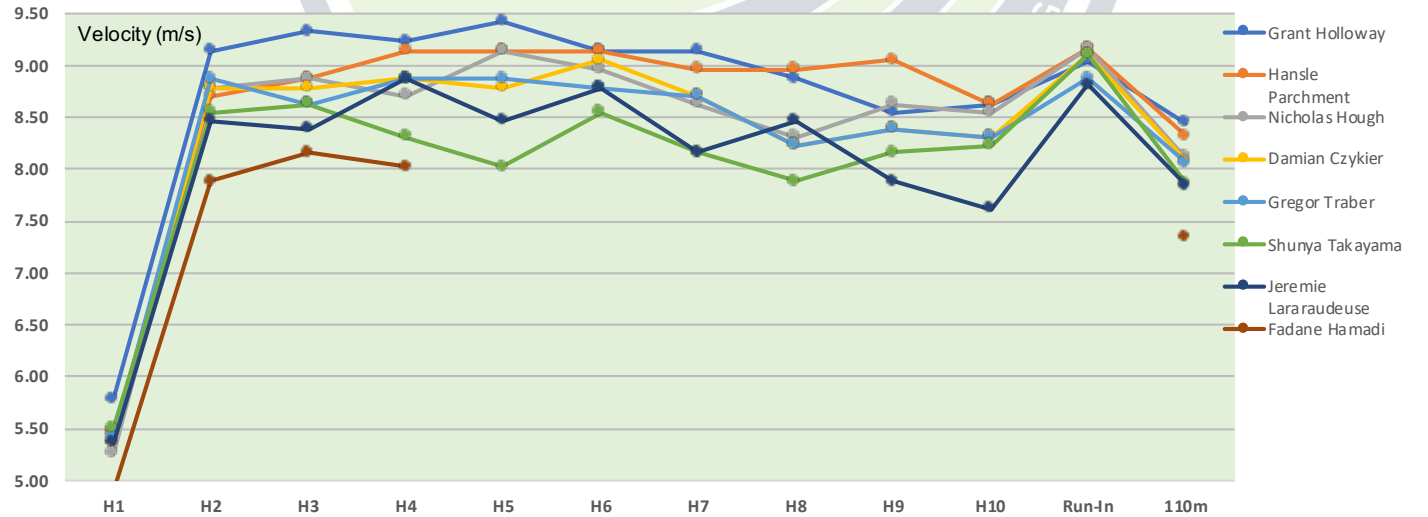
110m Hurdles

Date: 2021.08.03

Wind: -0.1 m/s

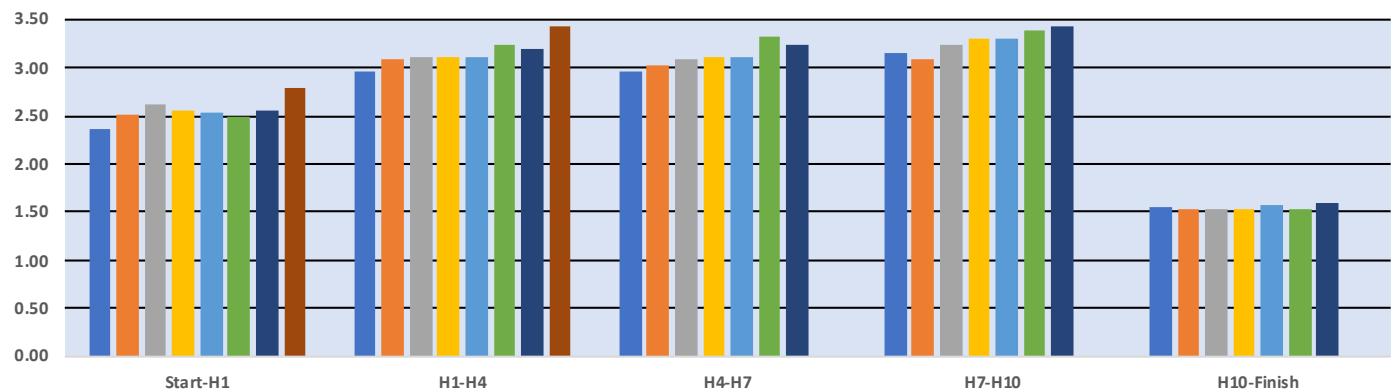
Heat 3

		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				
Hough, Nicholas (AUS) (1993)	time	2.61	3.65	4.68	5.73	6.73	7.75	8.81	9.91	10.97	12.04	13.57		3/3			
	reaction time	0.162													3.12	3.08	3.23
	interval	7 steps	1.04	1.03	1.05	1.00	1.02	1.06	1.10	1.06	1.07	1.53			8.79	8.90	8.49
	velocity	5.26	8.79	8.87	8.70	9.14	8.96	8.62	8.31	8.62	8.54	9.16	8.11				
Czykier, Damian (POL) (1992)	time	2.56	3.60	4.64	5.67	6.71	7.72	8.77	9.88	10.97	12.07	13.61		5/4			
	reaction time	0.141													3.11	3.10	3.30
	interval	7 steps	1.04	1.04	1.03	1.04	1.01	1.05	1.11	1.09	1.10	1.54			8.82	8.85	8.31
	velocity	5.36	8.79	8.79	8.87	8.79	9.05	8.70	8.23	8.39	8.31	9.10	8.08				
Traber, Gregor (GER) (1992)	time	2.53	3.56	4.62	5.65	6.68	7.72	8.77	9.88	10.97	12.07	13.65		4/5			
	reaction time	0.136													3.12	3.12	3.30
	interval	7 steps	1.03	1.06	1.03	1.03	1.04	1.05	1.11	1.09	1.10	1.58			8.79	8.79	8.31
	velocity	5.42	8.87	8.62	8.87	8.87	8.79	8.70	8.23	8.39	8.31	8.87	8.06				
Takayama, Shunya (JPN) (1994)	time	2.49	3.56	4.62	5.72	6.86	7.93	9.05	10.21	11.33	12.44	13.98		2/6			
	reaction time	0.153													3.23	3.33	3.39
	interval		1.07	1.06	1.10	1.14	1.07	1.12	1.16	1.12	1.11	1.54			8.49	8.23	8.09
	velocity	5.51	8.54	8.62	8.31	8.02	8.54	8.16	7.88	8.16	8.23	9.10	7.87				
Lararadeuse, Jeremie (MRI) (2001)	time	2.56	3.64	4.73	5.76	6.84	7.88	9.00	10.08	11.24	12.44	14.03		1/7			
	reaction time	0.132													3.20	3.24	3.44
	interval		1.08	1.09	1.03	1.08	1.04	1.12	1.08	1.16	1.20	1.59	PB		8.57	8.46	7.97
	velocity	5.36	8.46	8.39	8.87	8.46	8.79	8.16	8.46	7.88	7.62	8.82	7.84				
Hamadi, Fadane (COM) (1992)	time	2.80	3.96	5.08	6.22							14.99		8/8			
	reaction time	0.189													3.42		
	interval		1.16	1.12	1.14										8.02		
	velocity	4.90	7.88	8.16	8.02												



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field/day-11-evening-session-athletics-tokyo-2020-replays>

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

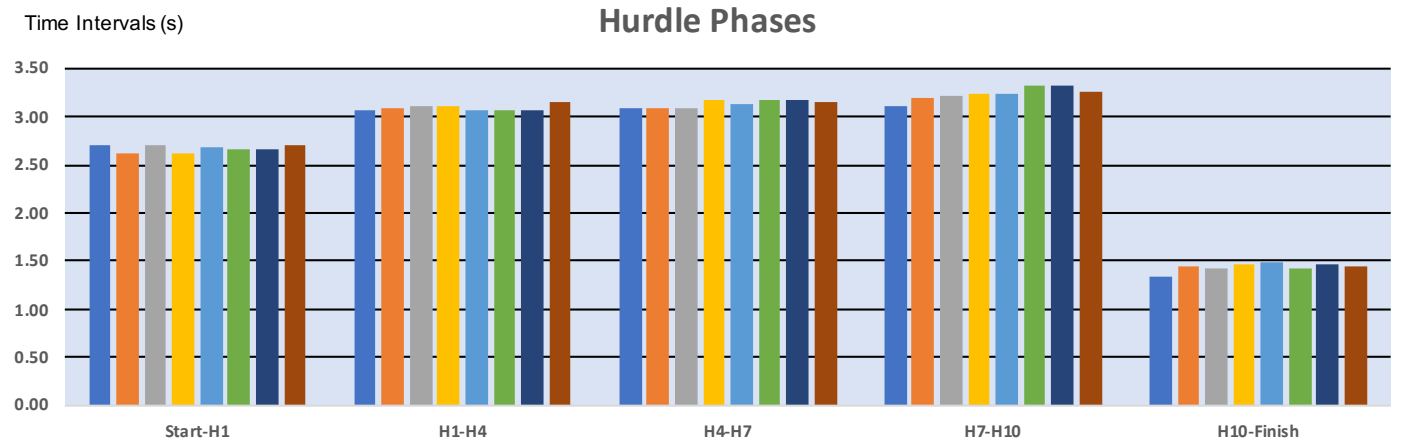
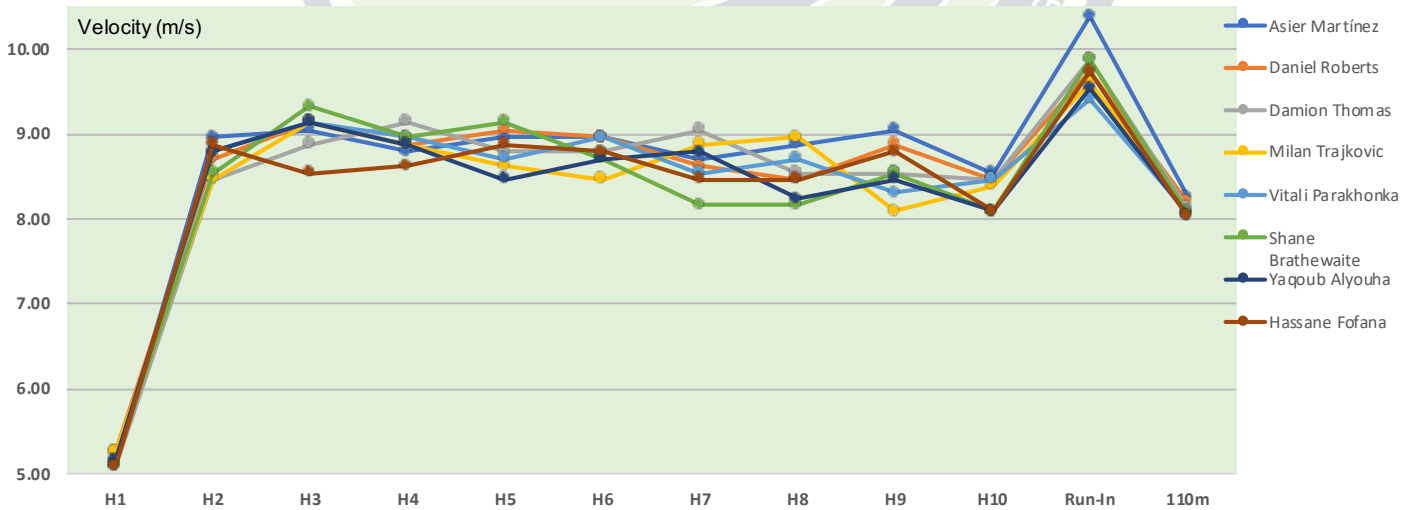
110m Hurdles

Date: 2021.08.03

Wind: -0.1 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
Martínez, Asier (ESP) (2000)	time	2.70	3.72	4.73	5.77	6.79	7.81	8.86	9.89	10.90	11.97	13.32		7 / 1			
	reaction time	0.146													3.07	3.09	3.11
	interval	7 steps	1.02	1.01	1.04	1.02	1.02	1.05	1.03	1.01	1.07	1.35			8.93	8.87	8.82
	velocity	5.08	8.96	9.05	8.79	8.96	8.96	8.70	8.87	9.05	8.54	10.39	8.26				
Roberts, Daniel (USA) (1997)	time	2.61	3.66	4.66	5.69	6.70	7.72	8.78	9.86	10.89	11.97	13.41		5 / 2			
	reaction time	0.188													3.08	3.09	3.19
	interval		1.05	1.00	1.03	1.01	1.02	1.06	1.08	1.03	1.08	1.44			8.90	8.87	8.60
	velocity	5.26	8.70	9.14	8.87	9.05	8.96	8.62	8.46	8.87	8.46	9.74	8.20				
Thomas, Damion (JAM) (1999)	time	2.70	3.78	4.81	5.81	6.85	7.89	8.90	9.97	11.04	12.12	13.54		8 / 3			
	reaction time	0.142													3.11	3.09	3.22
	interval	7 steps	1.08	1.03	1.00	1.04	1.04	1.01	1.07	1.07	1.08	1.42			8.82	8.87	8.52
	velocity	5.08	8.46	8.87	9.14	8.79	8.79	9.05	8.54	8.54	8.46	9.87	8.12				
Trajkovic, Milan (CYP) (1992)	time	2.61	3.69	4.69	5.72	6.78	7.86	8.89	9.91	11.04	12.13	13.59		2 / 4			
	reaction time	0.117													3.11	3.17	3.24
	interval	7 steps	1.08	1.00	1.03	1.06	1.08	1.03	1.02	1.13	1.09	1.46			8.82	8.65	8.46
	velocity	5.26	8.46	9.14	8.87	8.62	8.46	8.87	8.96	8.09	8.39	9.60	8.09				
Parakhonka, Vitali (BLR) (1993)	time	2.69	3.73	4.73	5.75	6.80	7.82	8.89	9.94	11.04	12.12	13.61		9 / 5			
	reaction time	0.133													3.06	3.14	3.23
	interval		1.04	1.00	1.02	1.05	1.02	1.07	1.05	1.10	1.08	1.49			8.96	8.73	8.49
	velocity	5.10	8.79	9.14	8.96	8.70	8.96	8.54	8.70	8.31	8.46	9.41	8.08				
Brathwaite, Shane (BAR) (1990)	time	2.66	3.73	4.71	5.73	6.73	7.78	8.90	10.02	11.09	12.22	13.64		4 / 6			
	reaction time	0.151													3.07	3.17	3.32
	interval	7 steps	1.07	0.98	1.02	1.00	1.05	1.12	1.12	1.07	1.13	1.42			8.93	8.65	8.26
	velocity	5.16	8.54	9.33	8.96	9.14	8.70	8.16	8.54	8.16	8.54	9.87	8.06				
Alyouha, Yaqoub (KUW) (1993)	time	2.66	3.70	4.70	5.73	6.81	7.86	8.90	10.01	11.09	12.22	13.69		3 / 7			
	reaction time	0.117													3.07	3.17	3.32
	interval		1.04	1.00	1.03	1.08	1.05	1.04	1.11	1.08	1.13	1.47			8.93	8.65	8.26
	velocity	5.16	8.79	9.14	8.87	8.46	8.70	8.79	8.23	8.46	8.09	9.54	8.04				
Fofana, Hassane (ITA) (1992)	time	2.70	3.73	4.80	5.86	6.89	7.93	9.01	10.09	11.13	12.26	13.70		6 / 8			
	reaction time	0.161													3.16	3.15	3.25
	interval		1.03	1.07	1.06	1.03	1.04	1.08	1.08	1.04	1.13	1.44			8.68	8.70	8.44
	velocity	5.08	8.87	8.54	8.62	8.87	8.79	8.46	8.46	8.79	8.09	9.74	8.03				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field/day-11-evening-session-athletics-tokyo-2020-replays>

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

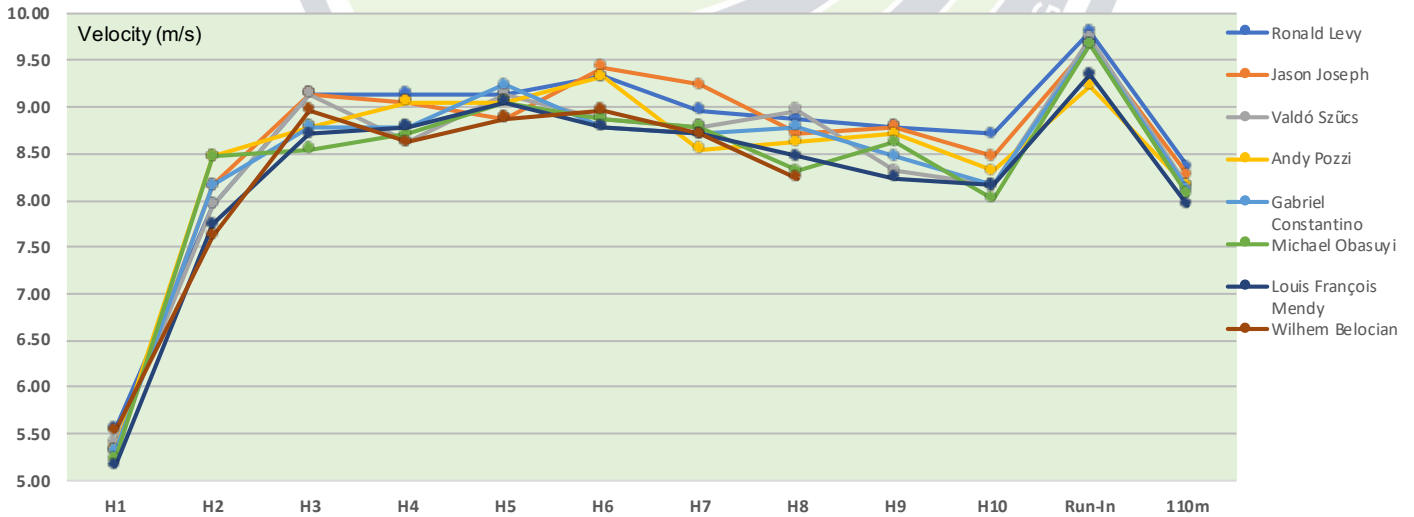
110m Hurdles

Date: 2021.08.03

Wind: 0.0 m/s

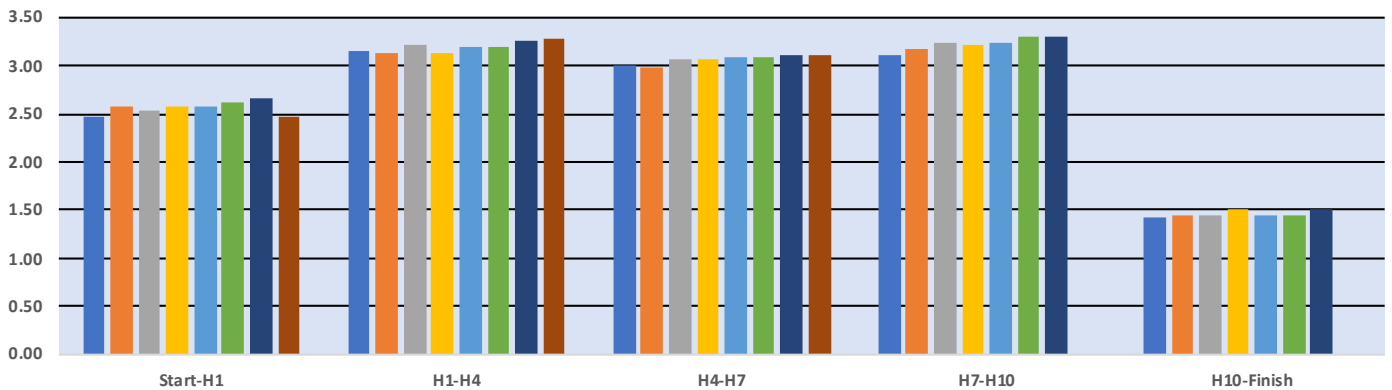
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Levy, Ronald (JAM) (1992)	time	2.47	3.62	4.62	5.62	6.62	7.60	8.62	9.65	10.69	11.74	13.17		4 / 1			
	reaction time	0.129															
	interval	7 steps	1.15	1.00	1.00	1.00	0.98	1.02	1.03	1.04	1.05	1.43			3.15	3.00	3.12
	velocity	5.55	7.95	9.14	9.14	9.14	9.33	8.96	8.87	8.79	8.70	9.80	8.35		8.70	9.14	8.79
Joseph, Jason (SUI) (1998)	time	2.57	3.69	4.69	5.70	6.73	7.70	8.69	9.74	10.78	11.86	13.31		6 / 2			
	reaction time	0.143															
	interval	7 steps	1.12	1.00	1.01	1.03	0.97	0.99	1.05	1.04	1.08	1.45			3.13	2.99	3.17
	velocity	5.34	8.16	9.14	9.05	8.87	9.42	9.23	8.70	8.79	8.46	9.67	8.26		8.76	9.17	8.65
Szűcs, Valdó (HUN) (1995)	time	2.54	3.69	4.69	5.75	6.75	7.78	8.82	9.84	10.94	12.06	13.50		9 / 3			
	reaction time	0.137															
	interval	7 steps	1.15	1.00	1.06	1.00	1.03	1.04	1.02	1.10	1.12	1.44			3.21	3.07	3.24
	velocity	5.40	7.95	9.14	8.62	9.14	8.87	8.79	8.96	8.31	8.16	9.74	8.15		8.54	8.93	8.46
Pozzi, Andy (GBR) (1992)	time	2.58	3.66	4.70	5.71	6.72	7.70	8.77	9.83	10.88	11.98	13.50		2 / 4			
	reaction time	0.135															
	interval	7 steps	1.08	1.04	1.01	1.01	0.98	1.07	1.06	1.05	1.10	1.52			3.13	3.06	3.21
	velocity	5.32	8.46	8.79	9.05	9.05	9.33	8.54	8.62	8.70	8.31	9.22	8.15		8.76	8.96	8.54
Constantino, Gabriel (BRA) (1995)	time	2.58	3.70	4.74	5.78	6.77	7.81	8.86	9.90	10.98	12.10	13.55		5 / 5			
	reaction time	0.154															
	interval	7 steps	1.12	1.04	1.04	0.99	1.04	1.05	1.04	1.08	1.12	1.45			3.20	3.08	3.24
	velocity	5.32	8.16	8.79	8.79	9.23	8.79	8.70	8.79	8.46	8.16	9.67	8.12		8.57	8.90	8.46
Obasuyi, Michael (BEL) (1999)	time	2.62	3.70	4.77	5.82	6.83	7.86	8.90	10.00	11.06	12.20	13.65		8 / 6			
	reaction time	0.141															
	interval	7 steps	1.08	1.07	1.05	1.01	1.03	1.04	1.10	1.06	1.14	1.45			3.20	3.08	3.30
	velocity	5.24	8.46	8.54	8.70	9.05	8.87	8.79	8.31	8.62	8.02	9.67	8.06		8.57	8.90	8.31
Mendy, Louis François (SEN) (1999)	time	2.66	3.84	4.89	5.93	6.94	7.98	9.03	10.11	11.22	12.34	13.84		7 / 7			
	reaction time	0.169															
	interval	7 steps	1.18	1.05	1.04	1.01	1.04	1.05	1.08	1.11	1.12	1.50			3.27	3.10	3.31
	velocity	5.16	7.75	8.70	8.79	9.05	8.79	8.70	8.46	8.23	8.16	9.35	7.95		8.39	8.85	8.28
Belocian, Wilhem (FRA) (1995)	time	2.48	3.68	4.70	5.76	6.79	7.81	8.86	9.97					3 / --			
	reaction time	0.135															
	interval	7 steps	1.20	1.02	1.06	1.03	1.02	1.05	1.11								
	velocity	5.53	7.62	8.96	8.62	8.87	8.96	8.70	8.23						8.36	8.85	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field/day-11-evening-session-athletics-tokyo-2020-replays>

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

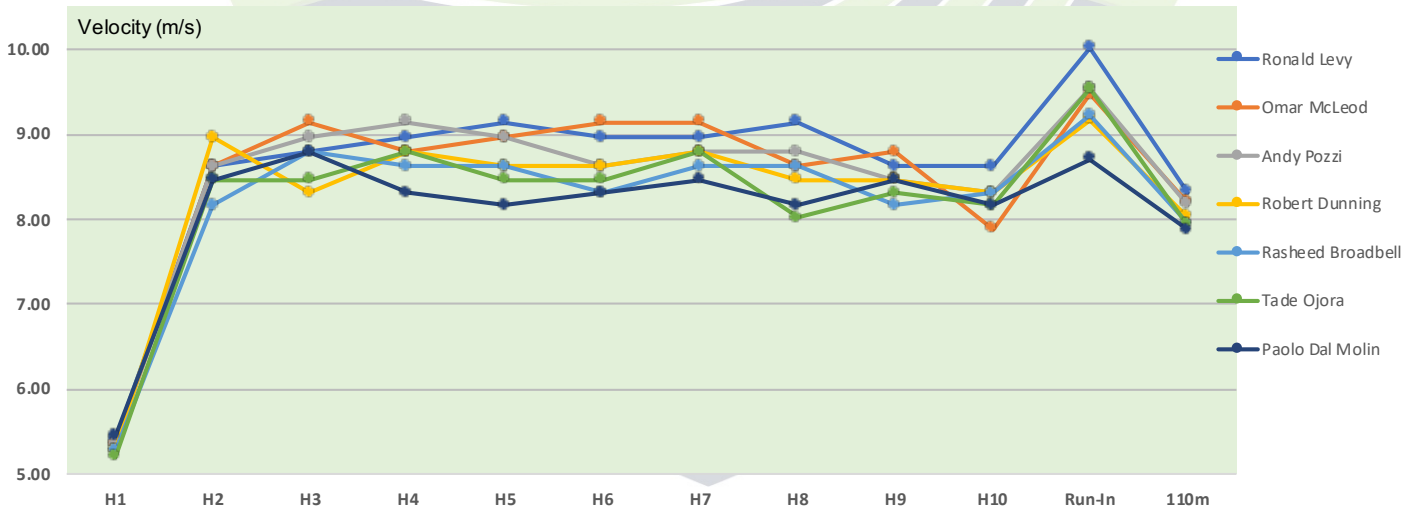
110m Hurdles

Date: 2021.07.13

Wind: 0.8 m/s

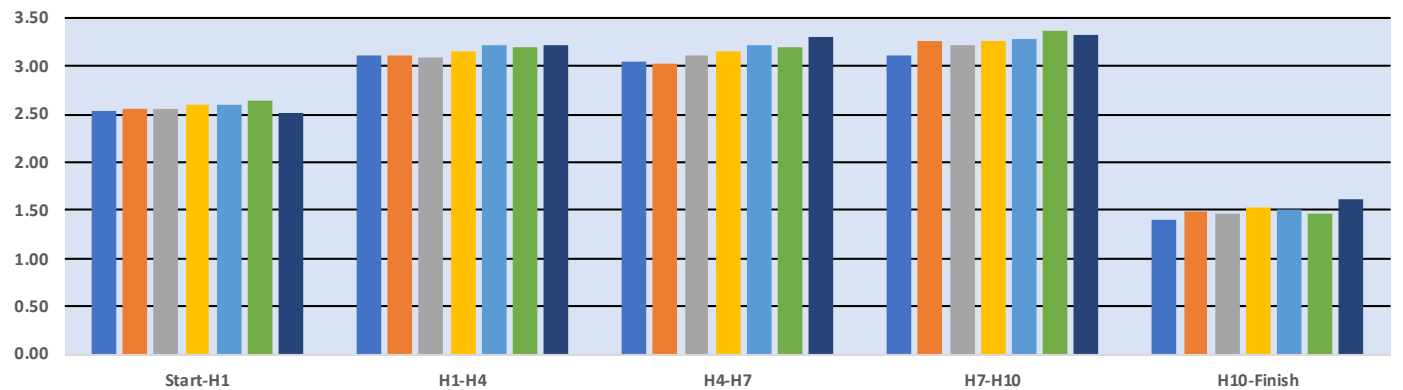
FINAL

		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
	velocity	5.40	8.62	8.79	8.96	9.14	8.96	8.96	9.14	8.62	8.62	10.01	8.32				
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
	velocity	5.36	8.62	9.14	8.79	8.96	9.14	9.14	8.62	8.79	7.88	9.47	8.20				
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
	velocity	5.36	8.62	8.96	9.14	8.96	8.62	8.79	8.79	8.46	8.31	9.54	8.18				
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
	velocity	5.28	8.96	8.31	8.79	8.62	8.62	8.79	8.46	8.46	8.31	9.16	8.02				
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
	velocity	5.28	8.16	8.79	8.62	8.62	8.31	8.62	8.62	8.16	8.31	9.22	7.95				
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
	velocity	5.20	8.46	8.46	8.79	8.46	8.46	8.79	8.02	8.31	8.16	9.54	7.93				
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				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1078 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=6T0k5f5eoPw>

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

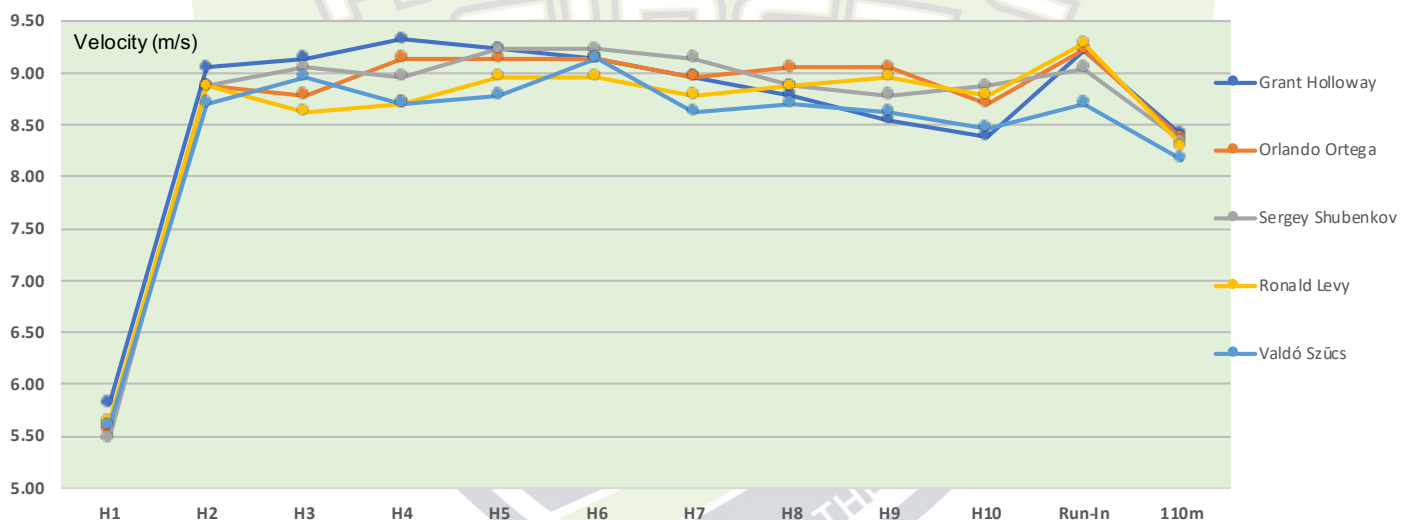
110m Hurdles

Date: 2021.07.06

Wind: -0.1 m/s

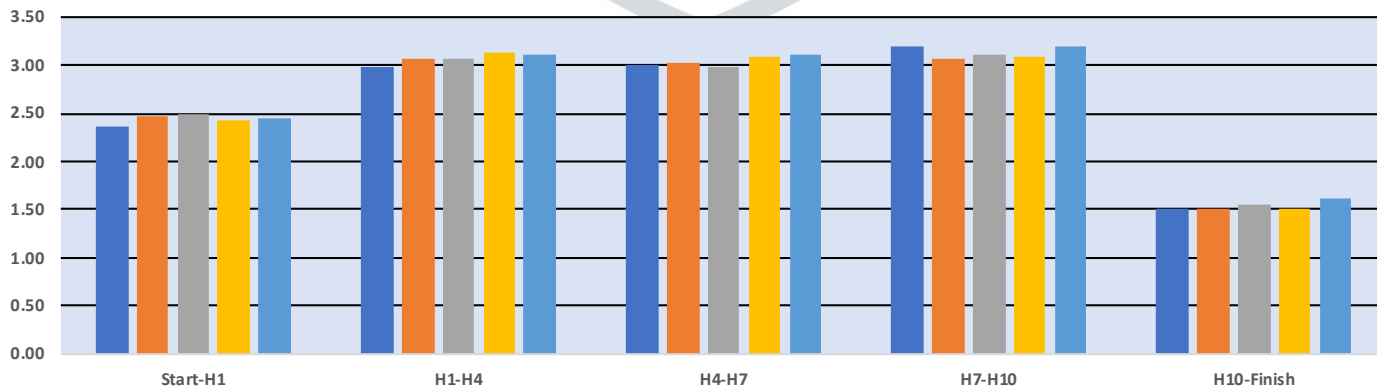
FINAL

		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
	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				
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
	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				
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
	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				
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
	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				
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	5.60	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>

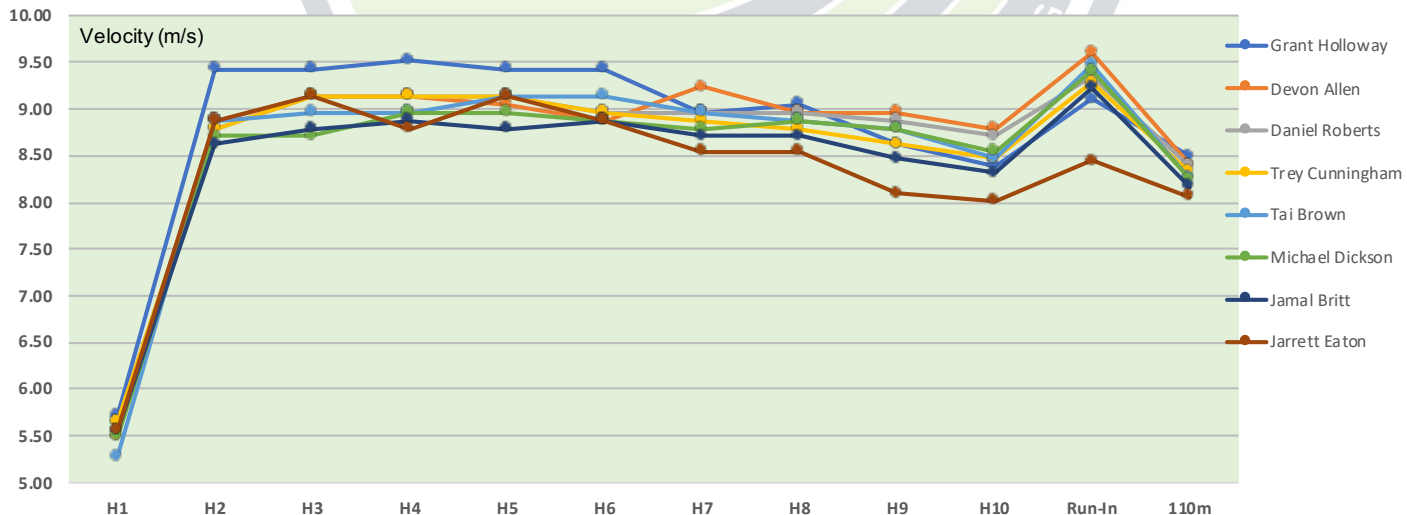
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

110m Hurdles

Date: 2021.06.26 Wind: 0.4 m/s

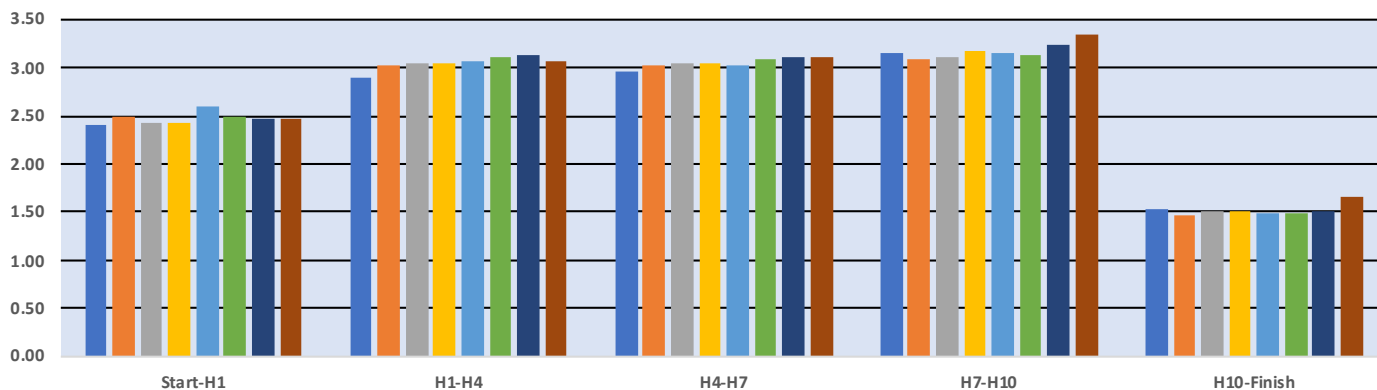
FINAL

		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	13.10	4 / 1	2.90	2.96	3.16
	reaction time	0.146													9.46	9.26	8.68
	interval	7 steps	0.97	0.97	0.96	0.97	0.97	0.97	1.02	1.01	1.06	1.09	1.54				
	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				
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	13.10	5 / 2	3.03	3.03	3.08
	reaction time	0.152													9.05	9.05	8.90
	interval		1.03	1.00	1.00	1.01	1.03	0.99	1.02	1.02	1.04	1.46					
	velocity	5.49	8.87	9.14	9.14	9.05	8.87	9.23	8.96	8.96	8.79	9.60	8.40				
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	13.11	6 / 3	3.04	3.04	3.10
	reaction time	0.201													9.02	9.02	8.85
	interval		1.04	1.00	1.00	1.00	1.02	1.02	1.02	1.03	1.05	1.50					
	velocity	5.65	8.79	9.14	9.14	9.14	8.96	8.96	8.96	8.87	8.70	9.35	8.39				
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	13.21	3 / 4	3.04	3.05	3.18
	reaction time	0.165													9.02	8.99	8.62
	interval	7 steps	1.04	1.00	1.00	1.00	1.02	1.03	1.04	1.06	1.08	1.51	=PB				
	velocity	5.65	8.79	9.14	9.14	9.14	8.96	8.87	8.79	8.62	8.46	9.28	8.33				
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	13.32	8 / 5	3.07	3.02	3.15
	reaction time	0.174													8.93	9.08	8.70
	interval		1.03	1.02	1.02	1.00	1.00	1.02	1.03	1.04	1.08	1.48	PB				
	velocity	5.28	8.87	8.96	8.96	9.14	9.14	8.96	8.87	8.79	8.46	9.47	8.26				
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	13.34	2 / 6	3.12	3.09	3.14
	reaction time	0.201													8.79	8.87	8.73
	interval	7 steps	1.05	1.05	1.02	1.02	1.03	1.04	1.03	1.04	1.07	1.49					
	velocity	5.49	8.70	8.70	8.96	8.96	8.87	8.79	8.87	8.79	8.54	9.41	8.25				
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	13.47	7 / 7	3.13	3.12	3.23
	reaction time	0.158													8.76	8.79	8.49
	interval	7 steps	1.06	1.04	1.03	1.04	1.04	1.03	1.05	1.05	1.08	1.10	1.52				
	velocity	5.55	8.62	8.79	8.87	8.79	8.87	8.70	8.70	8.46	8.31	9.22	8.17				
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	13.64	1 / 8	3.07	3.10	3.34
	reaction time	0.137													8.93	8.85	8.21
	interval	7 steps	1.03	1.00	1.04	1.00	1.03	1.07	1.07	1.13	1.14	1.66					
	velocity	5.55	8.87	9.14	8.79	9.14	8.87	8.54	8.54	8.09	8.02	8.45	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=2sin2Dbspu8>

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

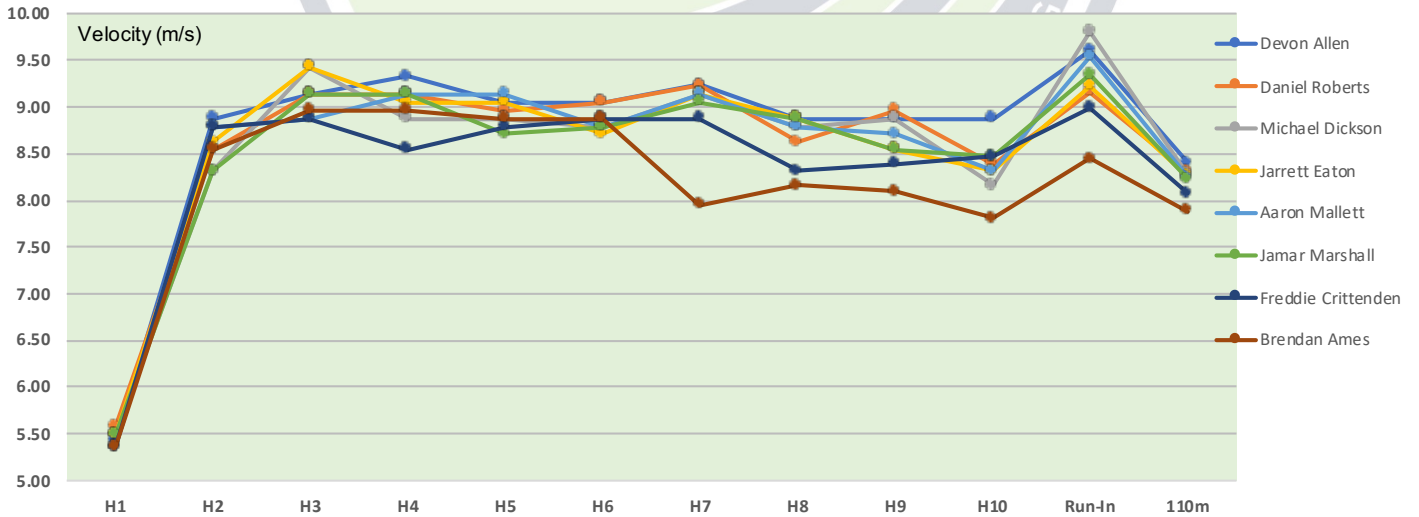
110m Hurdles

Date: 2021.06.26

Wind: 1.2 m/s

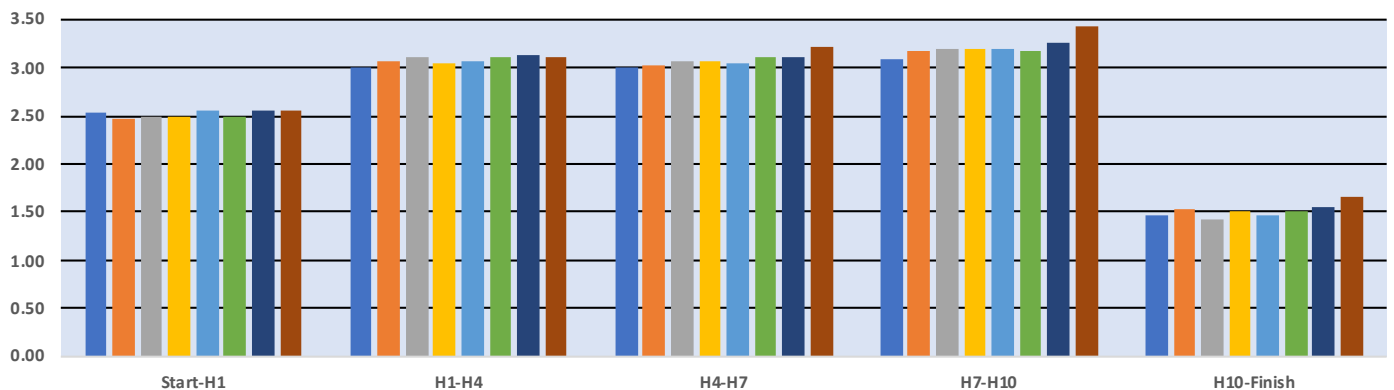
Semi-Final 2

		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
	velocity	5.42	8.87	9.14	9.33	9.05	9.05	9.23	8.87	8.87	8.87	9.60	8.40				
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
	velocity	5.58	8.54	9.14	9.14	8.96	9.05	9.23	8.62	8.96	8.39	9.16	8.30				
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		7 steps	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
	velocity	5.49	8.31	9.42	8.87	8.87	8.79	9.14	8.79	8.87	8.16	9.80	8.28				
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		7 steps	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
	velocity	5.49	8.62	9.42	9.05	9.05	8.70	9.14	8.87	8.54	8.31	9.22	8.26				
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
	velocity	5.36	8.79	8.87	9.14	9.14	8.79	9.14	8.79	8.70	8.31	9.54	8.25				
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		7 steps	1.10	1.00	1.00	1.05	1.04	1.01	1.03	1.07	1.08	1.50	DQ	8.85	8.85	8.62
	velocity	5.49	8.31	9.14	9.14	8.70	8.79	9.05	8.87	8.54	8.46	9.35	8.22				
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 6			
	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
	velocity	5.36	8.79	8.87	8.54	8.79	8.87	8.87	8.31	8.39	8.46	8.99	8.07				
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 / 8 7			
	reaction time	0.208													3.11	3.21	3.42
	interval		7 steps	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	5.36	8.54	8.96	8.96	8.87	8.87	7.95	8.16	8.09	7.81	8.45	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=ALtrPk_oJeo

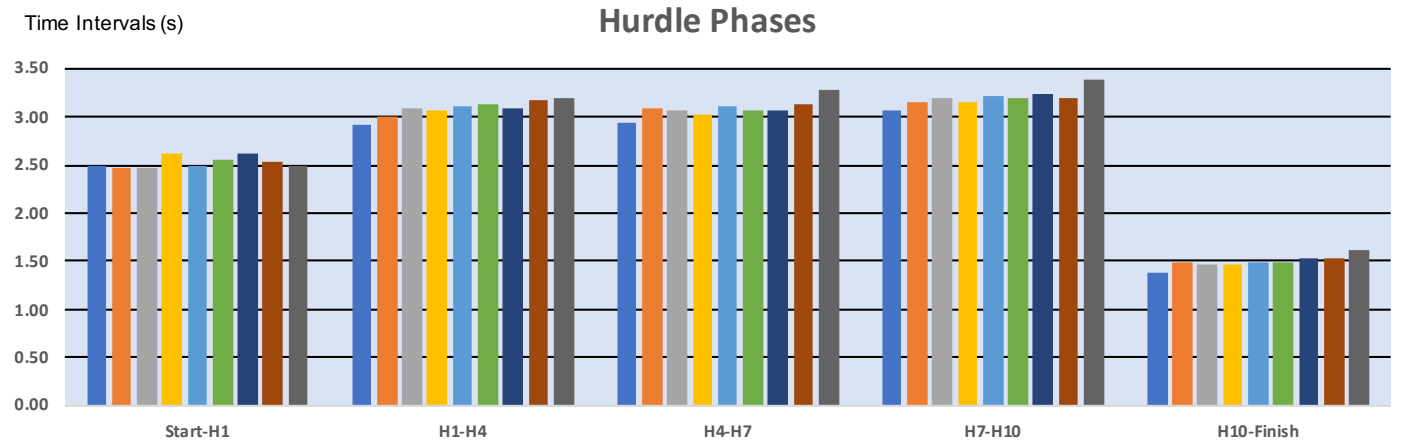
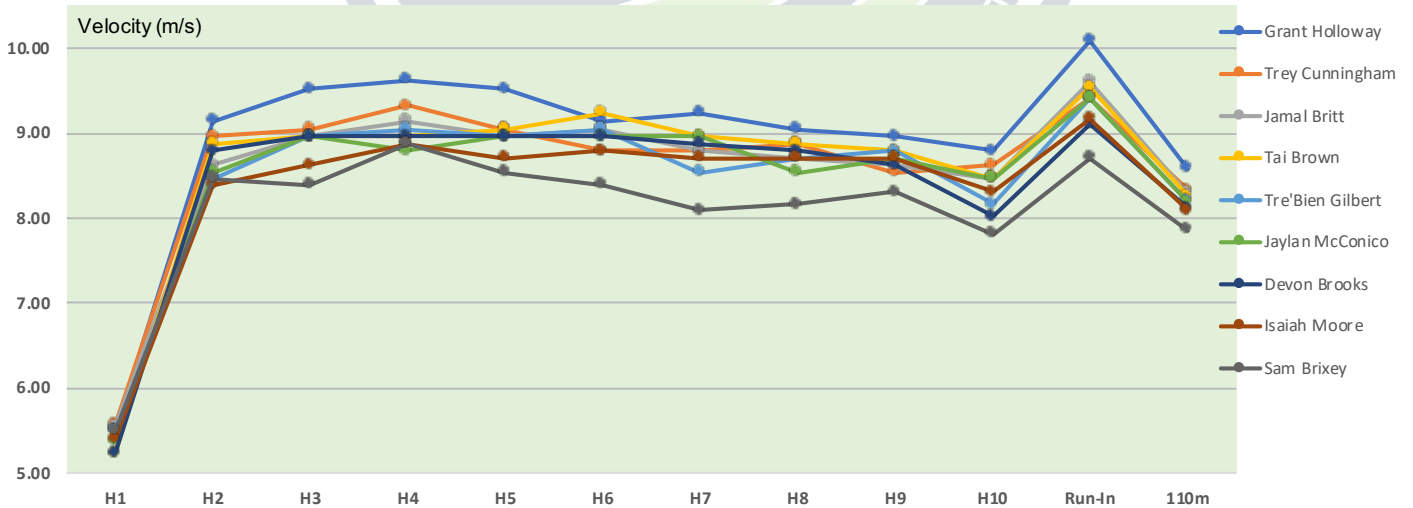
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

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	13.21	5 / 1			
	reaction time	0.169													2.91	2.95	3.07
	interval velocity	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	13.21	6 / 2			
	reaction time	0.163													3.01	3.09	3.16
	interval velocity	7 steps	1.02	1.01	0.98	1.01	1.04	1.03	1.03	1.07	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	13.27	3 / 3			
	reaction time	0.147													3.08	3.07	3.19
	interval velocity	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	13.33	2 / 4			
	reaction time	0.173													3.07	3.02	3.15
	interval velocity	7 steps	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	13.41	8 / 5			
	reaction time	0.191													3.11	3.10	3.21
	interval velocity	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	13.43	4 / 6			
	reaction time	0.209													3.13	3.06	3.20
	interval velocity	7 steps	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	13.55	1 / 7			
	reaction time	0.264													3.08	3.07	3.24
	interval velocity	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	13.59	7 / 8			
	reaction time	0.147													3.18	3.14	3.20
	interval velocity	7 steps	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	13.99	9 / 9			
	reaction time	0.148													3.20	3.29	3.39
	interval velocity	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



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
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=RMldL1bWGA>

Biomechanical Analysis

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													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	1.50			8.76	9.05	8.85
	velocity	5.49	8.87	8.87	8.54	9.14	9.14	8.87	8.54	9.14	8.87	9.35	8.30				
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													3.13	3.04	3.08
	interval		7 steps 1.04	1.03	1.06	1.00	1.00	1.04	1.03	1.00	1.05	1.48	PB4		8.76	9.02	8.90
	velocity	5.42	8.79	8.87	8.62	9.14	9.14	8.79	8.87	9.14	8.70	9.47	8.30				

Date: 2021.06.25 Wind: 1.5 m/s

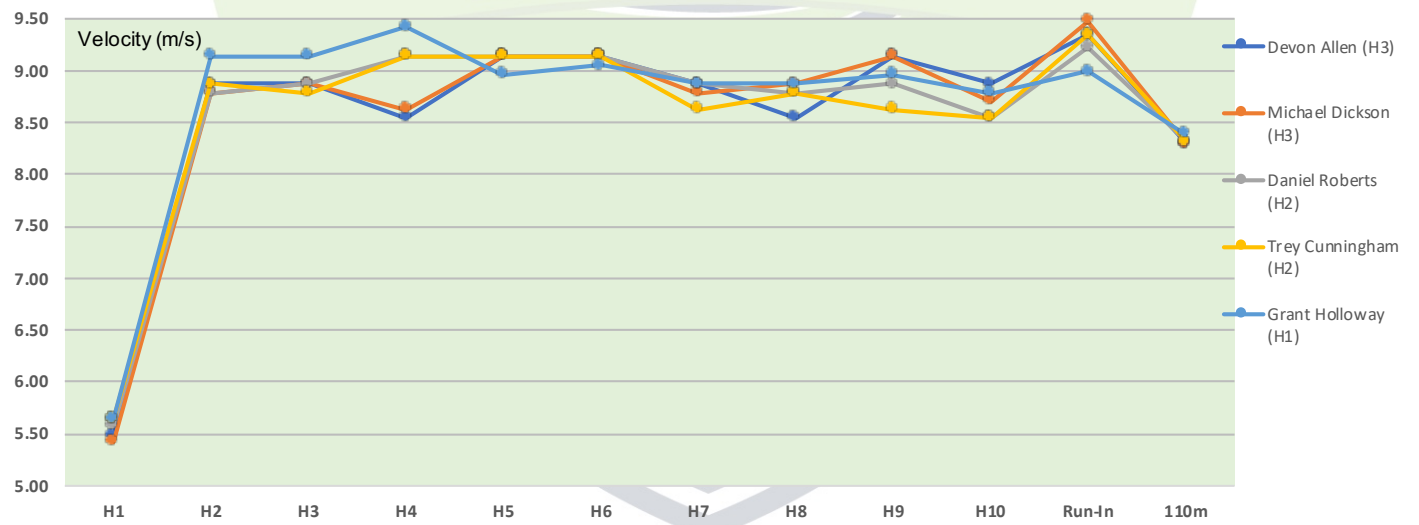
Heat 2

		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													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	1.52			8.93	9.05	8.73
	velocity	5.58	8.79	8.87	9.14	9.14	9.14	8.87	8.79	8.87	8.54	9.22	8.32				
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													3.07	3.06	3.17
	interval		7 steps 1.03	1.04	1.00	1.00	1.00	1.06	1.04	1.06	1.07	1.50	PB		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	9.35	8.31				

Date: 2021.06.25 Wind: 0.7 m/s

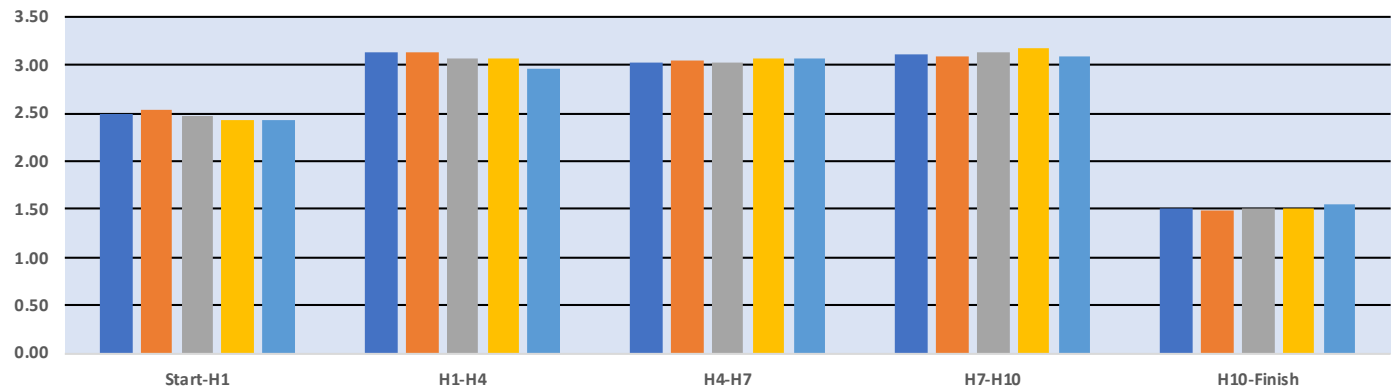
Heat 1

		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													2.97	3.06	3.09
	interval		7 steps 1.00	1.00	0.97	1.02	1.01	1.03	1.03	1.02	1.04	1.56			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	8.99	8.39				



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>

Biomechanical Analysis

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		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
	velocity	5.55	8.62	9.14	8.87	9.42	8.79	9.14	9.14	9.14	9.05	9.05	9.67	8.44	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		interval	1.00	1.03	1.00	0.97	1.00	1.00	1.03	1.04	1.48		3.03	2.97	3.07	
	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	9.05	9.23	8.93	

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		interval	1.06	1.05	1.02	0.97	1.00	1.07	1.02	1.02	1.08	1.42		3.13	3.04	3.12
	velocity	5.79	8.62	8.70	8.96	9.42	9.14	8.54	8.96	8.96	8.46	9.87	8.41	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		interval	1.07	1.00	1.06	1.04	1.03	1.06	1.01	1.03	1.09	1.46		3.13	3.13	3.13
	velocity	5.55	8.54	9.14	8.62	8.79	8.87	8.62	9.05	8.87	8.39	9.60	8.26	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		interval	1.07	1.00	1.03	1.03	1.02	1.03	1.07	1.10	1.50		3.10	3.07	3.20	
	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	8.85	8.93	8.57	

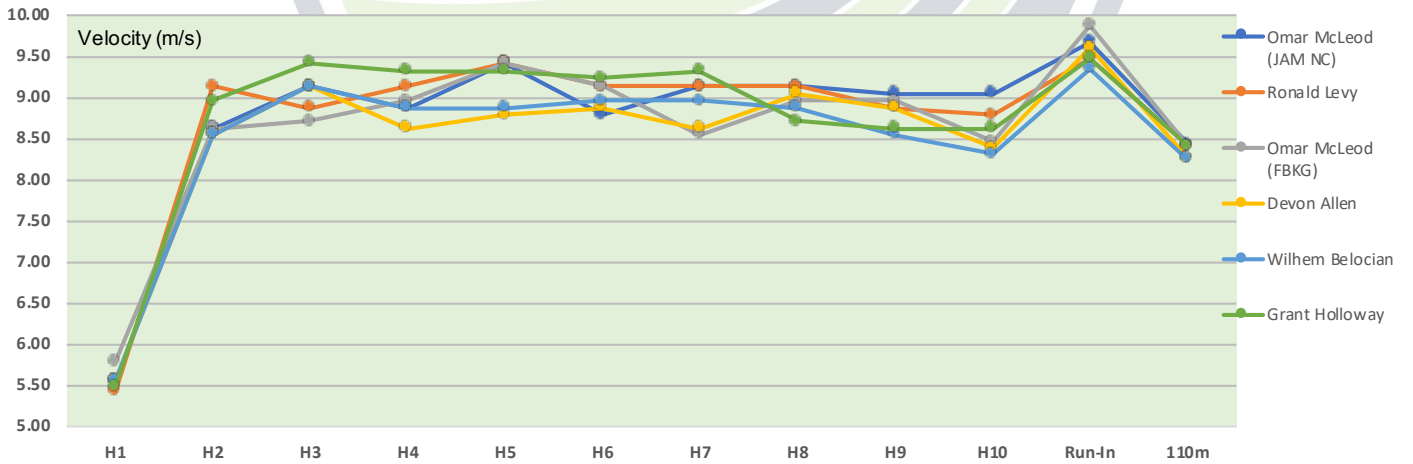
2021 Tom Jones Invitational (Gainesville, FL) (TV Analysis)

Date: 2021.04.17

Wind: 1.3 m/s

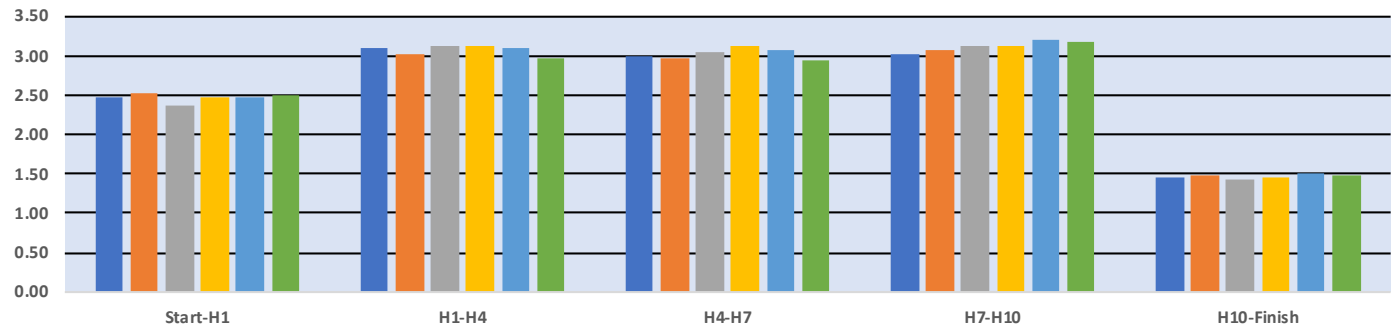
FINAL

		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		interval	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
	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	



Time Intervals (s)

Hurdle Phases



Jamaican Championships

Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=l5M1Zqz12Vs>

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=dkI9wp8nvAQ>

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

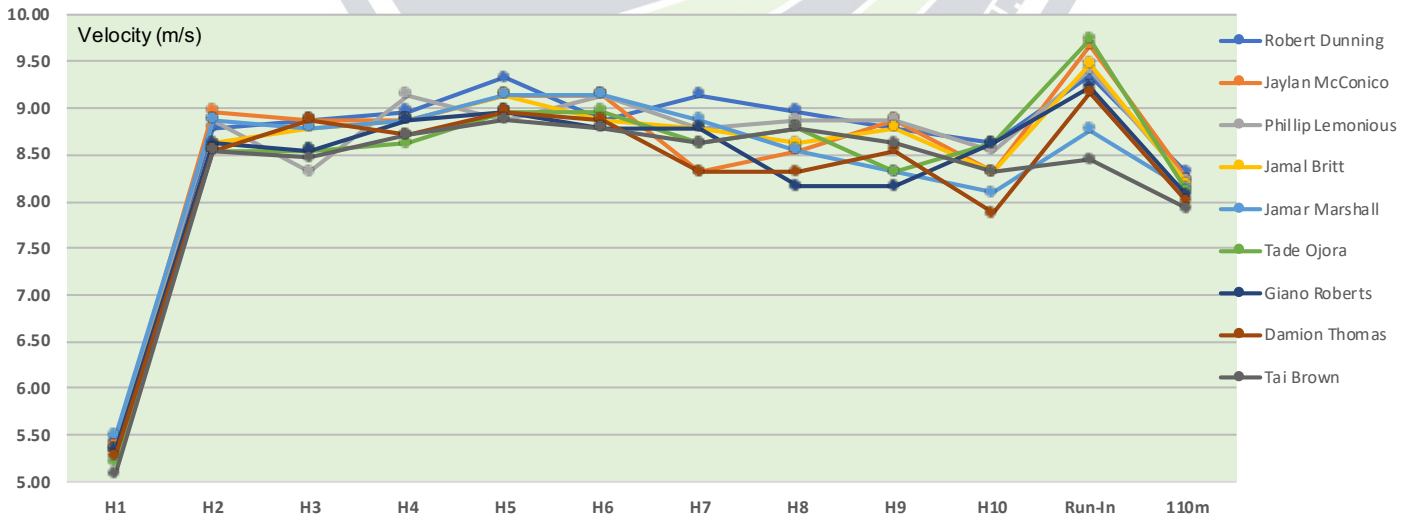
2021 NCAA Championships (Eugene, OR) (TV Analysis)

100m Hurdles

Date: 2021.06.11 Wind: -0.6 m/s

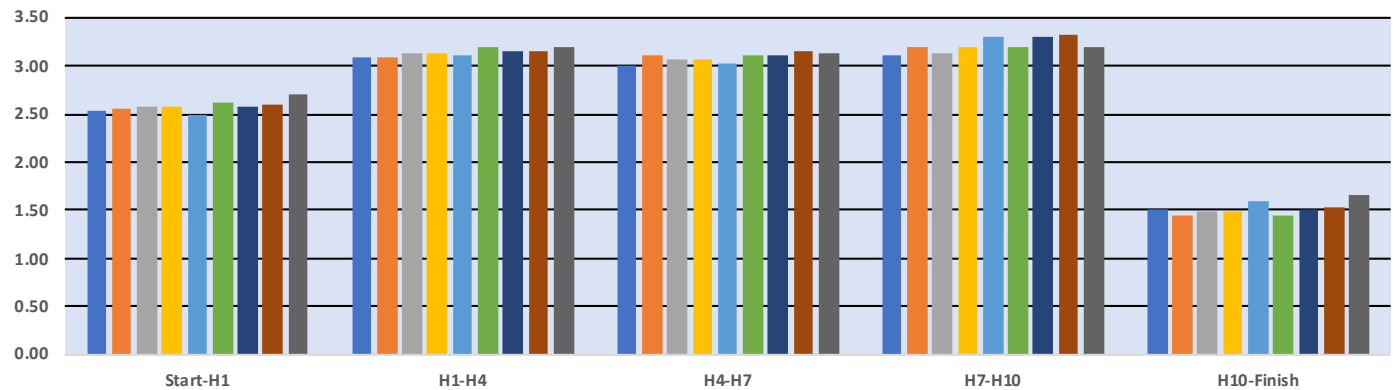
FINAL

		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															
	interval velocity	7 steps	1.04	1.03	1.02	0.98	1.03	1.00	1.02	1.04	1.06	1.50			3.09	3.01	3.12
	velocity	5.42	8.79	8.87	8.96	9.33	8.87	9.14	8.96	8.79	8.62	9.35	8.30		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															
	interval velocity		1.02	1.03	1.03	1.00	1.00	1.10	1.07	1.03	1.10	1.45			3.08	3.10	3.20
	velocity	5.38	8.96	8.87	8.87	9.14	9.14	8.31	8.54	8.87	8.31	9.67	8.22		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															
	interval velocity	7 steps	1.03	1.10	1.00	1.03	1.00	1.04	1.03	1.03	1.07	1.49	PB		3.13	3.07	3.13
	velocity	5.34	8.87	8.31	9.14	8.87	9.14	8.79	8.87	8.87	8.54	9.41	8.22		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															
	interval velocity	7 steps	1.06	1.04	1.03	1.00	1.03	1.04	1.06	1.04	1.10	1.48	PB		3.13	3.07	3.20
	velocity	5.34	8.62	8.79	8.87	9.14	8.87	8.79	8.62	8.79	8.31	9.47	8.18		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															
	interval velocity	7 steps	1.03	1.04	1.03	1.00	1.00	1.03	1.07	1.10	1.13	1.60			3.10	3.03	3.30
	velocity	5.49	8.87	8.79	8.87	9.14	9.14	8.87	8.54	8.31	8.09	8.76	8.13		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															
	interval velocity		1.07	1.07	1.06	1.02	1.02	1.06	1.04	1.10	1.06	1.44	PB		3.20	3.10	3.20
	velocity	5.22	8.54	8.54	8.62	8.96	8.62	8.79	8.31	8.62	9.74	8.11		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															
	interval velocity		1.06	1.07	1.03	1.02	1.04	1.04	1.12	1.12	1.06	1.52			3.16	3.10	3.30
	velocity	5.34	8.62	8.54	8.87	8.96	8.79	8.79	8.16	8.16	8.62	9.22	8.06		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															
	interval velocity	7 steps	1.07	1.03	1.05	1.02	1.03	1.10	1.10	1.07	1.16	1.53			3.15	3.15	3.33
	velocity	5.28	8.54	8.87	8.70	8.96	8.87	8.31	8.31	8.54	7.88	9.16	7.99		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															
	interval velocity		1.07	1.08	1.05	1.03	1.04	1.06	1.04	1.06	1.10	1.66			3.20	3.13	3.20
	velocity	5.08	8.54	8.46	8.70	8.87	8.79	8.62	8.79	8.62	8.31	8.45	7.92		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=bODF6lNmmg>

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

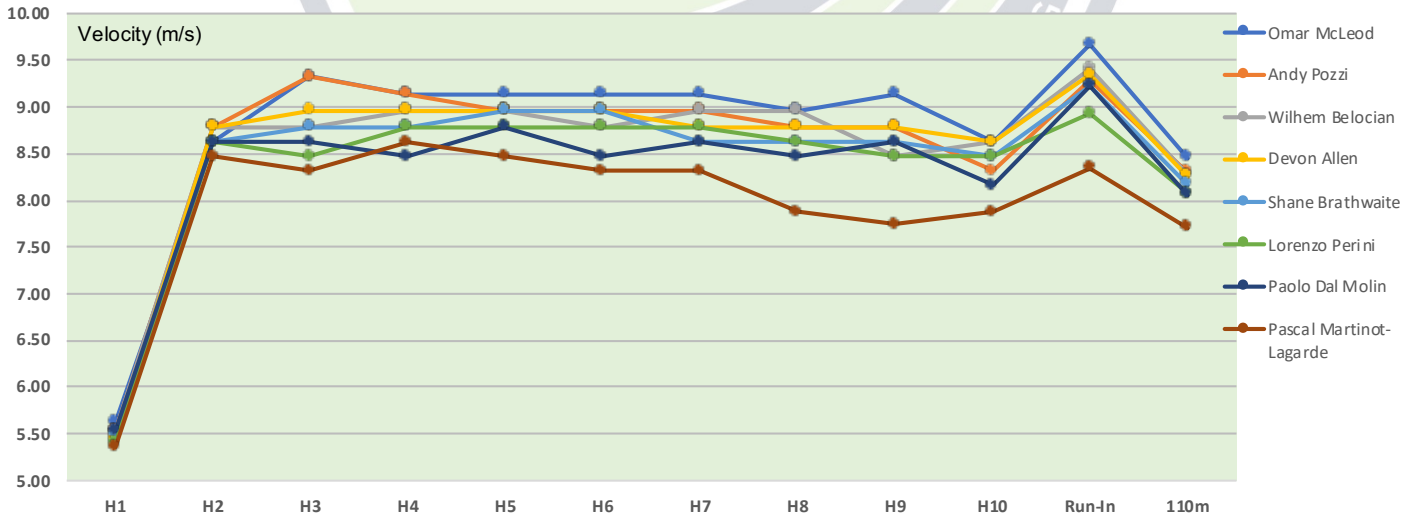
110m Hurdles

Date: 2021.06.10

Wind: -0.1 m/s

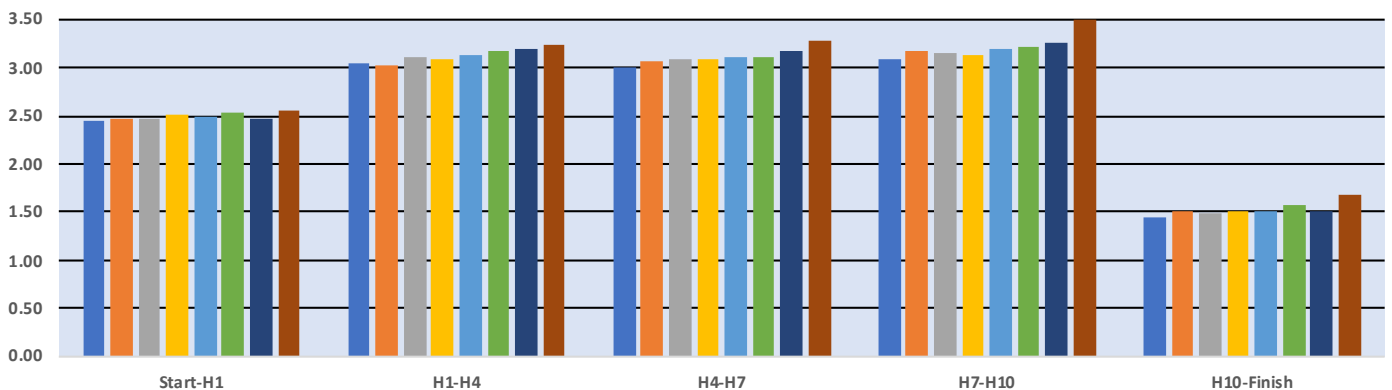
FINAL

		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													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
	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				
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													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
	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				
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													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
	velocity	5.53	8.79	8.79	8.96	8.96	8.79	8.96	8.96	8.46	8.62	9.41	8.26				
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													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
	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				
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													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
	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				
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													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
	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				
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													3.20	3.18	3.26
	interval		1.06	1.06	1.08	1.04	1.08	1.06	1.08	1.08	1.06	1.12	1.52		8.57	8.62	8.41
	velocity	5.53	8.62	8.62	8.46	8.79	8.46	8.62	8.46	8.62	8.16	9.22	8.06				
Martinot-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													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	5.36	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

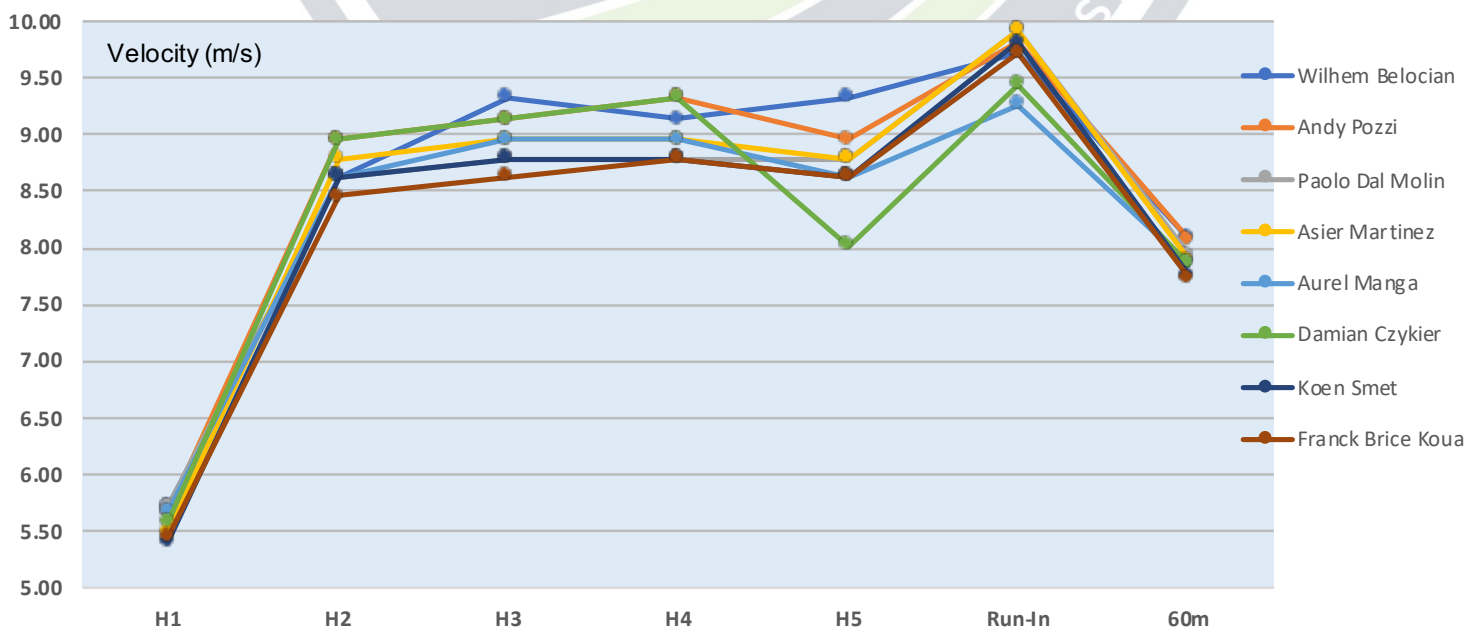
2021 European Indoor Championships (Toruń, POL) (TV Analysis)

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	interval	1.06	0.98	1.00	0.98	1.00	PB	
	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	interval	7 steps	1.02	1.00	0.98	1.02	0.99	=PB
	velocity	5.67	8.96	9.14	9.33	8.96	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	7 steps	1.06	1.04	1.04	0.98		
	velocity	5.72	8.62	8.79	8.79	8.79	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	interval	7 steps	1.04	1.02	1.04	0.98	PB	
	velocity	5.49	8.79	8.96	8.96	8.79	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	7 steps	1.06	1.02	1.06	1.05		
	velocity	5.67	8.62	8.96	8.96	8.62	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	7 steps	1.02	1.00	0.98	1.14	1.03	
	velocity	5.58	8.96	9.14	9.33	8.02	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	1.06	1.04	1.04	1.06	0.99		
	velocity	5.40	8.62	8.79	8.79	8.62	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	1.08	1.06	1.04	1.06	1.00		
	velocity	5.44	8.46	8.62	8.79	8.62	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

		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) (1996)																	
Semi-Final 3 - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)																	
date	1-Aug	time	2.53	3.53	4.49	5.44	6.38	7.31	8.25	9.21	10.17	11.17	12.26	7 / 1			
reaction time	0.175	interval		1.00	0.96	0.95	0.94	0.93	0.94	0.96	0.96	1.00	1.09	OR NR	2.91	2.81	2.92
wind	-0.2 m/s	velocity	5.14	8.50	8.85	8.95	9.04	9.14	9.04	8.85	8.85	8.50	9.22	8.16	8.76	9.07	8.73
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	12.32	6 / 1			
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	12.34	4 / 1			
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	0.96	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) (TV Analysis)																	
date	1-Aug	time	2.50	3.50	4.52	5.50	6.45	7.38	8.30	9.25	10.25	11.25	12.40	4 / 1			
reaction time	0.166	interval		1.00	1.02	0.98	0.95	0.93	0.92	0.95	1.00	1.00	1.15	PB	3.00	2.80	2.95
wind	0.0 m/s	velocity	5.20	8.50	8.33	8.67	8.95	9.14	9.24	8.95	8.50	8.50	8.74	8.06	8.50	9.11	8.64
Camacho-Quinn, Jasmine (PUR) (1996)																	
Heat 5 - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)																	
date	31-Jul	time	2.52	3.52	4.52	5.49	6.44	7.39	8.37	9.32	10.29	11.29	12.41	2 / 1			
reaction time	0.153	interval		1.00	1.00	0.97	0.95	0.95	0.98	0.95	0.97	1.00	1.12		2.97	2.88	2.92
wind	0.3 m/s	velocity	5.16	8.50	8.50	8.76	8.95	8.95	8.67	8.95	8.76	8.50	8.97	8.06	8.59	8.85	8.73
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	12.42	3 / 1			
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	12.44	5 / 1			
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	12.44	5 / 1			
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	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
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	12.47	4 / 1			
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)

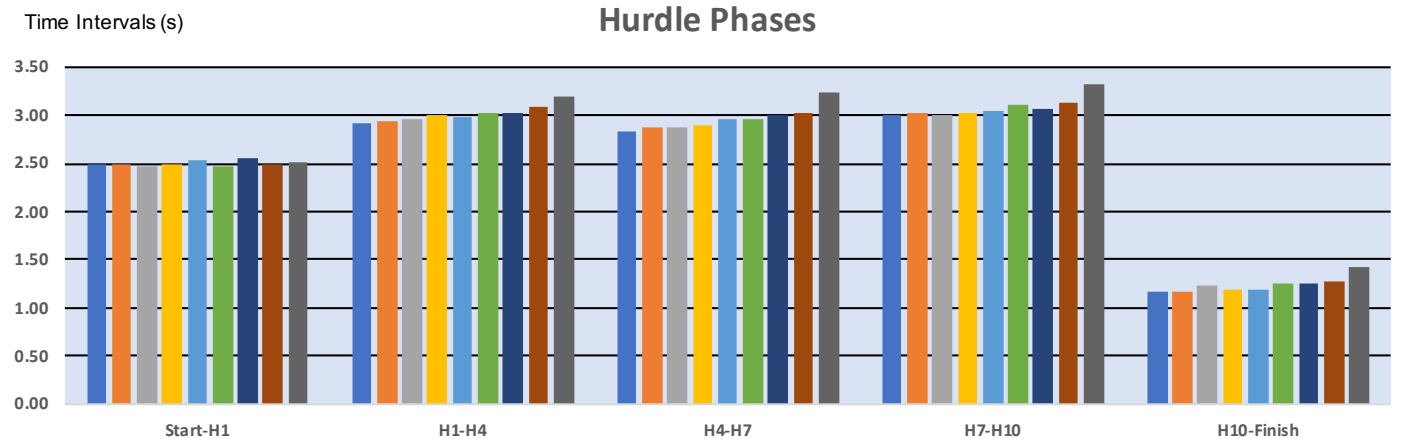
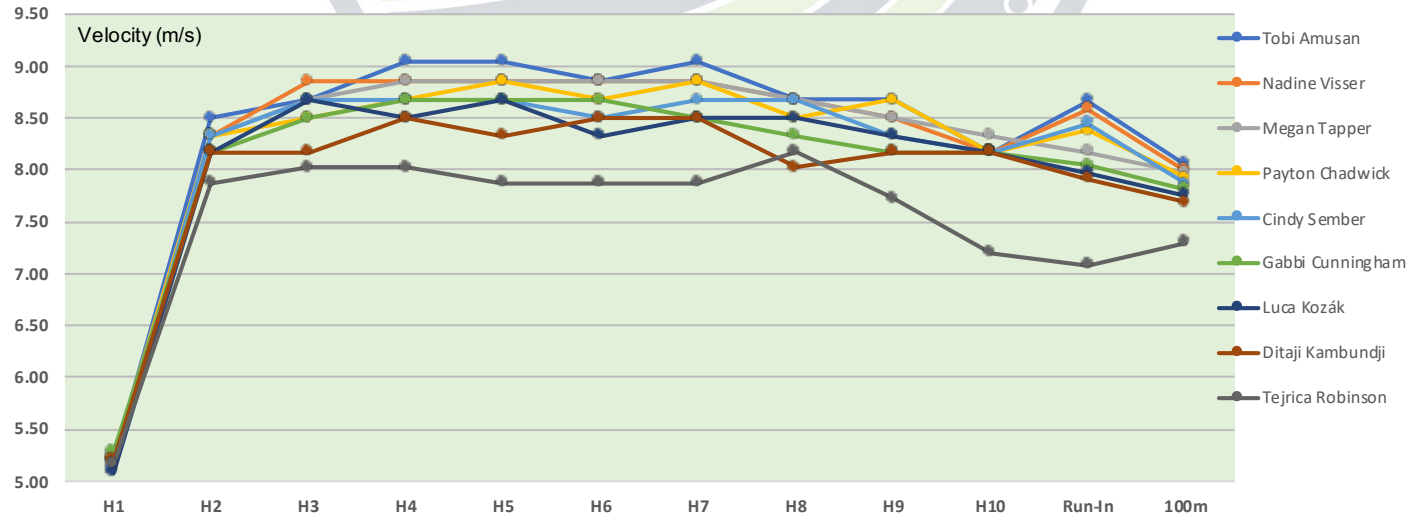
100m Hurdles

Date: 2021.09.09

Wind: 0.4 m/s

FINAL

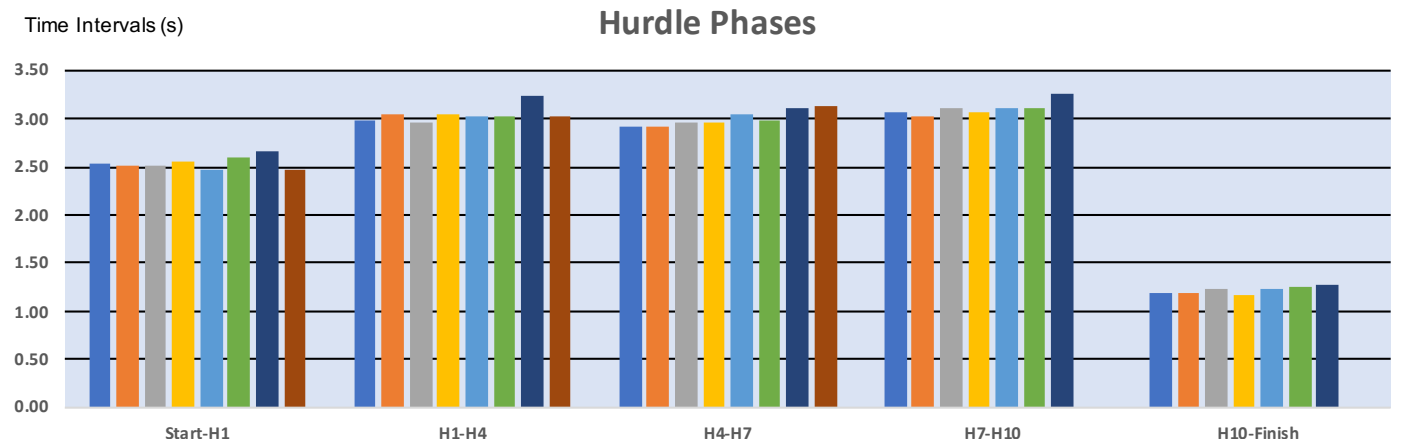
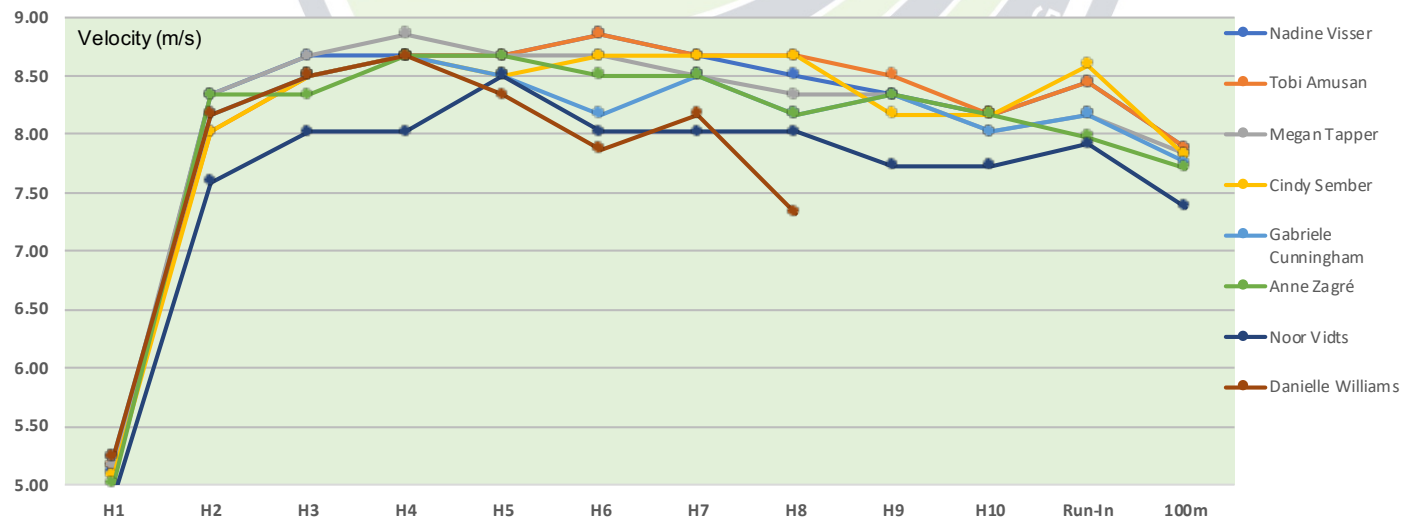
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Amusan, Tobi (NGR) (1997)	time	2.50	3.50	4.48	5.42	6.36	7.32	8.26	9.24	10.22	11.26		12.42	3 / 1			
	reaction time	0.134											AR		2.92	2.84	3.00
	interval		1.00	0.98	0.94	0.94	0.96	0.94	0.98	0.98	0.98	1.04	1.16		8.73	8.98	8.50
	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				
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
	velocity	5.20	8.33	8.85	8.85	8.85	8.85	8.85	8.67	8.50	8.17	8.59	7.99				
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
	velocity	5.24	8.33	8.67	8.85	8.85	8.85	8.85	8.67	8.50	8.33	8.17	7.97				
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	0.98	1.00	0.98	1.04	1.20	7.92		8.50	8.79	8.44
	velocity	5.20	8.33	8.50	8.67	8.85	8.67	8.85	8.50	8.67	8.17	8.38	7.92				
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
	velocity	5.12	8.33	8.67	8.67	8.67	8.50	8.67	8.67	8.33	8.17	8.45	7.87				
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
	velocity	5.28	8.17	8.50	8.67	8.67	8.67	8.50	8.33	8.17	8.17	8.04	7.82				
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
	velocity	5.08	8.17	8.67	8.50	8.67	8.33	8.50	8.50	8.33	8.17	7.98	7.75				
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
	velocity	5.20	8.17	8.17	8.50	8.33	8.50	8.50	8.02	8.17	8.17	7.91	7.69				
Robinson, Tejryca (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
	velocity	5.16	7.87	8.02	8.02	7.87	7.87	7.87	8.17	7.73	7.20	7.08	7.30				



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													2.98	2.92	3.06
	interval		1.02	0.98	0.98	0.98	0.96	0.98	1.00	1.02	1.04	1.19			8.56	8.73	8.33
	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				
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													3.04	2.92	3.02
	interval		1.06	1.00	0.98	0.98	0.96	0.98	1.00	1.04	1.19				8.39	8.73	8.44
	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				
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													2.96	2.96	3.10
	interval		1.02	0.98	0.96	0.98	0.98	1.00	1.02	1.02	1.06	1.23			8.61	8.61	8.23
	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				
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													3.04	2.96	3.06
	interval		1.06	1.00	0.98	1.00	0.98	0.98	0.98	1.04	1.04	1.17			8.39	8.61	8.33
	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				
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													3.02	3.04	3.12
	interval		1.04	1.00	0.98	1.00	1.04	1.00	1.04	1.02	1.06	1.23			8.44	8.39	8.17
	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				
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													3.02	2.98	3.10
	interval		1.02	1.02	0.98	0.98	1.00	1.00	1.04	1.02	1.04	1.26			8.44	8.56	8.23
	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				
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													3.24	3.12	3.26
	interval		1.12	1.06	1.06	1.00	1.06	1.06	1.06	1.10	1.10	1.27			7.87	8.17	7.82
	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				
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		1.04	1.00	0.98	1.02	1.08	1.04	1.16						8.44	8.12	
	velocity	5.24	8.17	8.50	8.67	8.33	7.87	8.17	7.33								



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=fvwaaSDT074>

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

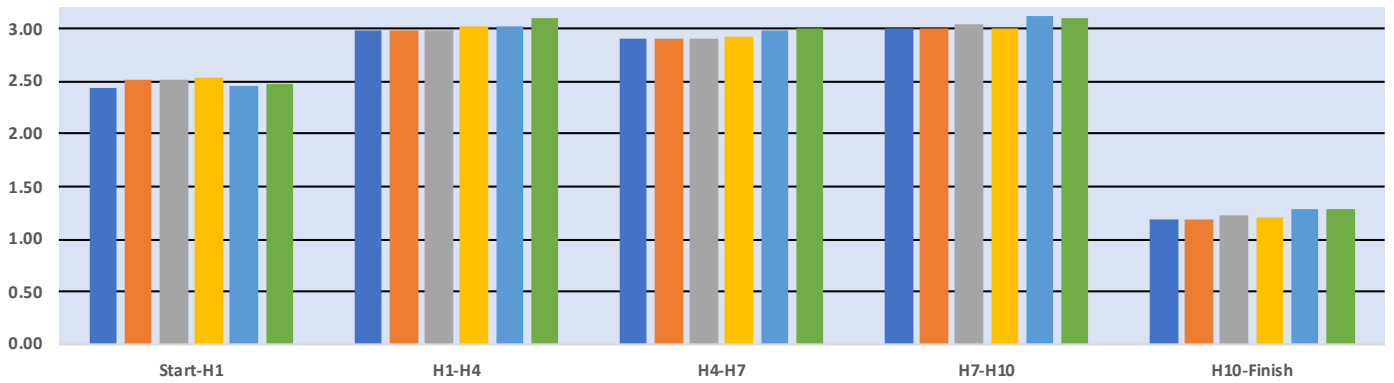
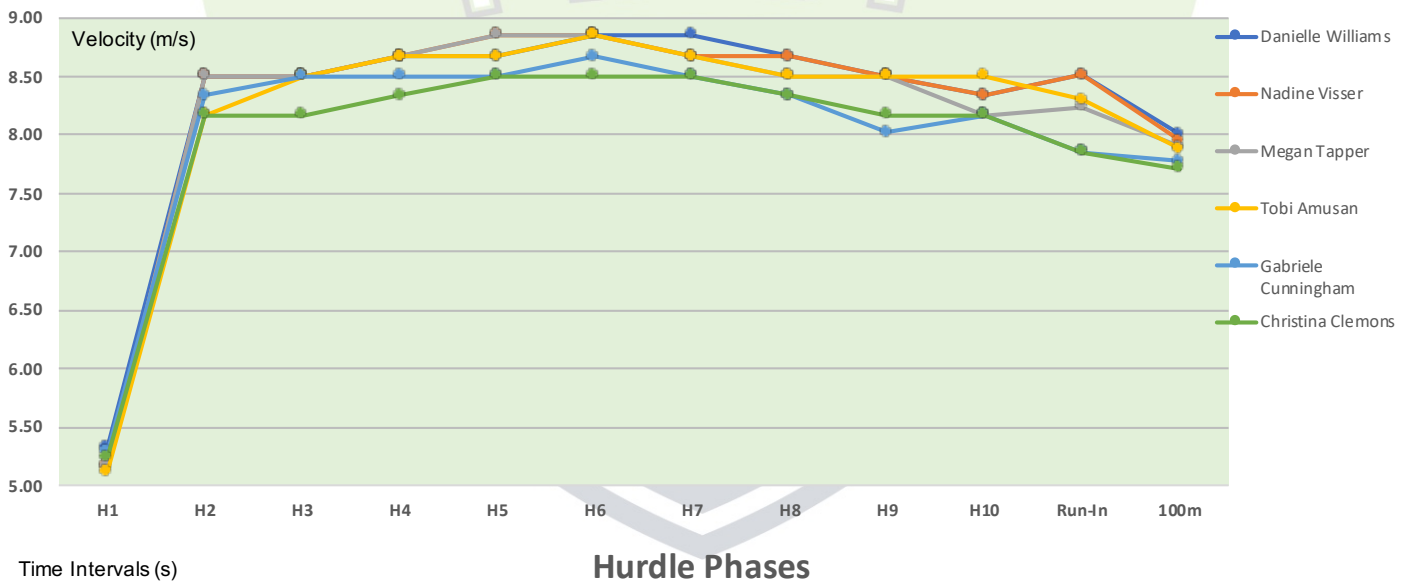
100m Hurdles

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													2.98	2.90	3.00
	interval		1.00	1.00	0.98	0.98	0.96	0.96	0.98	0.98	1.00	1.02	1.18		8.56	8.79	8.50
	velocity	5.33	8.50	8.50	8.67	8.67	8.85	8.85	8.67	8.50	8.33	8.52	8.00				
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													2.98	2.90	3.00
	interval		1.00	1.00	0.98	0.96	0.96	0.98	0.98	1.00	1.02	1.18	NR PB		8.56	8.79	8.50
	velocity	5.16	8.50	8.50	8.67	8.85	8.85	8.67	8.67	8.50	8.33	8.52	7.95				
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													2.98	2.90	3.04
	interval		1.00	1.00	0.98	0.96	0.96	0.98	1.00	1.00	1.04	1.22			8.56	8.79	8.39
	velocity	5.16	8.50	8.50	8.67	8.85	8.85	8.67	8.50	8.50	8.17	8.24	7.90				
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													3.02	2.92	3.00
	interval		1.04	1.00	0.98	0.98	0.96	0.98	1.00	1.00	1.00	1.21			8.44	8.73	8.50
	velocity	5.12	8.17	8.50	8.67	8.67	8.85	8.67	8.50	8.50	8.50	8.31	7.88				
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													3.02	2.98	3.12
	interval		1.02	1.00	1.00	1.00	0.98	1.00	1.02	1.06	1.04	1.28			8.44	8.56	8.17
	velocity	5.28	8.33	8.50	8.50	8.50	8.67	8.50	8.33	8.02	8.17	7.85	7.78				
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													3.10	3.00	3.10
	interval		1.04	1.04	1.02	1.00	1.00	1.00	1.02	1.04	1.04	1.28			8.23	8.50	8.23
	velocity	5.24	8.17	8.17	8.33	8.50	8.50	8.50	8.33	8.17	8.17	7.85	7.72				



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

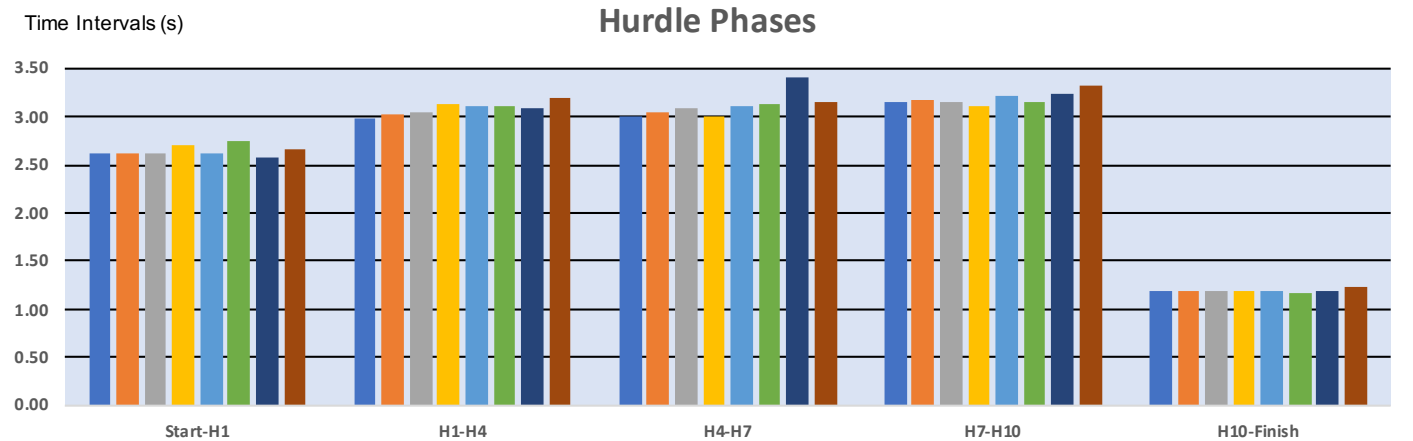
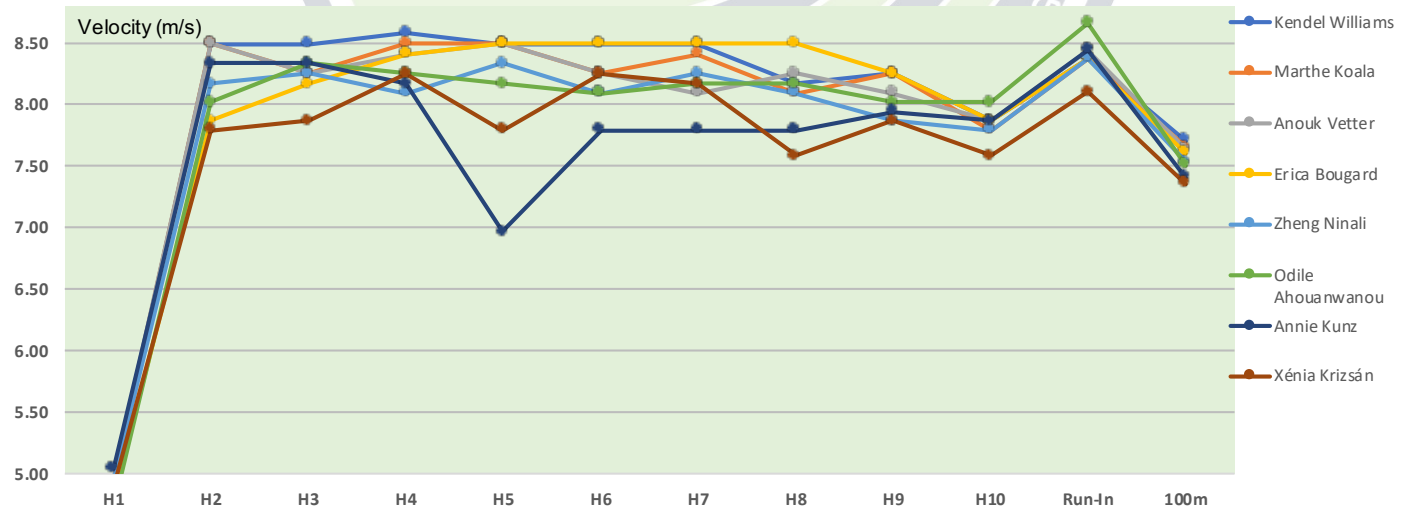
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

100m Hurdles

Date: 2021.08.04 Wind: -0.8 m/s

Heptathlon - Heat 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Williams, Kendel (USA) (1995)	time	2.63	3.63	4.63	5.62	6.62	7.62	8.62	9.66	10.69	11.77	12.97		6 / 1			
	reaction time	0.149													2.99	3.00	3.15
	interval		1.00	1.00	0.99	1.00	1.00	1.00	1.04	1.03	1.08	1.20			8.53	8.50	8.10
	velocity	4.94	8.50	8.50	8.59	8.50	8.50	8.50	8.17	8.25	7.87	8.37	7.71				
Koala, Marthe (BUR) (1994)	time	2.63	3.63	4.66	5.66	6.66	7.69	8.70	9.75	10.78	11.87		13.07	7 / 2			
	reaction time	0.139													3.03	3.04	3.17
	interval		1.00	1.03	1.00	1.00	1.03	1.01	1.05	1.03	1.09	1.20			8.42	8.39	8.04
	velocity	4.94	8.50	8.25	8.50	8.50	8.25	8.42	8.10	8.25	7.80	8.37	7.65				
Vetter, Anouk (NED) (1993)	time	2.62	3.62	4.65	5.66	6.66	7.69	8.74	9.77	10.82	11.90		13.09	5 / 3			
	reaction time	0.134													3.04	3.08	3.16
	interval		1.00	1.03	1.01	1.00	1.03	1.05	1.03	1.05	1.08	1.19	PB		8.39	8.28	8.07
	velocity	4.96	8.50	8.25	8.42	8.50	8.25	8.10	8.25	8.10	7.87	8.45	7.64				
Bougard, Erica (USA) (1993)	time	2.70	3.78	4.82	5.83	6.83	7.83	8.83	9.83	10.86	11.94		13.14	2 / 4			
	reaction time	0.176													3.13	3.00	3.11
	interval		1.08	1.04	1.01	1.00	1.00	1.00	1.00	1.03	1.08	1.20			8.15	8.50	8.20
	velocity	4.81	7.87	8.17	8.42	8.50	8.50	8.50	8.50	8.25	7.87	8.37	7.61				
Zheng Ninali (CHN) (1998)	time	2.63	3.67	4.70	5.75	6.77	7.82	8.85	9.90	10.98	12.07		13.27	3 / 5			
	reaction time	0.123													3.12	3.10	3.22
	interval		1.04	1.03	1.05	1.02	1.05	1.03	1.05	1.08	1.09	1.20	PB		8.17	8.23	7.92
	velocity	4.94	8.17	8.25	8.10	8.33	8.10	8.25	8.10	7.87	7.80	8.38	7.54				
Ahouanwanou, Odile (BEN) (1991)	time	2.75	3.81	4.83	5.86	6.90	7.95	8.99	10.03	11.09	12.15		13.31	4 / 6			
	reaction time	0.177													3.11	3.13	3.16
	interval		7 steps	1.06	1.02	1.03	1.04	1.05	1.04	1.04	1.06	1.06	1.16		8.20	8.15	8.07
	velocity	4.73	8.02	8.33	8.25	8.17	8.10	8.17	8.17	8.02	8.02	8.66	7.51				
Kunz, Annie (USA) (1993)	time	2.58	3.60	4.62	5.66	6.88	7.97	9.06	10.15	11.22	12.30		13.49	9 / 7			
	reaction time	0.137													3.08	3.40	3.24
	interval		7 steps	1.02	1.02	1.04	1.22	1.09	1.09	1.09	1.07	1.08	1.19		8.28	7.50	7.87
	velocity	5.04	8.33	8.33	8.17	6.97	7.80	7.80	7.80	7.94	7.87	8.45	7.41				
Krizsán, Xénia (HUN) (1993)	time	2.66	3.75	4.83	5.86	6.95	7.98	9.02	10.14	11.22	12.34		13.58	8 / 8			
	reaction time	0.152													3.20	3.16	3.32
	interval		1.09	1.08	1.03	1.09	1.03	1.04	1.12	1.08	1.12	1.24			7.97	8.07	7.68
	velocity	4.89	7.80	7.87	8.25	7.80	8.25	8.17	7.59	7.87	7.59	8.10	7.36				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field/day-12-morning-session-athletics-tokyo-2020-replays>

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

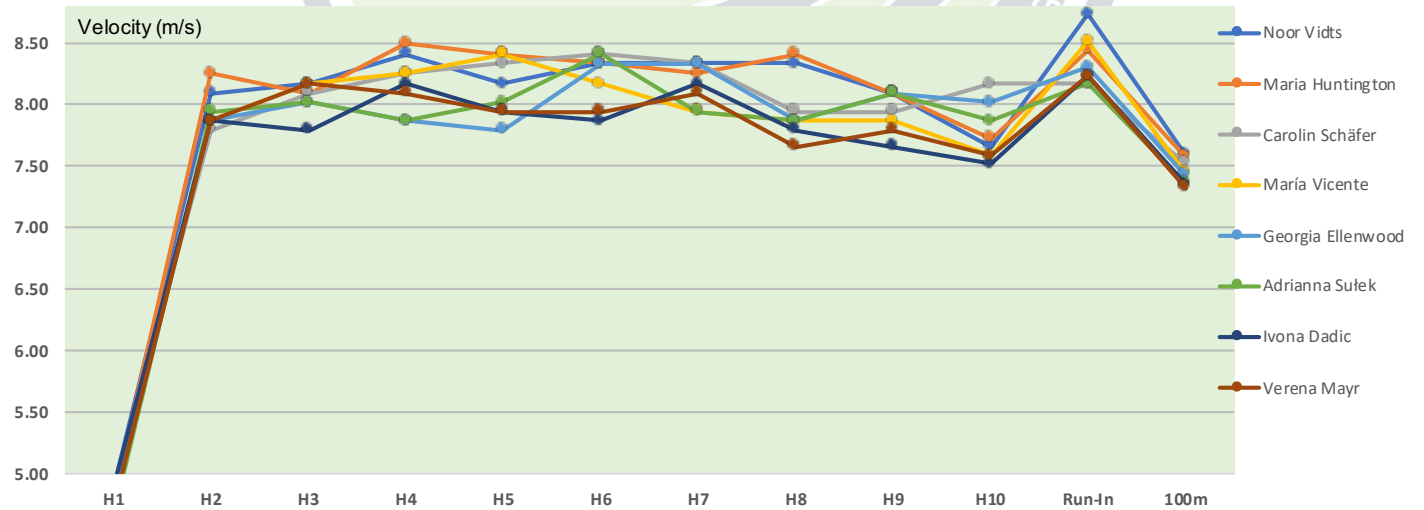
100m Hurdles

Date: 2021.08.04

Wind: 0.3 m/s

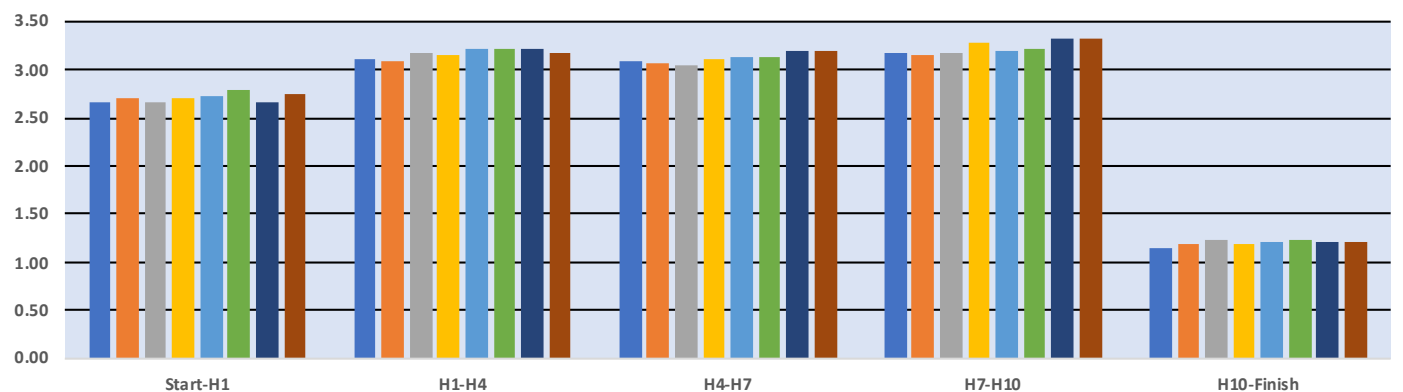
Heptathlon - Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Vidts, Noor (BEL) (1996)	time	2.66	3.71	4.75	5.76	6.80	7.82	8.84	9.86	10.91	12.02	13.17	13.17	8 / 1			
	reaction time	0.129													3.10	3.08	3.18
	interval		1.05	1.04	1.01	1.04	1.02	1.02	1.02	1.05	1.11	1.15	PB		8.23	8.28	8.02
	velocity	4.89	8.10	8.17	8.42	8.17	8.33	8.33	8.33	8.10	7.66	8.74	7.59				
Huntington, Maria (FIN) (1997)	time	2.71	3.74	4.79	5.79	6.80	7.82	8.85	9.86	10.91	12.01	13.20	13.20	6 / 2			
	reaction time	0.190													3.08	3.06	3.16
	interval		1.03	1.05	1.00	1.01	1.02	1.03	1.01	1.05	1.10	1.19			8.28	8.33	8.07
	velocity	4.80	8.25	8.10	8.50	8.42	8.33	8.25	8.42	8.10	7.73	8.45	7.58				
Schäfer, Carolin (GER) (1991)	time	2.66	3.75	4.80	5.83	6.85	7.86	8.88	9.95	11.02	12.06	13.29	13.29	9 / 3			
	reaction time	0.141													3.17	3.05	3.18
	interval		1.09	1.05	1.03	1.02	1.01	1.02	1.07	1.07	1.04	1.23			8.04	8.36	8.02
	velocity	4.89	7.80	8.10	8.25	8.33	8.42	8.33	7.94	7.94	8.17	8.17	7.52				
Vicente, Maria (ESP) (2001)	time	2.71	3.79	4.83	5.86	6.87	7.91	8.98	10.06	11.14	12.26	13.44	13.44	2 / 4			
	reaction time	0.154													3.15	3.12	3.28
	interval		1.08	1.04	1.03	1.01	1.04	1.07	1.08	1.08	1.12	1.18			8.10	8.17	7.77
	velocity	4.80	7.87	8.17	8.25	8.42	8.17	7.94	7.87	7.87	7.59	8.52	7.44				
Ellenwood, Georgia (CAN) (1995)	time	2.72	3.80	4.86	5.94	7.03	8.05	9.07	10.15	11.20	12.26	13.47	13.47	5 / 5			
	reaction time	0.158													3.22	3.13	3.19
	interval		1.08	1.06	1.08	1.09	1.02	1.02	1.08	1.05	1.06	1.21			7.92	8.15	7.99
	velocity	4.78	7.87	8.02	7.87	7.80	8.33	8.33	7.87	8.10	8.02	8.31	7.42				
Sulek, Adrianna (POL) (1999)	time	2.79	3.86	4.92	6.00	7.06	8.07	9.14	10.22	11.27	12.35	13.58	13.58	3 / 6			
	reaction time	0.182													3.21	3.14	3.21
	interval		1.07	1.06	1.08	1.06	1.01	1.07	1.08	1.05	1.08	1.23			7.94	8.12	7.94
	velocity	4.66	7.94	8.02	7.87	8.02	8.42	7.94	7.87	8.10	7.87	8.17	7.36				
Dadic, Ivona (AUT) (1993)	time	2.66	3.74	4.83	5.87	6.94	8.02	9.06	10.15	11.26	12.39	13.61	13.61	7 / 7			
	reaction time	0.140													3.21	3.19	3.33
	interval		1.08	1.09	1.04	1.07	1.08	1.04	1.09	1.11	1.13	1.22			7.94	7.99	7.66
	velocity	4.89	7.87	7.80	8.17	7.94	7.87	8.17	7.80	7.66	7.52	8.24	7.35				
Mayr, Verena (AUT) (1995)	time	2.75	3.83	4.87	5.92	6.99	8.06	9.11	10.22	11.31	12.43	13.65	13.65	4 / 8			
	reaction time	0.149													3.17	3.19	3.32
	interval		1.08	1.04	1.05	1.07	1.07	1.05	1.11	1.09	1.12	1.22			8.04	7.99	7.68
	velocity	4.73	7.87	8.17	8.10	7.94	7.94	8.10	7.66	7.80	7.59	8.24	7.33				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field-day-12-morning-session-athletics-tokyo-2020-replays>

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

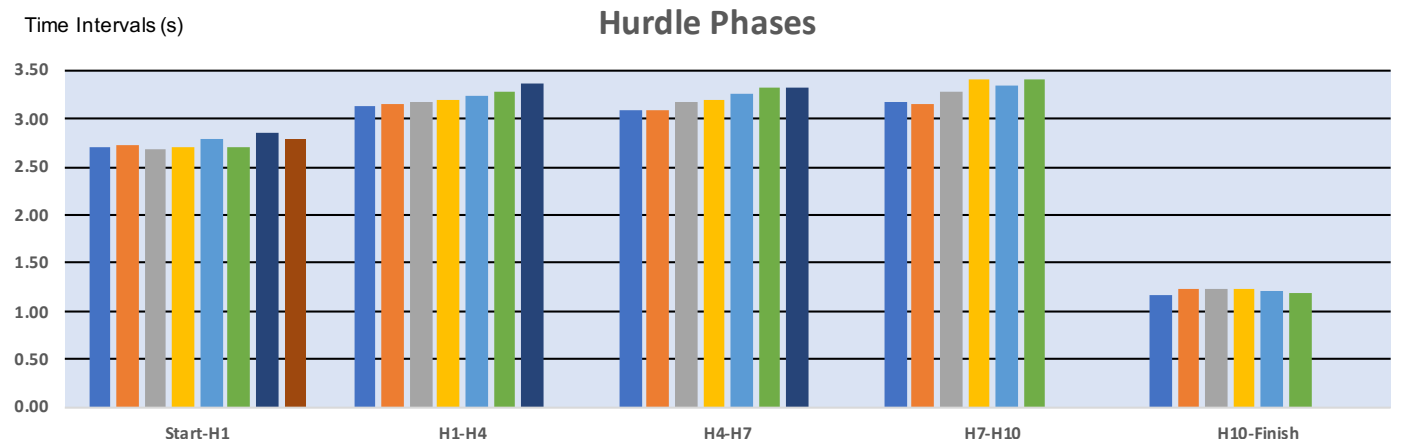
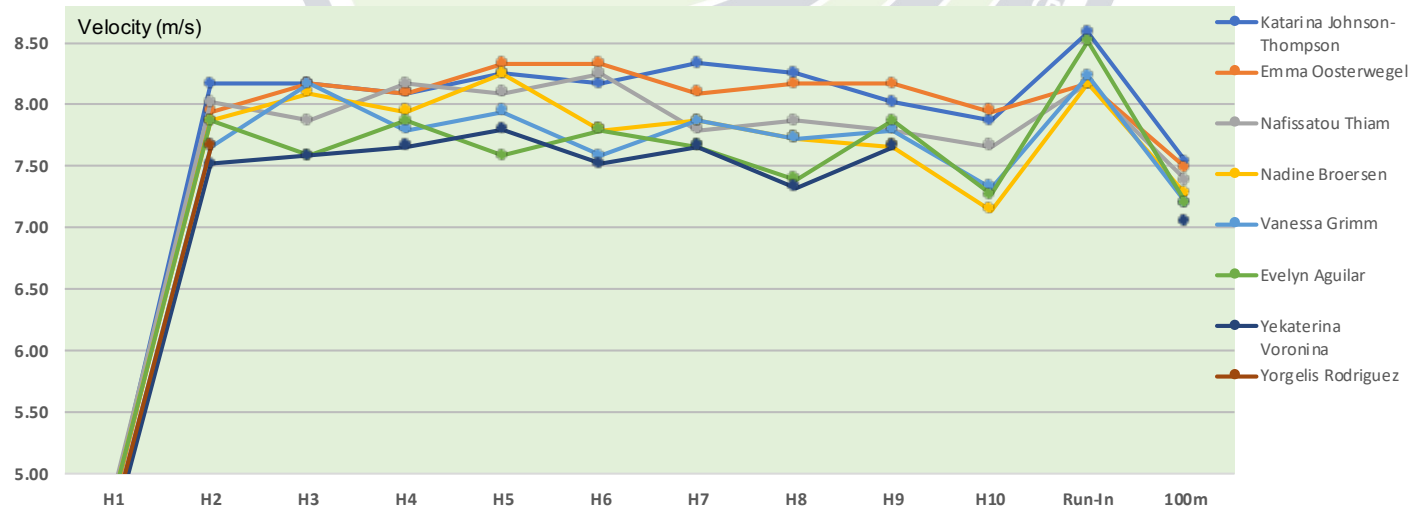
100m Hurdles

Date: 2021.08.04

Wind: 0.2 m/s

Heptathlon - Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Johnson-Thompson, Katarina (GBR)	time	2.71	3.75	4.79	5.84	6.87	7.91	8.93	9.96	11.02	12.10		13.27	7 / 1			
	reaction time	0.166													3.13	3.09	3.17
	interval velocity	7 steps	1.04	1.04	1.05	1.03	1.04	1.02	1.03	1.06	1.08	1.17			8.15	8.25	8.04
Oosterwegel, Emma (NED) (1998)	time	2.73	3.80	4.84	5.89	6.91	7.93	8.98	10.02	11.06	12.13		13.36	5 / 2			
	reaction time	0.176													3.16	3.09	3.15
	interval velocity		1.07	1.04	1.05	1.02	1.02	1.05	1.04	1.04	1.07	1.23	PB		8.07	8.25	8.10
Thiam, Nafissatou (BEL) (1994)	time	2.68	3.74	4.82	5.86	6.91	7.94	9.03	10.11	11.20	12.31		13.54	8 / 3			
	reaction time	0.156													3.18	3.17	3.28
	interval velocity		1.06	1.08	1.04	1.05	1.03	1.09	1.08	1.09	1.11	1.23			8.02	8.04	7.77
Broersen, Nadine (NED) (1990)	time	2.71	3.79	4.84	5.91	6.94	8.03	9.11	10.21	11.32	12.51		13.74	3 / 4			
	reaction time	0.146													3.20	3.20	3.40
	interval velocity		1.08	1.05	1.07	1.03	1.09	1.08	1.10	1.11	1.19	1.23			7.97	7.97	7.50
Grimm, Vanessa (GER) (1997)	time	2.80	3.91	4.95	6.04	7.11	8.23	9.31	10.41	11.50	12.66		13.88	6 / 5			
	reaction time	0.176													3.24	3.27	3.35
	interval velocity		1.11	1.04	1.09	1.07	1.12	1.08	1.10	1.09	1.16	1.22			7.87	7.80	7.61
Aguilar, Evelyn (COL) (1993)	time	2.71	3.79	4.91	5.99	7.11	8.20	9.31	10.46	11.54	12.71		13.89	4 / 6			
	reaction time	0.133													3.28	3.32	3.40
	interval velocity		1.08	1.12	1.08	1.12	1.09	1.11	1.15	1.08	1.17	1.18			7.77	7.68	7.50
Voronina, Yekaterina (UZB) (1992)	time	2.86	3.99	5.11	6.22	7.31	8.44	9.55	10.71	11.82			14.19	9 / 7			
	reaction time	0.179													3.36	3.33	
	interval velocity		1.13	1.12	1.11	1.09	1.13	1.11	1.16	1.11					7.59	7.66	
Rodriguez, Yorgelis (CUB) (1995)	time	2.80	3.91										dnf	2 / --			
	reaction time	0.132															
	interval velocity		1.11														
	velocity	4.64	7.66														



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field-day-12-morning-session-athletics-tokyo-2020-replays>

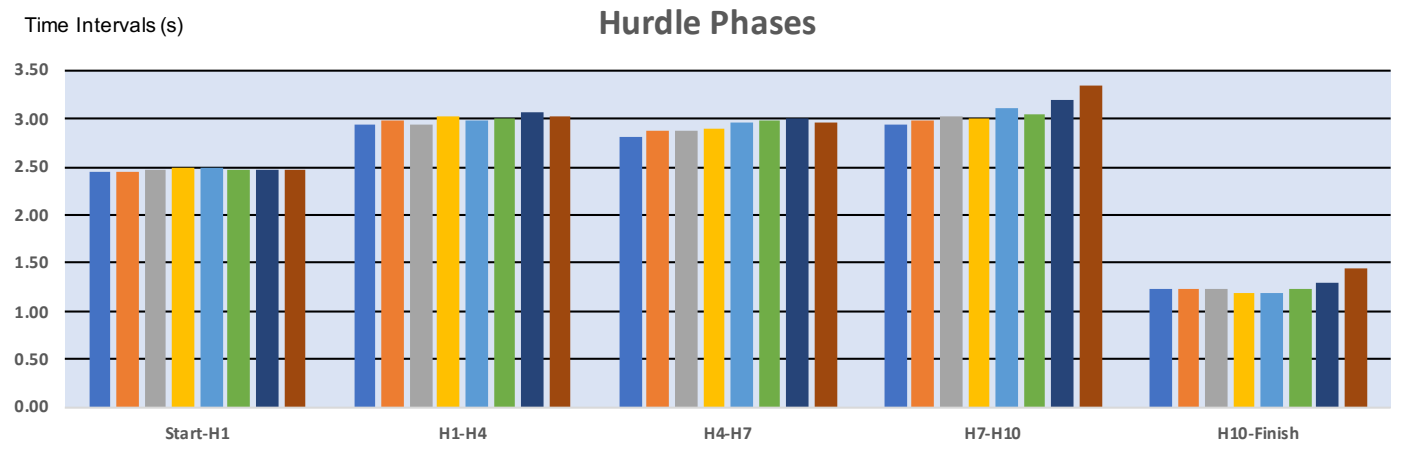
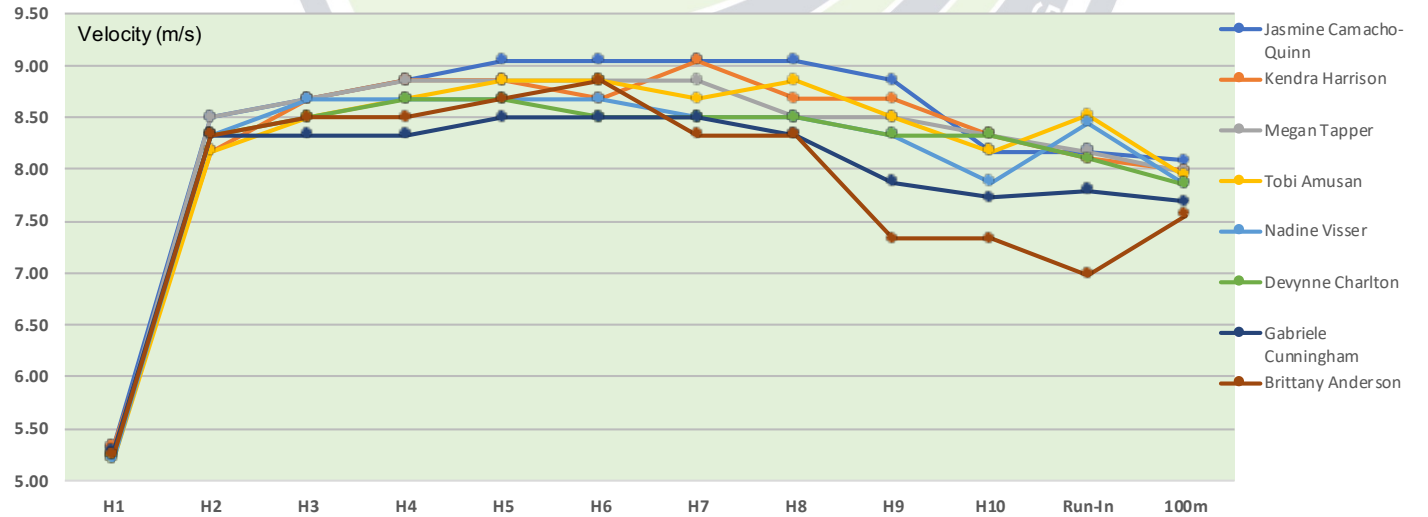
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

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	2.94	2.82	2.94
	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					
	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	2.98	2.88	2.98
	reaction time	0.158															
	interval		1.04	0.98	0.96	0.96	0.98	0.94	0.98	0.98	1.02	1.24					
	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	2.94	2.88	3.02
	reaction time	0.166															
	interval		1.00	0.98	0.96	0.96	0.96	0.96	1.00	1.00	1.02	1.23					
	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	3.02	2.90	3.00
	reaction time	0.161															
	interval		1.04	1.00	0.98	0.96	0.96	0.98	0.96	1.00	1.04	1.18					
	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	2.98	2.96	3.10
	reaction time	0.152															
	interval		1.02	0.98	0.98	0.98	0.98	1.00	1.00	1.02	1.08	1.19					
	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	3.00	2.98	3.04
	reaction time	0.144															
	interval		1.02	1.00	0.98	0.98	1.00	1.00	1.00	1.02	1.02	1.24					
	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	3.06	3.00	3.20
	reaction time	0.172															
	interval		1.02	1.02	1.02	1.00	1.00	1.00	1.02	1.08	1.10	1.29					
	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	3.02	2.96	3.34
	reaction time	0.164															
	interval		1.02	1.00	1.00	0.98	0.96	1.02	1.02	1.16	1.16	1.44					
	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



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)

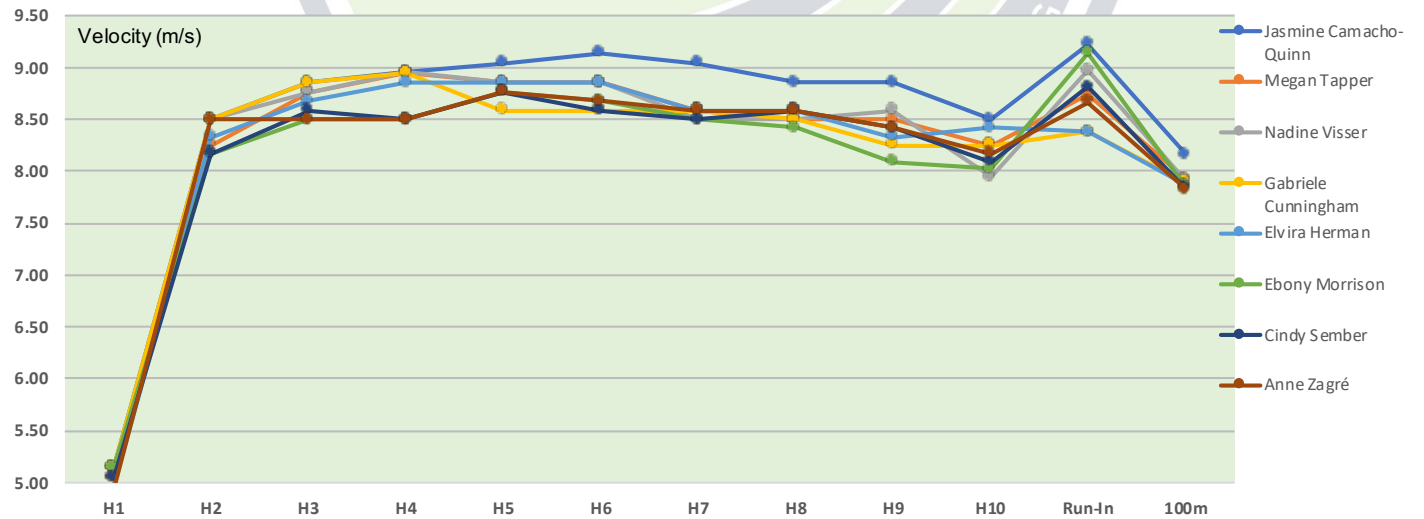
100m Hurdles

Date: 2021.08.01

Wind: -0.2 m/s

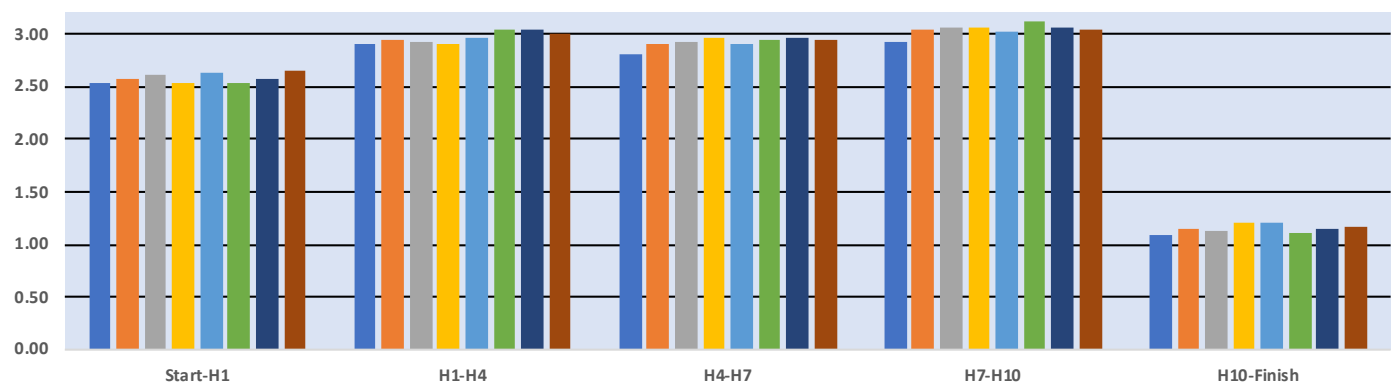
Semi-Final 3

		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)	time	2.53	3.53	4.49	5.44	6.38	7.31	8.25	9.21	10.17	11.17		12.26	7 / 1			
	reaction time	0.175															
	interval		1.00	0.96	0.95	0.94	0.93	0.94	0.96	0.96	1.00	1.09	OR AR PB		2.91	2.81	2.92
	velocity	5.14	8.50	8.85	8.95	9.04	9.14	9.04	8.85	8.85	8.50	9.22	8.16		8.76	9.07	8.73
Tapper, Megan (JAM) (1994)	time	2.58	3.61	4.58	5.53	6.49	7.45	8.44	9.44	10.44	11.47		12.62	4 / 2			
	reaction time	0.155															
	interval		1.03	0.97	0.95	0.96	0.96	0.99	1.00	1.00	1.03	1.15			2.95	2.91	3.03
	velocity	5.04	8.25	8.76	8.95	8.85	8.85	8.59	8.50	8.50	8.25	8.74	7.92		8.64	8.76	8.42
Visser, Nadine (NED) (1995)	time	2.61	3.61	4.58	5.53	6.49	7.45	8.45	9.45	10.44	11.51		12.63	6 / 3			
	reaction time	0.156															
	interval		1.00	0.97	0.95	0.96	0.96	1.00	1.00	0.99	1.07	1.12			2.92	2.92	3.06
	velocity	4.98	8.50	8.76	8.95	8.85	8.85	8.50	8.50	8.59	7.94	8.97	7.92		8.73	8.73	8.33
Cunningham, Gabriele (USA) (1998)	time	2.53	3.53	4.49	5.44	6.43	7.42	8.41	9.41	10.44	11.47		12.67	8 / 4			
	reaction time	0.165															
	interval		1.00	0.96	0.95	0.99	0.99	0.99	1.00	1.03	1.03	1.20			2.91	2.97	3.06
	velocity	5.14	8.50	8.85	8.95	8.59	8.59	8.59	8.50	8.25	8.25	8.38	7.89		8.76	8.59	8.33
Herman, Elvira (BLR) (1997)	time	2.62	3.64	4.62	5.58	6.54	7.50	8.49	9.48	10.50	11.51		12.71	9 / 5			
	reaction time	0.129															
	interval		1.02	0.98	0.96	0.96	0.96	0.99	0.99	1.02	1.01	1.20			2.96	2.91	3.02
	velocity	4.96	8.33	8.67	8.85	8.85	8.85	8.59	8.59	8.33	8.42	8.37	7.87		8.61	8.76	8.44
Morrison, Ebony (LBR) (1994)	time	2.53	3.57	4.57	5.57	6.54	7.52	8.52	9.53	10.58	11.64		12.74	2 / 6			
	reaction time	0.144															
	interval		1.04	1.00	1.00	0.97	0.98	1.00	1.01	1.05	1.06	1.10	NR PB		3.04	2.95	3.12
	velocity	5.14	8.17	8.50	8.50	8.76	8.67	8.50	8.42	8.10	8.02	9.14	7.85		8.39	8.64	8.17
Sember, Cindy (GBR) (1994)	time	2.58	3.62	4.61	5.61	6.58	7.57	8.57	9.56	10.57	11.62		12.76	3 / 7			
	reaction time	0.163															
	interval		1.04	0.99	1.00	0.97	0.99	1.00	0.99	1.01	1.05	1.14			3.03	2.96	3.05
	velocity	5.04	8.17	8.59	8.50	8.76	8.59	8.50	8.59	8.42	8.10	8.82	7.84		8.42	8.61	8.36
Zagré, Anne (BEL) (1990)	time	2.64	3.64	4.64	5.64	6.61	7.59	8.58	9.57	10.58	11.62		12.78	5 / 8			
	reaction time	0.153															
	interval		1.00	1.00	1.00	0.97	0.98	0.99	0.99	1.01	1.04	1.16			3.00	2.94	3.04
	velocity	4.92	8.50	8.50	8.50	8.76	8.67	8.59	8.59	8.42	8.17	8.66	7.82		8.50	8.67	8.39



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field-day-9-evening-session-athletics-tokyo-2020-replays>

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

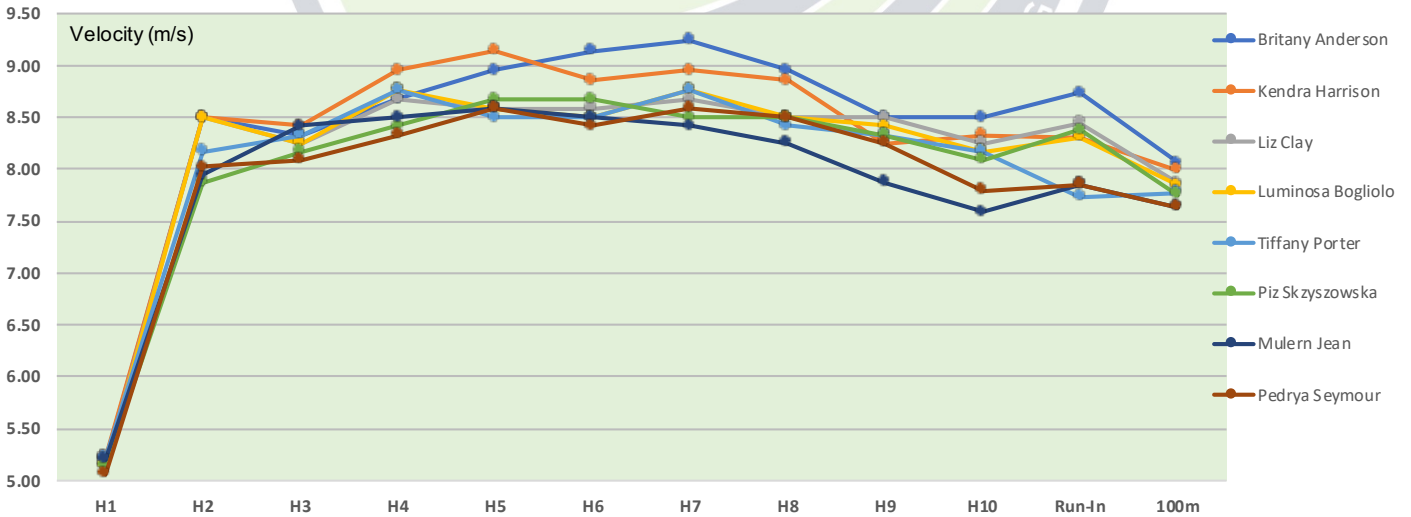
100m Hurdles

Date: 2021.08.01

Wind: 0.0 m/s

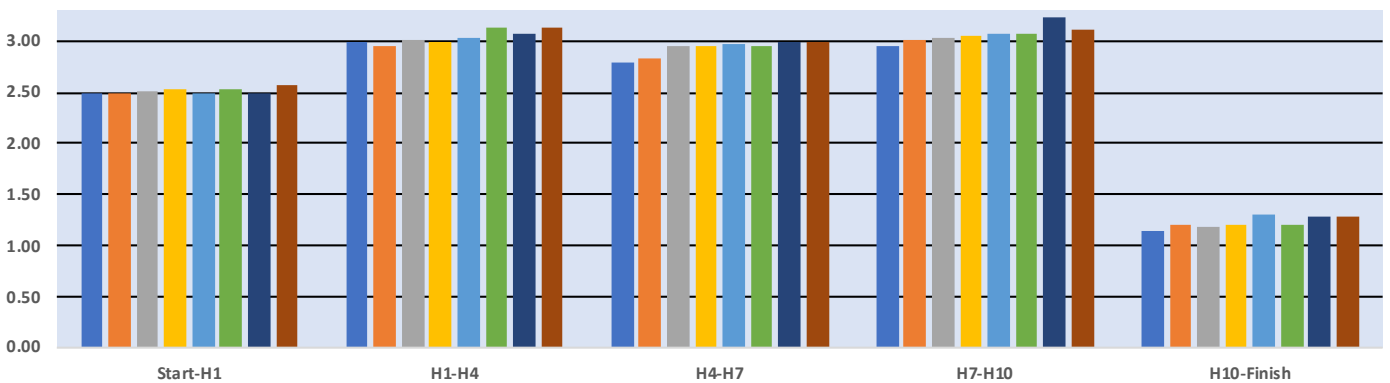
Semi-Final 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Anderson, Britany (JAM) (2001)	time	2.50	3.50	4.52	5.50	6.45	7.38	8.30	9.25	10.25	11.25	12.40		4 / 1			
	reaction time	0.166											PB		3.00	2.80	2.95
	interval		1.00	1.02	0.98	0.95	0.93	0.92	0.95	1.00	1.00	1.15	8.06		8.50	9.11	8.64
	velocity	5.20	8.50	8.33	8.67	8.95	9.14	9.24	8.95	8.50	8.50	8.74	8.06				
Harrison, Kendra (USA) (1992)	time	2.49	3.49	4.50	5.45	6.38	7.34	8.29	9.25	10.28	11.30	12.51		7 / 2			
	reaction time	0.153													2.96	2.84	3.01
	interval		1.00	1.01	0.95	0.93	0.96	0.95	0.96	1.03	1.02	1.21	7.99		8.61	8.98	8.47
	velocity	5.22	8.50	8.42	8.95	9.14	8.85	8.95	8.85	8.25	8.33	8.31	7.99				
Clay, Liz (AUS) (1995)	time	2.52	3.52	4.55	5.53	6.52	7.51	8.49	9.49	10.49	11.52	12.71		6 / 3			
	reaction time	0.142													3.01	2.96	3.03
	interval		1.00	1.03	0.98	0.99	0.99	0.98	1.00	1.00	1.03	1.19	7.87		8.47	8.61	8.42
	velocity	5.16	8.50	8.25	8.67	8.59	8.59	8.67	8.50	8.50	8.25	8.45	7.87				
Bogliolo, Luminosa (ITA) (1995)	time	2.53	3.53	4.56	5.53	6.52	7.52	8.49	9.49	10.50	11.54	12.75		8 / 4			
	reaction time	0.143													3.00	2.96	3.05
	interval		1.00	1.03	0.97	0.99	1.00	0.97	1.00	1.01	1.04	1.21	7.84		8.50	8.61	8.36
	velocity	5.14	8.50	8.25	8.76	8.59	8.50	8.76	8.50	8.42	8.17	8.31	7.84				
Porter, Tiffany (GBR) (1987)	time	2.49	3.53	4.55	5.52	6.52	7.52	8.49	9.50	10.52	11.56	12.86		9 / 5			
	reaction time	0.150													3.03	2.97	3.07
	interval		1.04	1.02	0.97	1.00	1.00	0.97	1.01	1.02	1.04	1.30	7.78		8.42	8.59	8.31
	velocity	5.22	8.17	8.33	8.76	8.50	8.50	8.76	8.42	8.33	8.17	7.73	7.78				
Skrzyszowska, Pia (POL) (2001)	time	2.53	3.61	4.65	5.66	6.64	7.62	8.62	9.62	10.64	11.69	12.89		5 / 6			
	reaction time	0.128													3.13	2.96	3.07
	interval		1.08	1.04	1.01	0.98	0.98	1.00	1.00	1.02	1.05	1.20	7.76		8.15	8.61	8.31
	velocity	5.14	7.87	8.17	8.42	8.67	8.67	8.50	8.50	8.33	8.10	8.37	7.76				
Jean, Mulern (HAI) (1992)	time	2.50	3.57	4.58	5.58	6.57	7.57	8.58	9.61	10.69	11.81	13.09		2 / 7			
	reaction time	0.156													3.08	3.00	3.23
	interval		1.07	1.01	1.00	0.99	1.00	1.01	1.03	1.08	1.12	1.28	7.64		8.28	8.50	7.89
	velocity	5.20	7.94	8.42	8.50	8.59	8.50	8.42	8.25	7.87	7.59	7.85	7.64				
Seymour, Pedrya (BAH) (1995)	time	2.57	3.63	4.68	5.70	6.69	7.70	8.69	9.69	10.72	11.81	13.09		3 / 8			
	reaction time	0.185													3.13	2.99	3.12
	interval		1.06	1.05	1.02	0.99	1.01	0.99	1.00	1.03	1.09	1.28	7.64		8.15	8.53	8.17
	velocity	5.06	8.02	8.10	8.33	8.59	8.42	8.59	8.50	8.25	7.80	7.85	7.64				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field/day-9-evening-session-athletics-tokyo-2020-replays>

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

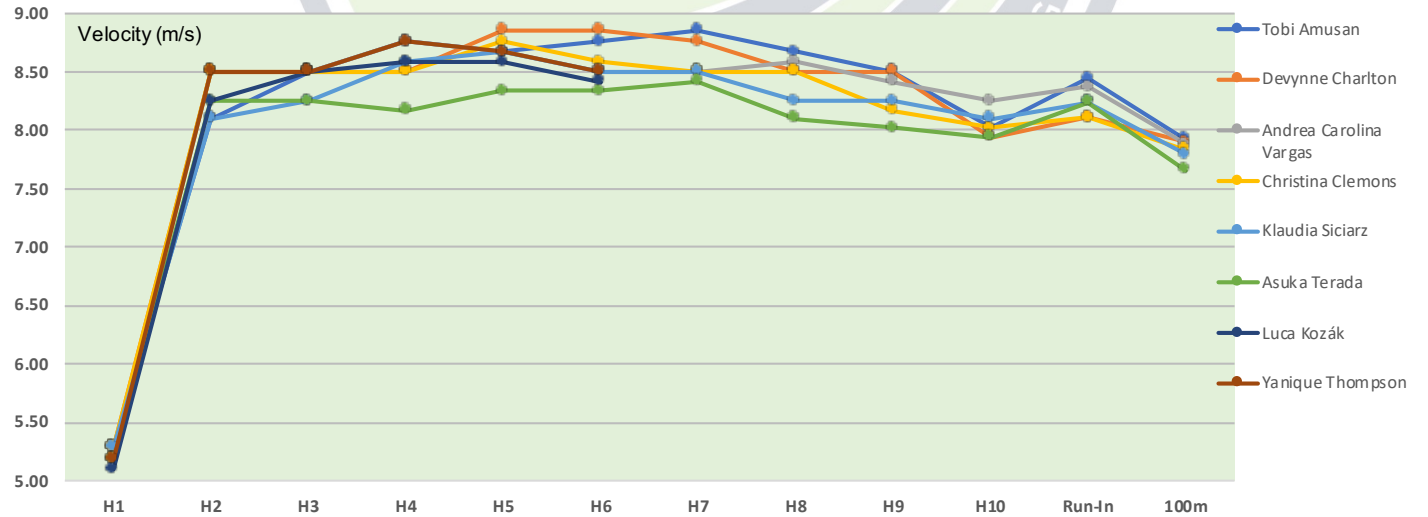
100m Hurdles

Date: 2021.08.01

Wind: -0.8 m/s

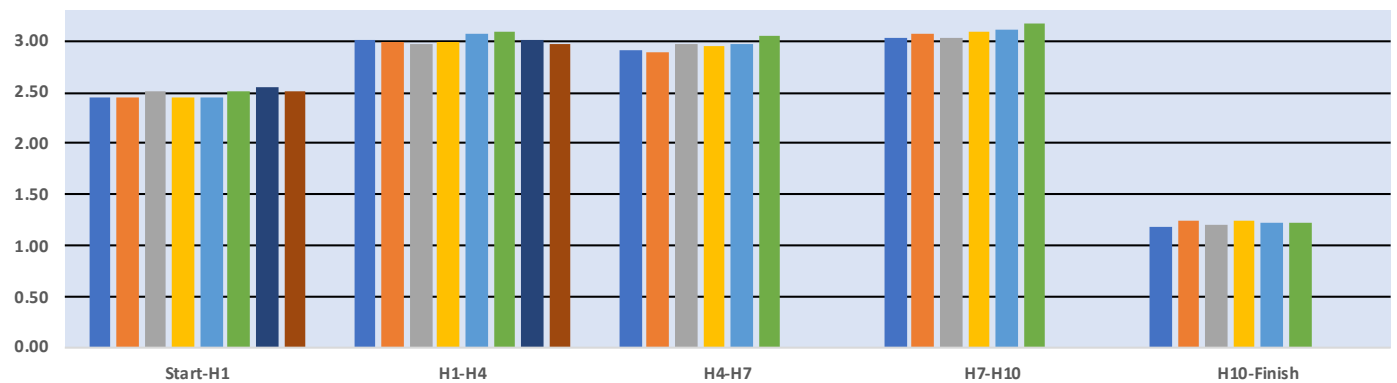
Semi-Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Amusan, Tobi (NGR) (1997)	time	2.46	3.51	4.51	5.48	6.46	7.43	8.39	9.37	10.37	11.43		12.62	5 / 1			
	reaction time	0.148													3.02	2.91	3.04
	interval		1.05	1.00	0.97	0.98	0.97	0.96	0.98	1.00	1.06	1.19			8.44	8.76	8.39
	velocity	5.28	8.10	8.50	8.76	8.67	8.76	8.85	8.67	8.50	8.02	8.45	7.92				
Charlton, Devynne (BAH) (1995)	time	2.46	3.46	4.46	5.46	6.42	7.38	8.35	9.35	10.35	11.42		12.66	8 / 2			
	reaction time	0.134													3.00	2.89	3.07
	interval		1.00	1.00	1.00	0.96	0.96	0.97	1.00	1.00	1.07	1.24			8.50	8.82	8.31
	velocity	5.28	8.50	8.50	8.50	8.85	8.85	8.76	8.50	8.50	7.94	8.10	7.90				
Vargas, Andrea Carolina (CRC) (1996)	time	2.51	3.51	4.51	5.48	6.46	7.46	8.46	9.45	10.46	11.49		12.69	4 / 3			
	reaction time	0.139													2.97	2.98	3.03
	interval		1.00	1.00	0.97	0.98	1.00	1.00	0.99	1.01	1.03	1.20			8.59	8.56	8.42
	velocity	5.18	8.50	8.50	8.76	8.67	8.50	8.50	8.59	8.42	8.25	8.38	7.88				
Clemons, Christina (USA) (1990)	time	2.46	3.46	4.46	5.46	6.43	7.42	8.42	9.42	10.46	11.52		12.76	7 / 4			
	reaction time	0.118													3.00	2.96	3.10
	interval		1.00	1.00	1.00	0.97	0.99	1.00	1.00	1.04	1.06	1.24			8.50	8.61	8.23
	velocity	5.28	8.50	8.50	8.50	8.76	8.59	8.50	8.50	8.17	8.02	8.10	7.84				
Siciarz, Klaudia (POL) (1998)	time	2.46	3.51	4.54	5.53	6.51	7.51	8.51	9.54	10.57	11.62		12.84	2 / 5			
	reaction time	0.146													3.07	2.98	3.11
	interval		1.05	1.03	0.99	0.98	1.00	1.00	1.03	1.03	1.05	1.22			8.31	8.56	8.20
	velocity	5.28	8.10	8.25	8.59	8.67	8.50	8.50	8.25	8.25	8.10	8.24	7.79				
Terada, Asuka (JPN) (1990)	time	2.51	3.54	4.57	5.61	6.63	7.65	8.66	9.71	10.77	11.84		13.06	3 / 6			
	reaction time	0.163													3.10	3.05	3.18
	interval		1.03	1.03	1.04	1.02	1.02	1.01	1.05	1.06	1.07	1.22			8.23	8.36	8.02
	velocity	5.18	8.25	8.25	8.17	8.33	8.33	8.42	8.10	8.02	7.94	8.24	7.66				
Kozák, Luca (HUN) (1996)	time	2.55	3.58	4.58	5.57	6.56	7.57						dnf	9 / --			
	reaction time	0.164													3.02		
	interval		1.03	1.00	0.99	0.99	1.01								8.44		
	velocity	5.10	8.25	8.50	8.59	8.59	8.42										
Thompson, Yanique (JAM) (1996)	time	2.51	3.51	4.51	5.48	6.46	7.46						dnf	6 / --			
	reaction time	0.145													2.97		
	interval		1.00	1.00	0.97	0.98	1.00								8.59		
	velocity	5.18	8.50	8.50	8.76	8.67	8.50										



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field-day-9-evening-session-athletics-tokyo-2020-replays>

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

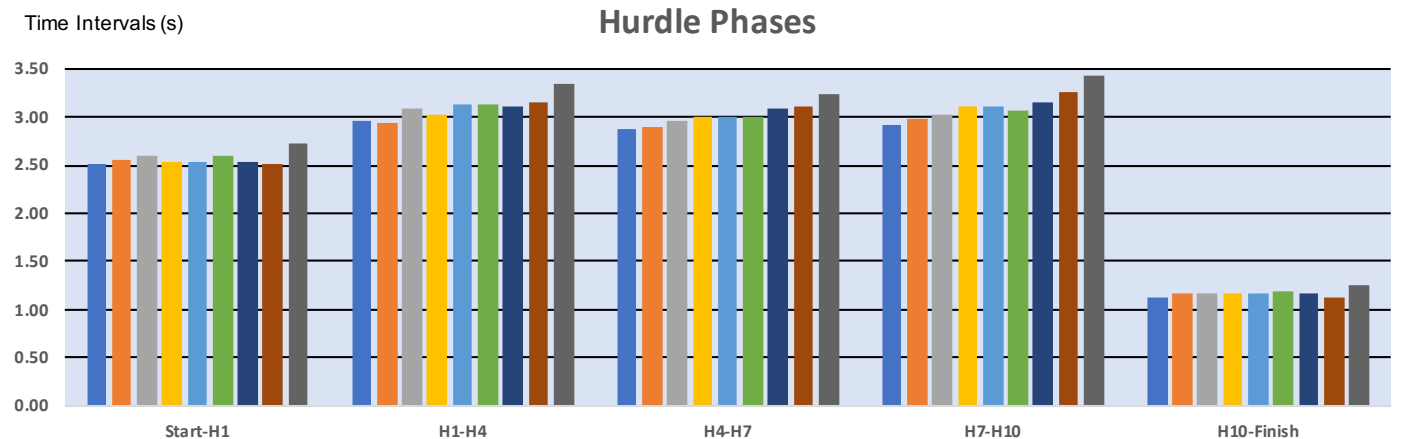
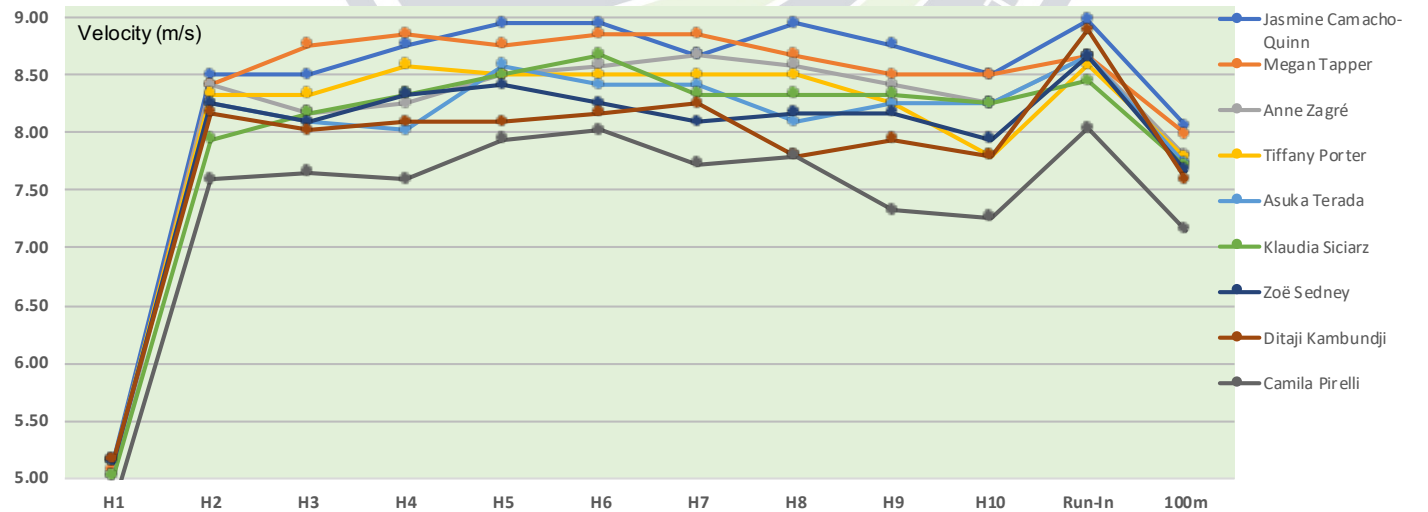
100m Hurdles

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)	time	2.52	3.52	4.52	5.49	6.44	7.39	8.37	9.32	10.29	11.29		12.41	2/1			
	reaction time	0.153													2.97	2.88	2.92
	interval		1.00	1.00	0.97	0.95	0.95	0.98	0.95	0.97	1.00	1.12			8.59	8.85	8.73
	velocity	5.16	8.50	8.50	8.76	8.95	8.95	8.67	8.95	8.76	8.50	8.97	8.06				
Tapper, Megan (JAM) (1994)	time	2.56	3.57	4.54	5.50	6.47	7.43	8.39	9.37	10.37	11.37		12.53	5/2			
	reaction time	0.163													2.94	2.89	2.98
	interval		1.01	0.97	0.96	0.97	0.96	0.96	0.98	1.00	1.00	1.16			8.67	8.82	8.56
	velocity	5.08	8.42	8.76	8.85	8.76	8.85	8.85	8.67	8.50	8.50	8.66	7.98				
Zagré, Anne (BEL) (1990)	time	2.59	3.60	4.64	5.67	6.67	7.66	8.64	9.63	10.64	11.67		12.83	8/3			
	reaction time	0.153													3.08	2.97	3.03
	interval		1.01	1.04	1.03	1.00	0.99	0.98	0.99	1.01	1.03	1.16			8.28	8.59	8.42
	velocity	5.02	8.42	8.17	8.25	8.50	8.59	8.67	8.59	8.42	8.25	8.66	7.79				
Porter, Tiffany (GBR) (1987)	time	2.53	3.55	4.57	5.56	6.56	7.56	8.56	9.56	10.59	11.68		12.85	6/4			
	reaction time	0.139													3.03	3.00	3.12
	interval		1.02	1.02	0.99	1.00	1.00	1.00	1.00	1.03	1.09	1.17			8.42	8.50	8.17
	velocity	5.14	8.33	8.33	8.59	8.50	8.50	8.50	8.50	8.25	7.80	8.59	7.78				
Terada, Asuka (JPN) (1990)	time	2.53	3.56	4.61	5.67	6.66	7.67	8.68	9.73	10.76	11.79		12.95	4/5			
	reaction time	0.164													3.14	3.01	3.11
	interval		1.03	1.05	1.06	0.99	1.01	1.01	1.05	1.03	1.03	1.16			8.12	8.47	8.20
	velocity	5.14	8.25	8.10	8.02	8.59	8.42	8.42	8.10	8.25	8.25	8.66	7.72				
Siczarz, Klaudia (POL) (1998)	time	2.59	3.66	4.70	5.72	6.72	7.70	8.72	9.74	10.76	11.79		12.98	3/6			
	reaction time	0.165													3.13	3.00	3.07
	interval		1.07	1.04	1.02	1.00	0.98	1.02	1.02	1.02	1.03	1.19			8.15	8.50	8.31
	velocity	5.02	7.94	8.17	8.33	8.50	8.67	8.33	8.33	8.33	8.25	8.45	7.70				
Sedney, Zoë (NED) (2001)	time	2.53	3.56	4.61	5.63	6.64	7.67	8.72	9.76	10.80	11.87		13.03	9/7			
	reaction time	0.162													3.10	3.09	3.15
	interval		1.03	1.05	1.02	1.01	1.03	1.05	1.04	1.04	1.07	1.16			8.23	8.25	8.10
	velocity	5.14	8.25	8.10	8.33	8.42	8.25	8.10	8.17	8.17	7.94	8.66	7.67				
Kambundji, Ditaji (SUI) (2002)	time	2.52	3.56	4.62	5.67	6.72	7.76	8.79	9.88	10.95	12.04		13.17	7/8			
	reaction time	0.138													3.15	3.12	3.25
	interval		1.04	1.06	1.05	1.05	1.04	1.03	1.09	1.07	1.09	1.13			8.10	8.17	7.85
	velocity	5.16	8.17	8.02	8.10	8.10	8.17	8.25	7.80	7.94	7.80	8.89	7.59				
Pirelli, Camila (PAR) (1989)	time	2.73	3.85	4.96	6.08	7.15	8.21	9.31	10.40	11.56	12.73		13.98	1/9			
	reaction time	0.166													3.35	3.23	3.42
	interval		1.12	1.11	1.12	1.07	1.06	1.10	1.09	1.16	1.17	1.25			7.61	7.89	7.46
	velocity	4.76	7.59	7.66	7.59	7.94	8.02	7.73	7.80	7.33	7.26	8.04	7.15				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field-day-8-morning-session-athletics-tokyo-2020-replays>

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

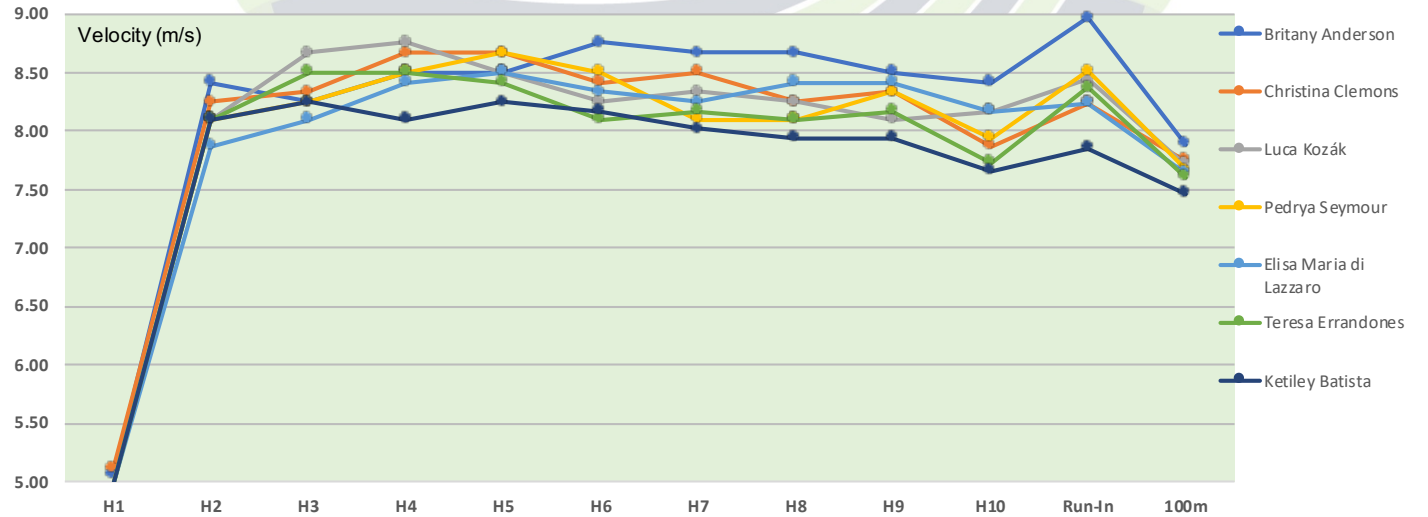
100m Hurdles

Date: 2021.07.31

Wind: -1.1 m/s

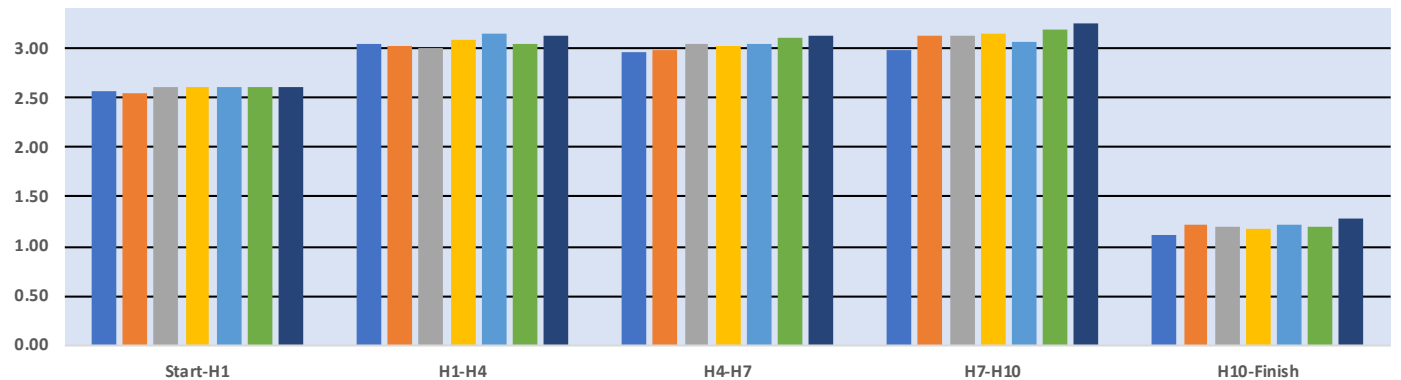
Heat 4

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Anderson, Britany (JAM) (2001)	time	2.57	3.58	4.61	5.61	6.61	7.58	8.56	9.54	10.54	11.55		12.67	9 / 1			
	reaction time														3.04	2.95	2.99
	interval		1.01	1.03	1.00	1.00	0.97	0.98	0.98	1.00	1.01	1.12			8.39	8.64	8.53
	velocity	5.06	8.42	8.25	8.50	8.50	8.76	8.67	8.67	8.50	8.42	8.97	7.89				
Clemons, Christina (USA) (1990)	time	2.54	3.57	4.59	5.57	6.55	7.56	8.56	9.59	10.61	11.69		12.91	3 / 2			
	reaction time														3.03	2.99	3.13
	interval		1.03	1.02	0.98	0.98	1.01	1.00	1.03	1.02	1.08	1.22			8.42	8.53	8.15
	velocity	5.12	8.25	8.33	8.67	8.67	8.42	8.50	8.25	8.33	7.87	8.24	7.75				
Kozák, Luca (HUN) (1996)	time	2.61	3.66	4.64	5.61	6.61	7.64	8.66	9.69	10.74	11.78		12.97	4 / 3			
	reaction time														3.00	3.05	3.12
	interval		1.05	0.98	0.97	1.00	1.03	1.02	1.03	1.05	1.04	1.19			8.50	8.36	8.17
	velocity	4.98	8.10	8.67	8.76	8.50	8.25	8.33	8.25	8.10	8.17	8.45	7.71				
Seymour, Pedrya (BAH) (1995)	time	2.61	3.66	4.69	5.69	6.67	7.67	8.72	9.77	10.79	11.86		13.04	7 / 4			
	reaction time														3.08	3.03	3.14
	interval		1.05	1.03	1.00	0.98	1.00	1.05	1.05	1.02	1.07	1.18			8.28	8.42	8.12
	velocity	4.98	8.10	8.25	8.50	8.50	8.67	8.50	8.10	8.10	8.33	7.94	8.52	7.67			
di Lazzaro, Elisa Maria (ITA) (1998)	time	2.61	3.69	4.74	5.75	6.75	7.77	8.80	9.81	10.82	11.86		13.08	5 / 5			
	reaction time														3.14	3.05	3.06
	interval		1.08	1.05	1.01	1.00	1.02	1.03	1.01	1.01	1.04	1.22			8.12	8.36	8.33
	velocity	4.98	7.87	8.10	8.42	8.50	8.33	8.25	8.42	8.42	8.17	8.24	7.65				
Errandonea, Teresa (ESP) (1994)	time	2.61	3.66	4.66	5.66	6.67	7.72	8.76	9.81	10.85	11.95		13.15	2 / 6			
	reaction time														3.05	3.10	3.19
	interval		1.05	1.00	1.00	1.01	1.05	1.04	1.05	1.04	1.10	1.20			8.36	8.23	7.99
	velocity	4.98	8.10	8.50	8.50	8.42	8.10	8.17	8.10	8.17	7.73	8.37	7.60				
Batista, Ketiley (BRA) (1999)	time	2.61	3.66	4.69	5.74	6.77	7.81	8.87	9.94	11.01	12.12		13.40	8 / 7			
	reaction time														3.13	3.13	3.25
	interval		1.05	1.03	1.05	1.03	1.04	1.06	1.07	1.07	1.11	1.28			8.15	8.15	7.85
	velocity	4.98	8.10	8.25	8.10	8.25	8.17	8.02	7.94	7.94	7.66	7.85	7.46				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field/day-8-morning-session-athletics-tokyo-2020-replays>

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

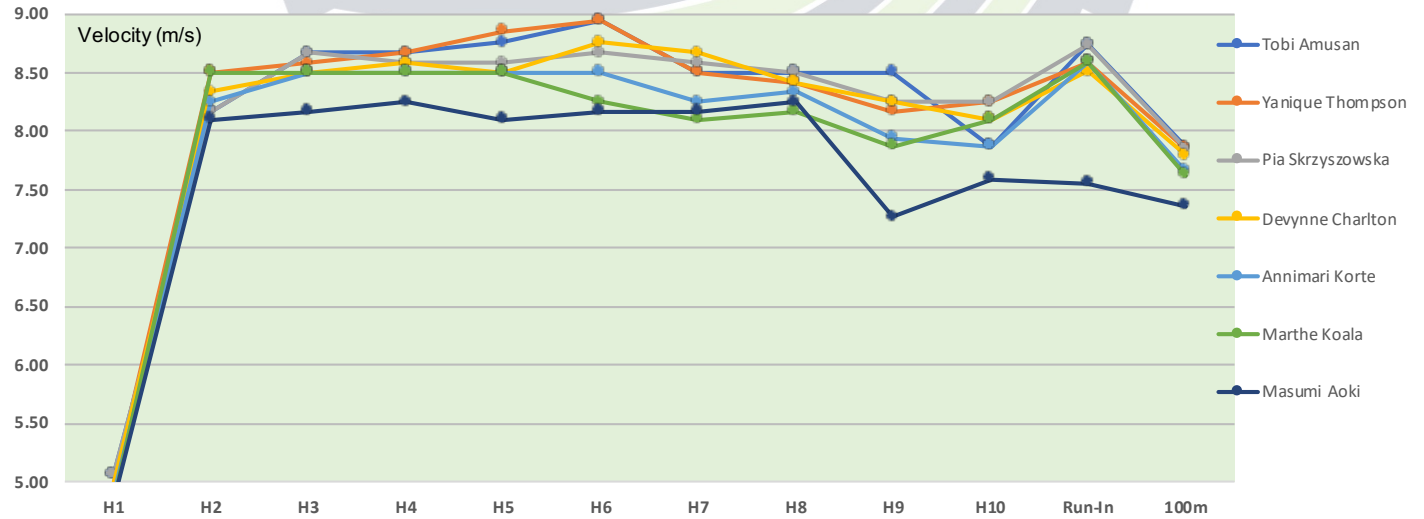
100m Hurdles

Date: 2021.07.31

Wind: 0.4 m/s

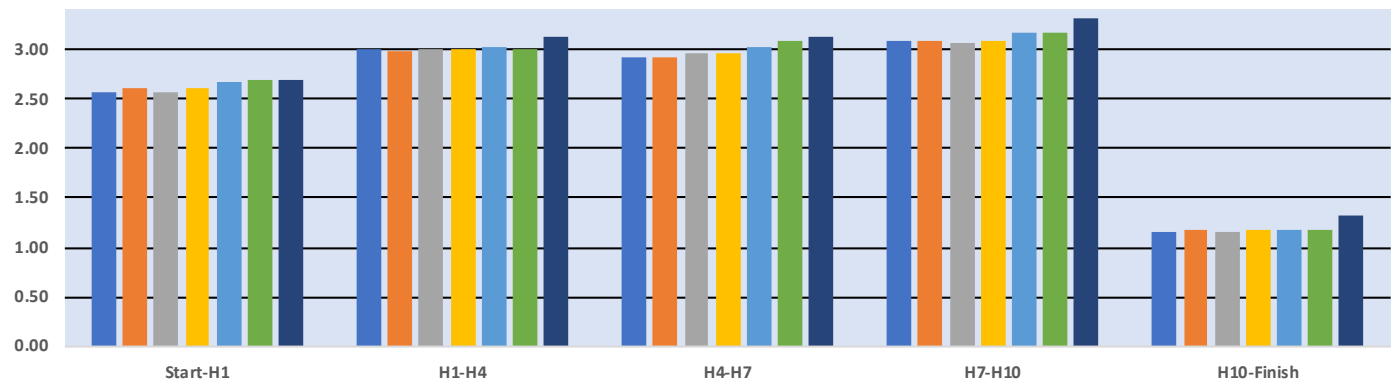
Heat 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Amusan, Tobi (NGR) (1997)	time	2.57	3.61	4.59	5.57	6.54	7.49	8.49	9.49	10.49	11.57		12.72	4 / 1			
	reaction time	0.134													3.00	2.92	3.08
	interval		1.04	0.98	0.98	0.97	0.95	1.00	1.00	1.00	1.08	1.15			8.50	8.73	8.28
	velocity	5.06	8.17	8.67	8.67	8.76	8.95	8.50	8.50	8.50	7.87	8.74	7.86				
Thompson, Yanique (JAM) (1996)	time	2.61	3.61	4.60	5.58	6.54	7.49	8.49	9.50	10.54	11.57		12.74	8 / 2			
	reaction time	0.147													2.97	2.91	3.08
	interval		1.00	0.99	0.98	0.96	0.95	1.00	1.01	1.04	1.03	1.17			8.59	8.76	8.28
	velocity	4.98	8.50	8.59	8.67	8.85	8.95	8.50	8.42	8.17	8.25	8.59	7.85				
Skrzyszowska, Pia (POL) (2001)	time	2.57	3.61	4.59	5.58	6.57	7.55	8.54	9.54	10.57	11.60		12.75	6 / 3			
	reaction time	0.144													3.01	2.96	3.06
	interval		1.04	0.98	0.99	0.99	0.98	0.99	1.00	1.03	1.03	1.15	PB		8.47	8.61	8.33
	velocity	5.06	8.17	8.67	8.59	8.59	8.67	8.59	8.50	8.25	8.25	8.74	7.84				
Charlton, Devynne (BAH) (1995)	time	2.61	3.63	4.63	5.62	6.62	7.59	8.57	9.58	10.61	11.66		12.84	9 / 4			
	reaction time	0.135													3.01	2.95	3.09
	interval		1.02	1.00	0.99	1.00	0.97	0.98	1.01	1.03	1.05	1.18			8.47	8.64	8.25
	velocity	4.98	8.33	8.50	8.59	8.50	8.76	8.67	8.42	8.25	8.10	8.52	7.79				
Korte, Annimari (FIN) (1988)	time	2.66	3.69	4.69	5.69	6.69	7.69	8.72	9.74	10.81	11.89		13.06	7 / 5			
	reaction time	0.146													3.03	3.03	3.17
	interval		1.03	1.00	1.00	1.00	1.00	1.03	1.02	1.07	1.08	1.17			8.42	8.42	8.04
	velocity	4.89	8.25	8.50	8.50	8.50	8.50	8.25	8.33	7.94	7.87	8.59	7.66				
Koala, Marthe (BUR) (1994)	time	2.69	3.69	4.69	5.69	6.69	7.72	8.77	9.81	10.89	11.94		13.11	3 / 6			
	reaction time	0.148													3.00	3.08	3.17
	interval		1.00	1.00	1.00	1.00	1.03	1.05	1.04	1.08	1.05	1.17			8.50	8.28	8.04
	velocity	4.83	8.50	8.50	8.50	8.50	8.25	8.10	8.17	7.87	8.10	8.59	7.63				
Aoki, Masumi (JPN) (1994)	time	2.69	3.74	4.78	5.81	6.86	7.90	8.94	9.97	11.14	12.26		13.59	2 / 7			
	reaction time	0.141													3.12	3.13	3.32
	interval		1.05	1.04	1.03	1.05	1.04	1.04	1.03	1.17	1.12	1.33			8.17	8.15	7.68
	velocity	4.83	8.10	8.17	8.25	8.10	8.17	8.17	8.25	7.26	7.59	7.56	7.36				
Pesiridou, Elisavet (GRE) (1992)	0.162	fell into hurdle 1											dnf	5 / --			



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field-day-8-morning-session-athletics-tokyo-2020-replays>

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

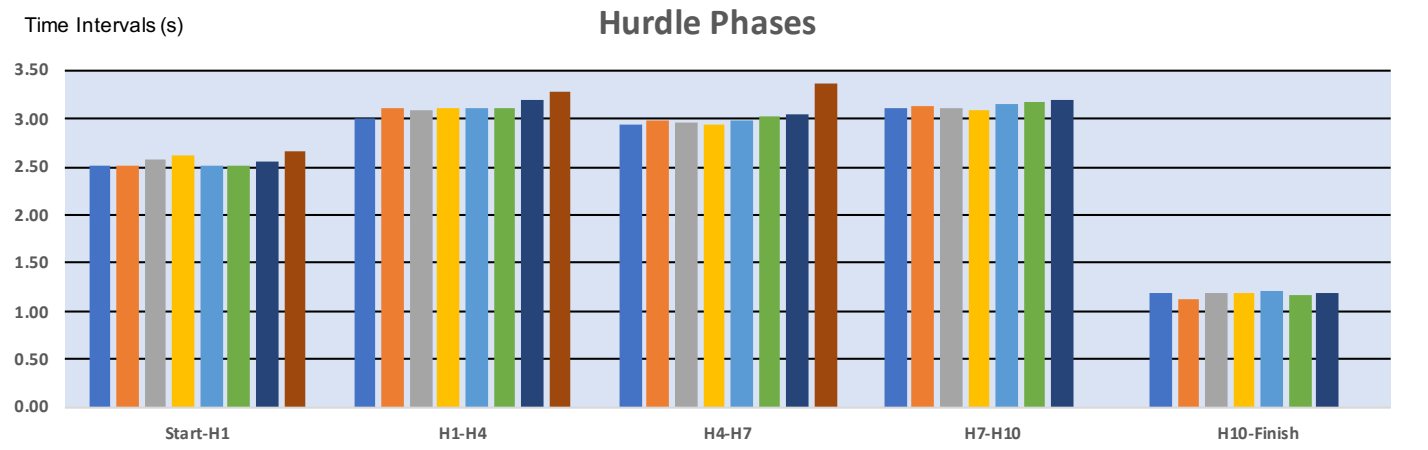
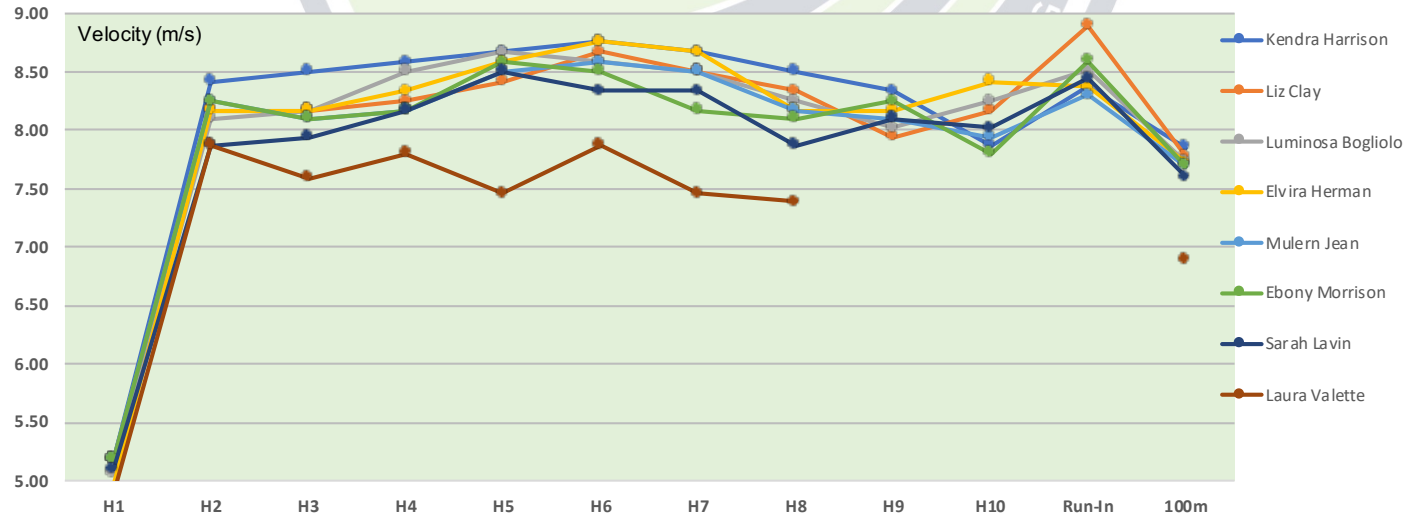
100m Hurdles

Date: 2021.07.31

Wind: 0.4 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
Harrison, Kendra (USA) (1992)	time	2.51	3.52	4.52	5.51	6.49	7.46	8.44	9.44	10.46	11.54		12.74	6 / 1			
	reaction time	0.152													3.00	2.93	3.10
	interval		1.01	1.00	0.99	0.98	0.97	0.98	1.00	1.02	1.08	1.20			8.50	8.70	8.23
	velocity	5.18	8.42	8.50	8.59	8.67	8.76	8.67	8.50	8.33	7.87	8.37	7.85				
Clay, Liz (AUS) (1995)	time	2.51	3.55	4.59	5.62	6.63	7.61	8.61	9.63	10.70	11.74		12.87	3 / 2			
	reaction time	0.127													3.11	2.99	3.13
	interval		1.04	1.04	1.03	1.01	0.98	1.00	1.02	1.07	1.04	1.13			8.20	8.53	8.15
	velocity	5.18	8.17	8.17	8.25	8.42	8.67	8.50	8.33	7.94	8.17	8.89	7.77				
Bogliolo, Luminosa (ITA) (1995)	time	2.57	3.62	4.66	5.66	6.64	7.63	8.63	9.66	10.72	11.75		12.93	2 / 3			
	reaction time	0.165													3.09	2.97	3.12
	interval		1.05	1.04	1.00	0.98	0.99	1.00	1.03	1.06	1.03	1.18			8.25	8.59	8.17
	velocity	5.06	8.10	8.17	8.50	8.67	8.59	8.50	8.25	8.02	8.25	8.52	7.73				
Herman, Elvira (BLR) (1997)	time	2.62	3.66	4.70	5.72	6.71	7.68	8.66	9.70	10.74	11.75		12.95	4 / 4			
	reaction time	0.144													3.10	2.94	3.09
	interval		1.04	1.04	1.02	0.99	0.97	0.98	1.04	1.04	1.01	1.20			8.23	8.67	8.25
	velocity	4.96	8.17	8.17	8.33	8.59	8.76	8.67	8.17	8.17	8.42	8.38	7.72				
Jean, Mulern (HAI) (1992)	time	2.51	3.54	4.59	5.63	6.63	7.62	8.62	9.66	10.71	11.78		12.99	7 / 5			
	reaction time	0.155													3.12	2.99	3.16
	interval		1.03	1.05	1.04	1.00	0.99	1.00	1.04	1.05	1.07	1.21			8.17	8.53	8.07
	velocity	5.18	8.25	8.10	8.17	8.50	8.59	8.50	8.17	8.10	7.94	8.31	7.70				
Morrison, Ebony (LBR) (1994)	time	2.51	3.54	4.59	5.63	6.62	7.62	8.66	9.71	10.74	11.83		13.00	9 / 6			
	reaction time	0.150													3.12	3.03	3.17
	interval		1.03	1.05	1.04	0.99	1.00	1.04	1.05	1.03	1.09	1.17			8.17	8.42	8.04
	velocity	5.18	8.25	8.10	8.17	8.59	8.50	8.17	8.10	8.25	7.80	8.59	7.69				
Lavin, Sarah (IRL) (1994)	time	2.55	3.63	4.70	5.74	6.74	7.76	8.78	9.86	10.91	11.97		13.16	8 / 7			
	reaction time	0.141													3.19	3.04	3.19
	interval		1.08	1.07	1.04	1.00	1.02	1.02	1.08	1.05	1.06	1.19			7.99	8.39	7.99
	velocity	5.10	7.87	7.94	8.17	8.50	8.33	8.33	7.87	8.10	8.02	8.45	7.60				
Valette, Laura (FRA) (1997)	time	2.66	3.74	4.86	5.95	7.09	8.17	9.31	10.46				14.52	5 / 8			
	reaction time	0.155													3.29	3.36	
	interval		1.08	1.12	1.09	1.14	1.08	1.14	1.15						7.75	7.59	
	velocity	4.89	7.87	7.59	7.80	7.46	7.87	7.46	7.39				6.89				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field/day-8-morning-session-athletics-tokyo-2020-replays>

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

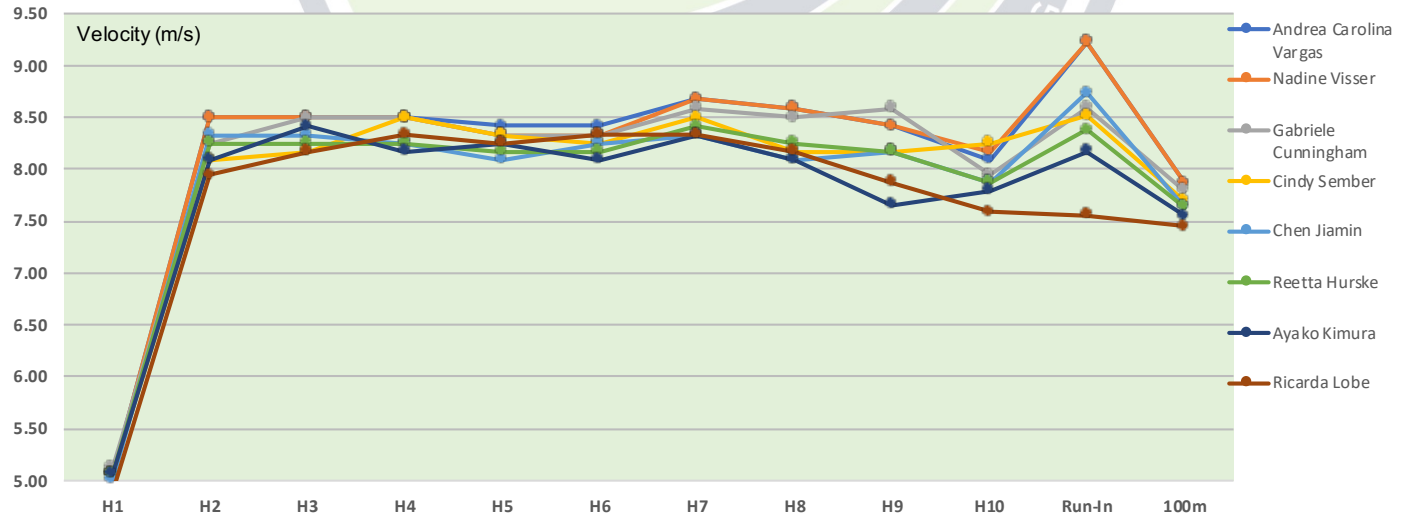
100m Hurdles

Date: 2021.07.31

Wind: 1.0 m/s

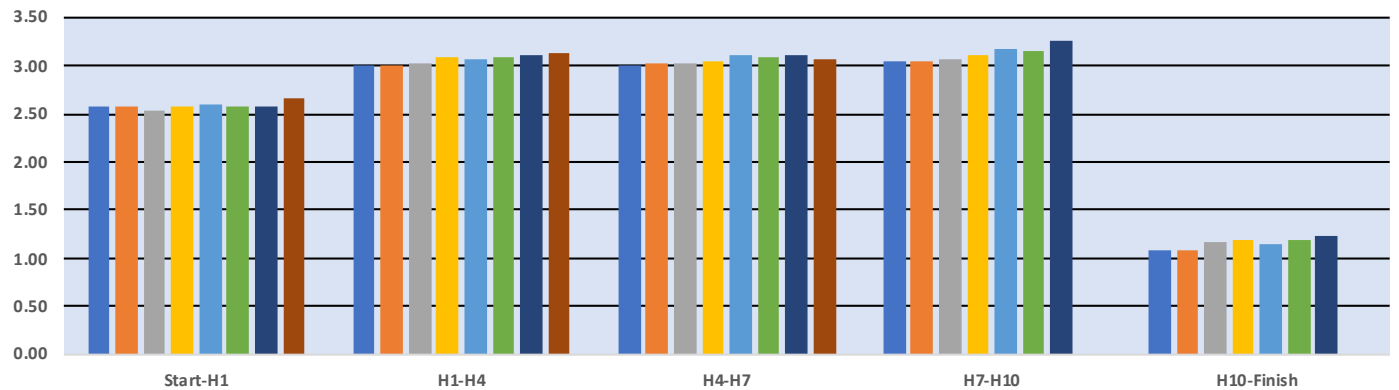
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Vargas, Andrea Carolina (CRC) (1996)	time	2.57	3.57	4.57	5.57	6.58	7.59	8.57	9.56	10.57	11.62		12.71	6 / 1			
	reaction time	0.157													3.00	3.00	3.05
	interval		1.00	1.00	1.00	1.01	1.01	0.98	0.99	1.01	1.05	1.09			8.50	8.50	8.36
	velocity	5.06	8.50	8.50	8.50	8.42	8.42	8.67	8.59	8.42	8.10	9.22	7.87				
Visser, Nadine (NED) (1995)	time	2.57	3.57	4.57	5.57	6.59	7.61	8.59	9.58	10.59	11.63		12.72	9 / 2			
	reaction time	0.144													3.00	3.02	3.04
	interval		1.00	1.00	1.00	1.02	1.02	0.98	0.99	1.01	1.04	1.09			8.50	8.44	8.39
	velocity	5.06	8.50	8.50	8.50	8.33	8.33	8.67	8.59	8.42	8.17	9.22	7.86				
Cunningham, Gabriele (USA) (1998)	time	2.54	3.57	4.57	5.57	6.59	7.61	8.60	9.60	10.59	11.66		12.83	8 / 3			
	reaction time	0.172													3.03	3.03	3.06
	interval		1.03	1.00	1.00	1.02	1.02	0.99	1.00	0.99	1.07	1.17			8.42	8.42	8.33
	velocity	5.12	8.25	8.50	8.50	8.33	8.33	8.59	8.50	8.59	7.94	8.59	7.79				
Sember, Cindy (GBR) (1994)	time	2.57	3.62	4.66	5.66	6.68	7.71	8.71	9.75	10.79	11.82		13.00	5 / 4			
	reaction time	0.178													3.09	3.05	3.11
	interval		1.05	1.04	1.00	1.02	1.03	1.00	1.04	1.04	1.03	1.18			8.25	8.36	8.20
	velocity	5.06	8.10	8.17	8.50	8.25	8.25	8.50	8.17	8.17	8.17	8.25	7.69				
Chen Jiamin (CHN) (1996)	time	2.60	3.62	4.64	5.67	6.72	7.75	8.77	9.82	10.86	11.94		13.09	3 / 5			
	reaction time	0.144													3.07	3.10	3.17
	interval		1.02	1.02	1.03	1.05	1.03	1.02	1.05	1.04	1.08	1.15			8.31	8.23	8.04
	velocity	5.00	8.33	8.33	8.25	8.10	8.25	8.33	8.10	8.17	7.87	8.74	7.64				
Hurske, Reetta (FIN) (1995)	time	2.57	3.60	4.63	5.66	6.70	7.74	8.75	9.78	10.82	11.90		13.10	4 / 6			
	reaction time	0.125													3.09	3.09	3.15
	interval		1.03	1.03	1.03	1.04	1.04	1.01	1.03	1.04	1.08	1.20			8.25	8.25	8.10
	velocity	5.06	8.25	8.25	8.25	8.17	8.17	8.42	8.25	8.17	7.87	8.38	7.63				
Kimura, Ayako (JPN) (1988)	time	2.57	3.62	4.63	5.67	6.70	7.75	8.77	9.82	10.93	12.02		13.25	2 / 7			
	reaction time	0.146													3.10	3.10	3.25
	interval		1.05	1.01	1.04	1.03	1.05	1.02	1.05	1.11	1.09	1.23			8.23	8.23	7.85
	velocity	5.06	8.10	8.42	8.17	8.25	8.10	8.33	8.10	7.66	7.80	8.17	7.55				
Lobe, Ricarda (GER) (1994)	time	2.66	3.73	4.77	5.79	6.82	7.84	8.86	9.90	10.98	12.10		13.43	7 / 8			
	reaction time	0.139													3.13	3.07	
	interval		1.07	1.04	1.02	1.03	1.02	1.02	1.04	1.08	1.12	1.33			8.15	8.31	
	velocity	4.89	7.94	8.17	8.33	8.25	8.33	8.33	8.17	7.87	7.59	7.56	7.45				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field/day-8-morning-session-athletics-tokyo-2020-replays>

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

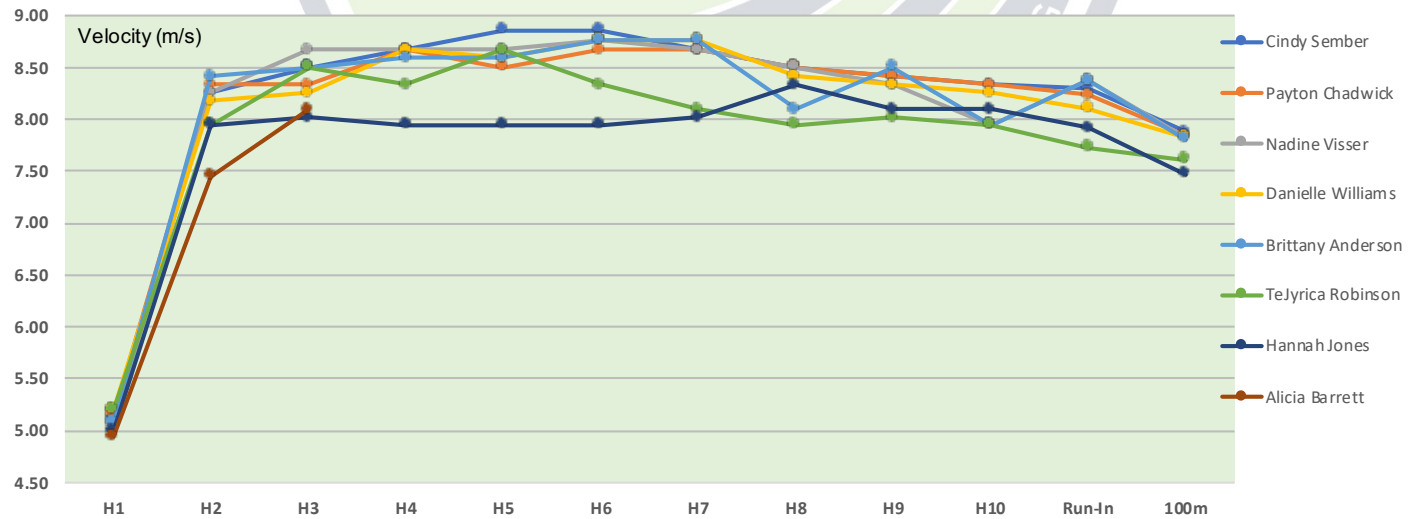
100m Hurdles

Date: 2021.07.13

Wind: 1.5 m/s

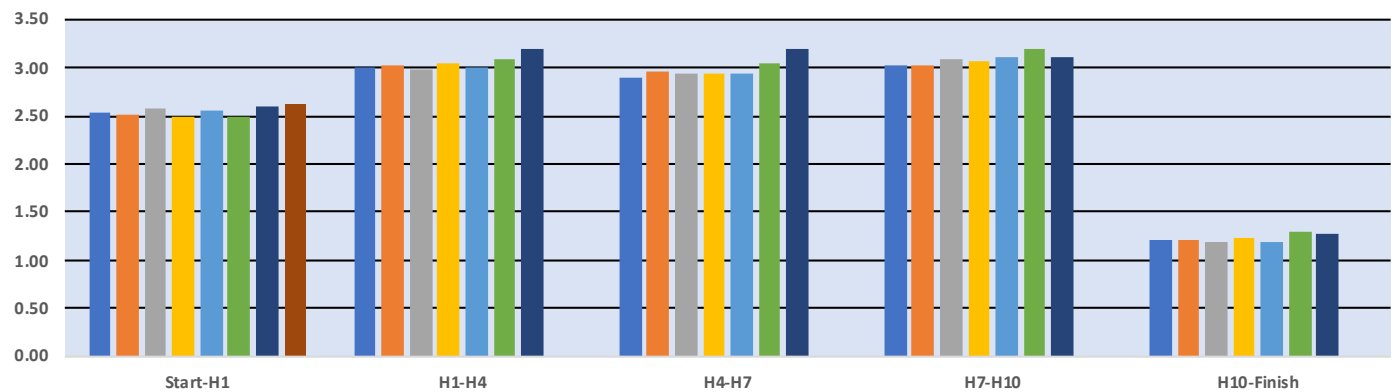
FINAL

		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		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	
	velocity	5.12	8.25	8.50	8.67	8.85	8.85	8.67	8.50	8.42	8.33	8.31	7.88					
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		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	
	velocity	5.16	8.33	8.33	8.67	8.50	8.67	8.67	8.50	8.42	8.33	8.24	7.84					
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		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	
	velocity	5.06	8.25	8.67	8.67	8.67	8.76	8.67	8.50	8.33	7.94	8.38	7.82					
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		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	
	velocity	5.20	8.17	8.25	8.67	8.59	8.76	8.76	8.42	8.33	8.25	8.10	7.82					
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		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	
	velocity	5.08	8.42	8.50	8.59	8.59	8.76	8.76	8.10	8.50	7.94	8.37	7.81					
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		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	
	velocity	5.20	7.94	8.50	8.33	8.67	8.33	8.10	7.94	8.02	7.94	7.73	7.61					
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		1.07	1.06	1.07	1.07	1.07	1.06	1.02	1.02	1.05	1.27			7.97	7.97	8.17	
	velocity	5.00	7.94	8.02	7.94	7.94	7.94	8.02	8.33	8.10	8.10	7.91	7.47					
Barrett, Alicia (GBR) (1998)	time	2.63	3.77	4.82										dnf	1 / --			
	reaction time	0.180																
	interval		1.14	1.05														
	velocity	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-ls>

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

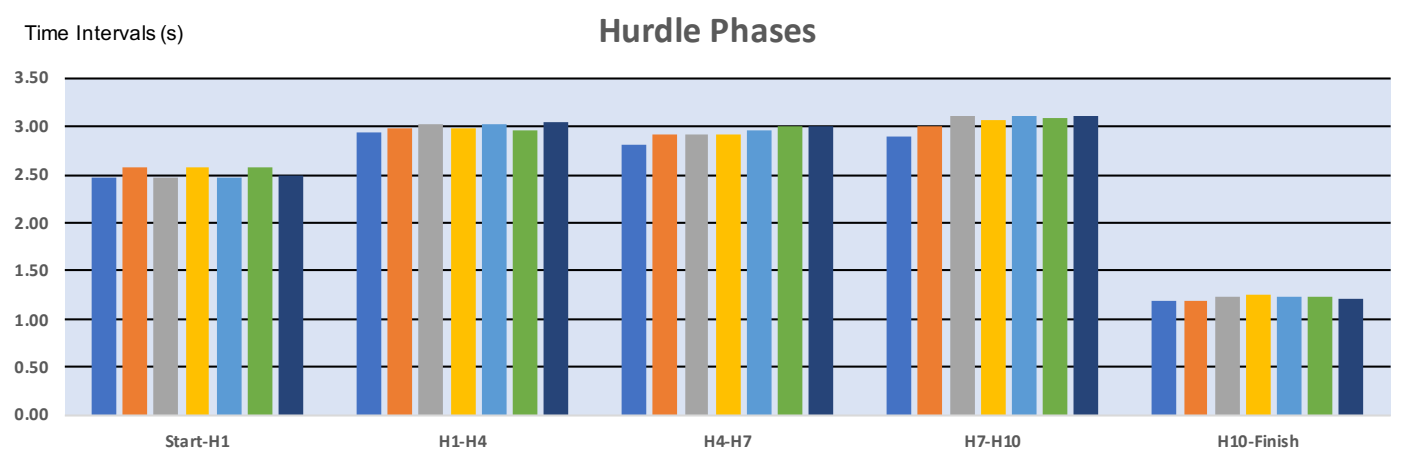
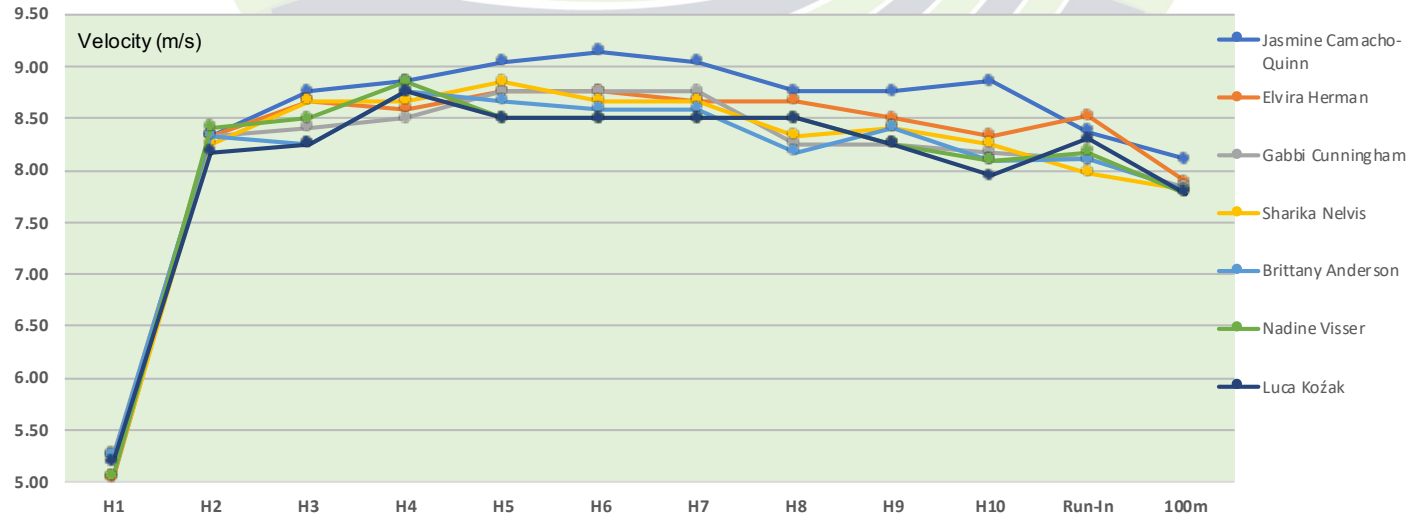
100m Hurdles

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
	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				
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
	velocity	5.04	8.33	8.67	8.59	8.76	8.76	8.67	8.67	8.50	8.33	8.52	7.89				
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
	velocity	5.26	8.33	8.42	8.50	8.76	8.76	8.76	8.25	8.25	8.17	8.10	7.84				
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		7 steps 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
	velocity	5.06	8.25	8.67	8.67	8.85	8.67	8.67	8.33	8.42	8.25	7.98	7.81				
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
	velocity	5.24	8.33	8.25	8.76	8.67	8.59	8.59	8.17	8.42	8.10	8.10	7.81				
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	1.00	1.03	1.05	1.23			8.59	8.50	8.28
	velocity	5.06	8.42	8.50	8.85	8.50	8.50	8.50	8.50	8.25	8.10	8.17	7.78				
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	1.00	1.03	1.07	1.21			8.39	8.50	8.23
	velocity	5.20	8.17	8.25	8.76	8.50	8.50	8.50	8.50	8.25	7.94	8.31	7.78				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=IGkDWOYnCD8>

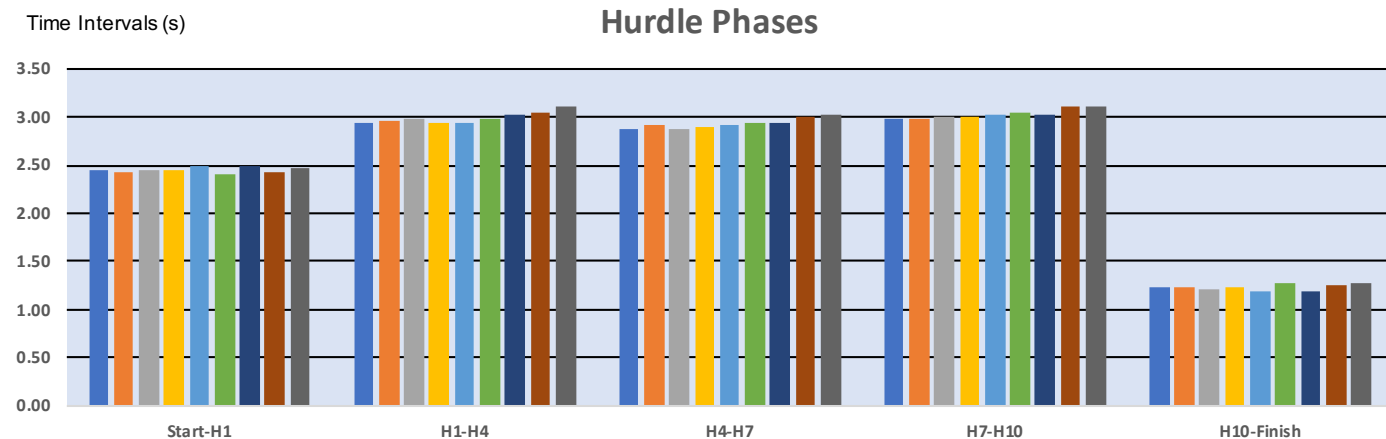
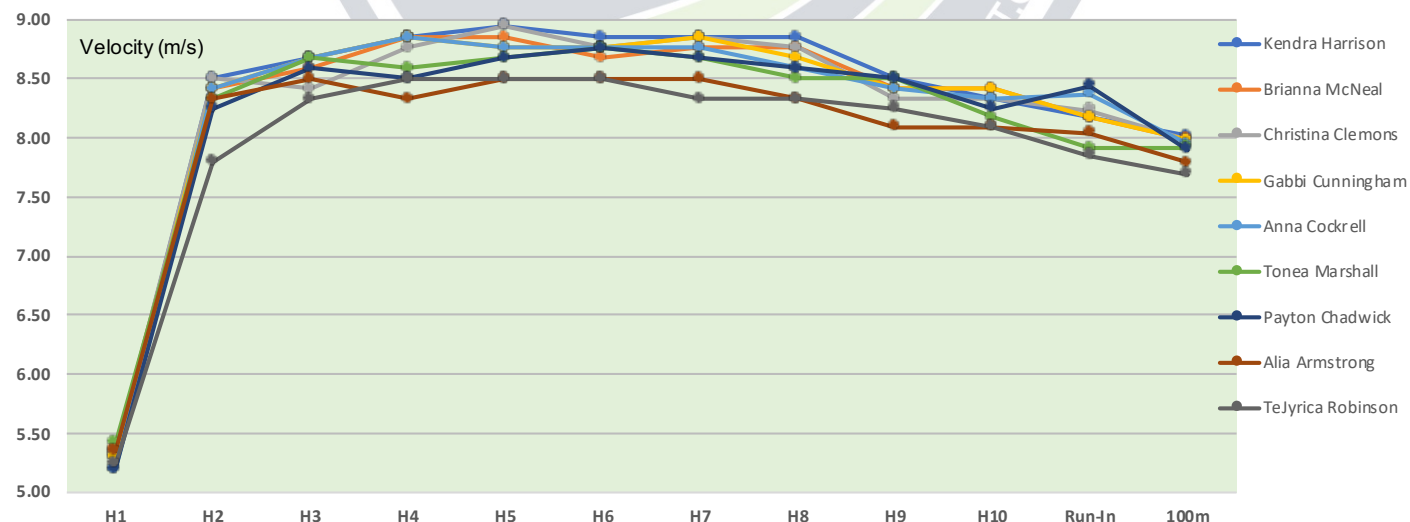
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

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	0.96	1.00	1.02	1.23		8.67	8.89	8.56
	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				
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
	velocity	5.37	8.42	8.59	8.85	8.85	8.67	8.76	8.76	8.42	8.42	8.17	7.99				
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
	velocity	5.33	8.50	8.42	8.76	8.95	8.76	8.85	8.76	8.33	8.33	8.24	7.98				
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	PB		8.64	8.79	8.50
	velocity	5.31	8.42	8.67	8.85	8.76	8.76	8.85	8.67	8.42	8.42	8.17	7.98				
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
	velocity	5.20	8.42	8.67	8.85	8.76	8.76	8.76	8.59	8.42	8.33	8.38	7.95				
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
	velocity	5.42	8.33	8.67	8.59	8.67	8.76	8.67	8.50	8.50	8.17	7.91	7.92				
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
	velocity	5.20	8.25	8.59	8.50	8.67	8.76	8.67	8.59	8.50	8.25	8.45	7.90				
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
	velocity	5.35	8.33	8.50	8.33	8.50	8.50	8.50	8.33	8.10	8.10	8.04	7.79				
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	5.24	7.80	8.33	8.50	8.50	8.50	8.33	8.33	8.25	8.10	7.85	7.70				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=G15I57v6nBM>

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

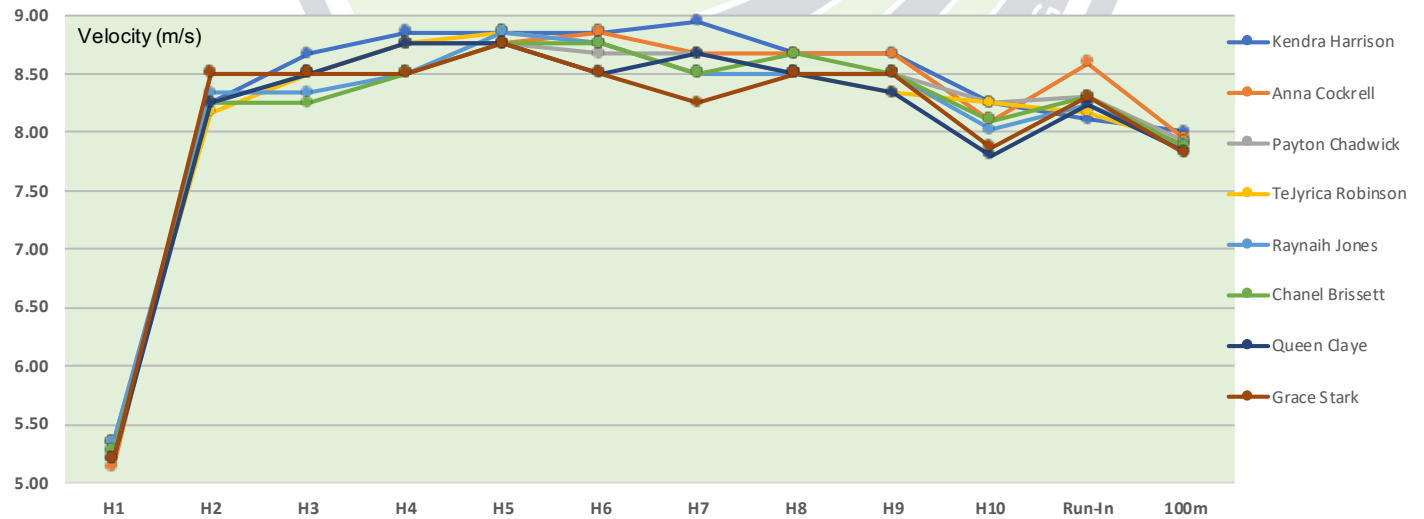
100m Hurdles

Date: 2021.06.20

Wind: 1.3 m/s

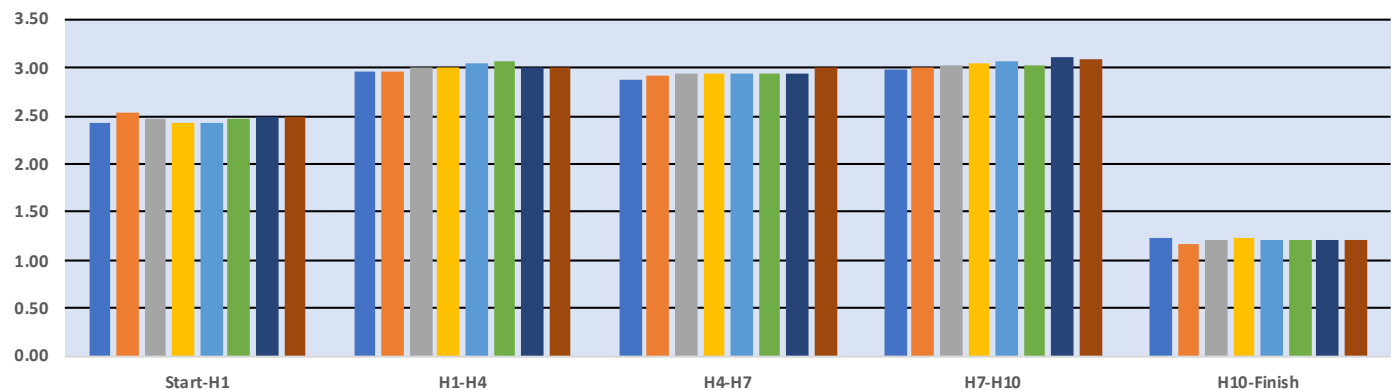
Semi-Final 2

		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
	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				
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	0.98	1.05	1.17			8.59	8.76	8.47
	velocity	5.14	8.50	8.50	8.76	8.76	8.85	8.67	8.67	8.67	8.10	8.59	7.94				
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
	velocity	5.26	8.25	8.50	8.76	8.76	8.67	8.67	8.50	8.50	8.25	8.31	7.91				
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
	velocity	5.35	8.17	8.50	8.76	8.85	8.76	8.50	8.50	8.33	8.25	8.17	7.91				
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
	velocity	5.35	8.33	8.33	8.50	8.85	8.76	8.50	8.50	8.50	8.02	8.24	7.89				
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
	velocity	5.26	8.25	8.25	8.50	8.76	8.76	8.50	8.67	8.50	8.10	8.31	7.87				
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
	velocity	5.20	8.25	8.50	8.76	8.76	8.50	8.67	8.50	8.33	7.80	8.24	7.82				
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	5.20	8.50	8.50	8.50	8.76	8.50	8.25	8.50	8.50	7.87	8.31	7.82				



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)

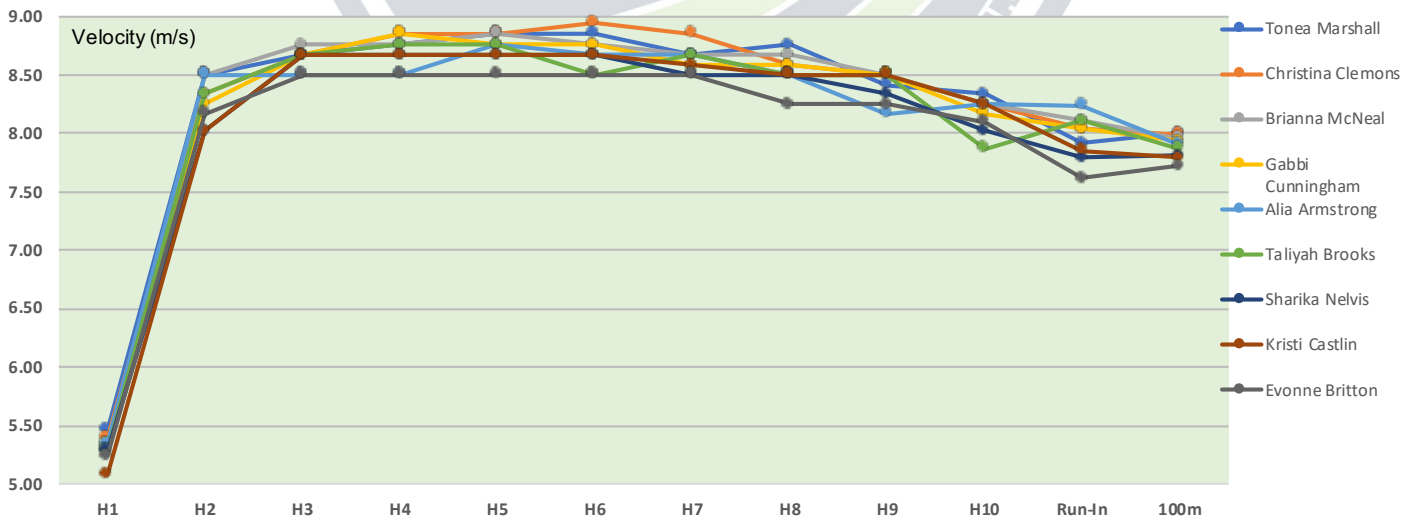
100m Hurdles

Date: 2021.06.20

Wind: 1.2 m/s

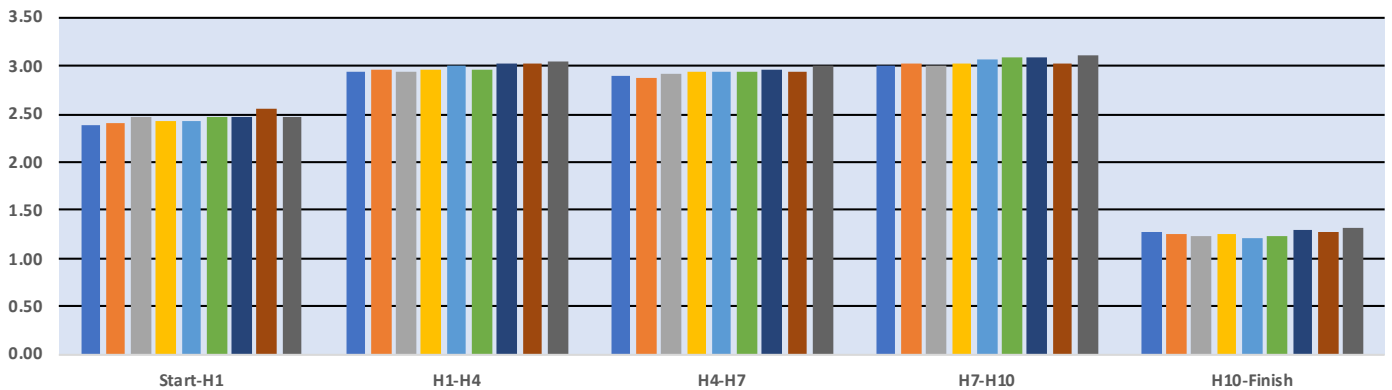
Semi-Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Marshall, Tonea (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			
	reaction time	0.137													2.95	2.90	3.00
	interval		1.00	0.98	0.97	0.96	0.96	0.98	0.97	1.01	1.02	1.27			8.64	8.79	8.50
	velocity	5.46	8.50	8.67	8.76	8.85	8.85	8.67	8.76	8.42	8.33	7.91	8.00				
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			
	reaction time	0.142													2.96	2.87	3.02
	interval		1.02	0.98	0.96	0.96	0.95	0.96	0.99	1.00	1.03	1.25			8.61	8.89	8.44
	velocity	5.39	8.33	8.67	8.85	8.85	8.95	8.85	8.59	8.50	8.25	8.04	7.99				
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			
	reaction time	0.173													2.94	2.91	3.01
	interval		1.00	0.97	0.97	0.96	0.97	0.98	0.98	1.00	1.03	1.24			8.67	8.76	8.47
	velocity	5.28	8.50	8.76	8.76	8.85	8.76	8.67	8.67	8.50	8.25	8.10	7.96				
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			
	reaction time	0.158													2.97	2.93	3.03
	interval		1.03	0.98	0.96	0.97	0.97	0.99	0.99	1.00	1.04	1.25			8.59	8.70	8.42
	velocity	5.35	8.25	8.67	8.85	8.76	8.76	8.59	8.59	8.50	8.17	8.04	7.93				
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			
	reaction time	0.154													3.00	2.93	3.07
	interval		1.00	1.00	1.00	0.97	0.98	0.98	1.00	1.04	1.03	1.22			8.50	8.70	8.31
	velocity	5.35	8.50	8.50	8.50	8.76	8.67	8.67	8.50	8.17	8.25	8.24	7.91				
Brooks, Taliyah (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			
	reaction time	0.156													2.97	2.95	3.08
	interval		7 steps	1.02	0.98	0.97	0.97	1.00	0.98	1.00	1.00	1.08	1.24		8.59	8.64	8.28
	velocity	5.28	8.33	8.67	8.76	8.76	8.50	8.67	8.50	8.50	7.87	8.10	7.87				
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			
	reaction time	0.160													3.02	2.96	3.08
	interval		7 steps	1.06	0.98	0.98	0.98	0.98	1.00	1.00	1.02	1.06	1.29		8.44	8.61	8.28
	velocity	5.28	8.02	8.67	8.67	8.67	8.67	8.50	8.50	8.33	8.02	7.79	7.81				
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			
	reaction time	0.162													3.02	2.95	3.03
	interval		1.06	0.98	0.98	0.98	0.98	0.98	0.99	1.00	1.00	1.03	1.28		8.44	8.64	8.42
	velocity	5.08	8.02	8.67	8.67	8.67	8.67	8.59	8.50	8.50	8.25	7.85	7.79				
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			
	reaction time	0.144													3.04	3.00	3.11
	interval		1.04	1.00	1.00	1.00	1.00	1.00	1.03	1.03	1.05	1.32			8.39	8.50	8.20
	velocity	5.24	8.17	8.50	8.50	8.50	8.50	8.50	8.25	8.25	8.10	7.61	7.72				



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=uyzQpw1bmlM&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													2.95	2.88	3.00
	interval		1.03	0.96	0.96	0.96	0.96	0.96	1.00	1.00	1.00	1.24			8.64	8.85	8.50
	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				
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													2.99	2.94	3.06
	interval		1.03	0.98	0.98	0.98	0.96	1.00	1.00	1.04	1.02	1.25	PB		8.53	8.67	8.33
	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				

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													3.03	2.90	3.03
	interval		1.03	1.00	1.00	0.97	0.96	0.97	1.00	1.00	1.03	1.17			8.42	8.79	8.42
	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				
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													3.03	2.94	3.03
	interval		1.02	1.01	1.00	0.97	1.00	0.97	1.00	1.00	1.03	1.21	PB		8.42	8.67	8.42
	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				
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													3.07	2.90	3.00
	interval		1.06	1.02	0.99	0.97	0.97	0.96	1.00	1.00	1.00	1.23	PB		8.31	8.79	8.50
	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				

Date: 2021.06.19 Wind: 0.8 m/s

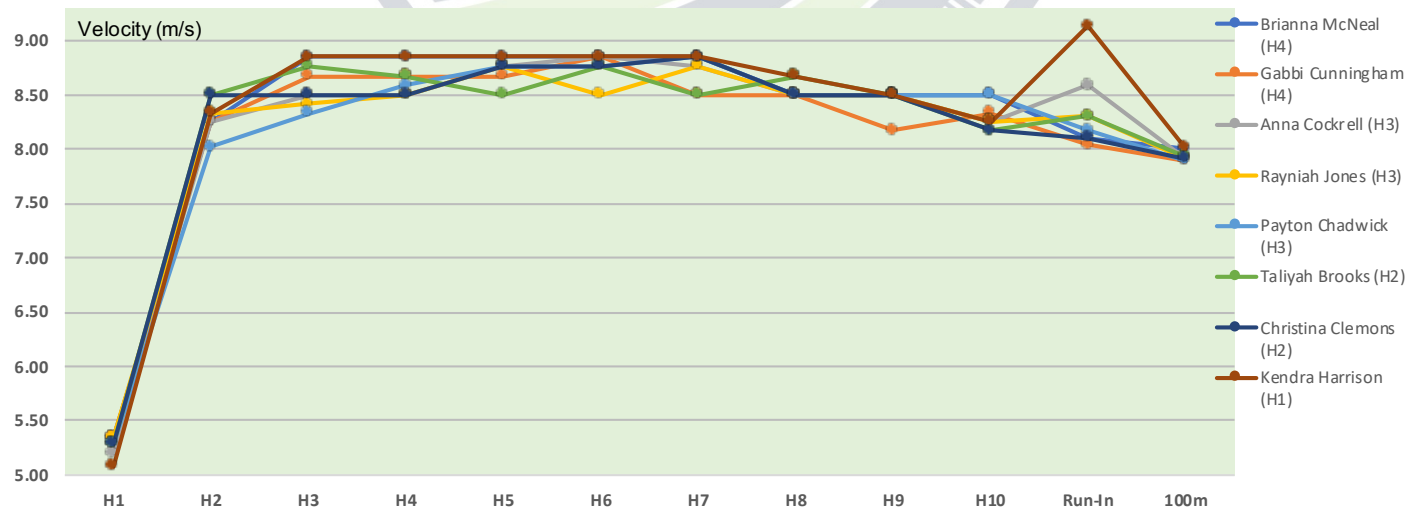
Heat 2

		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													2.95	2.97	3.02
	interval		7 steps	1.00	0.97	0.98	1.00	0.97	1.00	0.98	1.00	1.04	1.21	PB	8.64	8.59	8.44
	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				
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													3.00	2.90	3.04
	interval		1.00	1.00	1.00	0.97	0.97	0.96	1.00	1.00	1.04	1.24			8.50	8.79	8.39
	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				

Date: 2021.06.19 Wind: -0.3 m/s

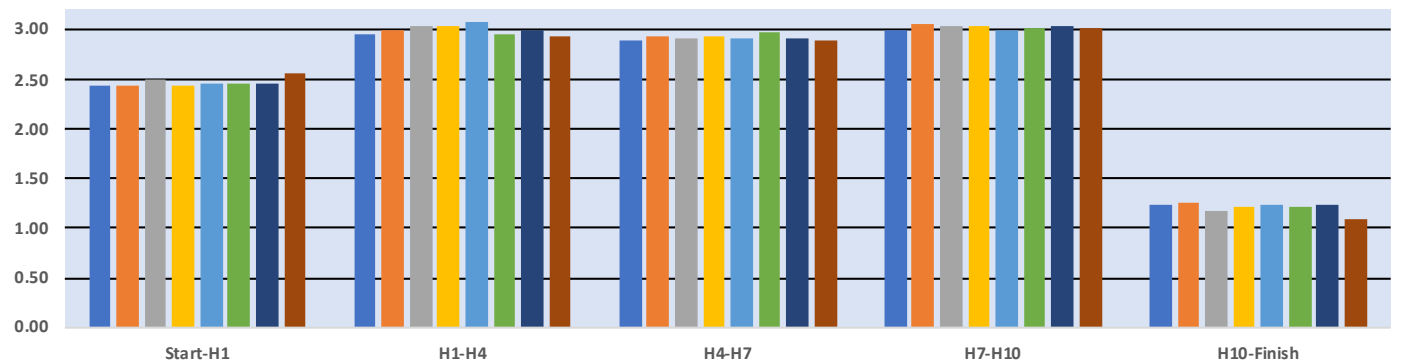
Heat 1

		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													2.94	2.88	3.01
	interval		1.02	0.96	0.96	0.96	0.96	0.96	0.98	1.00	1.03	1.10			8.67	8.85	8.47
	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				



Time Intervals (s)

Hurdle Phases



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>

Biomechanical Analysis

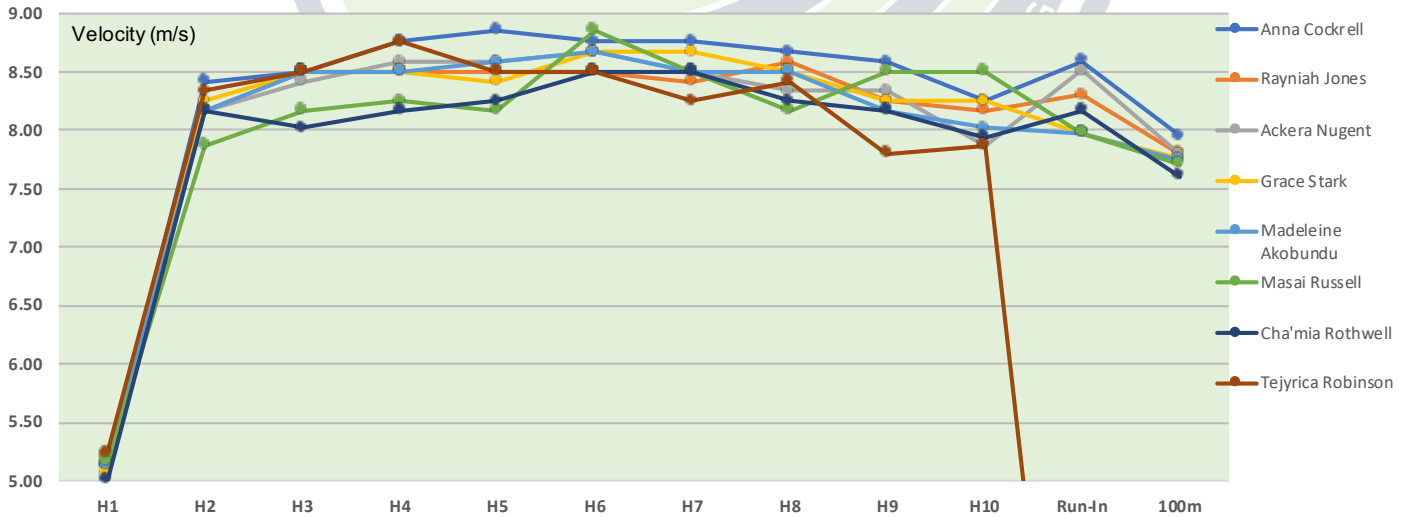
2021 NCAA Championships (Eugene, OR) (TV Analysis)

100m Hurdles

Date: 2021.06.12 Wind: 0.4 m/s

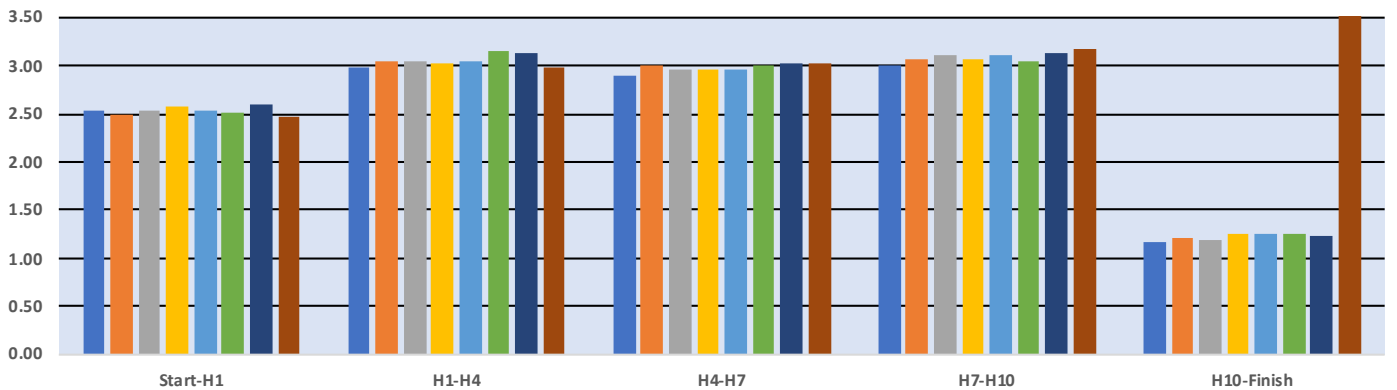
FINAL

		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														2.98	2.90	3.00
	interval		1.01	1.00	0.97	0.96	0.97	0.97	0.98	0.99	1.03	1.17				8.56	8.79	8.50
	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					
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														3.04	3.01	3.06
	interval		1.04	1.00	1.00	1.00	1.00	1.01	0.99	1.03	1.04	1.21				8.39	8.47	8.33
	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					
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														3.04	2.97	3.12
	interval		1.04	1.01	0.99	0.99	0.98	1.00	1.02	1.02	1.08	1.18				8.39	8.59	8.17
	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					
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														3.03	2.97	3.06
	interval		1.03	1.00	1.00	1.01	0.98	0.98	1.00	1.03	1.03	1.26				8.42	8.59	8.33
	velocity	5.06	8.25	8.50	8.50	8.50	8.67	8.67	8.50	8.25	8.25	7.98	7.76					
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														3.04	2.97	3.10
	interval		1.04	1.00	1.00	0.99	0.98	1.00	1.00	1.04	1.06	1.26				8.39	8.59	8.23
	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					
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														3.15	3.00	3.04
	interval		1.08	1.04	1.03	1.04	0.96	1.00	1.04	1.00	1.00	1.26				8.10	8.50	8.39
	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					
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														3.14	3.03	3.14
	interval		1.04	1.06	1.04	1.03	1.00	1.00	1.03	1.04	1.04	1.23				8.12	8.42	8.12
	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					
Robinson, Tejryca (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														2.99	3.03	3.18
	interval		1.02	1.00	0.97	1.00	1.00	1.00	1.03	1.01	1.09	1.08	17.43			8.53	8.42	8.02
	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					



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=iJlMavmRKtM>

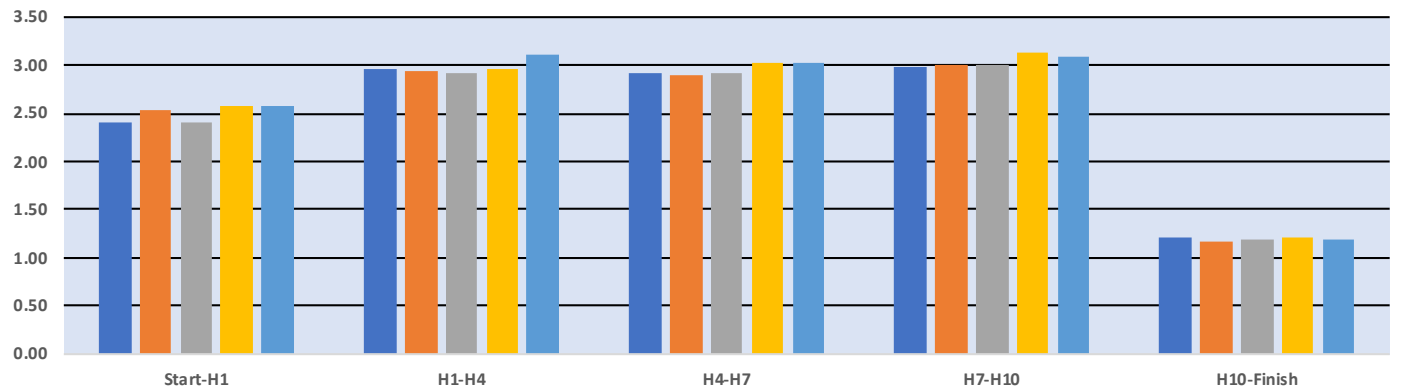
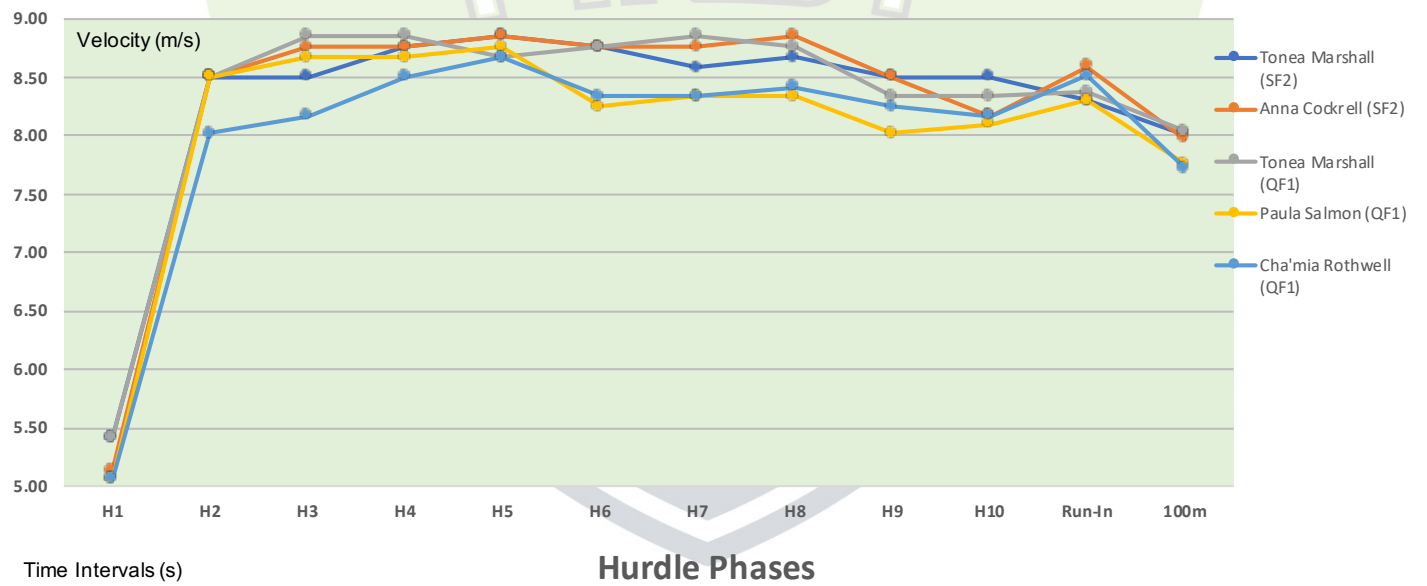
Biomechanical Analysis

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														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														2.94	2.90	3.00
	interval		1.00	0.97	0.97	0.96	0.97	0.96	0.97	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	8.50	8.31	8.01				
	velocity		5.14	8.50	8.76	8.76	8.85	8.76	8.76	8.85	8.50	8.17	8.59	7.97				

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															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															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															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	8.33	8.42	8.25	8.17	8.52	7.72				



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=l_dvP0jaFXy&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)

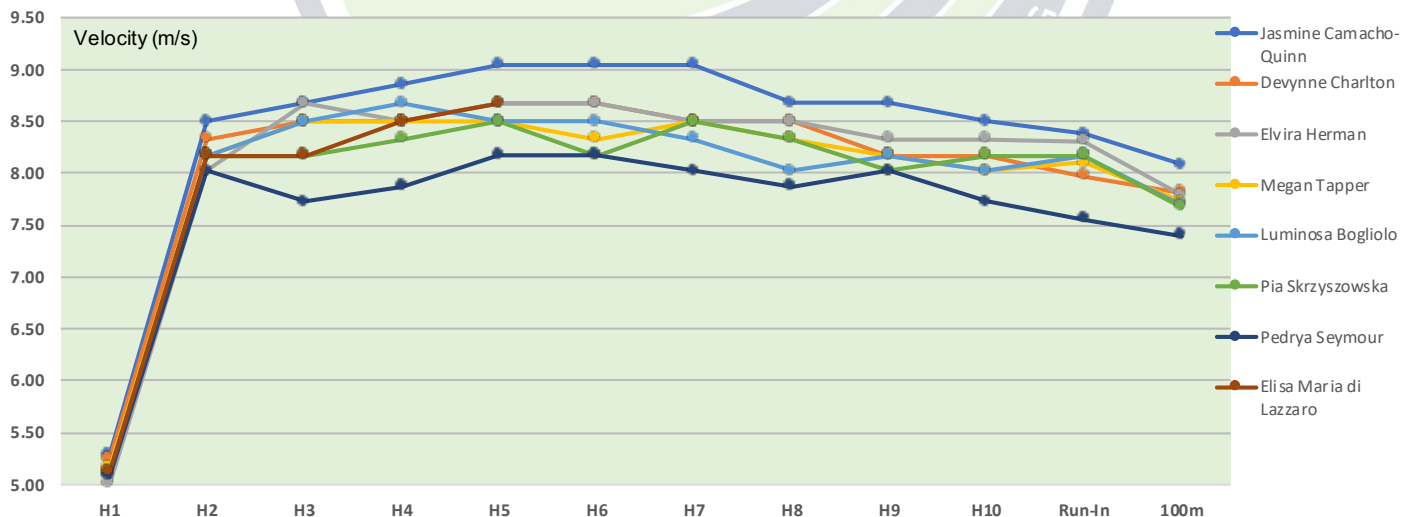
100m Hurdles

Date: 2021.06.10

Wind: -0.8 m/s

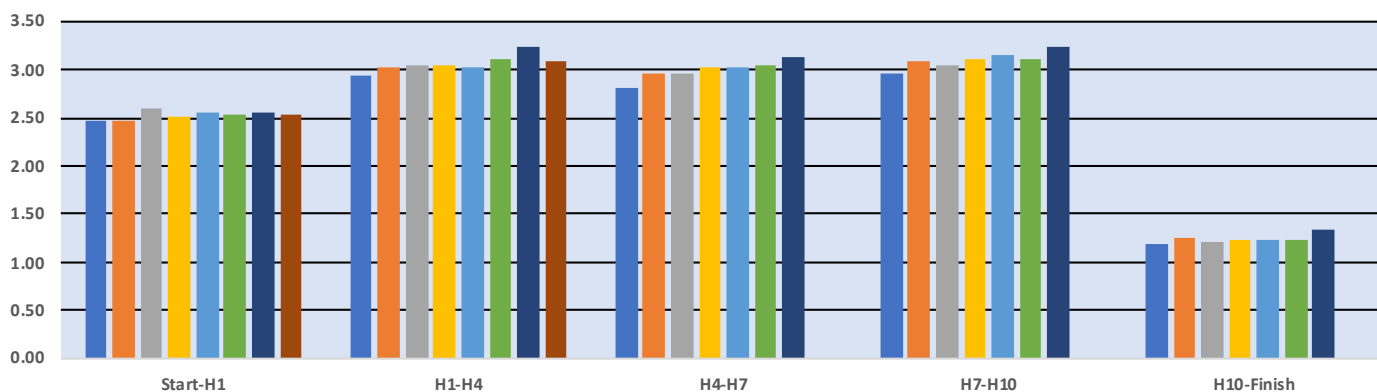
FINAL

		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	2.94	2.82	2.96
	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					
	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	3.02	2.96	3.08
	reaction time	0.147															
	interval		1.02	1.00	1.00	0.98	0.98	1.00	1.00	1.04	1.04	1.26					
	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	3.04	2.96	3.04
	reaction time	0.132															
	interval		1.06	0.98	1.00	0.98	0.98	1.00	1.00	1.02	1.02	1.21					
	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	3.04	3.02	3.12
	reaction time	0.170															
	interval		1.04	1.00	1.00	1.00	1.02	1.00	1.02	1.04	1.06	1.24					
	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	3.02	3.02	3.16
	reaction time	0.161															
	interval		1.04	1.00	0.98	1.00	1.00	1.02	1.06	1.04	1.06	1.23					
	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
Skrzyszowska, 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	3.10	3.04	3.12
	reaction time	0.151															
	interval		1.04	1.04	1.02	1.00	1.04	1.00	1.02	1.06	1.04	1.23					
	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	3.24	3.14	3.24
	reaction time	0.168															
	interval		1.06	1.10	1.08	1.04	1.04	1.06	1.08	1.06	1.10	1.33					
	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 / --	3.08		
	reaction time	0.143															
	interval		1.04	1.04	1.00	0.98											
	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>

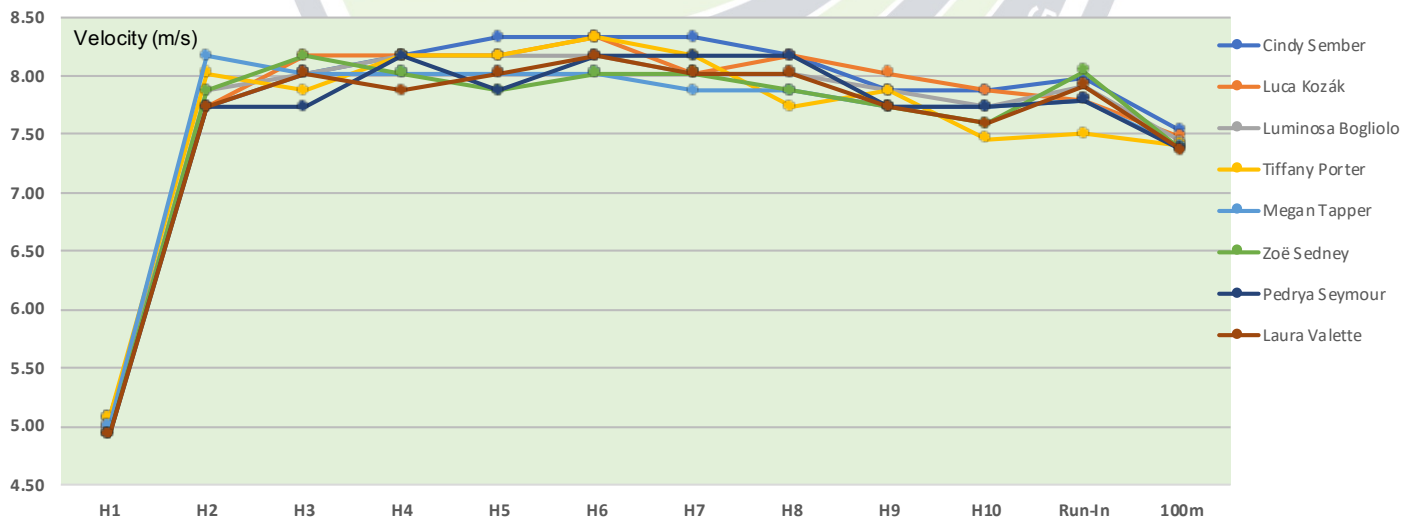
2021 Müller Grand Prix (Gateshead, GBR) (TV Analysis)

100m Hurdles

Date: 2021.05.23 Wind: -3.9 m/s

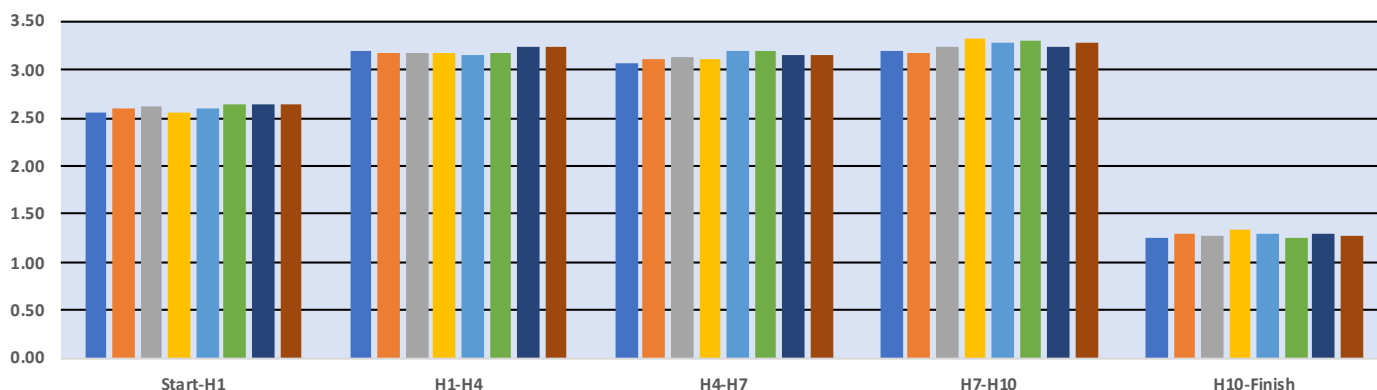
FINAL

		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													3.20	3.06	3.20
	interval		1.10	1.06	1.04	1.02	1.02	1.02	1.04	1.08	1.08	1.26			7.97	8.33	7.97
	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				
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													3.18	3.12	3.18
	interval		1.10	1.04	1.04	1.04	1.02	1.06	1.04	1.06	1.08	1.29			8.02	8.17	8.02
	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				
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													3.18	3.14	3.24
	interval		1.08	1.06	1.04	1.04	1.04	1.06	1.06	1.08	1.10	1.27			8.02	8.12	7.87
	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				
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													3.18	3.10	3.32
	interval		1.06	1.08	1.04	1.04	1.02	1.04	1.10	1.08	1.14	1.34			8.02	8.23	7.68
	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				
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													3.16	3.20	3.28
	interval		1.04	1.06	1.06	1.06	1.06	1.08	1.08	1.10	1.10	1.29			8.07	7.97	7.77
	velocity	5.00	8.17	8.02	8.02	8.02	8.02	7.87	7.87	7.73	7.73	7.39					
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													3.18	3.20	3.30
	interval		1.08	1.04	1.06	1.08	1.06	1.06	1.08	1.10	1.12	1.25			8.02	7.97	7.73
	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				
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													3.24	3.16	3.24
	interval		1.10	1.10	1.04	1.08	1.04	1.04	1.04	1.04	1.10	1.10	1.29		7.87	8.07	7.87
	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				
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													3.24	3.16	3.28
	interval		1.10	1.06	1.08	1.06	1.04	1.06	1.06	1.10	1.12	1.27			7.87	8.07	7.77
	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				



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)

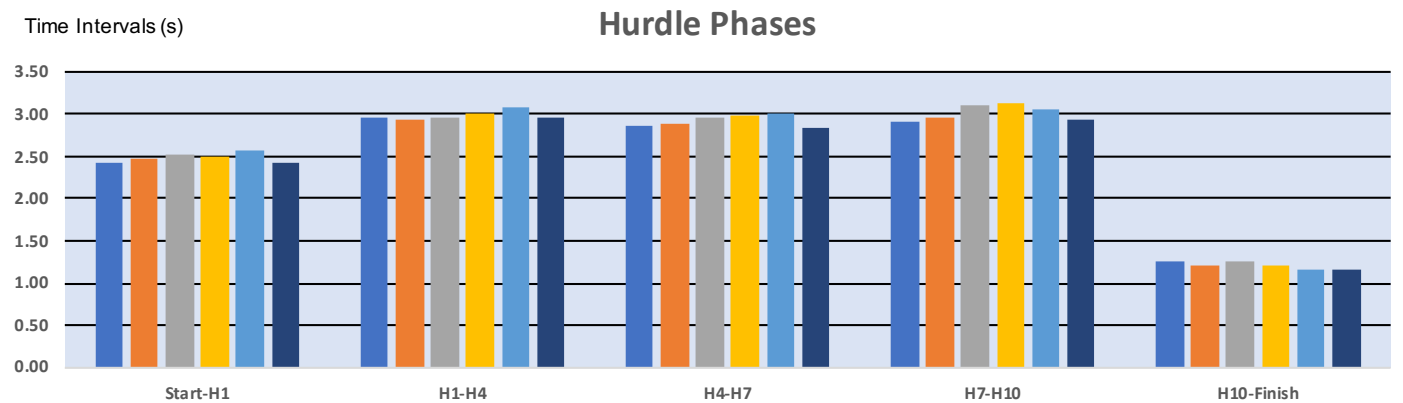
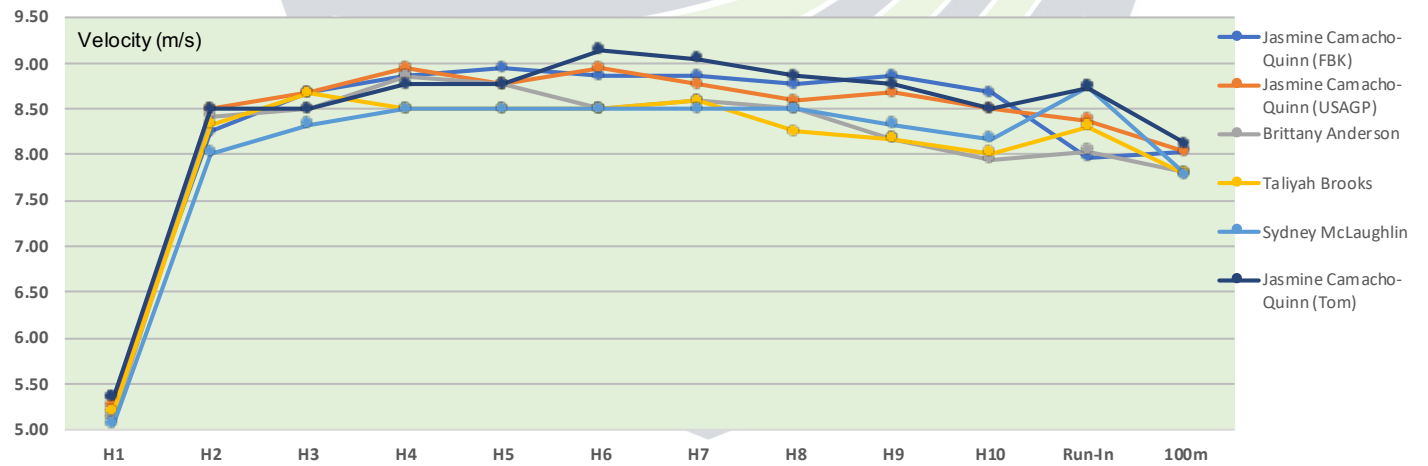
		Date: 2021.06.06		Wind: 0.5 m/s										FINAL			
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	time	2.43	3.46	4.44	5.40	6.35	7.31	8.27	9.24	10.20	11.18		12.44	5 / 1			
	reaction time																
	interval		1.03	0.98	0.96	0.95	0.96	0.96	0.97	0.96	0.98	1.26					
	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		8.97	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)	time	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					
	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)	time	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					
	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)	time	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					
	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)	time	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				
	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)	time	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				
	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



Tom Jones Invitational
 Evaluated with: ObjectusVideo
 Quality & Frame Rate: 60fps
 Timing From: Gun Flash
 Source: Coaches Video

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>

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>

Biomechanical Analysis

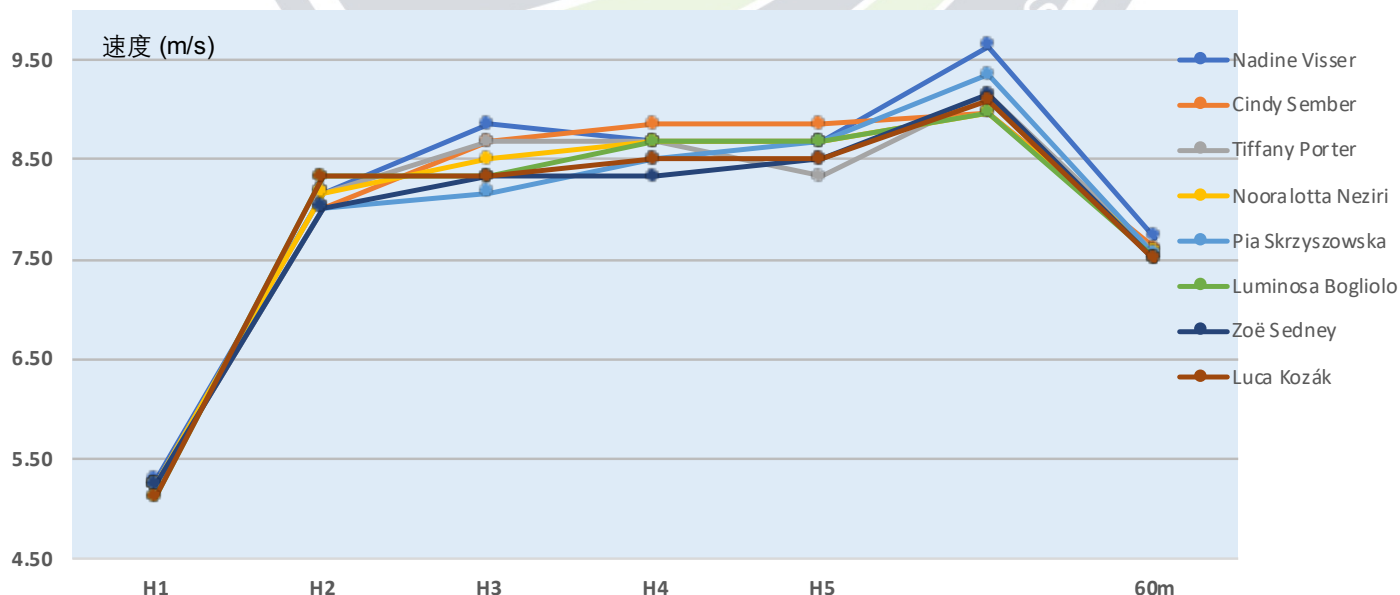
2021 European Indoor Championships (Toruń, POL) (TV Analysis)

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						NR PB	
	interval 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						=PB	
	interval 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 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 velocity	5.24	8.17	8.50	8.67	8.67	8.97	7.57	
Skrzyszowska, Pia (POL) (2001)	time	2.48	3.54	4.58	5.58	6.56		7.95	4 / 5
	reaction time	0.147							
	interval 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						=PB	
	interval 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 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 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

Biomechanical Analysis

2021 Top 10 Times - Men's 400m Hurdles

		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)																		
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)		Henson (2021) - Athlete First: 2021 year end hurdle report																
date	3-Aug	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
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	13	15	18				
Benjamin, Rai (USA) (1997)																		
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)		Henson (2021) - Athlete First: 2021 year end hurdle report																
date	3-Aug	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
H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	13	17					
Warholm, Karsten (NOR) (1996)																		
FINAL - 2021 Bislett Games (Oslo, NOR) (TV Analysis)		Henson (2021) - Athlete First: 2021 year end hurdle report																
date	1-Jul	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)																		
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)		Henson (2021) - Athlete First: 2021 year end hurdle report																
date	3-Aug	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
H1 lead leg	L	strides	20	13	13	12	12	13	13	13	13	14	13	16.2				
Benjamin, Rai (USA) (1997)																		
FINAL - 2020 USA Olympic Trials (Eugene, OR) (TV Analysis)		Henson (2021) - Athlete First: 2021 year end hurdle report																
date	26-Jun	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		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	7.80	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
H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	13	16	153				
Warholm, Karsten (NOR) (1996)																		
FINAL - 2021 Herculis Meeting International d'Athletisme (Monaco, MON) (TV Analysis)		Henson (2021) - Athlete First: 2021 year end hurdle report																
date	9-Jul	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		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
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	15	18	157				
McMaster, Kyron (IVB) (1997)																		
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)		Henson (2021) - Athlete First: 2021 year end hurdle report																
date	3-Aug	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
H1 lead leg	R	strides	20	13	13	13	13	14	14	14	14	14	17					
Samba, Abderrahman (QAT) (1995)																		
FINAL - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)		Henson (2021) - Athlete First: 2021 year end hurdle report																
date	3-Aug	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	3.84	4.08	4.12	4.24	4.32	4.42	5.22	NR		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
H1 lead leg	R	strides	21	13	13	13	13	13	13	13	14	14	17					
Benjamin, Rai (USA) (1997)																		
FINAL - 2021 USATF Golden Games (Walnut, CA) (TV Analysis)		Henson (2021) - Athlete First: 2021 year end hurdle report																
date	9-May	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		interval		3.60	3.77	3.87	3.94	3.97	4.10	4.28	4.30	4.44	5.02			11.24	12.01	13.02
		velocity	7.71	9.72	9.28	9.04	8.88	8.82	8.54	8.18	8.14	7.88	7.97	8.49		9.34	8.74	8.06
H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	13	16	153				
Warholm, Karsten (NOR) (1996)																		
Semi-Final 1 - 2020 Olympic Games (Tokyo, JPN) (TV Analysis)		Henson (2024) - Athlete First: 2021 year end hurdle report																
date	1-Aug	time	5.73	9.30	12.93	16.63	20.56	24.56	28.73	33.02	37.40	42.20		47.30	7 / 1			
reaction time	0.156	interval		3.57	3.63	3.70	3.93	4.00	4.17	4.29	4.38	4.80	5.10			10.90	12.10	13.47
		velocity	7.85	9.80	9.64	9.46	8.91	8.75	8.39	8.16	7.99	7.29	7.84	8.46		9.63	8.68	7.80
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	15	17.5	156.5				
dos Santos, Alison (BRA) (2000)																		
Semi-Final 2 - 2020 Olympic Games (Tokyo, JPN)		Henson (2024) - Athlete First: 2021 year end hurdle report																
date	1-Aug	time	5.80	9.43	13.13	16.93	20.76	24.90	29.00	33.28	37.70	42.20		47.31	7 / 1			
reaction time	0.171	interval		3.63	3.70	3.80	3.83	4.14	4.10	4.28	4.42	4.50	5.11	AR PB		11.13	12.07	13.20
		velocity	7.76	9.64	9.46	9.21	9.14	8.45	8.54	8.18	7.92	7.78	7.83	8.45		9.43	8.70	7.95
H1 lead leg	L	strides	20	13	13	12	12	13	13	13	13	13	16	151				
dos Santos, Alison (BRA) (2000)																		
FINAL - 2021 Bauhaus Galan (Stockholm, SWE) (TV Analysis)		Henson (2021) - Athlete First: 2021 year end hurdle report																
date	4-Jul	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	strides		13	13	12	12	13	13	13	13	13	17	132				
Warholm, Karsten (NOR) (1996)																		
FINAL - 2021 Weltklasse (Zürich, SUI) (TV Analysis)		Henson (2021) - Athlete First: 2021 year end hurdle report																
date	9-Sep	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
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	15	15	18	159				

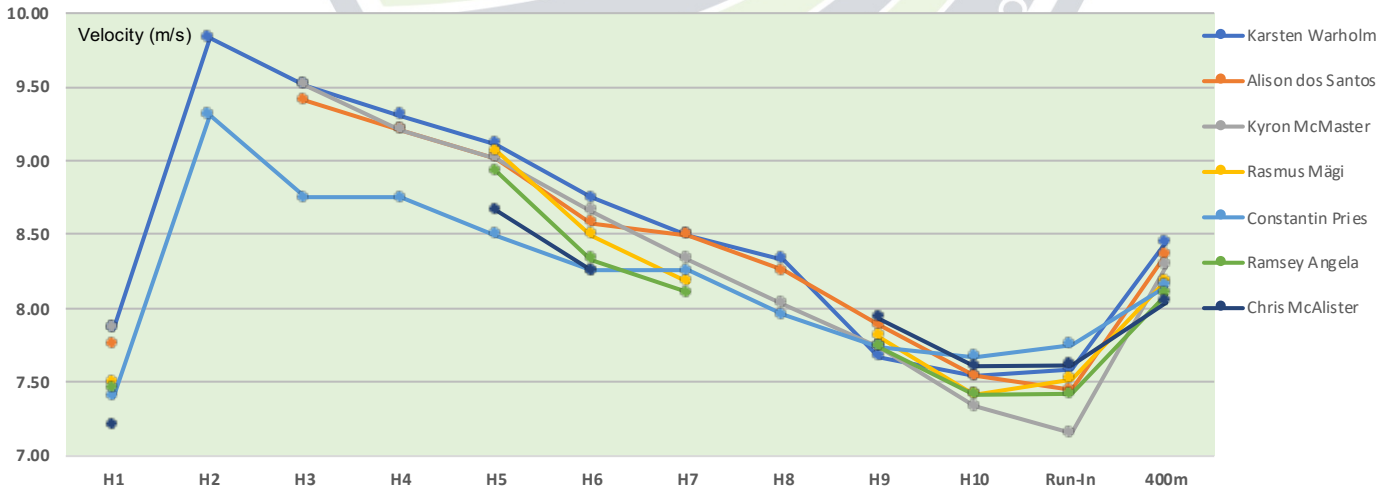
2021 Weltklasse (Zürich, SUI) (TV Analysis)

Men's 400m Hurdles

Date 2021.09.09

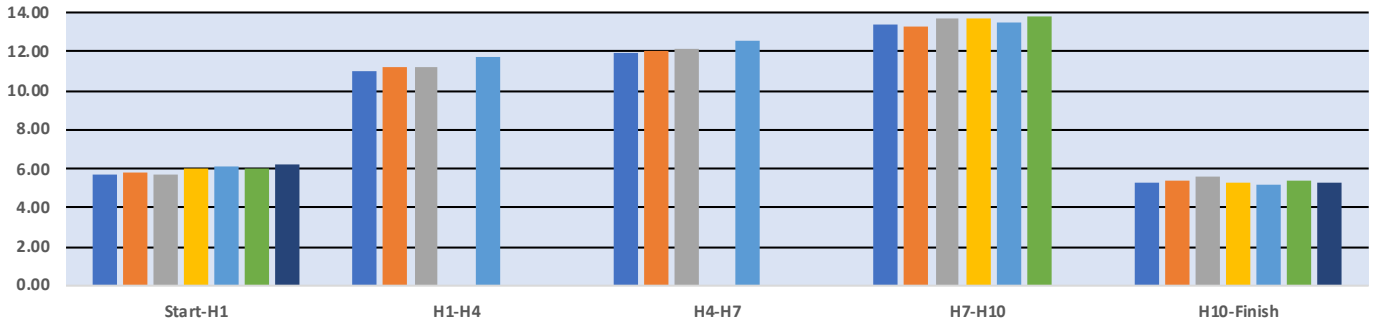
FINAL

		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
H1 lead leg	L																
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	9.21	9.02	8.58	8.50	8.25	7.88	7.54	7.45	8.37			9.34	8.69	7.88
H1 lead leg	L																
McMaster, Kyron (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
H1 lead leg	L																
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					
	interval					9.07	8.50	8.18		7.81	7.42	7.52	8.19				
	velocity	7.50				13	13	13	14	14	14	17	77				
H1 lead leg	R																
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
H1 lead leg	L																
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					
	interval					8.93	8.33	8.10		7.74	7.42	7.42	8.10				
	velocity	7.45				15	15			18	70						
H1 lead leg	R																
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							
H1 lead leg	R																



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>

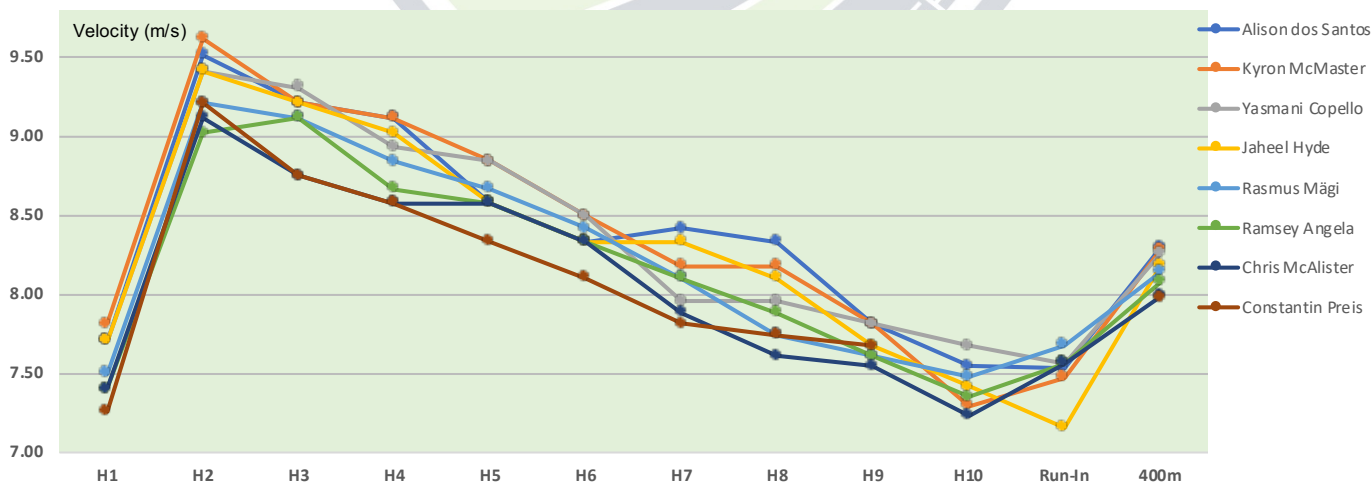
2021 Memorial van Damme (Brussels, BEL) (TV Analysis)

Men's 400m Hurdles

Date 2021.09.03

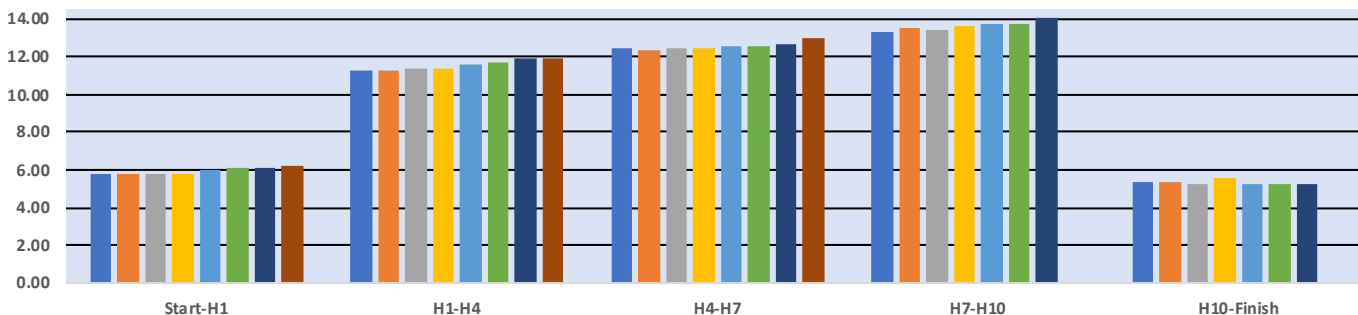
FINAL

		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																
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																
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																
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																
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	4.44	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																
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																
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																
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																



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=9w3ku7JrNo>

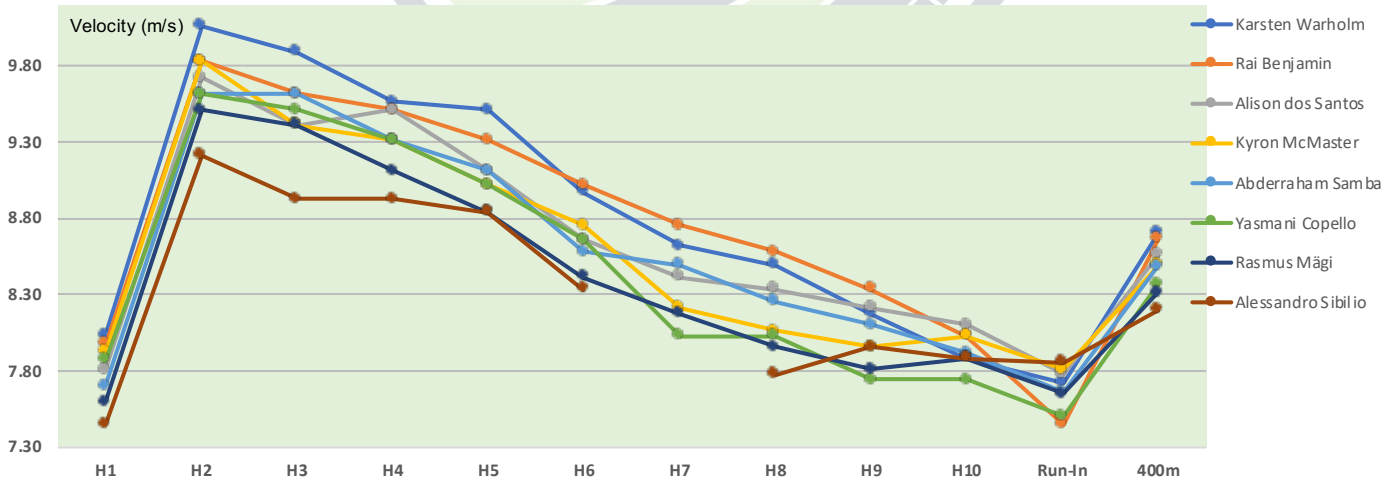
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Men's 400m Hurdles

Date 2021.08.03

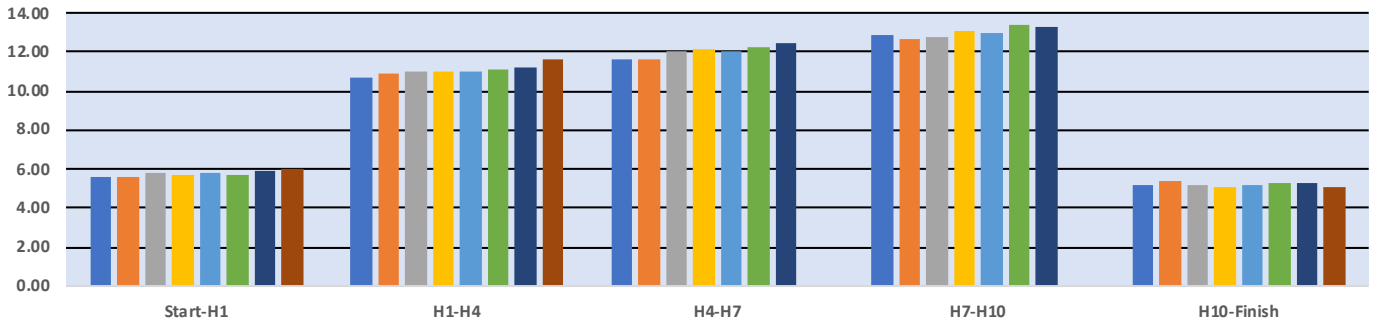
FINAL

		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
H1 lead leg	L																
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
H1 lead leg	R																
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
H1 lead leg	L																
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
H1 lead leg	R																
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
H1 lead leg	R																
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
H1 lead leg	R																
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
H1 lead leg	L																
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																



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=mGzBtclnfyw>

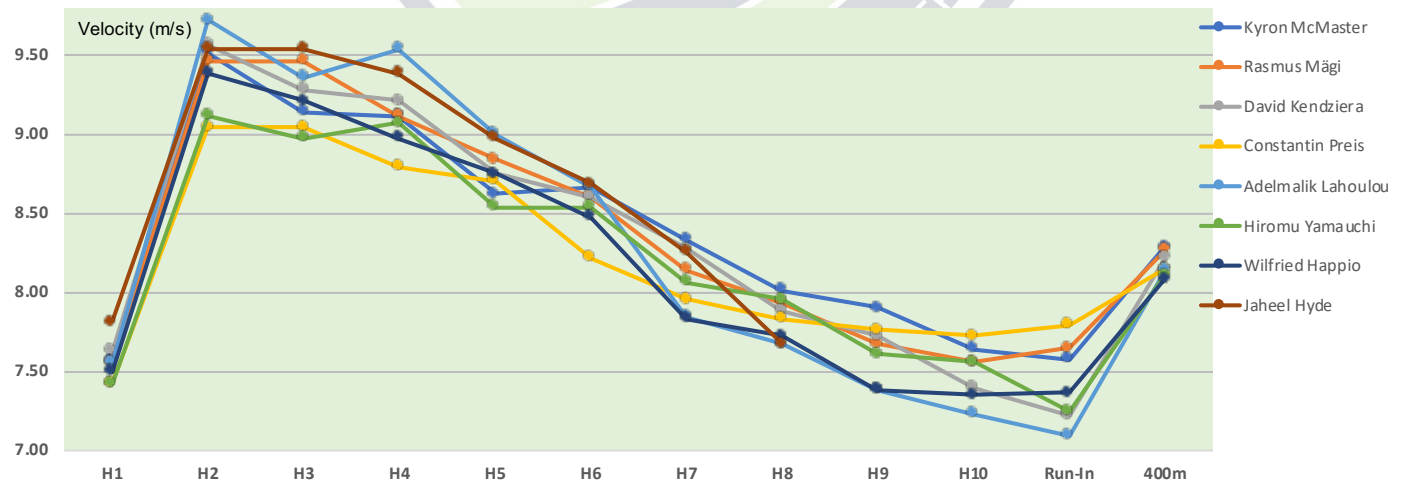
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Men's 400m Hurdles

Date 2021.08.01

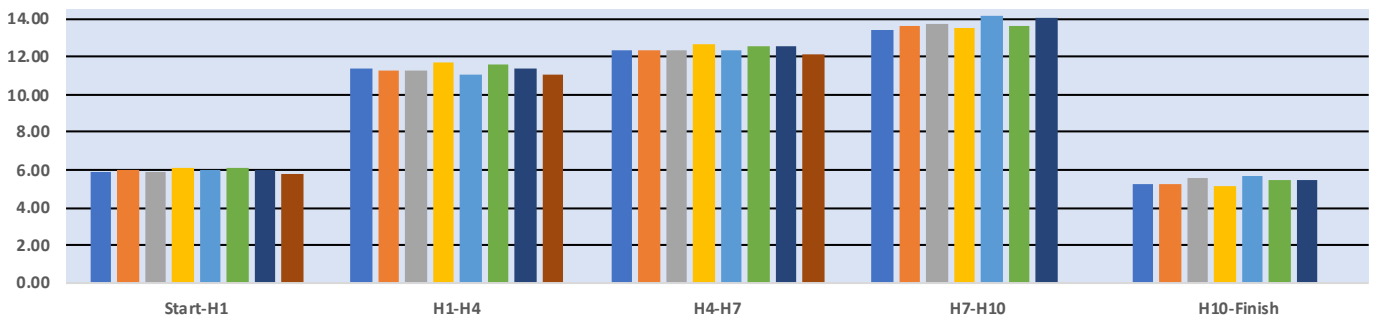
Semi-Final 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McMaster, Kyron (IVB) (1997)	time	5.95	9.63	13.46	17.30	21.36	25.40	29.60	33.97	38.40	42.98		48.26	7 / 1			
	reaction time	0.179															
	interval velocity	7.56	9.51	9.14	9.11	8.62	8.66	8.20	8.33	8.01	7.64	7.58	8.29		11.35	12.30	13.38
	H1 lead leg L strides	21	13	13	13	13	13	14	14	14	14	17	159		9.25	8.54	7.85
Mägi, Rasmus (EST) (1992)	time	5.96	9.66	13.36	17.20	21.16	25.23	29.53	33.94	38.50	43.13		48.36	6 / 2			
	reaction time	0.156															
	interval velocity	7.55	9.46	9.46	9.11	8.84	8.60	8.14	7.94	7.68	7.56	7.65	8.27		11.24	12.33	13.60
	H1 lead leg R strides	20	13	13	13	13	13	13	14	14	14	17	157		9.34	8.52	7.72
Kenziera, David (USA) (1994)	time	5.90	9.56	13.33	17.13	21.13	25.20	29.43	33.87	38.40	43.13		48.67	9 / 3			
	reaction time	0.190															
	interval velocity	7.63	9.56	9.28	9.21	8.75	8.60	8.27	7.88	7.73	7.40	7.22	8.22		11.23	12.30	13.70
	H1 lead leg R strides	20	13	13	13	13	13	13	14	14	15	18.2	159.2		9.35	8.54	7.66
Preis, Constantin (GER) (1998)	time	6.06	9.93	13.80	17.78	21.80	26.06	30.46	34.93	39.44	43.97		49.10	2 / 4			
	reaction time	0.186															
	interval velocity	7.43	9.04	9.04	8.79	8.71	8.22	7.95	7.83	7.76	7.73	7.80	8.15		11.72	12.68	13.51
	H1 lead leg L strides	22	14	14	14	14	15	15	15	15	15	18.2	171.2		8.96	8.28	7.77
Lahoulou, Adelmalik (ALG) (1992)	time	5.96	9.56	13.30	16.97	20.86	24.90	29.36	33.92	38.66	43.50		49.14	5 / 5			
	reaction time	0.125															
	interval velocity	7.55	9.72	9.36	9.54	9.00	8.66	7.85	7.68	7.38	7.23	7.09	8.14		11.01	12.39	14.14
	H1 lead leg L strides	22	13	13	13	13	13	14	14	15	15	17.7	162.7		9.54	8.47	7.43
Yamauchi, Hiromu (JPN) (1999)	time	6.06	9.90	13.80	17.66	21.76	25.86	30.20	34.60	39.20	43.83		49.35	8 / 6			
	reaction time	0.192															
	interval velocity	7.43	9.11	8.97	9.07	8.54	8.54	8.06	7.95	7.61	7.56	7.25	8.11		11.60	12.54	13.63
	H1 lead leg L strides	21	14	14	14	14	14	14	15	15	15	19	169		9.05	8.37	7.70
Happio, Wilfried (FRA) (1998)	time	6.00	9.73	13.53	17.43	21.43	25.56	30.03	34.56	39.30	44.06		49.49	3 / 7			
	reaction time	0.130															
	interval velocity	7.50	9.38	9.21	8.97	8.75	8.47	7.83	7.73	7.38	7.35	7.37	8.08		11.43	12.60	14.03
	H1 lead leg L strides	20	13	13	13	13	13	14	14	15	15	18	161		9.19	8.33	7.48
Hyde, Jaheel (JAM) (1997)	time	5.76	9.43	13.10	16.83	20.73	24.76	29.00	33.56				87.38	4 / 8			
	reaction time	0.159															
	interval velocity	7.81	9.54	9.54	9.38	8.97	8.68	8.25	7.68				4.58		11.07	12.17	
	H1 lead leg L strides	22	13	13	13	13	14	14	15				117		9.49	8.63	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field-day-9-evening-session-athletics-tokyo-2020-replays>

Biomechanical Analysis

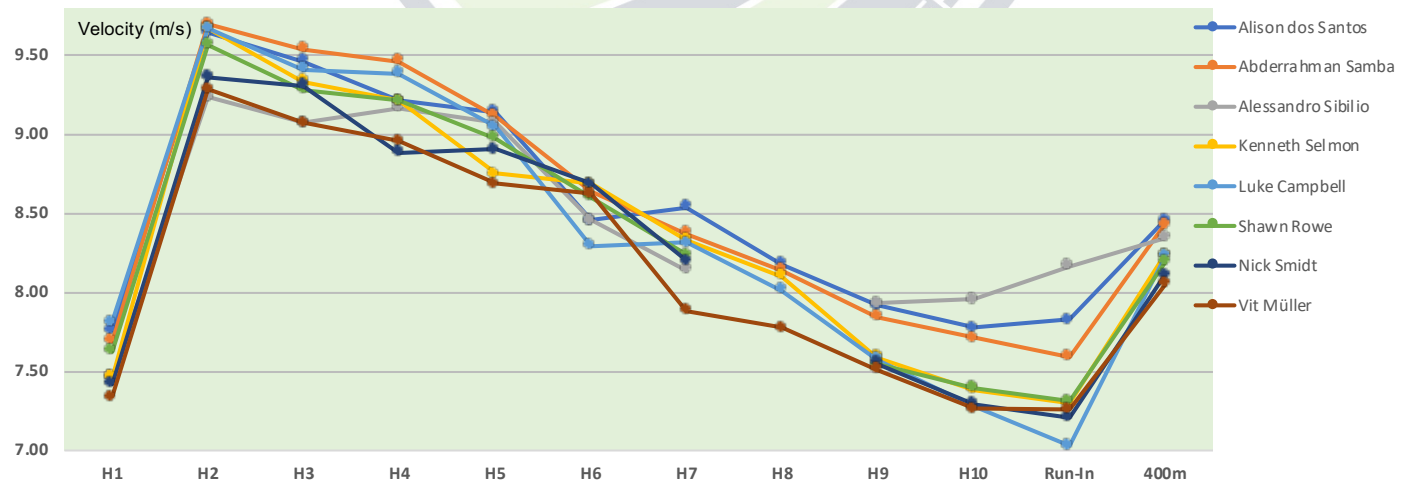
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Men's 400m Hurdles

Date 2021.08.01

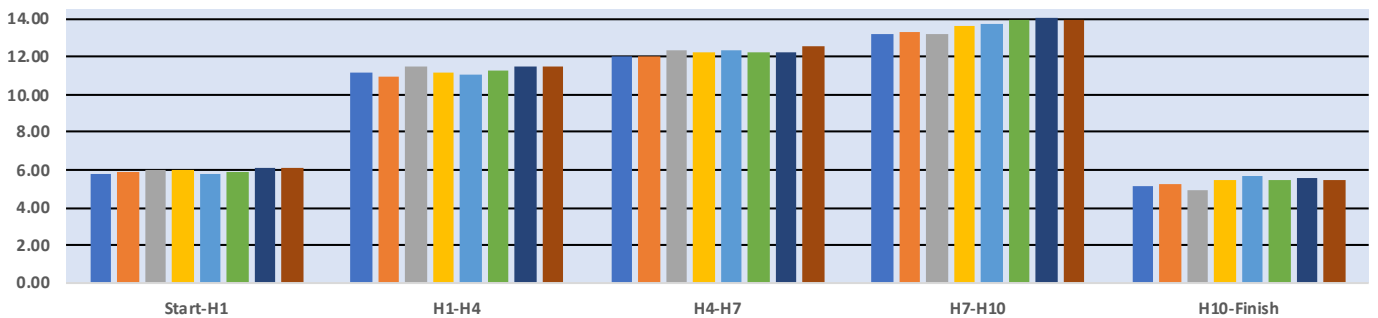
Semi-Final 2

		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	5.80	9.43	13.13	16.93	20.76	24.90	29.00	33.28	37.70	42.20		47.31	7 / 1			
	reaction time	0.171															
	interval		3.63	3.70	3.80	3.83	4.14	4.10	4.28	4.42	4.50	5.11	AR PB		11.13	12.07	13.20
	velocity	7.76	9.64	9.46	9.21	9.14	8.45	8.54	8.18	7.92	7.78	7.83	8.45		9.43	8.70	7.95
H1 lead leg	L																
Samba, Abderrahman (QAT) (1995)	time	5.85	9.46	13.13	16.83	20.67	24.72	28.90	33.20	37.66	42.20		47.47	5 / 2			
	reaction time	0.188															
	interval		3.61	3.67	3.70	3.84	4.05	4.18	4.30	4.46	4.54	5.27			10.98	12.07	13.30
	velocity	7.69	9.70	9.54	9.46	9.11	8.64	8.37	8.14	7.85	7.71	7.59	8.43		9.56	8.70	7.89
H1 lead leg	R																
Sibilio, Alessandro (ITA) (1999)	time	6.03	9.82	13.68	17.50	21.36	25.50	29.80		38.63	43.03		47.93	4 / 3			
	reaction time	0.123															
	interval		3.79	3.86	3.82	3.86	4.14	4.30		8.83	4.40	4.90	PB		11.47	12.30	13.23
	velocity	7.46	9.23	9.07	9.16	9.07	8.45	8.14		7.93	7.95	8.16	8.35		9.15	8.54	7.94
H1 lead leg	R																
Selmon, Kenneth (USA) (1996)	time	6.03	9.65	13.40	17.20	21.20	25.23	29.43	33.75	38.36	43.10		48.58	6 / 4			
	reaction time	0.255															
	interval		3.62	3.75	3.80	4.00	4.03	4.20	4.32	4.61	4.74	5.48			11.17	12.23	13.67
	velocity	7.46	9.67	9.33	9.21	8.75	8.68	8.33	8.10	7.59	7.38	7.30	8.23		9.40	8.59	7.68
H1 lead leg	R																
Campbell, Luke (GER) (1994)	time	5.76	9.38	13.10	16.83	20.70	24.92	29.13	33.50	38.12	42.93		48.62	8 / 5			
	reaction time	0.153															
	interval		3.62	3.72	3.73	3.87	4.22	4.21	4.37	4.62	4.81	5.69	PB		11.07	12.30	13.80
	velocity	7.81	9.67	9.41	9.38	9.04	8.29	8.31	8.01	7.58	7.28	7.03	8.23		9.49	8.54	7.61
H1 lead leg	L																
Rowe, Shawn (JAM) (1992)	time	5.90	9.56	13.33	17.13	21.03	25.10	29.35		38.63	43.36		48.83	9 / 6			
	reaction time	0.204															
	interval		3.66	3.77	3.80	3.90	4.07	4.25		9.28	4.73	5.47	PB		11.23	12.22	14.01
	velocity	7.63	9.56	9.28	9.21	8.97	8.60	8.24		7.54	7.40	7.31	8.19		9.35	8.59	7.49
H1 lead leg	L																
Smidt, Nick (NED) (1997)	time	6.06	9.80	13.56	17.50	21.43	25.46	29.73		39.00	43.80		49.35	2 / 7			
	reaction time	0.164															
	interval		3.74	3.76	3.94	3.93	4.03	4.27		9.27	4.80	5.55			11.44	12.23	14.07
	velocity	7.43	9.36	9.31	8.88	8.91	8.68	8.20		7.55	7.29	7.21	8.11		9.18	8.59	7.46
H1 lead leg	L																
Müller, Vit (CZE) (1996)	time	6.13	9.90	13.76	17.67	21.70	25.76	30.20	34.70	39.36	44.18		49.69	3 / 8			
	reaction time	0.145															
	interval		3.77	3.86	3.91	4.03	4.06	4.44	4.50	4.66	4.82	5.51			11.54	12.53	13.98
	velocity	7.34	9.28	9.07	8.95	8.68	8.62	7.88	7.78	7.51	7.26	7.26	8.05		9.10	8.38	7.51
H1 lead leg	L																



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field/day-9-evening-session-athletics-tokyo-2020-replays>

Biomechanical Analysis

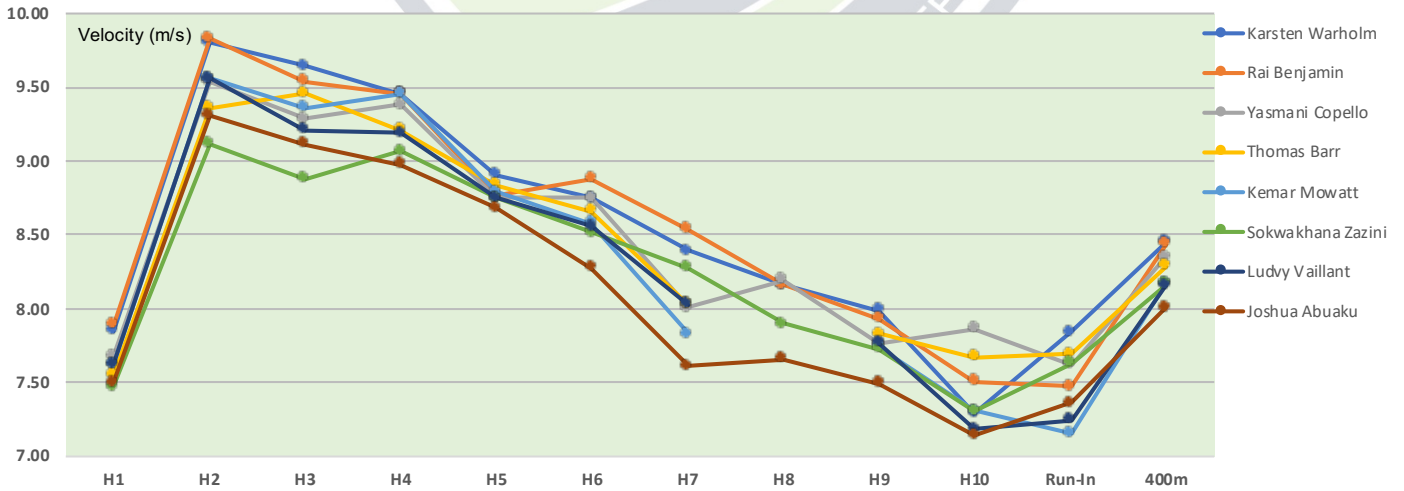
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Men's 400m Hurdles

Date 2021.08.01

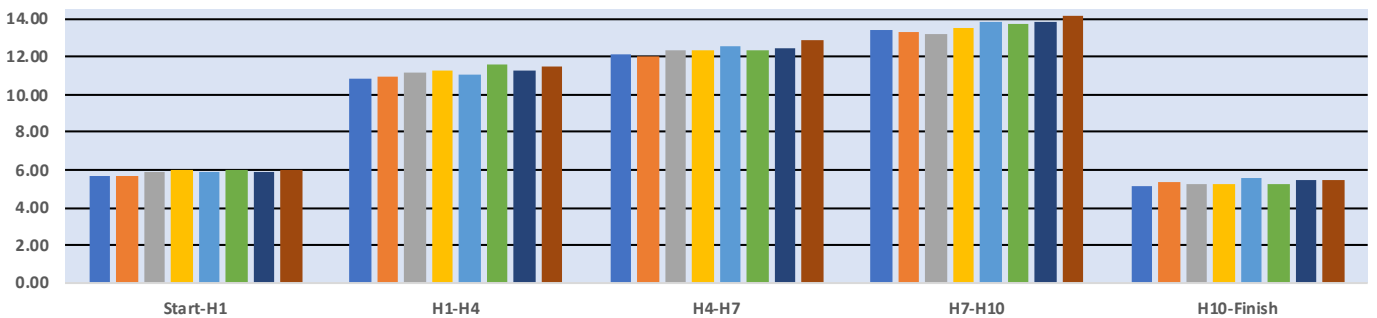
Semi-Final 1

		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	5.73	9.30	12.93	16.63	20.56	24.56	28.73	33.02	37.40	42.20		47.30	7 / 1			
	reaction time	0.156															
	interval velocity	7.85	9.57	9.63	3.70	3.93	4.00	4.17	4.29	4.38	4.80	5.10			10.90	12.10	13.47
H1 lead leg	L														9.63	8.68	7.80
Benjamin, Rai (USA) (1997)	time	5.70	9.26	12.93	16.63	20.62	24.56	28.66	32.95	37.36	42.02		47.37	5 / 2			
	reaction time	0.184															
	interval velocity	7.89	9.83	9.54	9.46	8.77	8.88	8.54	8.16	7.94	7.51	7.48	8.44		10.93	12.03	13.36
H1 lead leg	R														9.61	8.73	7.86
Copello, Yasmani (TUR) (1987)	time	5.86	9.53	13.30	17.03	21.03	25.03	29.40	33.67	38.18	42.63		47.88	4 / 3			
	reaction time	0.183															
	interval velocity	7.68	9.54	9.28	9.38	8.75	8.75	8.01	8.20	7.76	7.87	7.62	8.35		11.17	12.37	13.23
H1 lead leg	R														9.40	8.49	7.94
Barr, Thomas (IRL) (1992)	time	5.96	9.70	13.40	17.20	21.16	25.20	29.56		38.50	43.06		48.26	6 / 4			
	reaction time	0.151															
	interval velocity	7.55	9.36	9.46	9.21	8.84	8.66	8.03		7.83	7.68	7.69	8.29		11.24	12.36	13.50
H1 lead leg	L														9.34	8.50	7.78
Mowatt, Kemar (JAM) (1995)	time	5.90	9.56	13.30	17.00	20.98	25.06	29.53		38.57	43.36		48.95	9 / 5			
	reaction time	0.166															
	interval velocity	7.63	9.56	9.36	9.46	8.79	8.58	7.83		7.74	7.31	7.16	8.17		11.10	12.53	13.83
H1 lead leg	L														9.46	8.38	7.59
Zazini, Sokwakhana (RSA) (2000)	time	6.02	9.86	13.80	17.66	21.66	25.77	30.00	34.43	38.96	43.75		48.99	8 / 6			
	reaction time	0.150															
	interval velocity	7.48	9.11	8.88	9.07	8.75	8.52	8.27	7.90	7.73	7.31	7.63	8.16		11.64	12.34	13.75
H1 lead leg	L														9.02	8.51	7.64
Vaillant, Ludvy (FRA) (1995)	time	5.90	9.56	13.36	17.17	21.17	25.26	29.62		38.63	43.50		49.02	3 / 7			
	reaction time	0.162															
	interval velocity	7.63	9.56	9.21	9.19	8.75	8.56	8.03		7.77	7.19	7.25	8.16		11.27	12.45	13.88
H1 lead leg	R														9.32	8.43	7.56
Abuaku, Joshua (GER) (1996)	time	6.00	9.76	13.60	17.50	21.53	25.76	30.36	34.93	39.60	44.50		49.93	2 / 8			
	reaction time	0.179															
	interval velocity	7.50	9.31	9.11	8.97	8.68	8.27	7.61	7.66	7.49	7.14	7.37	8.01		11.50	12.86	14.14
H1 lead leg	L														9.13	8.16	7.43



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field/day-9-evening-session-athletics-tokyo-2020-replays>

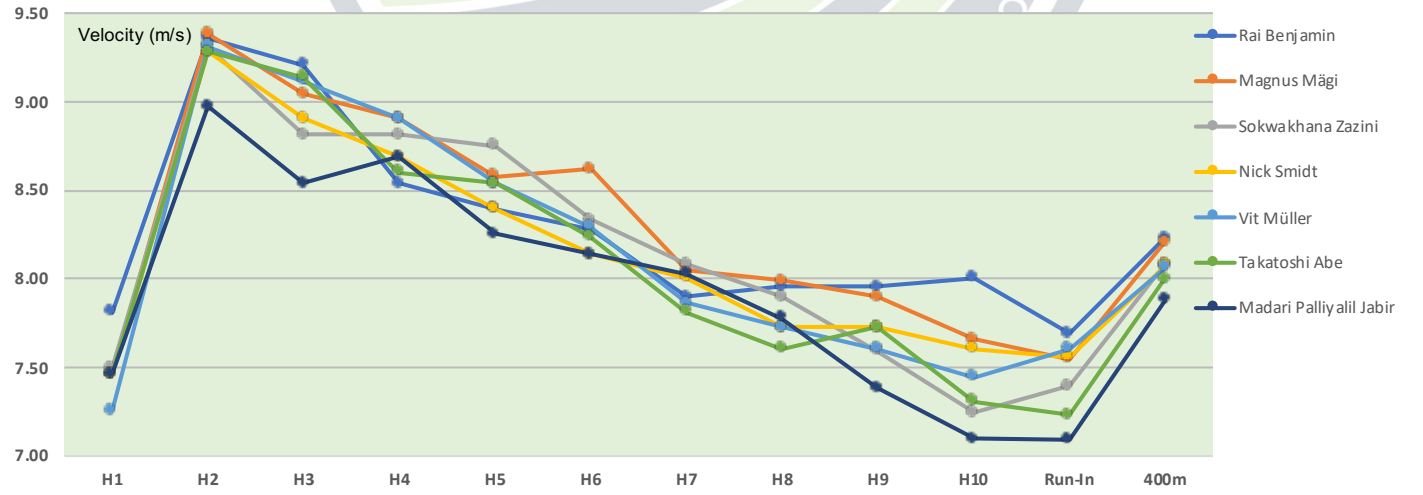
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Men's 400m Hurdles

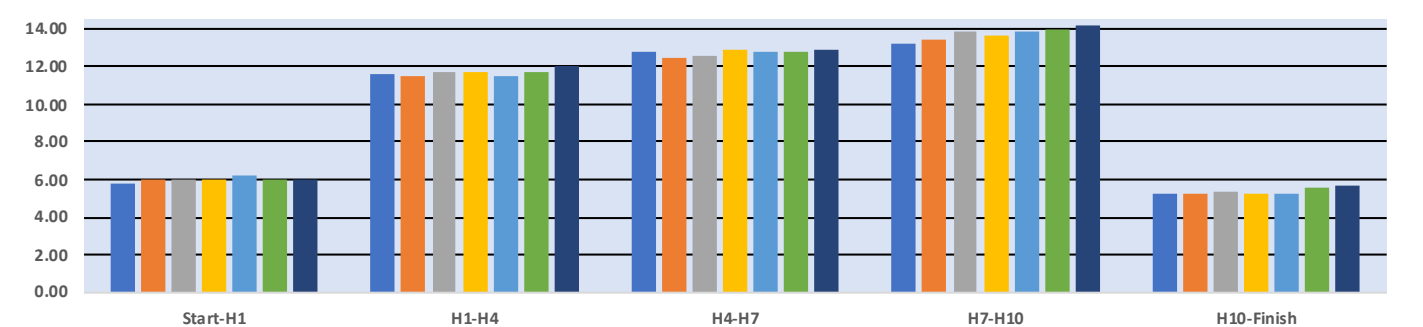
Date 2021.07.30

Heat 5

		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	5.76	9.50	13.30	17.40	21.57	25.80	30.23	34.63	39.03	43.40		48.60	6 / 1			
	reaction time	0.209															
	interval		3.74	3.80	4.10	4.17	4.23	4.43	4.40	4.40	4.37	5.20			11.64	12.83	13.17
	velocity	7.81	9.36	9.21	8.54	8.39	8.27	7.90	7.95	7.95	8.01	7.69	8.23		9.02	8.18	7.97
H1 lead leg	R																
Mägi, Rasmus (EST) (1992)	time	6.03	9.76	13.63	17.56	21.64	25.70	30.05	34.43	38.86	43.43		48.73	4 / 2			
	reaction time	0.160															
	interval		3.73	3.87	3.93	4.08	4.06	4.35	4.38	4.43	4.57	5.30			11.53	12.49	13.38
	velocity	7.46	9.38	9.04	8.91	8.58	8.62	8.05	7.99	7.90	7.66	7.55	8.21		9.11	8.41	7.85
H1 lead leg	R																
Zazini, Sokwakhana (RSA) (2000)	time	6.00	9.76	13.73	17.70	21.70	25.90	30.23	34.66	39.27	44.10		49.51	2 / 3			
	reaction time	0.147															
	interval		3.76	3.97	3.97	4.00	4.20	4.33	4.43	4.61	4.83	5.41			11.70	12.53	13.87
	velocity	7.50	9.31	8.82	8.82	8.75	8.33	8.08	7.90	7.59	7.25	7.39	8.08		8.97	8.38	7.57
H1 lead leg	L																
Smidt, Nick (NED) (1997)	time	6.03	9.80	13.73	17.76	21.93	26.23	30.60	35.13	39.66	44.26		49.55	7 / 4			
	reaction time	0.181															
	interval		3.77	3.93	4.03	4.17	4.30	4.37	4.53	4.53	4.60	5.29			11.73	12.84	13.66
	velocity	7.46	9.28	8.91	8.68	8.39	8.14	8.01	7.73	7.73	7.61	7.56	8.07		8.95	8.18	7.69
H1 lead leg	L																
Müller, Vit (CZE) (1996)	time	6.20	9.96	13.80	17.73	21.83	26.05	30.50	35.03	39.63	44.33		49.59	3 / 5			
	reaction time	0.143															
	interval		3.76	3.84	3.93	4.10	4.22	4.45	4.53	4.60	4.70	5.26			11.53	12.77	13.83
	velocity	7.26	9.31	9.11	8.91	8.54	8.29	7.87	7.73	7.61	7.45	7.60	8.07		9.11	8.22	7.59
H1 lead leg	L																
Abe, Takatoshi (JPN) (1991)	time	6.03	9.80	13.63	17.70	21.80	26.05	30.53	35.13	39.66	44.45		49.98	8 / 6			
	reaction time	0.166															
	interval		3.77	3.83	4.07	4.10	4.25	4.48	4.60	4.53	4.79	5.53			11.67	12.83	13.92
	velocity	7.46	9.28	9.14	8.60	8.54	8.24	7.81	7.61	7.73	7.31	7.23	8.00		9.00	8.18	7.54
H1 lead leg	R																
Jabir, Madari Palliyalil (IND) (1996)	time	6.03	9.93	14.03	18.06	22.30	26.60	30.96	35.46	40.20	45.13		50.77	5 / 7			
	reaction time	0.167															
	interval		3.90	4.10	4.03	4.24	4.30	4.36	4.50	4.74	4.93	5.64			12.03	12.90	14.17
	velocity	7.46	8.97	8.54	8.68	8.25	8.14	8.03	7.78	7.38	7.10	7.09	7.88		8.73	8.14	7.41
H1 lead leg	L																



Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field/day-7-morning-session-athletics-tokyo-2020-replays>

Biomechanical Analysis

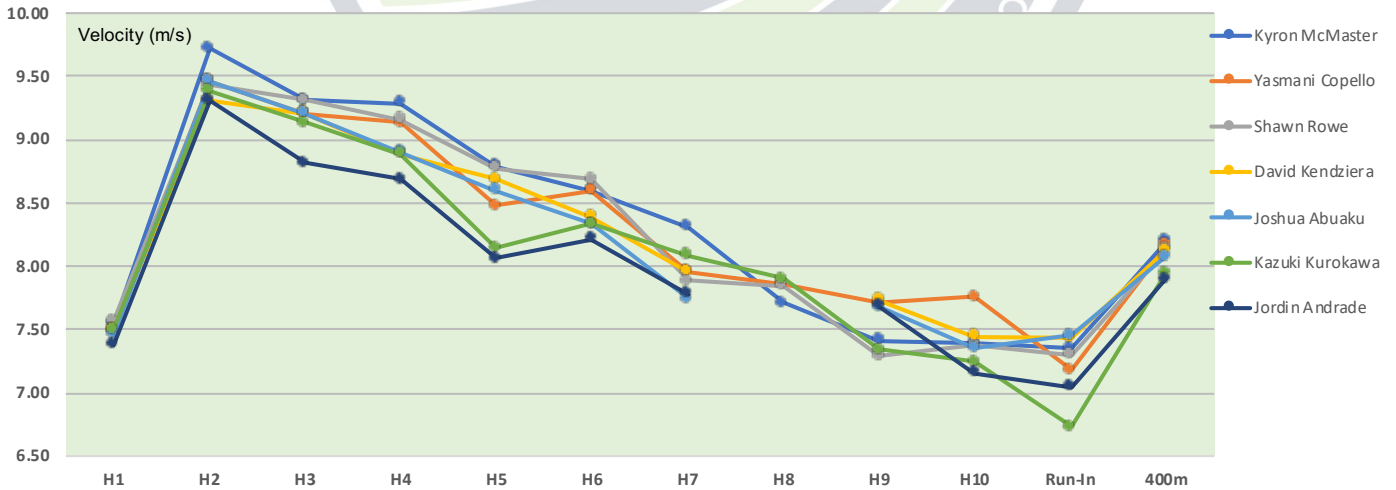
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Men's 400m Hurdles

Date 2021.07.30

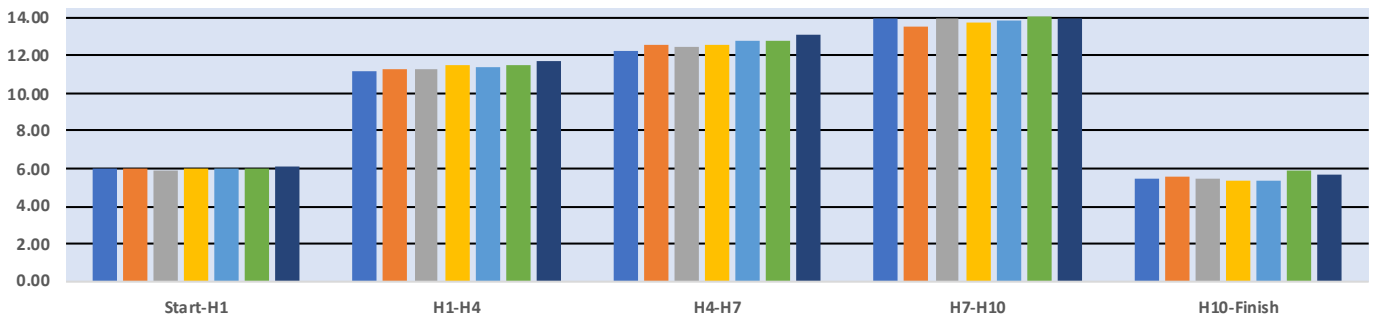
Heat 4

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McMaster, Kyron (IVB) (1997)	time	5.97	9.57	13.33	17.10	21.08	25.15	29.36	33.90	38.62	43.35		48.79	2 / 1			
	reaction time	0.184													11.13	12.26	13.99
	interval		3.60	3.76	3.77	3.98	4.07	4.21	4.54	4.72	4.73	5.44			9.43	8.56	7.51
	velocity	7.54	9.72	9.31	9.28	8.79	8.60	8.31	7.71	7.42	7.40	7.35	8.20				
H1 lead leg	L																
	strides	20	13	13	13	13	13	13	14	14	14	17	157				
Copello, Yasmani (TUR) (1987)	time	6.00	9.70	13.50	17.33	21.46	25.53	29.93	34.38	38.92	43.43		49.00	5 / 2			
	reaction time	0.188													11.33	12.60	13.50
	interval		3.70	3.80	3.83	4.13	4.07	4.40	4.45	4.54	4.51	5.57			9.27	8.33	7.78
	velocity	7.50	9.46	9.21	9.14	8.47	8.60	7.95	7.87	7.71	7.76	7.18	8.16				
H1 lead leg	R																
	strides	20	13	13	13	13	13	14	14	14	15	17.5	159.5				
Rowe, Shawn (JAM) (1992)	time	5.95	9.66	13.42	17.24	21.23	25.26	29.70	34.16	38.96	43.70		49.18	4 / 3			
	reaction time	0.157													11.29	12.46	14.00
	interval		3.71	3.76	3.82	3.99	4.03	4.44	4.46	4.80	4.74	5.48			9.30	8.43	7.50
	velocity	7.56	9.43	9.31	9.16	8.77	8.68	7.88	7.85	7.29	7.38	7.30	8.13				
H1 lead leg	L																
	strides	20	13	13	13	13	13	14	14	14	14	17	158				
Kenziera, David (USA) (1994)	time	6.00	9.76	13.56	17.50	21.53	25.70	30.10		39.15	43.85		49.23	6 / 4			
	reaction time	0.192								9.05	4.70	5.38			11.50	12.60	13.75
	interval		3.76	3.80	3.94	4.03	4.17	4.40							9.13	8.33	7.64
	velocity	7.50	9.31	9.21	8.88	8.68	8.39	7.95		7.73	7.45	7.43	8.13				
H1 lead leg	R																
	strides	20	13	13	13	13	13	14	14	14	18	145					
Abuaku, Joshua (GER) (1996)	time	6.03	9.73	13.53	17.46	21.53	25.73	30.25		39.37	44.13		49.50	8 / 5			
	reaction time	0.169								9.12	4.76	5.37			11.43	12.79	13.88
	interval		3.70	3.80	3.93	4.07	4.20	4.52	4.43	4.77	4.83	5.94			9.19	8.21	7.56
	velocity	7.46	9.46	9.21	8.91	8.60	8.33	7.74		7.68	7.35	7.45	8.08				
H1 lead leg	L																
	strides	20	13	13	13	13	13	14	14	14	18	131					
Kurokawa, Kazuki (JPN) (2001)	time	6.00	9.73	13.56	17.50	21.80	26.00	30.33	34.76	39.53	44.36		50.30	3 / 6			
	reaction time	0.154								9.11	4.89	5.68			11.50	12.83	14.03
	interval		3.73	3.83	3.94	4.30	4.20	4.33	4.43	4.77	4.83	5.94			9.13	8.18	7.48
	velocity	7.50	9.38	9.14	8.88	8.14	8.33	8.08	7.90	7.34	7.25	6.73	7.95				
H1 lead leg	L																
	strides	21	13	13	13	13	14	14	14	14	15	18	162				
Andrade, Jordin (CPV) (1992)	time	6.10	9.86	13.83	17.86	22.20	26.46	30.96		40.07	44.96		50.64	7 / 7			
	reaction time	0.202								9.11	4.89	5.68			11.76	13.10	14.00
	interval		3.76	3.97	4.03	4.34	4.26	4.50							8.93	8.02	7.50
	velocity	7.38	9.31	8.82	8.68	8.06	8.22	7.78		7.68	7.16	7.04	7.90				
H1 lead leg	L																
	strides	22	14	14	14	14	15	15		15	15	138					



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field/day-7-morning-session-athletics-tokyo-2020-replays>

Biomechanical Analysis

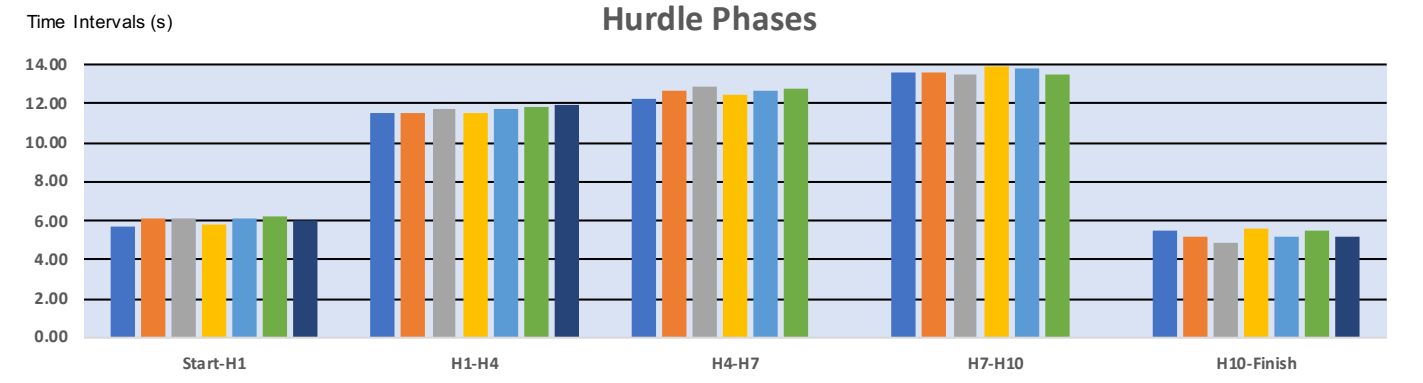
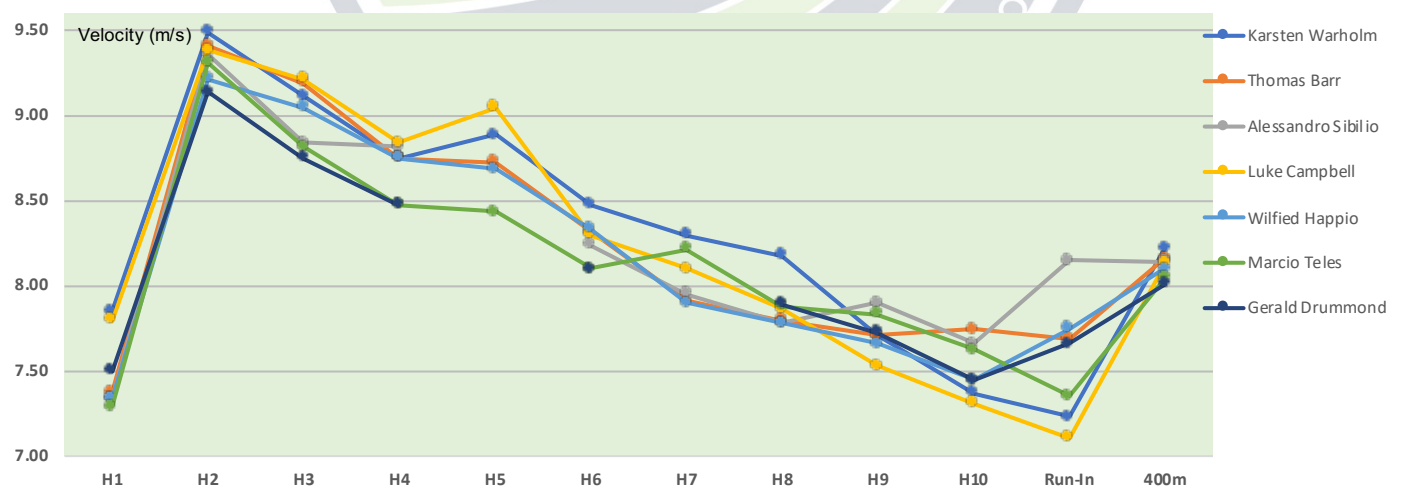
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

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	5.73	9.42	13.26	17.26	21.20	25.33	29.55	33.83	38.37	43.12		48.65	8 / 1			
	reaction time	0.157															
	interval		3.69	3.84	4.00	3.94	4.13	4.22	4.28	4.54	4.75	5.53			11.53	12.29	13.57
	velocity	7.85	9.49	9.11	8.75	8.88	8.47	8.29	8.18	7.71	7.37	7.23	8.22		9.11	8.54	7.74
H1 lead leg	L																
	strides	20	13	13	13	13	13	13	13	15	15	17	158				
Barr, Thomas (IRL) (1992)	time	6.10	9.82	13.63	17.63	21.64	25.85	30.27	34.76	39.30	43.82		49.02	7 / 2			
	reaction time	0.147															
	interval		3.72	3.81	4.00	4.01	4.21	4.42	4.49	4.54	4.52	5.20			11.53	12.64	13.55
	velocity	7.38	9.41	9.19	8.75	8.73	8.31	7.92	7.80	7.71	7.74	7.69	8.16		9.11	8.31	7.75
H1 lead leg	L																
	strides	20	13	13	13	13	13	14	14	14	14	17.2	158.2				
Sibilio, Alessandro (ITA) (1999)	time	6.13	9.87	13.83	17.80		26.30	30.70	35.20	39.63	44.20		49.11	3 / 3			
	reaction time	0.126															
	interval		3.74	3.96	3.97		8.50	4.40	4.50	4.43	4.57	4.91			11.67	12.90	13.50
	velocity	7.34	9.36	8.84	8.82		8.24	7.95	7.78	7.90	7.66	8.15	8.14		9.00	8.14	7.78
H1 lead leg	R																
	strides	21	13	13	13	13		14	15	15	15	17.5	149.5				
Campbell, Luke (GER) (1994)	time	5.77	9.50	13.30	17.26	21.13	25.35	29.67	34.12	38.77	43.56		49.19	4 / 4			
	reaction time	0.145															
	interval		3.73	3.80	3.96	3.87	4.22	4.32	4.45	4.65	4.79	5.63			11.49	12.41	13.89
	velocity	7.80	9.38	9.21	8.84	9.04	8.29	8.10	7.87	7.53	7.31	7.10	8.13		9.14	8.46	7.56
H1 lead leg	L																
	strides	21	13	13	13	13	14	14	15	15	18	164					
Happio, Wilfried (FRA) (1998)	time	6.13	9.93	13.80	17.80	21.83	26.03	30.46	34.96	39.53	44.23		49.39	5 / 5			
	reaction time	0.152															
	interval		3.80	3.87	4.00	4.03	4.32	4.26	4.44	4.47	4.59	5.16			11.67	12.66	13.77
	velocity	7.34	9.21	9.04	8.75	8.68	8.33	7.90	7.78	7.66	7.45	7.75	8.10		9.00	8.29	7.63
H1 lead leg	L																
	strides	20	13	13	13	13	13	14	14	15	15	17.7	160.7				
Teles, Marcio (BRA) (1994)	time	6.17	9.93	13.90	18.03	22.18	26.50	30.76	35.20	39.67	44.26		49.70	6 / 6			
	reaction time	0.154															
	interval		3.76	3.97	4.13	4.15	4.32	4.26	4.44	4.47	4.59	5.44			11.86	12.73	13.50
	velocity	7.29	9.31	8.82	8.47	8.43	8.10	8.22	7.88	7.83	7.63	7.35	8.05		8.85	8.25	7.78
H1 lead leg	L																
	strides	21	13	14	14	14	14	14	15	15	15	18	167				
Drummond, Gerald (CRC) (1994)	time	6.00	9.83	13.83	17.96		26.60		35.47	40.00	44.70		49.92	2 / 7			
	reaction time	0.183															
	interval		3.83	4.00	4.13		8.64		8.87	4.53	4.70	5.22			11.96	-17.96	44.70
	velocity	7.50	9.14	8.75	8.47		8.10		7.89	7.73	7.45	7.66	8.01		8.78	-5.85	2.35
H1 lead leg	L																
	strides	22	14	14	14						15	15	18	112			



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field/day-7-morning-session-athletics-tokyo-2020-replays>

Biomechanical Analysis

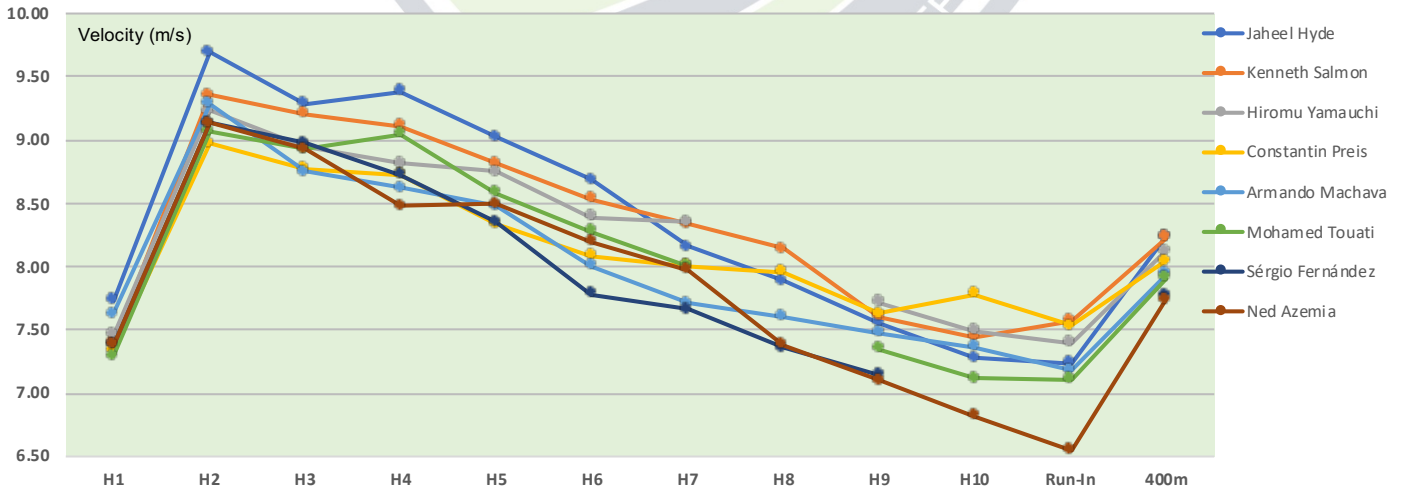
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Men's 400m Hurdles

Date 2021.07.30

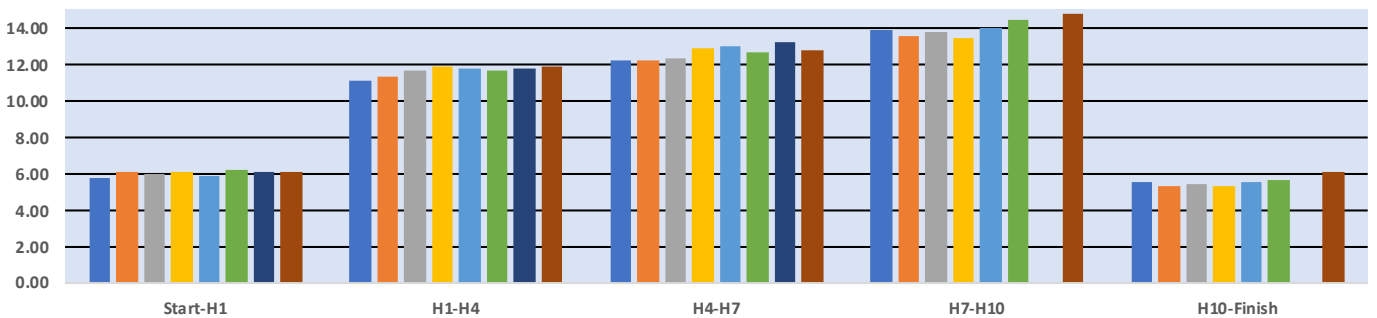
Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Hyde, Jaheel (JAM) (1997)	time	5.82	9.43	13.20	16.93	20.81	24.84	29.13	33.57	38.20	43.01		48.54	4 / 1			
	reaction time	0.184															
	interval		3.61	3.77	3.73	3.88	4.03	4.29	4.44	4.63	4.81	5.53			11.11	12.20	13.88
	velocity	7.73	9.70	9.28	9.38	9.02	8.68	8.16	7.88	7.56	7.28	7.23	8.24		9.45	8.61	7.56
H1 lead leg	L																
Selmon, Kenneth (USA) (1996)	time	6.08	9.82	13.62	17.46	21.43	25.53	29.73	34.03	38.63	43.33		48.61	7 / 2			
	reaction time	0.185															
	interval		3.74	3.80	3.84	3.97	4.10	4.20	4.30	4.60	4.70	5.28			11.38	12.27	13.60
	velocity	7.40	9.36	9.21	9.11	8.82	8.54	8.33	8.14	7.61	7.45	7.58	8.23		9.23	8.56	7.72
H1 lead leg	R																
Yamauchi, Hiromu (JPN) (1999)	time	6.03	9.82	13.73	17.70	21.70	25.87	30.06		39.13	43.80		49.21	8 / 3			
	reaction time	0.184															
	interval		3.79	3.91	3.97	4.00	4.17	4.19		9.07	4.67	5.41			11.67	12.36	13.74
	velocity	7.46	9.23	8.95	8.82	8.75	8.39	8.35		7.72	7.49	7.39	8.13		9.00	8.50	7.64
H1 lead leg	L																
Preis, Constantin (GER) (1998)	time	6.13	10.03	14.02	18.03	22.23	26.56	30.93	35.33	39.92	44.42		49.73	9 / 4			
	reaction time	0.215															
	interval		3.90	3.99	4.01	4.20	4.33	4.37	4.40	4.59	4.50	5.31			11.90	12.90	13.49
	velocity	7.34	8.97	8.77	8.73	8.33	8.08	8.01	7.95	7.63	7.78	7.53	8.04		8.82	8.14	7.78
H1 lead leg	L																
Machava, Armando (MOZ) (1996)	time	5.90	9.67	13.67	17.73	21.86	26.23	30.77	35.37	40.05	44.80		50.37	6 / 5			
	reaction time	0.159															
	interval		3.77	4.00	4.06	4.13	4.37	4.54	4.60	4.68	4.75	5.57			11.83	13.04	14.03
	velocity	7.63	9.28	8.75	8.62	8.47	8.01	7.71	7.61	7.48	7.37	7.18	7.94		8.88	8.05	7.48
H1 lead leg	L																
Touati, Mohamed (TUN) (1998)	time	6.17	10.03	13.95	17.82	21.90	26.13	30.50		40.03	44.95		50.58	2 / 6			
	reaction time	0.152															
	interval		3.86	3.92	3.87	4.08	4.23	4.37		9.53	4.92	5.63			11.65	12.68	14.45
	velocity	7.29	9.07	8.93	9.04	8.58	8.27	8.01		7.35	7.11	7.10	7.91		9.01	8.28	7.27
H1 lead leg	L																
Fernández, Sérgio (ESP) (1993)	time	6.10	9.93	13.83	17.84	22.03	26.53	31.10	35.86	40.76			51.51	5 / 7			
	reaction time	0.152															
	interval		3.83	3.90	4.01	4.19	4.50	4.57	4.76	4.90					11.74	13.26	-31.10
	velocity	7.38	9.14	8.97	8.73	8.35	7.78	7.66	7.35	7.14			7.77		8.94	7.92	-3.38
H1 lead leg	L																
Azemía, Ned (SEY) (1997)	time	6.10	9.93	13.85	17.98	22.10	26.37	30.76	35.50	40.43	45.56		51.67	3 / 8			
	reaction time	0.151															
	interval		3.83	3.92	4.13	4.12	4.27	4.39	4.74	4.93	5.13	6.11			11.88	12.78	14.80
	velocity	7.38	9.14	8.93	8.47	8.50	8.20	7.97	7.38	7.10	6.82	6.55	7.74		8.84	8.22	7.09
H1 lead leg	L																



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field/day-7-morning-session-athletics-tokyo-2020-replays>

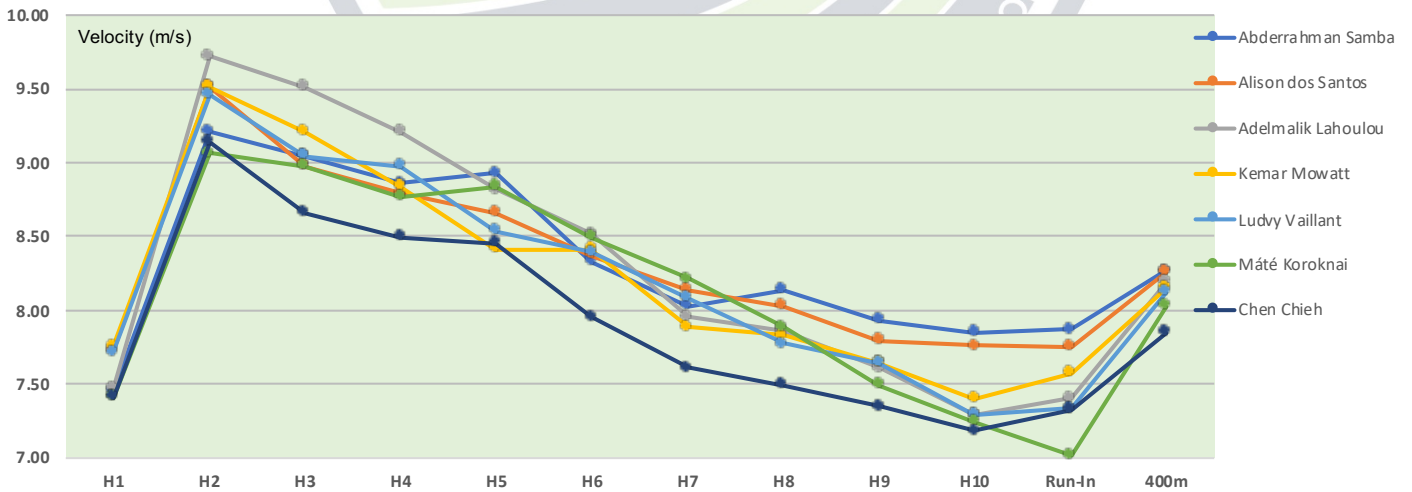
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Men's 400m Hurdles

Date 2021.07.30

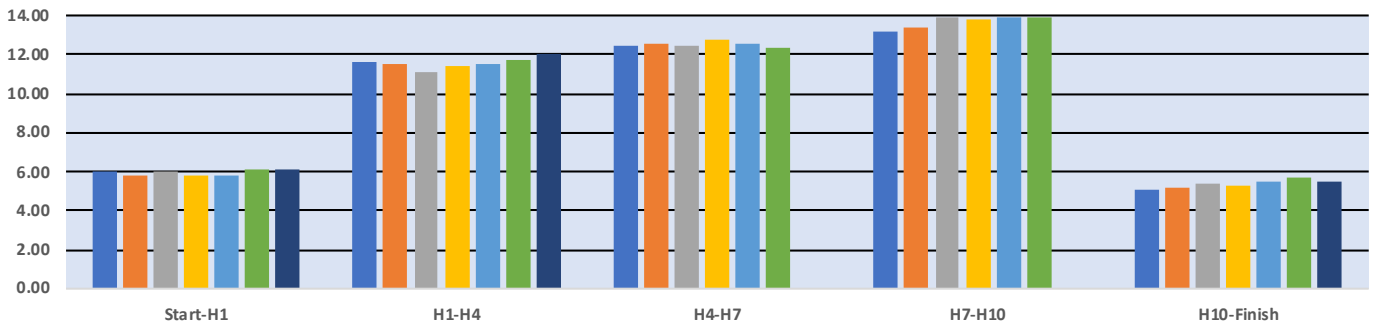
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10				
Samba, Abderrahman (QAT) (1995)	time	6.03	9.83	13.70	17.65	21.57	25.77	30.13	34.43	38.84	43.30		48.38	2 / 1	11.62	12.48	13.17				
	reaction time	0.200																			
	interval		3.80	3.87	3.95	3.92	4.20	4.36	4.30	4.41	4.46	5.08									
	velocity	7.46	9.21	9.04	8.86	8.93	8.33	8.03	8.14	7.94	7.85	7.87	8.27						9.04	8.41	7.97
	H1 lead leg	R																			
	strides	21	13	13	13	13	13	13	14	14	13	17.2	157.2								
dos Santos, Alison (BRA) (2000)	time	5.82	9.50	13.40	17.38	21.42	25.60	29.90	34.26	38.75	43.26		48.42	6 / 2	11.56	12.52	13.36				
	reaction time	0.152																			
	interval		3.68	3.90	3.98	4.04	4.18	4.30	4.36	4.49	4.51	5.16									
	velocity	7.73	9.51	8.97	8.79	8.66	8.37	8.14	8.03	7.80	7.76	7.75	8.26						9.08	8.39	7.86
	H1 lead leg	L																			
	strides	20	13	13	12	12	13	13	13	13	13	16	151								
Lahoulou, Adelmalik (ALG) (1992)	time	6.02	9.62	13.30	17.10	21.07	25.18	29.58	34.03	38.63	43.43		48.83	8 / 3	11.08	12.48	13.85				
	reaction time	0.149																			
	interval		3.60	3.68	3.80	3.97	4.11	4.40	4.45	4.60	4.80	5.40									
	velocity	7.48	9.72	9.51	9.21	8.82	8.52	7.95	7.87	7.61	7.29	7.41	8.19						9.48	8.41	7.58
	H1 lead leg	L																			
	strides	22	13	13	13	13	13	15	15	15	15	17.5	164.5								
Mowatt, Kemar (JAM) (1995)	time	5.80	9.48	13.28	17.24	21.40	25.56	30.00	34.47	39.05	43.78		49.06	4 / 4	11.44	12.76	13.78				
	reaction time	0.139																			
	interval		3.68	3.80	3.96	4.16	4.16	4.44	4.47	4.58	4.73	5.28									
	velocity	7.76	9.51	9.21	8.84	8.41	8.41	7.88	7.83	7.64	7.40	7.58	8.15						9.18	8.23	7.62
	H1 lead leg	L																			
	strides	21	13	13	13	13	13	14	14	15	15	17.7	161.7								
Vaillant, Ludvy (FRA) (1995)	time	5.83	9.53	13.40	17.30	21.40	25.57	29.90	34.40	38.98	43.78		49.23	5 / 5	11.47	12.60	13.88				
	reaction time	0.152																			
	interval		3.70	3.87	3.90	4.10	4.17	4.33	4.50	4.58	4.80	5.45									
	velocity	7.72	9.46	9.04	8.97	8.54	8.39	8.08	7.78	7.64	7.29	7.34	8.13						9.15	8.33	7.56
	H1 lead leg	R																			
	strides	21	13	13	13	13	13	14	14	14	14	17	159								
Koroknai, Máté (HUN) (1993)	time	6.07	9.93	13.83	17.82	21.78	25.90	30.16	34.60	39.27	44.10		49.80	7 / 6	11.75	12.34	13.94				
	reaction time	0.151																			
	interval		3.86	3.90	3.99	3.96	4.12	4.26	4.44	4.67	4.83	5.70									
	velocity	7.41	9.07	8.97	8.77	8.84	8.50	8.22	7.88	7.49	7.25	7.02	8.03						8.94	8.51	7.53
	H1 lead leg	R																			
	strides	21	13	13	13	13	13	14	14	14	15	143									
Chen Chieh (TPE) (1992)	time	6.07	9.90	13.94	18.06	22.20	26.60	31.20	35.87	40.63	45.50		50.96	3 / 7	11.99	13.14	14.30				
	reaction time	0.158																			
	interval		3.83	4.04	4.12	4.14	4.40	4.60	4.67	4.76	4.87	5.46									
	velocity	7.41	9.14	8.66	8.50	8.45	7.95	7.61	7.49	7.35	7.19	7.33	7.85						8.76	7.99	7.34
	H1 lead leg	L																			
	strides	21	13	13	13	13	14	14	15	15	15	146									



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field/day-7-morning-session-athletics-tokyo-2020-replays>

Biomechanical Analysis

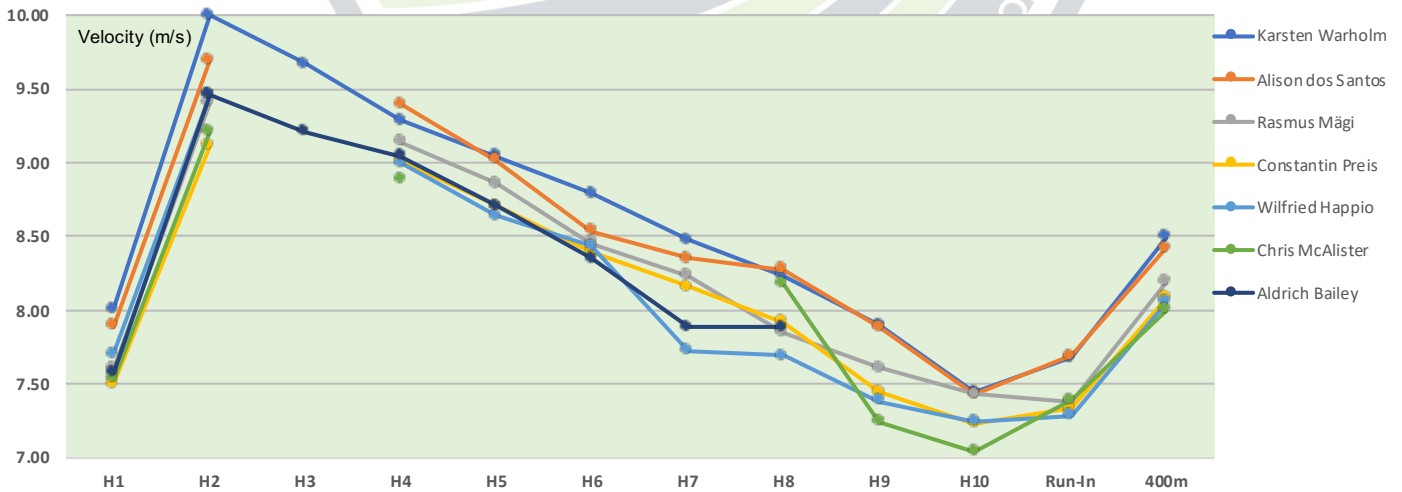
2021 Herculis Meeting International d'Athletisme (Monaco, MON) (TV Analysis)

Men's 400m Hurdles

Date 2021.07.09

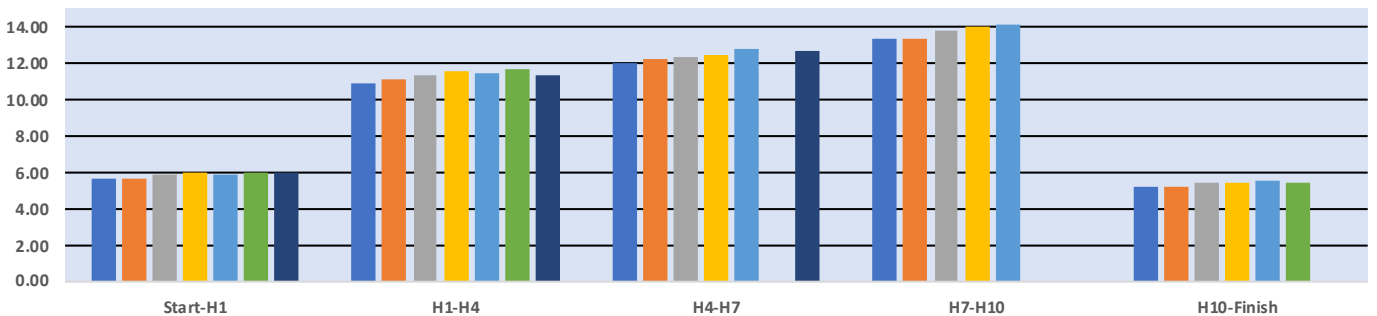
FINAL

		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		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
H1 lead leg	L																
dos Santos, Alison (BRA) (2000)	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
	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			13		12	13	14		15	15	16.5	131.5				
Mägi, Rasmus (EST) (1992)	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															
	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					13	13	13	14	14	14	114					
Preis, Constantin (GER) (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
H1 lead leg	L					14	15	15		16	16	112					
Happio, Wilfried (FRA) (1998)	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
	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					13	13	14		15	15	103					
McAlister, Chris (GBR) (1995)	time	5.97	9.77		17.65				34.77	39.60	44.57		49.98	2 / 6			
	reaction time	0.144															
	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									16	16	68					
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								
H1 lead leg	L											114		11.37	12.65	8.30	



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>

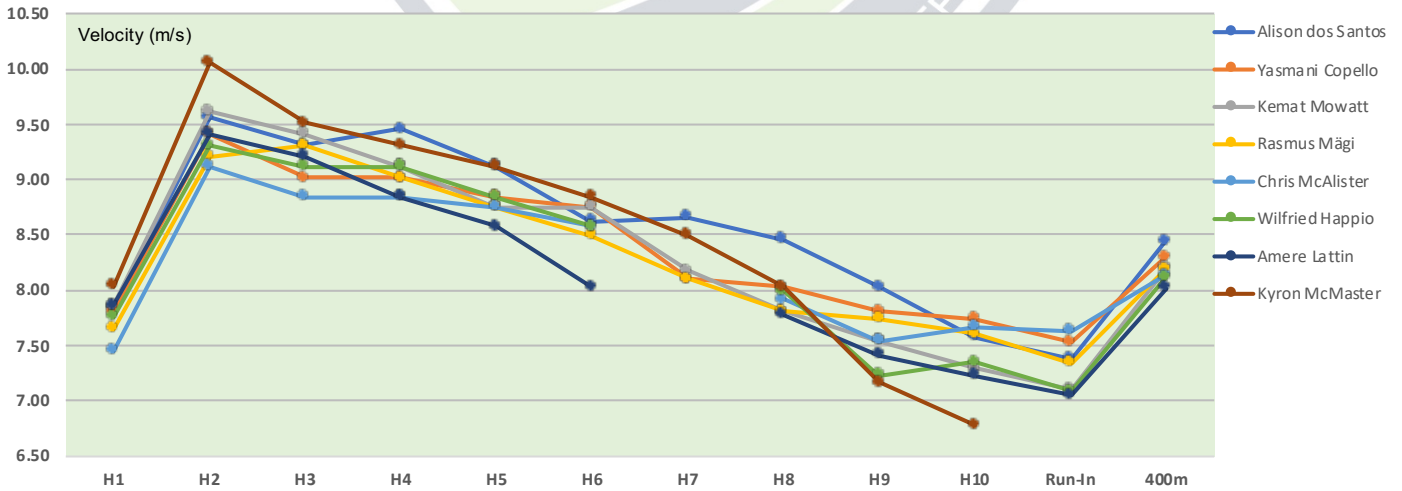
2021 Bauhaus Galan (Stockholm, SWE) (TV Analysis)

Men's 400m Hurdles

Date 2021.07.04

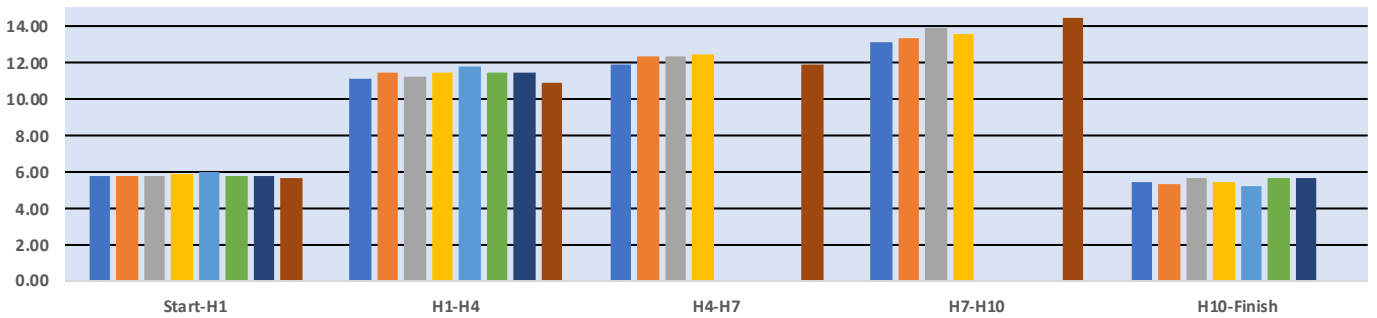
FINAL

		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	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	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	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	3.96	4.00	4.08		8.84	4.64	4.56	5.24			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	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		8.76	4.84	4.76	5.64			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	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		9.00	4.72	4.84	5.67			9.15		
	velocity	7.87	9.41	9.21	8.84	8.58	8.03		7.78	7.42	7.23	7.05	8.02				
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													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	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>

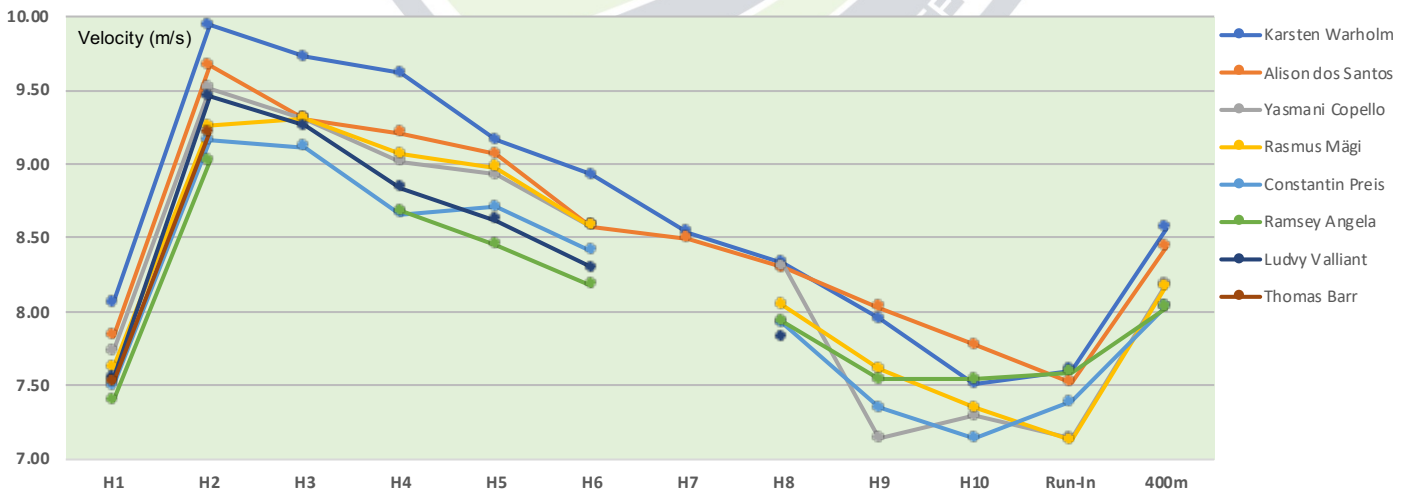
2021 Bislett Games (Oslo, NOR) (TV Analysis)

Men's 400m Hurdles

Date 2021.07.01

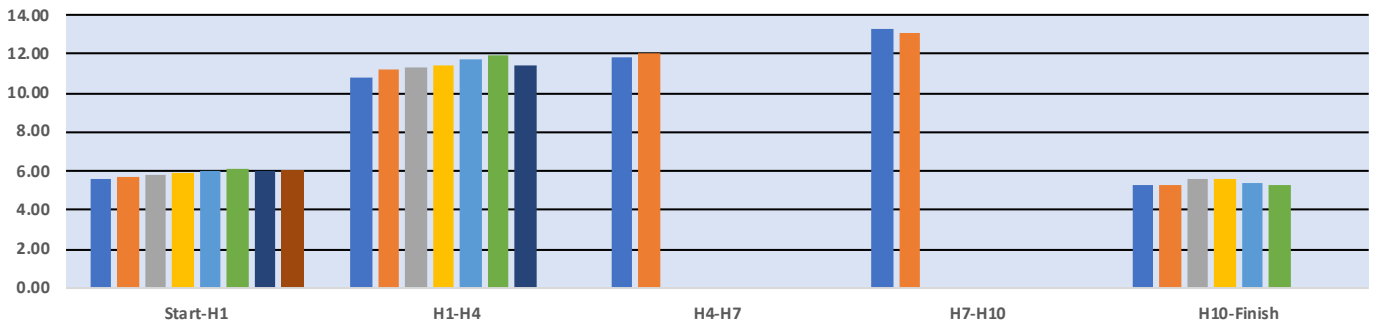
FINAL

		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																
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																
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																
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																
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																
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																
Valliant, 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								
	velocity	7.55	9.46	9.26	8.84	8.62	8.29		7.83								
H1 lead leg	R																
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																



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

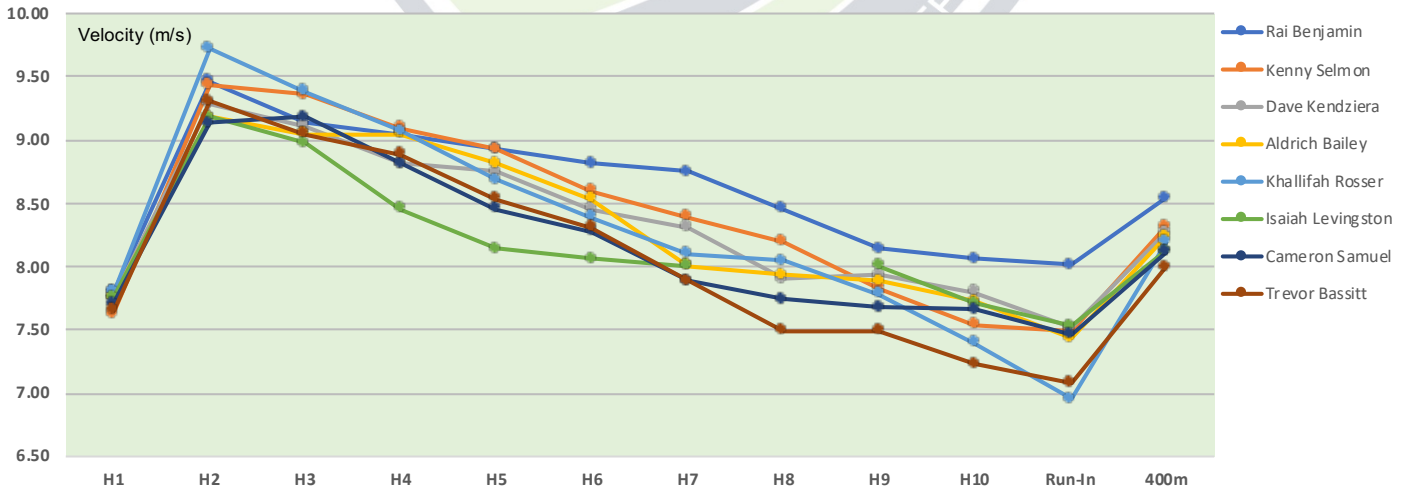
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Men's 400m Hurdles

Date 2021.06.26

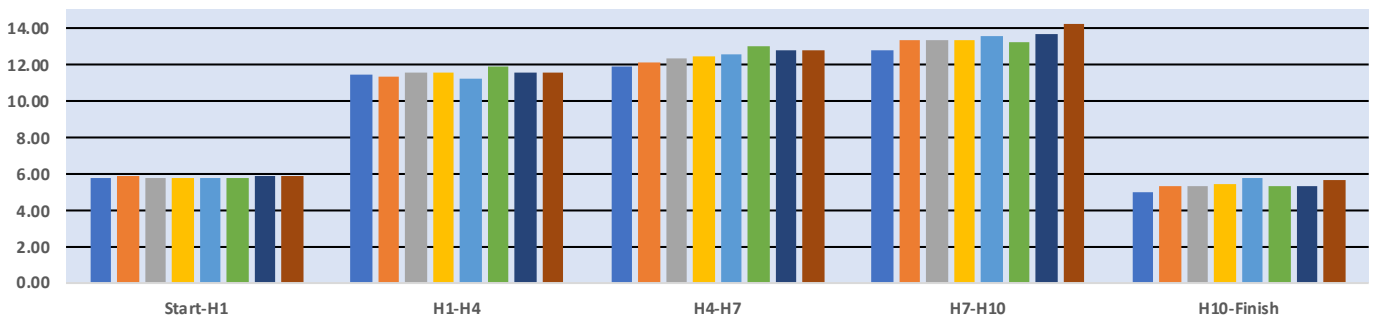
FINAL

		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 velocity	7.80	9.46	9.34	9.87	9.92	9.97	10.00	10.00	10.00	10.00	10.00	10.00		11.40	11.89	12.78
H1 lead leg	R														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 velocity	7.63	9.43	9.36	9.09	8.93	8.60	8.39	8.20	7.83	7.54	7.49	8.32		11.30	12.16	13.38
H1 lead leg	R													9.29	8.63	7.85	
Kenziera, 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 velocity	7.76	9.28	9.11	8.82	8.75	8.45	8.31	7.90	7.94	7.80	7.52	8.27		11.58	12.35	13.33
H1 lead leg	R													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 velocity	7.76	9.19	9.04	9.04	8.82	8.54	8.01	7.94	7.88	7.73	7.43	8.24		11.55	12.44	13.38
H1 lead leg	L													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 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		11.19	12.52	13.58
H1 lead leg	R													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 velocity	7.76	9.19	8.97	8.45	8.14	8.06	8.01		8.01	7.71	7.53	8.12		11.85	13.01	13.28
H1 lead leg	L													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 velocity	7.71	9.14	9.19	8.82	8.45	8.27	7.88	7.74	7.68	7.66	7.46	8.12		11.61	12.81	13.65
H1 lead leg	R													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 velocity	7.65	9.31	9.04	8.88	8.54	8.31	7.88	7.49	7.49	7.23	7.08	8.00		11.57	12.75	14.18
H1 lead leg	R													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=XA2nUJFo-CDI>

Biomechanical Analysis

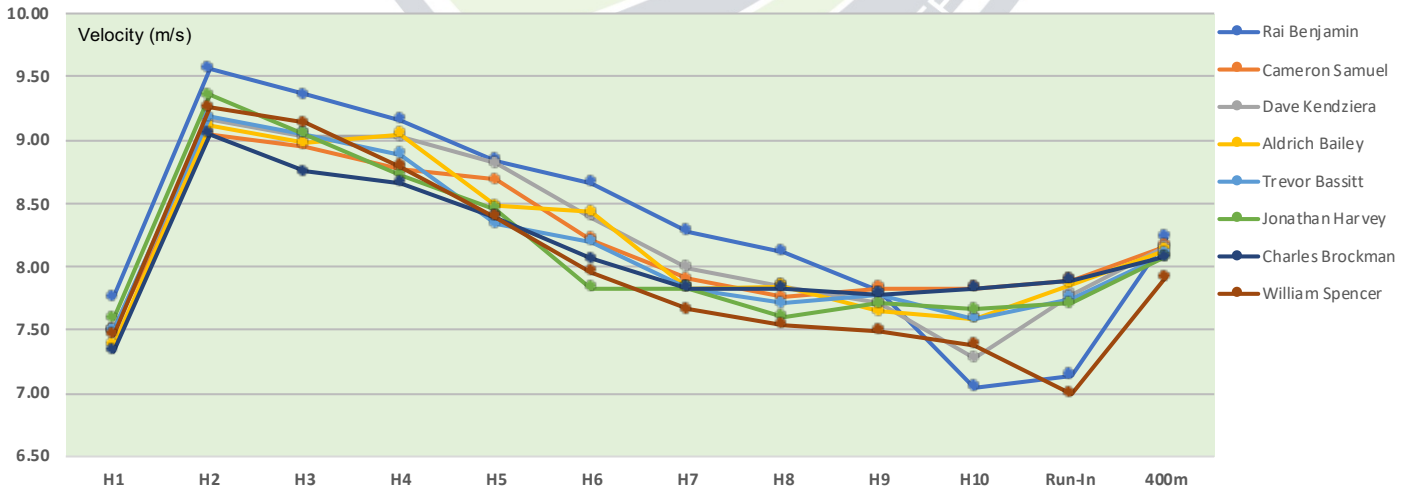
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Men's 400m Hurdles

Date 2021.06.25

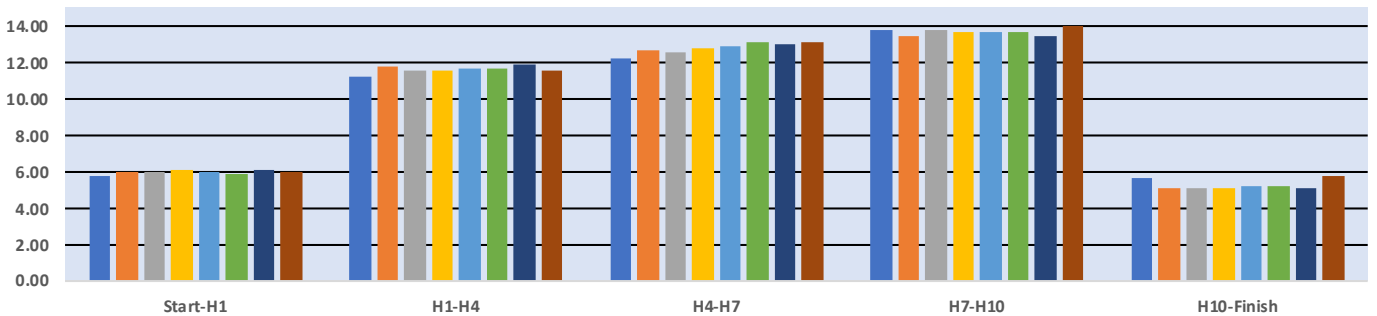
Semi-Final 2

		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 velocity	7.76	9.56	9.36	9.16	8.84	8.66	8.27	8.12	7.81	7.04	5.60	8.23		11.22	12.23	13.76
H1 lead leg	R														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 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		11.77	12.72	13.45
H1 lead leg	R														8.92	8.25	7.81
Kenziera, 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 velocity	7.50	9.16	9.02	9.02	8.82	8.39	7.99	7.85	7.71	7.28	5.14	8.15		11.58	12.52	13.81
H1 lead leg	R														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 velocity	7.38	9.11	8.97	9.04	8.47	8.43	7.83	7.85	7.64	7.59	5.09	8.13		11.61	12.75	13.65
H1 lead leg	L														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 velocity	7.50	9.19	9.04	8.88	8.33	8.20	7.83	7.71	7.78	7.59	5.16	8.10		11.62	12.94	13.65
H1 lead leg	R														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 velocity	7.59	9.36	9.04	8.73	8.45	7.83	7.83	7.61	7.71	7.66	5.19	8.08		11.62	13.08	13.71
H1 lead leg	R														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 velocity	7.33	9.04	8.75	8.66	8.39	8.06	7.83	7.83	7.78	7.83	5.07	8.07		11.91	12.98	13.44
H1 lead leg	R														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 velocity	7.46	9.26	9.14	8.79	8.39	7.95	7.66	7.54	7.49	7.38	5.72	7.92		11.59	13.14	14.05
H1 lead leg	R														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=Cm1GzHulwFo>

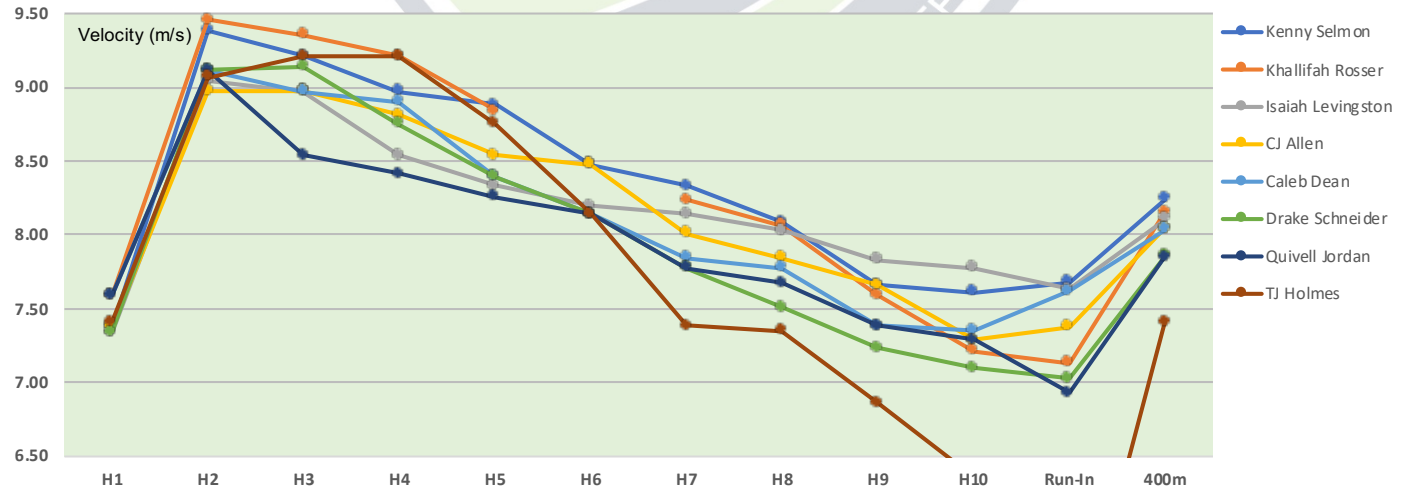
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Men's 400m Hurdles

Date 2021.06.25

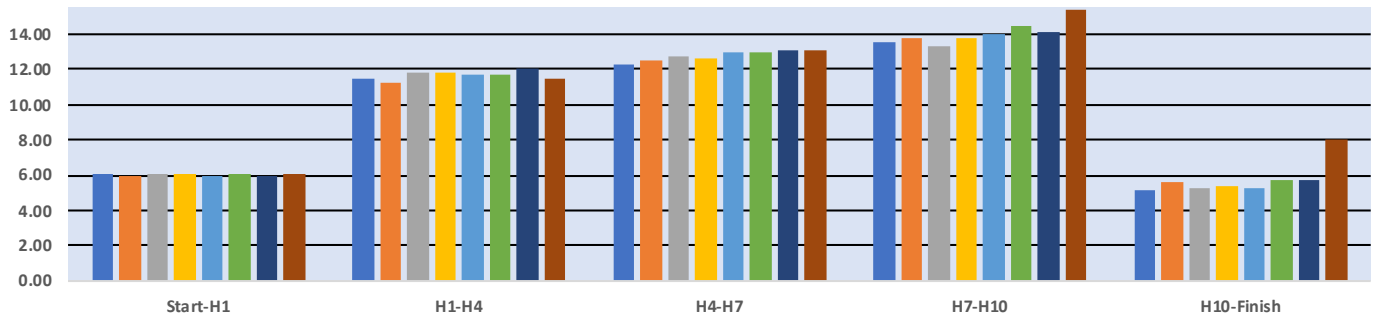
Semi-Final 1

		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	5.21			11.43	12.27	13.50
	H1 lead leg	R	velocity	7.38	9.38	9.21	8.97	8.88	8.47	8.33	8.08	7.61	7.68	8.25		9.19	8.56
			strides	20	13	13	13	13	13	14	14	17	156				
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
	H1 lead leg	R	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
			strides		13	13	13	14	14	15	15	18.5	128.5				
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
	H1 lead leg	L	velocity	7.34	9.04	8.97	8.54	8.33	8.20	8.14	8.03	7.83	7.78	8.11		8.85	8.22
			strides	21	13	13	13	13	13	13	13	31	162.2				
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
	H1 lead leg	L	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
			strides	19	13	13	13	13	13	14	15	15	18.2	146.2			
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
	H1 lead leg	R	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
			strides		13	13	13	13	15	15	15	15	18	145			
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
	H1 lead leg	R	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
			strides		13	13	13	13	14	14	15	15	15	125			
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
	H1 lead leg	L	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
			strides	21	13	14	14	14	15	15	15	15	136				
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
	H1 lead leg	L	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
			strides	19	12	12	13	13	13	14	14	14	15	139			



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

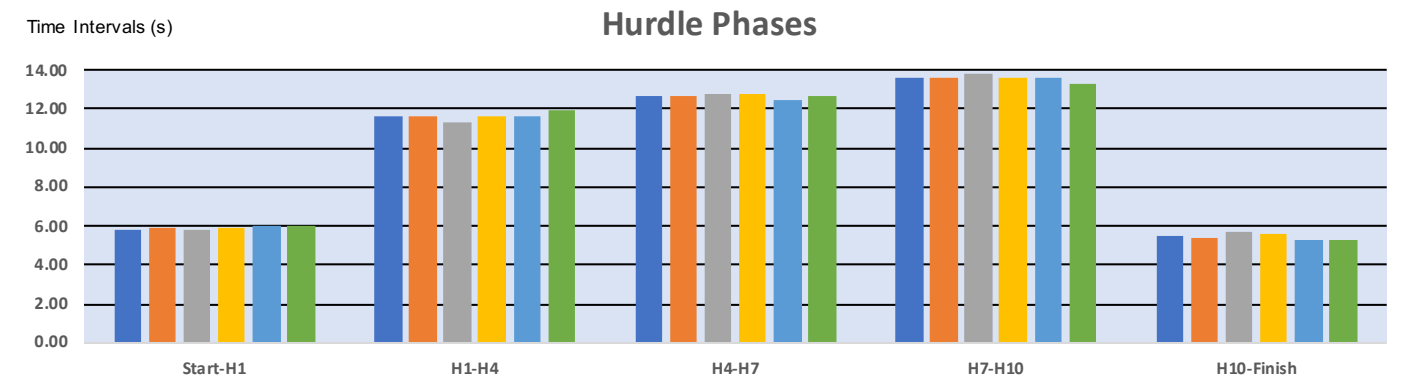
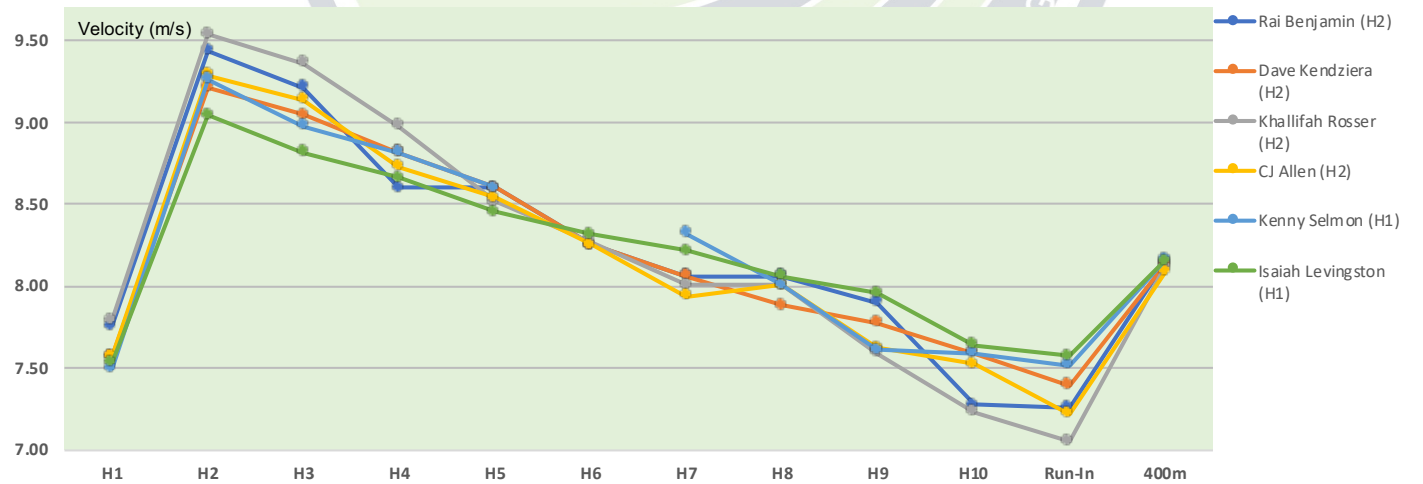
Heat 2

		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	4.81	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
H1 lead leg	R																
		20	13	12	14	13	13	13	13	13	14	17	155				
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
H1 lead leg	R																
		13	13	13	13	13	13	13	14	14	14	17.5	137.5				
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
H1 lead leg	R																
		13	13	13	13	14	14	14	14	14	14	140					
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
H1 lead leg	L																
		13	13	13	13	13	14	14	15	15	18	128					

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															
	interval		3.78	3.90	3.97	4.07		8.41	4.37	4.60	4.61	5.32			11.65	12.48	13.58
	velocity	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
H1 lead leg	R																
		13	13	13	13	13		13	14	14	14	109.7					
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
H1 lead leg	L																
		13	13	13	13	13	13	13	13	13	16	133					



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=ohCeUjXh8LZY>

Biomechanical Analysis

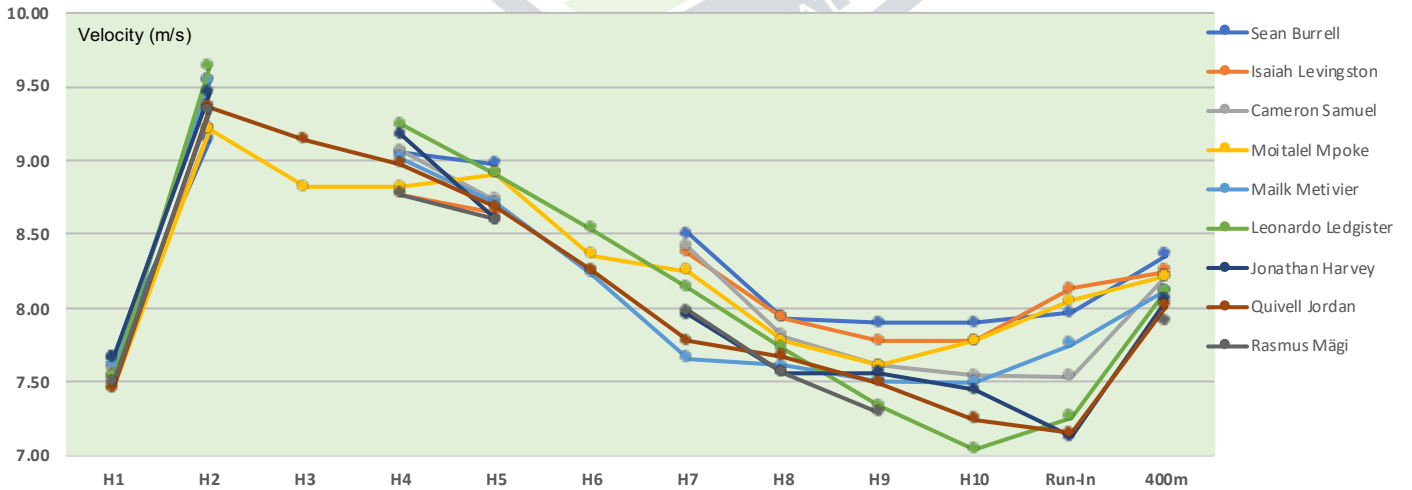
2021 NCAA Championships (Eugene, OR) (TV Analysis)

100m Hurdles

Date: 2021.06.11

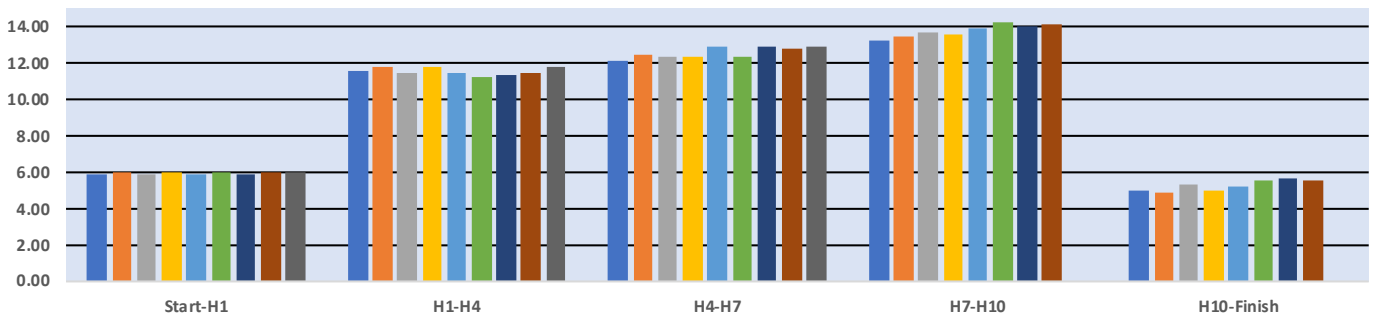
FINAL

		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
H1 lead leg	L		22	14		14		15	15	15	15	18.2	113.2				
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	7.78	8.13	8.25		8.91	8.46	7.83
H1 lead leg	L		21	13		13		13	14	14	14	16.5	104.5				
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
H1 lead leg	R		21	14		14		15	15	15	15	18.5	112.5				
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	3.97	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
H1 lead leg	R		21	13	14	14	13	14	15	15	15	18.5	166.5				
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
H1 lead leg	R		22	13		13	14	14	15	15	15	18.2	139.2				
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
H1 lead leg	R		22	14		14	14	15	15	16	16	18.2	144.2				
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
H1 lead leg	R		21	13		13		15	15	15	15	18.5	110.5				
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	7.49	7.25	7.16	8.01		9.15	8.22	7.47
H1 lead leg	R		22	14	14	13	14	15	15	15	15	15	152				
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=bODEf6llNmmg>

Biomechanical Analysis

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											4.68	WB PB		10.66	11.80	
	interval		3.48	3.56	3.62	3.82	3.92	4.06									
	velocity	8.17	10.06	9.83	9.67	9.16	8.93	8.62				8.55	9.02		9.85	8.90	
	H1 lead leg	L	strides	23	13	13	13	13	13	13	13	17	118				

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

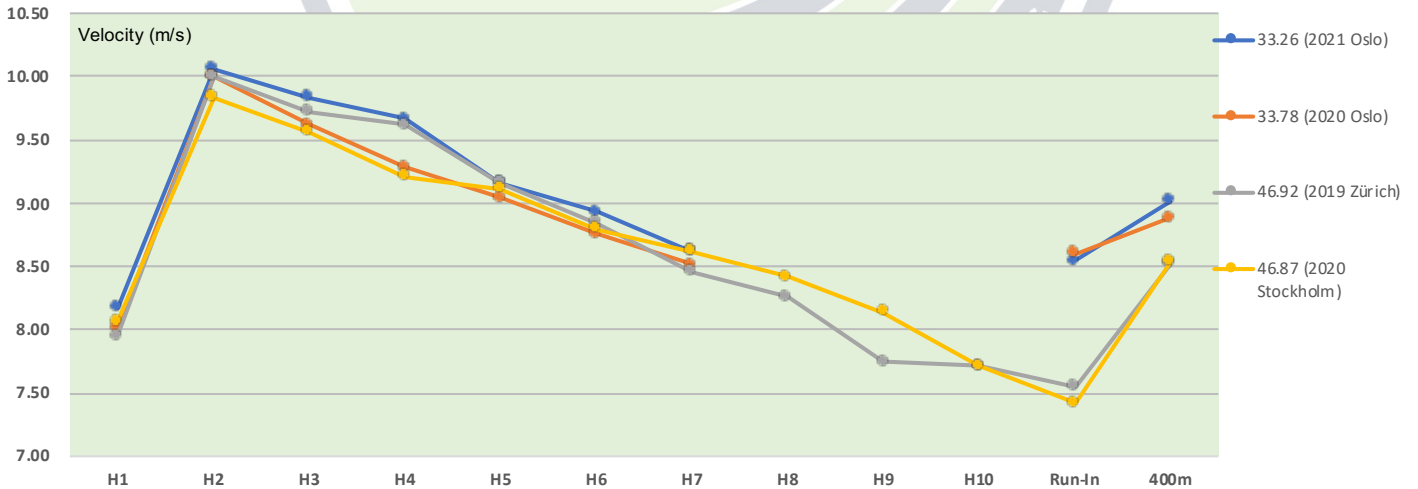
Men's 300m Hurdles		Date 2020.06.11										FINAL					
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Warholm, Karsten (NOR) (1996)	time	6.24	9.74	13.38	17.15	21.02	25.02	29.13					46.92	7 / 1			
	reaction time	0.182										4.65	WB PB		10.91	11.98	
	interval		3.50	3.64	3.77	3.87	4.00	4.11									
	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	strides	20	13	13	13	13	13	13	13	16.5	114.5				

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						
	velocity	7.95	10.00	9.72	9.62	9.16	8.84	8.45	8.25	7.74	7.71	7.55	8.53		9.78	8.81	7.89
	H1 lead leg	L	strides	20	13	13	13	13	13	15	15	18.2	159.2				

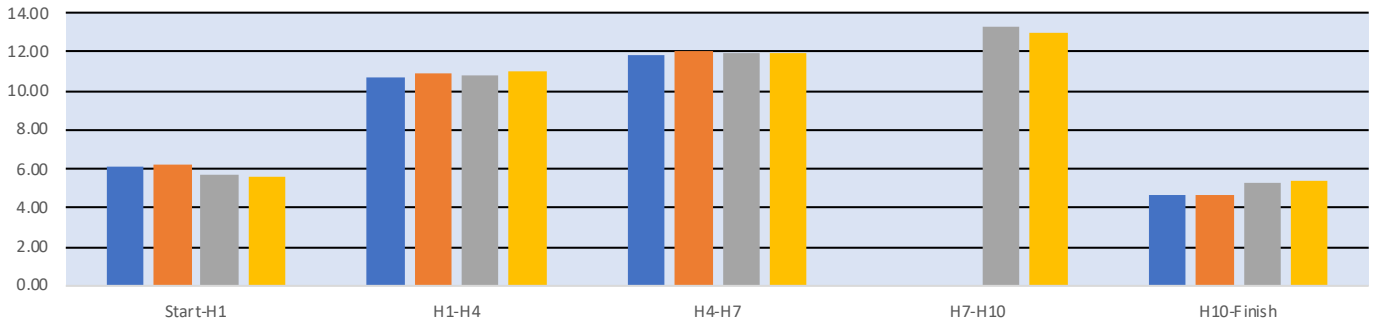
2020 Bauhaus Galan (Stockholm, SWE) (TV Analysis)

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						
	velocity	8.06	9.83	9.56	9.21	9.11	8.79	8.62	8.41	8.14	7.71	7.42	8.53		9.53	8.84	8.08
	H1 lead leg	L	strides	20	13	13	13	13	13	13	15	18	157				



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=NjvYikNOI0&t=2s>

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=NNmVWf1-x-g>

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=JrYoaU0-HEc>

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=Sq4lpzQEI0E>

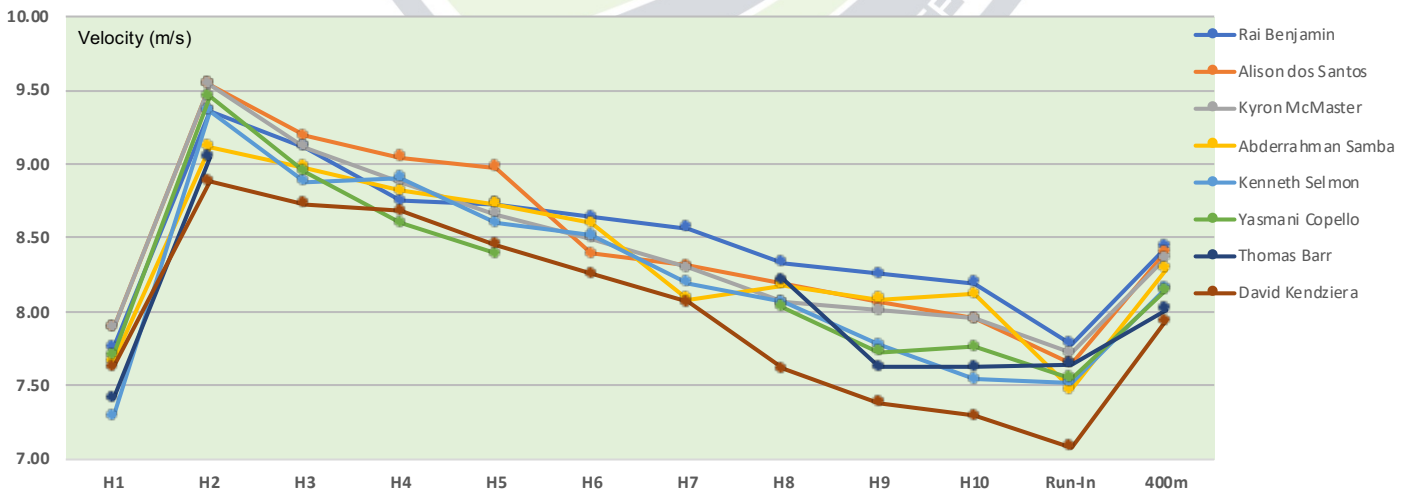
2021 Doha Diamond League (Doha, QAT) (TV Analysis)

Men's 400m Hurdles

Date 2021.05.28

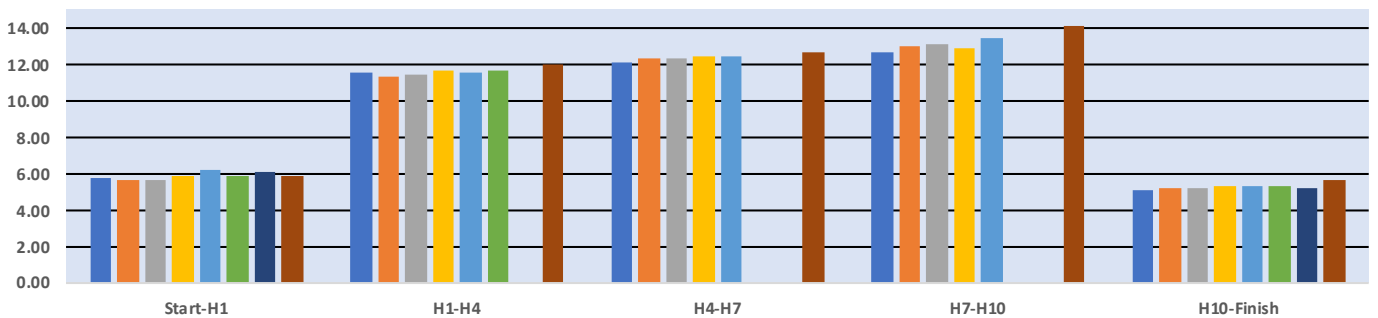
FINAL

		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
	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
H1 lead leg	R												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
	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
H1 lead leg	L												151.2				
McMaster, Kyron (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
	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
H1 lead leg	R												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
	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
H1 lead leg	R												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
	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
H1 lead leg	R												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		
	velocity	7.71	9.46	8.95	8.60	8.39			8.03	7.73	7.76	7.55	8.14		8.99		
H1 lead leg	R												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					
	velocity	7.41	9.04						8.22	7.63	7.63	7.65	8.01				
H1 lead leg	L												61				
Kenziera, 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
	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
H1 lead leg	R												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=SqvYpwH11HA>

Biomechanical Analysis

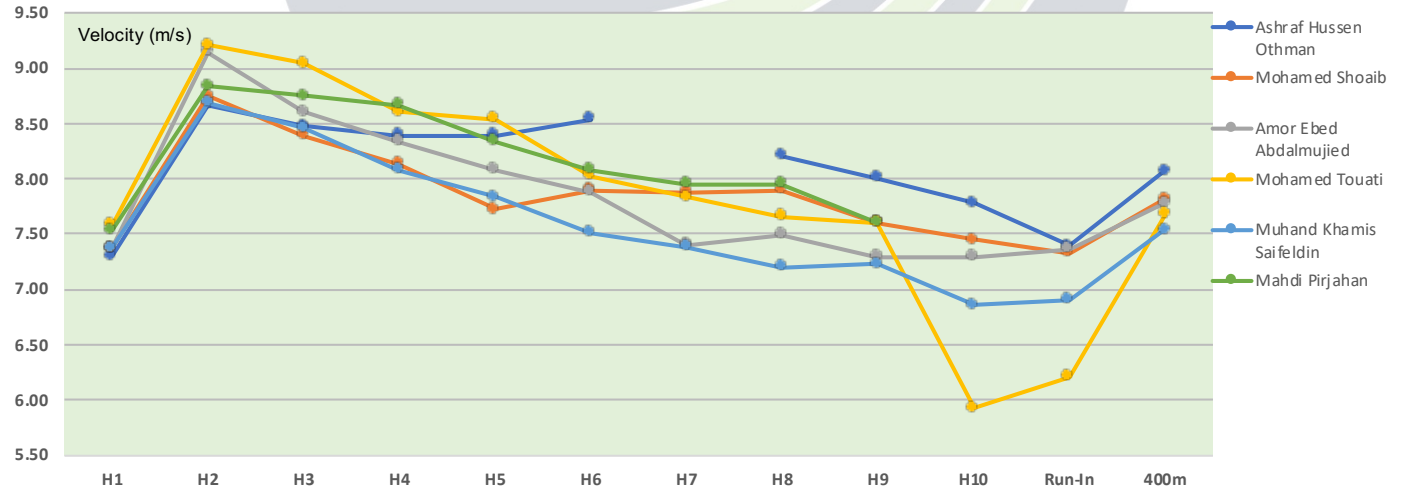
2021 Doha Diamond League (Doha, QAT) (TV Analysis)

Men's 400m Hurdles

Date 2021.05.28

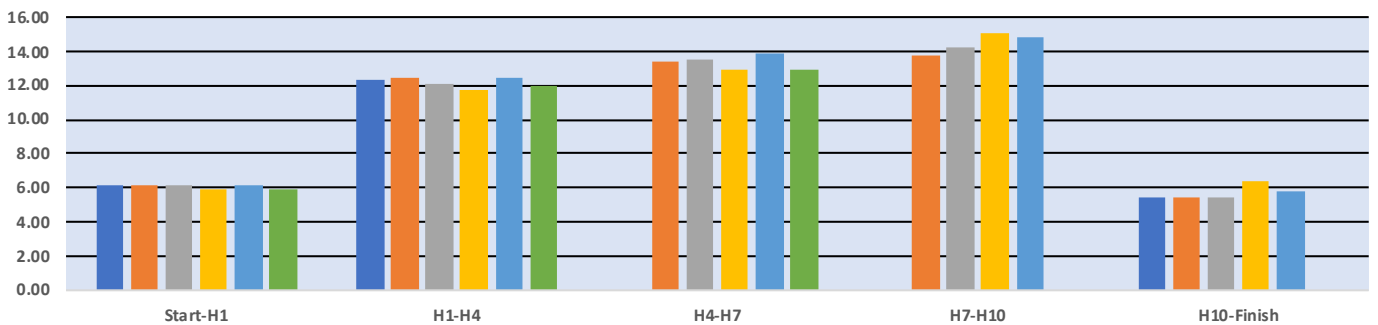
B FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Othman, Ashraf Hussien (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							4.44	4.60	4.70	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	9.14	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) (1999)	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							4.84	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=0Vpqrubl4A>

Biomechanical Analysis

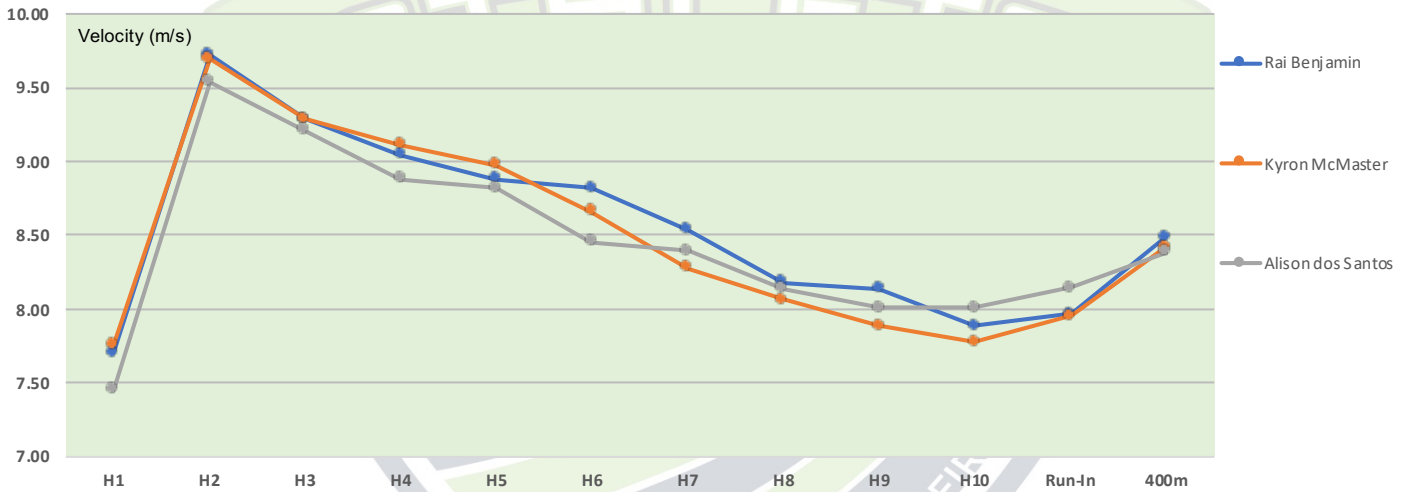
2021 USATF Golden Games (Walnut, CA) (TV Analysis)

Men's 400m Hurdles

Date 2021.05.09

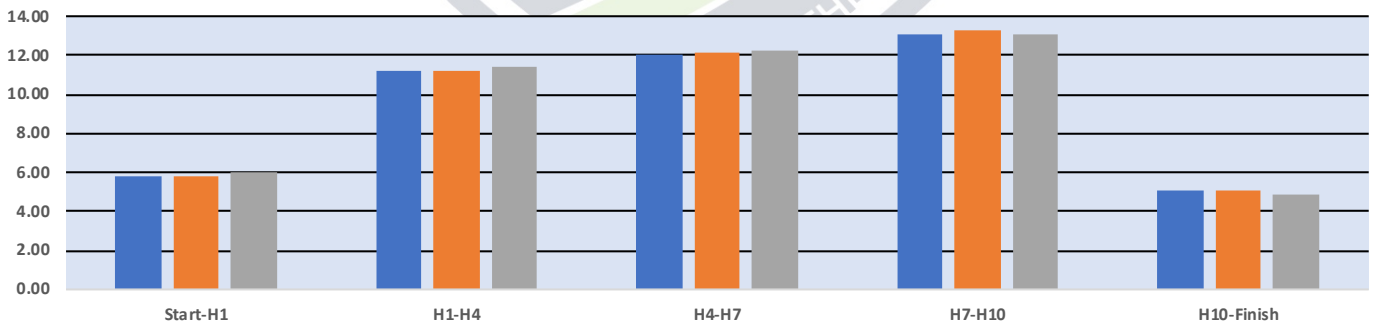
FINAL

		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		interval	3.60	3.77	3.87	3.94	3.97	4.10	4.28	4.30	4.44	5.02		11.24	12.01	13.02	
		velocity	7.71	9.72	9.28	9.04	8.88	8.82	8.54	8.18	8.14	7.88	7.97	8.49		9.34	8.74	8.06
	H1 lead leg	R	strides	20	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		interval	3.61	3.77	3.84	3.90	4.04	4.23	4.34	4.44	4.50	5.03	NR PB	11.22	12.17	13.28	
		velocity	7.76	9.70	9.28	9.11	8.97	8.66	8.27	8.06	7.88	7.78	7.95	8.42		9.36	8.63	7.91
	H1 lead leg	R	strides	20	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		interval	3.67	3.80	3.94	3.97	4.14	4.17	4.30	4.37	4.37	4.91	AR PB	11.41	12.28	13.04	
		velocity	7.45	9.54	9.21	8.88	8.82	8.45	8.39	8.14	8.01	8.01	8.15	8.39		9.20	8.55	8.05
	H1 lead leg	L	strides	20	13	13	12	12	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

Runner	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)																	
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	Henson (2021) - Athlete First: 2021 year end hurdle report				
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	51.46	4 / 1	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
H1 lead leg	R	strides	22	14	14	14	14	14	14	15	16	15	18.5	170.5			
Muhammad, Dalilah (USA) (1990)																	
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	Henson (2021) - Athlete First: 2021 year end hurdle report				
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	51.58	7 / 2	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
H1 lead leg	R	strides	22	14	14	15	15	15	15	15	16	16	19	176			
McLaughlin, Sydney (USA) (1999)																	
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	Athlete Tracking (2021) - Women's 400mH - Unofficial Split Times				
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	51.90	6 / 1	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
H1 lead leg	R	strides	22	14	14	14	14	15	15	15	15	15	18.2	171.2			
Bol, Femke (NED) (2000)																	
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	Henson (2021) - Athlete First: 2021 year end hurdle report				
reaction time	0.165	interval	3.98	4.02	4.08	4.20	4.40	4.44	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
H1 lead leg	L	strides	22	15	15	15	15	15	15	15	15	15	19	176			
Bol, Femke (NED) (2000)																	
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	Henson (2021) - Athlete First: 2021 year end hurdle report				
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	NR PB	12.21	13.51	14.64	
		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	7.17
H1 lead leg	L	strides	15	15	15	15	15	15	15	15	15	15	19	154			
Little, Shamier (USA) (1995)																	
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	Henson (2021) - Athlete First: 2021 year end hurdle report				
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	52.39	6 / 2	12.60	13.48	14.46
		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	7.26
H1 lead leg	R	strides	15	15	15	15	15	15	15	15	16	16	19.7	156.7			
Muhammad, Dalilah (USA) (1990)																	
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	Athlete Tracking (2021) - Women's 400mH - Unofficial Split Times				
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	52.42	7 / 2	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
H1 lead leg	R	strides	22	15	15	15	15	15	15	15	16	16	19	178			
Muhammad, Dalilah (USA) (1990)																	
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	Henson (2021) - Athlete First: 2021 year end hurdle report				
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	52.77	5 / 1	12.16	13.56	14.92
		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	7.04
H1 lead leg	R	strides	23	15	15	15	15	15	15	15	16	16	19.2	179.2			
Bol, Femke (NED) (2000)																	
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	Henson (2021) - Athlete First: 2021 year end hurdle report				
reaction time	0.172	interval	4.04		4.48	4.36	4.56	4.72	4.72	4.92	5.04	5.60	52.80	4 / 1	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	15	15	18.7	145.7			
Bol, Femke (NED) (2000)																	
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	Henson (2021) - Athlete First: 2021 year end hurdle report				
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	52.81	5 / 1	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
H1 lead leg	L	strides	22	15	15	15	15	15	15	15	15	15	19.2	161.2			
McLaughlin, Sydney (USA) (1999)																	
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	Henson (2021) - Athlete First: 2021 year end hurdle report				
reaction time		interval	4.30	4.24	4.19	4.38	4.47	4.61	4.81	5.10	5.04	5.35	52.83	5 / 1	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	16	18.5	158.5			
Little, Shamier (USA) (1995)																	
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	Henson (2021) - Athlete First: 2021 year end hurdle report				
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	52.85	6 / 2	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
H1 lead leg	R	strides	22	15	15	15	15	15	15	16	16	16	19.5	164.5			
Ryzykova, Anna (UKR) (1989)																	
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	Henson (2021) - Athlete First: 2021 year end hurdle report				
reaction time	0.183	interval	3.96	4.06		4.48	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	strides	22	14	14		15	15	15	15	15	16	19.2	145.2			

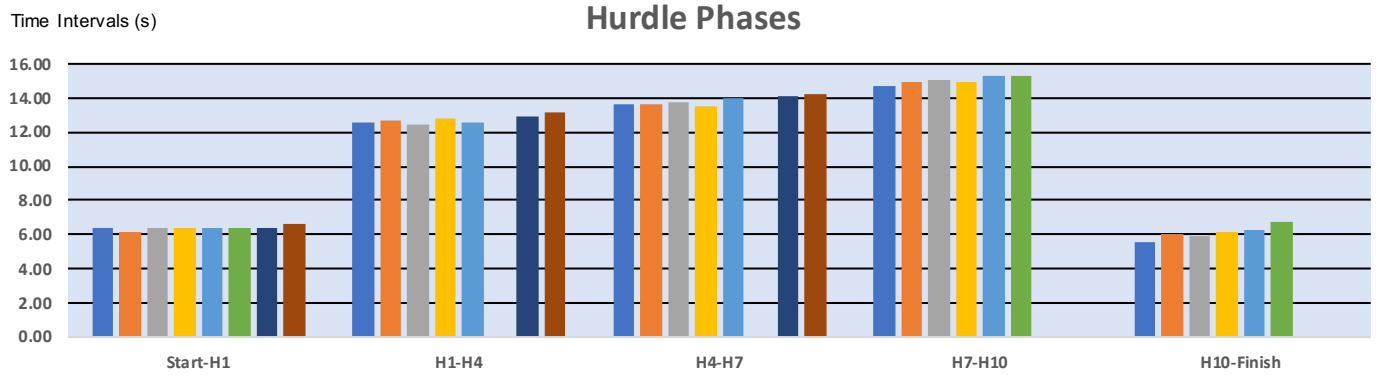
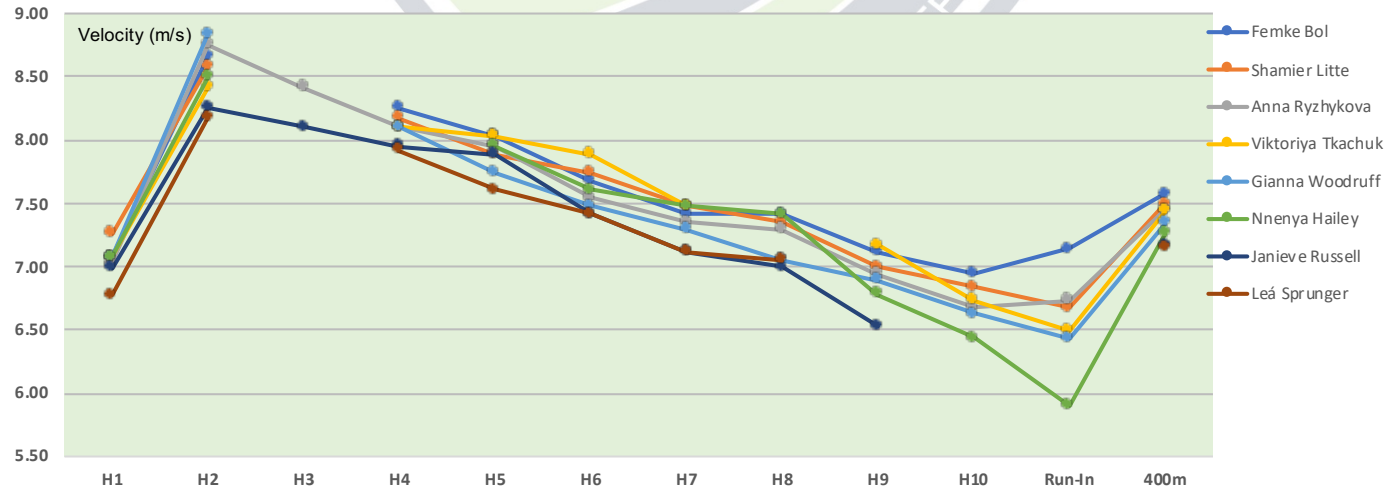
2021 Weltklasse (Zürich, SUI) (TV Analysis)

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	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	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	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	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	5.94			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	15	15	15	15	16	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	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	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	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, Nnena (USA) (1994)	time	6.36	10.48		23.68	28.28	32.96	37.68	42.84	48.28	55.06	55.06	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	55.74	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	55.87	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					



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=CWE1R07998Y>

Biomechanical Analysis

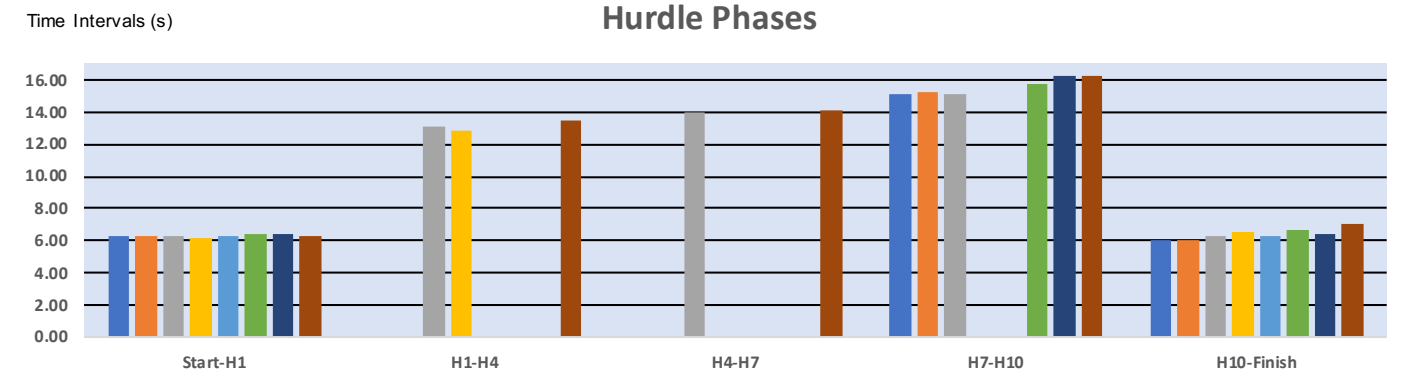
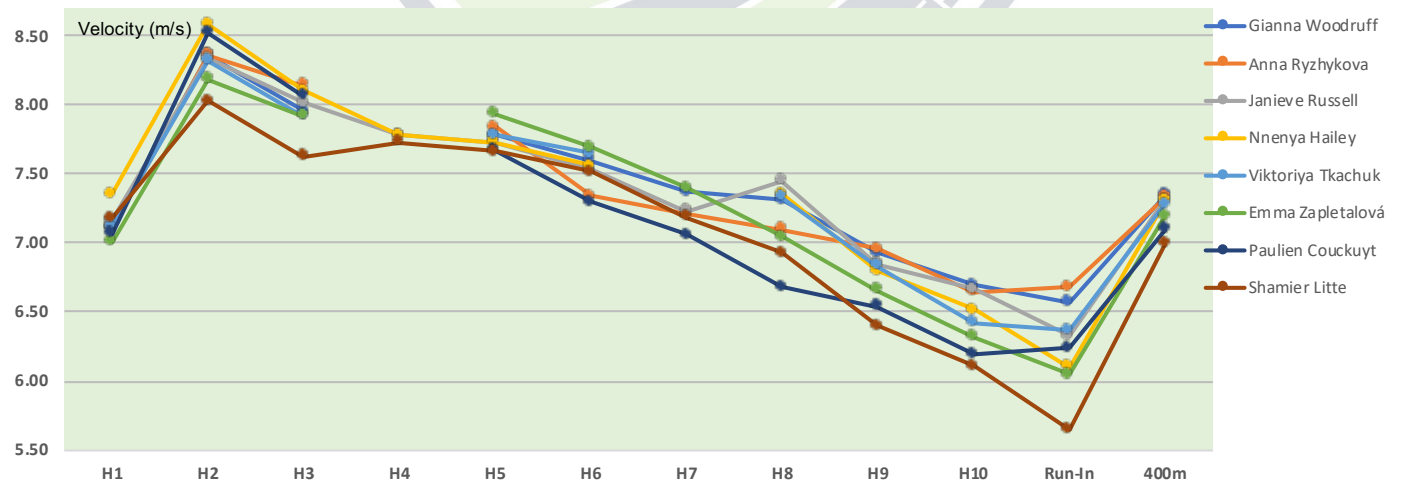
2021 Meeting de Paris (Paris, FRA) (TV Analysis)

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	54.44	7 / 1			
	reaction time	0.206															15.07
	interval		4.19	4.40		9.00	4.61	4.75	4.79	5.05	5.23	6.09					6.97
	velocity	7.11	8.35	7.95		7.78	7.59	7.37	7.31	6.93	6.69	6.57	7.35				
H1 lead leg	L		15	15	15		15	15	15	16	16	19.5	164.5				
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	54.59	6 / 2			
	reaction time	0.175															15.23
	interval		4.19	4.30		8.93	4.77	4.85	4.93	5.03	5.27	5.99					6.89
	velocity	7.11	8.35	8.14		7.84	7.34	7.22	7.10	6.96	6.64	6.68	7.33				
H1 lead leg	R		14	14	14		15	15	15	15	19	158					
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	54.75	4 / 3			
	reaction time	0.162													13.07	14.02	15.06
	interval		4.20	4.37	4.50	4.53	4.65	4.84	4.70	5.11	5.25	6.32			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				
H1 lead leg	R		15	15	15	15	16	16	16	17	17	20	184				
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	54.78	1 / 4			
	reaction time	0.187													12.90		
	interval		4.08	4.32	4.50	4.53	4.63		9.52	5.15	5.37	6.56			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				
H1 lead leg	L		16	16	17	17	17	18	18	19	24	185					
Tkachuk, Viktoriya (UKR) (1994)	time	6.32	10.53	14.95		23.95	28.53		38.08	43.20	48.65	54.93	54.93	3 / 5			
	reaction time	0.228															
	interval		4.21	4.42		9.00	4.58		9.55	5.12	5.45	6.28					
	velocity	7.12	8.31	7.92		7.78	7.64		7.33	6.84	6.42	6.37	7.28				
H1 lead leg	L		15	15	15	15	15	15	16	16	17	20	166				
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	55.61	8 / 6			
	reaction time	0.138															15.77
	interval		4.28	4.42		8.83	4.55	4.73	4.97	5.26	5.54	6.61					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				
H1 lead leg	R		15	15	15	15	15	15	16	16	20.2	150.2					
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	56.36	2 / 7			
	reaction time	0.169															16.24
	interval		4.11	4.34		9.13	4.80	4.96	5.24	5.35	5.65	6.41					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				
H1 lead leg	L		15	15	16	16	16	16	17	18	21	173					
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	57.18	5 / 8			
	reaction time	0.222													13.48	14.10	16.25
	interval		4.36	4.59	4.53	4.57	4.66	4.87	5.05	5.47	5.73	7.08			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	R		16	16	15	15	16	16	16	17	17	20.2	187.2				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 60fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=vs6t6DFk6QI>

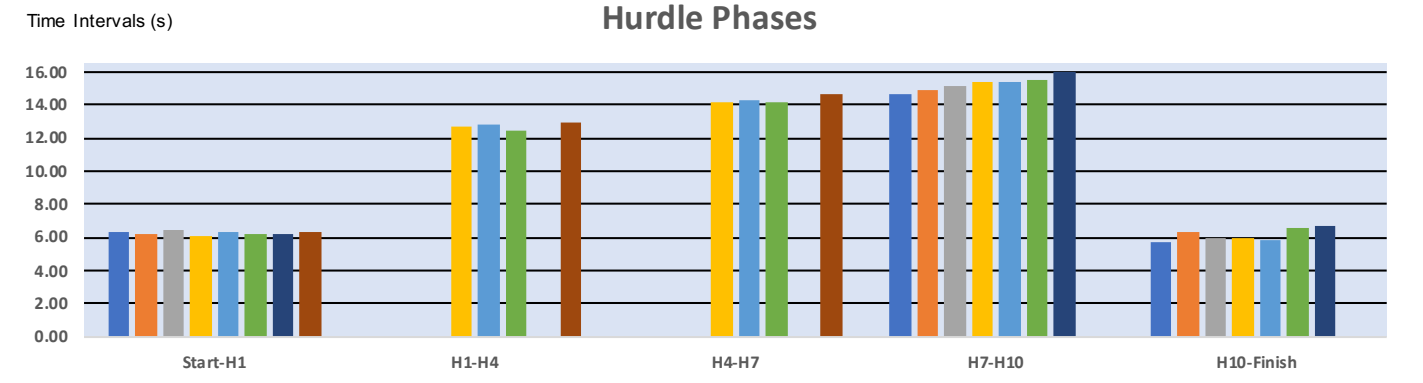
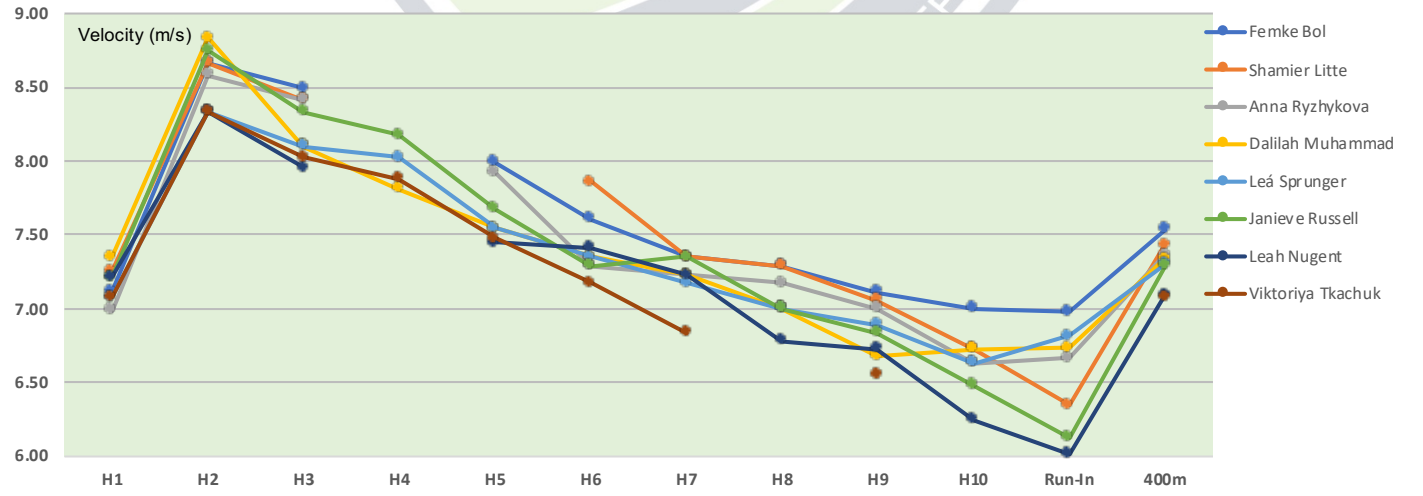
2021 Athletissima (Lausanne, SUI) (TV Analysis)

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	18.7	145.7				
Little, Shamier (USA) (1995)	time	6.20	10.24	14.40		23.52	28.22	33.16	38.04	43.04	48.32		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	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	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	4.28	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	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	5.12	5.40	6.53			13.00	14.68		
		velocity	7.08	8.33	8.03	7.88	7.48	7.17	6.84		6.55	10.68	7.08		8.08	7.15		
	H1 lead leg	L	strides	22	15	15	15	15	16	16	16		130					



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

Biomechanical Analysis

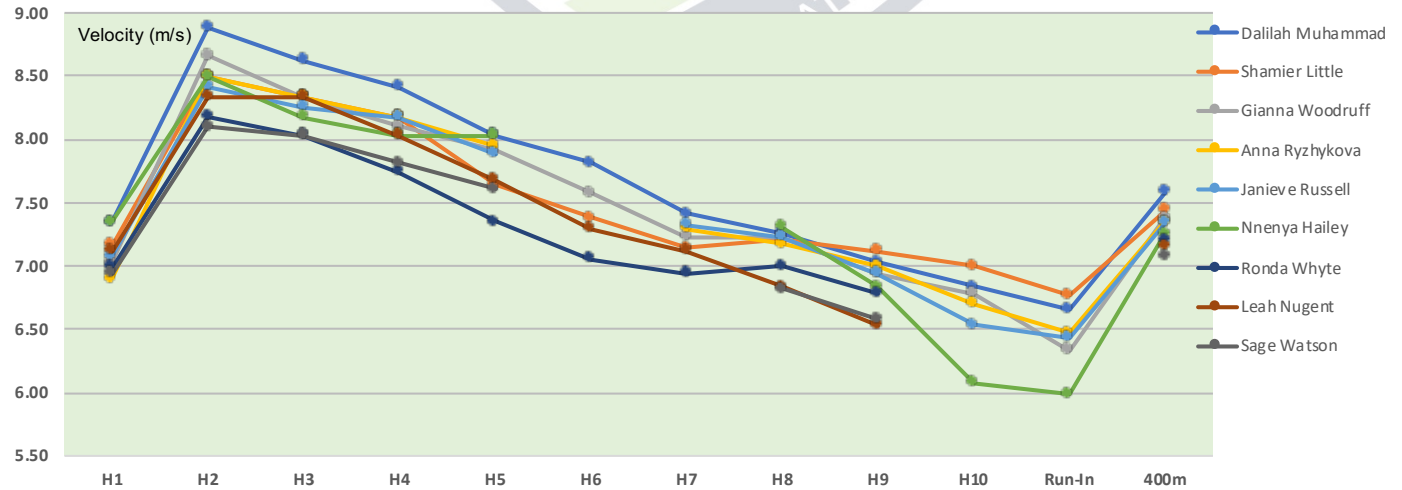
2021 Prefontaine Classic (Eugene, OR) (TV Analysis)

100m Hurdles

Date: 2021.08.21

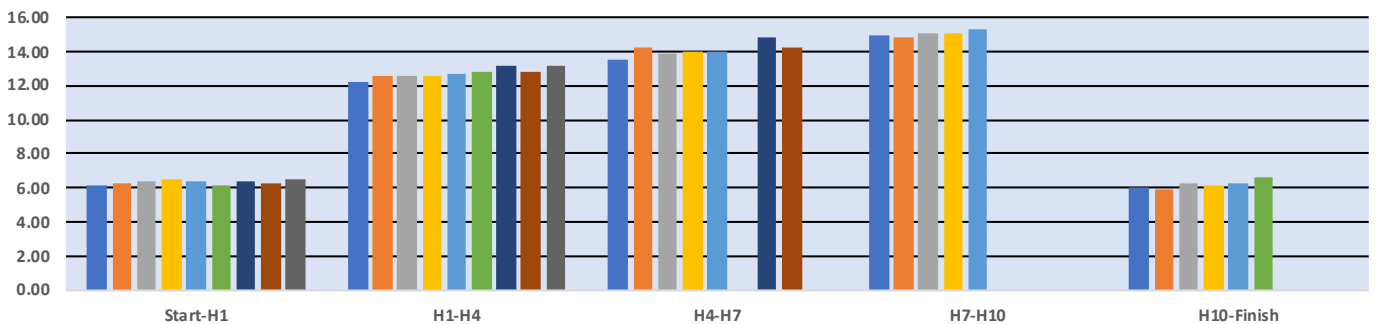
FINAL

		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 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		12.16	13.56	14.92
	H1 lead leg R strides	23	15	15	15	15	15	15	15	16	16	19.2	179.2		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 velocity	7.17	8.50	8.33	8.18	7.64	7.38	7.14	7.20	7.11	7.00	6.77	7.44		12.60	14.22	14.78
	H1 lead leg R strides	23	15	15	15	16	16	16	16	17	16	19	184		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 velocity	7.03	8.66	8.33	8.10	7.92	7.58	7.23	7.23	6.94	6.78	6.33	7.38		12.56	13.88	15.04
	H1 lead leg L strides	23	15	15	15	15	15	15	15	16	16	19.2	179.2		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 velocity	6.90	8.50	8.33	8.18	7.95		9.60	4.88	5.00	5.22	6.18	7.35		12.60	14.00	15.10
	H1 lead leg R strides	22	14	14	14	14		15	15	15	15	20	143		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 velocity	7.08	8.41	8.25	8.18	7.88		9.56	4.84	5.04	5.36	6.22	7.34		12.68	14.00	15.24
	H1 lead leg R strides	23	15	15	15	15		16	17	18	20.5	154.5		8.28	7.50	6.89	
Hailey, Nnena (USA) (1994)	time	6.12	10.24	14.52	18.88	23.24			37.60	42.72	48.48		55.16	1 / 6			
	reaction time	0.153															
	interval velocity	7.35	8.50	8.18	8.03	8.03			14.36	5.12	5.76	6.68	7.25		12.76		
	H1 lead leg L strides	24	16	16	16	16			17	19	23	147		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 velocity	6.99	8.18	8.03	7.74	7.35	7.06	6.94	7.00	6.78			7.20		13.16	14.76	
	H1 lead leg L strides	23	15	15	15	16		16	16	17			133		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 velocity	7.12	8.33	8.33	8.03	7.68	7.29	7.11	6.84	6.53			7.16		12.76	14.28	
	H1 lead leg R strides	22	15	15	15	15	15	15	15	16			143		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 velocity	6.94	8.10	8.03	7.81	7.61			15.40	5.32			7.08		13.16		
	H1 lead leg R strides	22	15	15	15	15			16	16			98		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>

Biomechanical Analysis

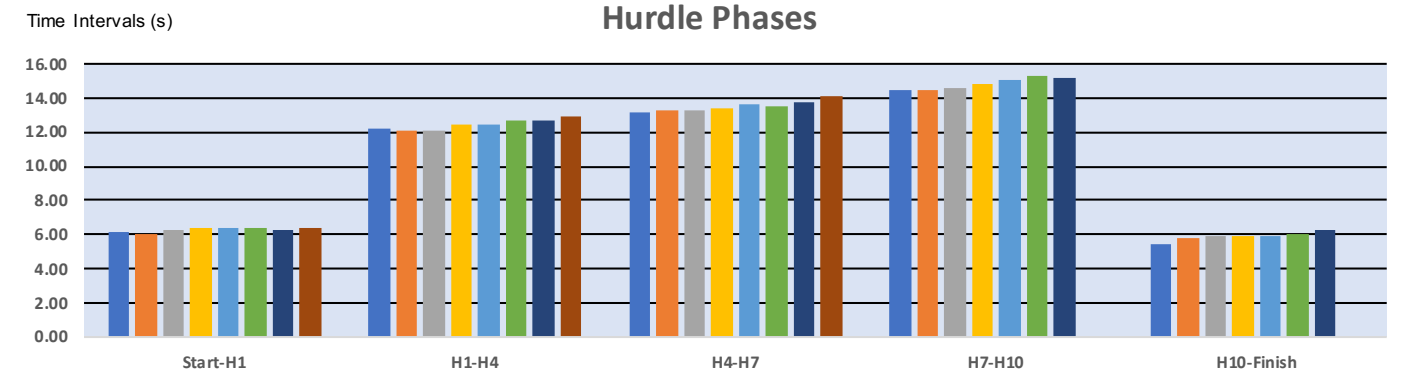
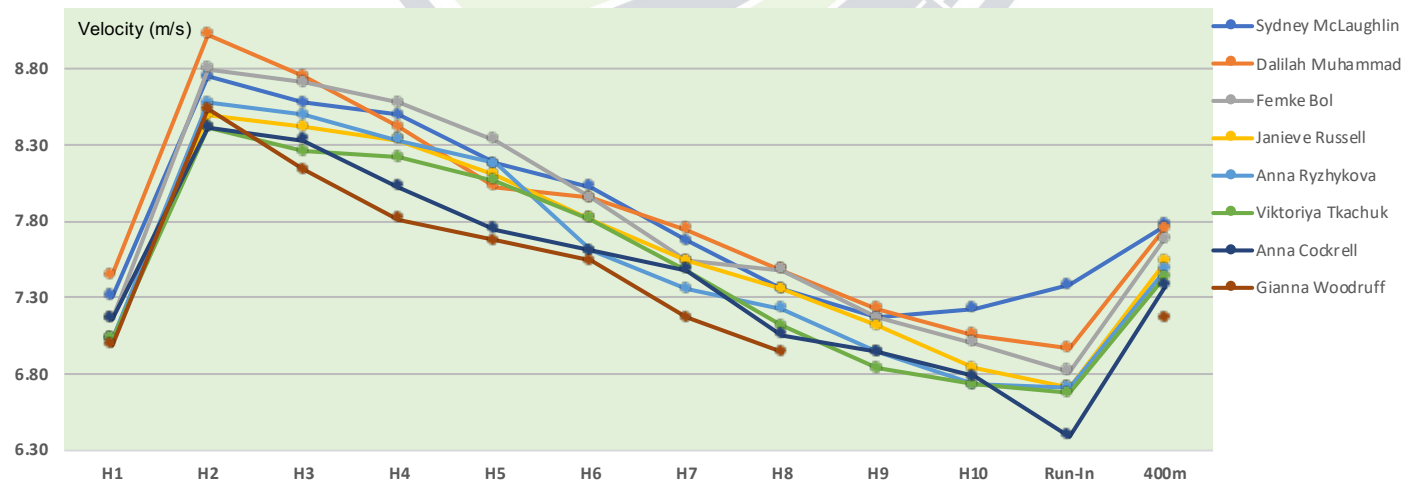
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

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
H1 lead leg	R												170.5				
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
H1 lead leg	R												176				
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
H1 lead leg	L												176				
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
H1 lead leg	R												181.7				
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	4.48	4.68	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
H1 lead leg	R												173.2				
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
H1 lead leg	L												179.7				
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			
	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
H1 lead leg	L												160				
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								
	velocity	6.99	8.54	8.14	7.81	7.68	7.54	7.17	6.94								
H1 lead leg	L												128				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=-BT0qOqSR-k>

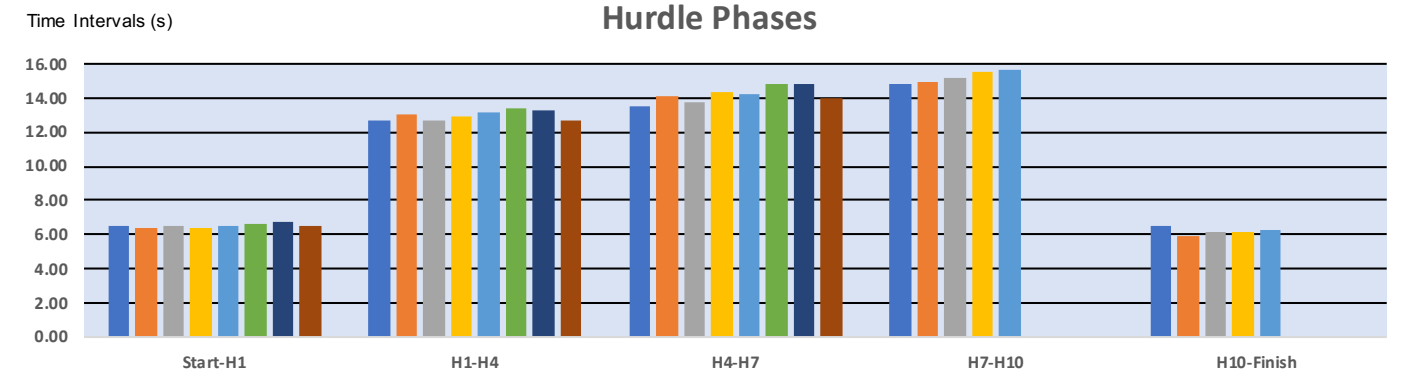
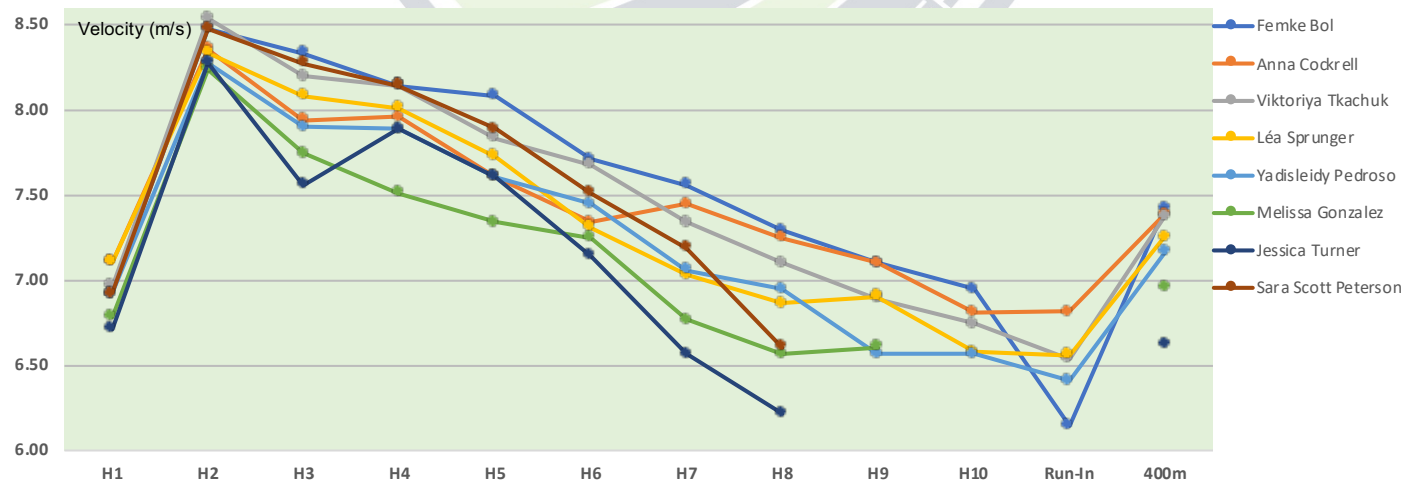
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

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	6.50	10.63	14.83	19.13	23.46	28.00	32.63	37.43	42.36	47.40	53.91	53.91	5 / 1			
	reaction time	0.215															
	interval		4.13	4.20	4.30	4.33	4.54	4.63	4.80	4.93	5.04	6.51			12.63	13.50	14.77
	velocity	6.92	8.47	8.33	8.14	8.08	7.71	7.56	7.29	7.10	6.94	6.14	7.42		8.31	7.78	7.11
H1 lead leg	L																
Cockrell, Anna (USA) (1997)	time	6.33	10.52	14.93	19.33	23.93	28.70	33.40	38.23	43.16	48.30	54.17	54.17	8 / 2			
	reaction time	0.174															
	interval		4.19	4.41	4.40	4.60	4.77	4.70	4.83	4.93	5.14	5.87			13.00	14.07	14.90
	velocity	7.11	8.35	7.94	7.95	7.61	7.34	7.45	7.25	7.10	6.81	6.81	7.38		8.08	7.46	7.05
H1 lead leg	L																
Tkachuk, Viktoriya (UKR) (1994)	time	6.46	10.56	14.83	19.13	23.60	28.16	32.93	37.86	42.94	48.13	54.25	54.25	7 / 3			
	reaction time	0.224															
	interval		4.10	4.27	4.30	4.47	4.56	4.77	4.93	5.08	5.19	6.12			12.67	13.80	15.20
	velocity	6.97	8.54	8.20	8.14	7.83	7.68	7.34	7.10	6.89	6.74	6.54	7.37		8.29	7.61	6.91
H1 lead leg	L																
Sprunger, Léa (SUI) (1990)	time	6.33	10.53	14.86	19.23	23.76	28.55	33.53	38.63	43.70	49.02	55.12	55.12	6 / 4			
	reaction time	0.140															
	interval		4.20	4.33	4.37	4.53	4.79	4.98	5.10	5.07	5.32	6.10			12.90	14.30	15.49
	velocity	7.11	8.33	8.08	8.01	7.73	7.31	7.03	6.86	6.90	6.58	6.56	7.26		8.14	7.34	6.78
H1 lead leg	R																
Pedroso, Yadisleidy (ITA) (1987)	time	6.50	10.73	15.16	19.60	24.20	28.90	33.86	38.90	44.23	49.56	55.80	55.80	2 / 5			
	reaction time	0.181															
	interval		4.23	4.43	4.44	4.60	4.70	4.96	5.04	5.33	5.33	6.24			13.10	14.26	15.70
	velocity	6.92	8.27	7.90	7.88	7.61	7.45	7.06	6.94	6.57	6.57	6.41	7.17		8.02	7.36	6.69
H1 lead leg	R																
Gonzalez, Melissa (COL) (1994)	time	6.63	10.88	15.40	20.06	24.83	29.66	34.83	40.16	45.46	51.16	57.47	57.47	4 / 6			
	reaction time	0.191															
	interval		4.25	4.52	4.66	4.44	4.60	4.90	5.17	5.33	5.30	6.96			13.43	14.77	
	velocity	6.79	8.24	7.74	7.51	7.34	7.25	6.77	6.57	6.60	6.60	6.96			7.82	7.11	
H1 lead leg	L																
Turner, Jessica (GBR) (1995)	time	6.70	10.93	15.56	20.00	24.60	29.50	34.83	40.46	46.33	52.33	60.36	60.36	3 / 7			
	reaction time	0.185															
	interval		4.23	4.63	4.44	4.60	4.90	5.33	5.63	6.22	6.22	6.63			13.30	14.83	
	velocity	6.72	8.27	7.56	7.88	7.61	7.14	6.57	6.22	6.22	6.22	6.63			7.89	7.08	
H1 lead leg	L																
Petersen, Sara Scott (DEN) (1987)	time	6.50	10.63	14.86	19.16	23.60	28.26	33.13	38.43	43.33	48.33	54.33	54.33	9 / --			
	reaction time	0.165															
	interval		4.13	4.23	4.30	4.44	4.66	4.87	5.30	5.30	5.30	DQ			12.66	13.97	
	velocity	6.92	8.47	8.27	8.14	7.88	7.51	7.19	6.60	6.60	6.60	DQ			8.29	7.52	
H1 lead leg	R																



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field/day-10-evening-session-athletics-tokyo-2020-replays>

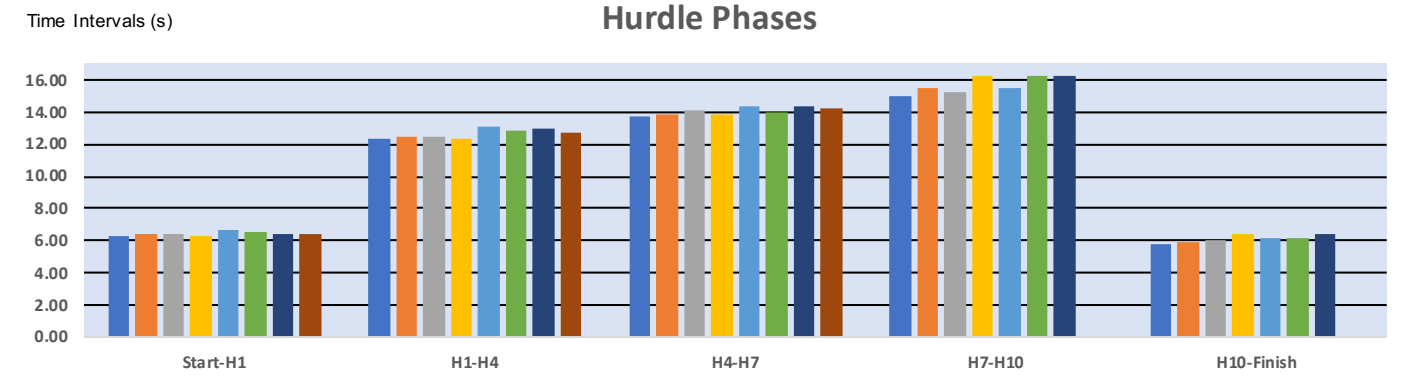
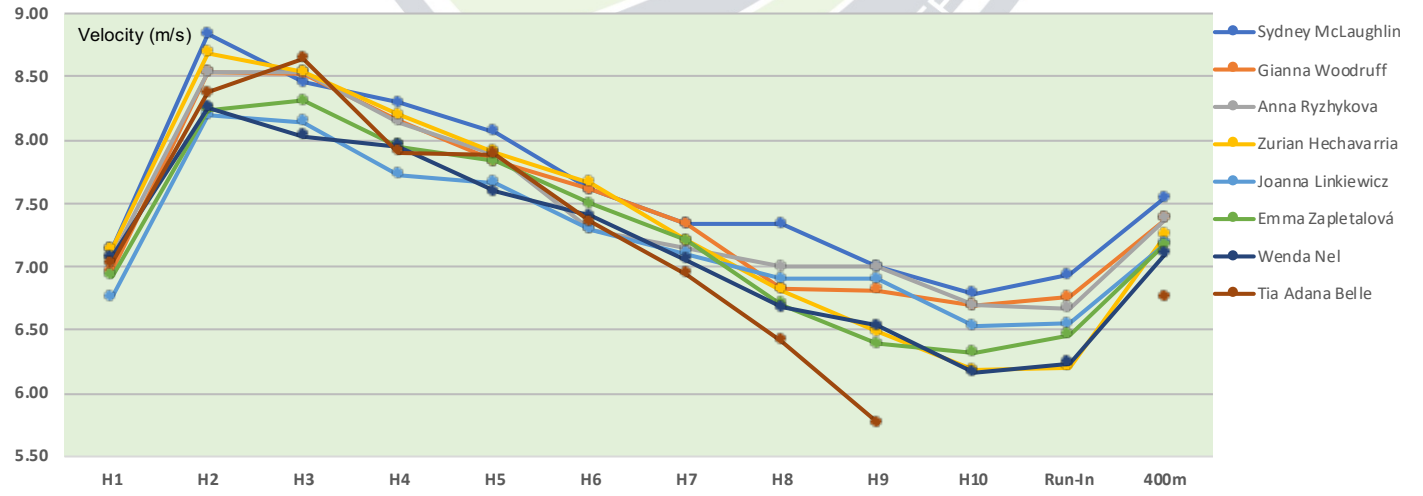
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Women's 400m Hurdles

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	6.30	10.26	14.40	18.62	22.96	27.56	32.33	37.10	42.10	47.26		53.03	5 / 1			
	reaction time	0.204															
	interval		3.96	4.14	4.22	4.34	4.60	4.77	4.77	5.00	5.16	5.77			12.32	13.71	14.93
	velocity	7.14	8.84	8.45	8.29	8.06	7.61	7.34	7.34	7.00	6.78	6.93	7.54		8.52	7.66	7.03
H1 lead leg	R																
Woodruff, Gianna (PAN) (1993)	time	6.46	10.56	14.67	18.96	23.43	28.03	32.80	37.93	43.07	48.30		54.22	4 / 2			
	reaction time	0.207															
	interval		4.10	4.11	4.29	4.47	4.60	4.77	5.13	5.14	5.23	5.92	AR PB		12.50	13.84	15.50
	velocity	6.97	8.54	8.52	8.16	7.83	7.61	7.34	6.82	6.81	6.69	6.76	7.38		8.40	7.59	6.77
H1 lead leg	L																
Ryzhykova, Anna (UKR) (1989)	time	6.36	10.46	14.56	18.86	23.30	28.10	33.00	38.00	43.00	48.23		54.23	6 / 3			
	reaction time	0.162															
	interval		4.10	4.10	4.30	4.44	4.80	4.90	5.00	5.00	5.23	6.00			12.50	14.14	15.23
	velocity	7.08	8.54	8.54	8.14	7.88	7.29	7.14	7.00	7.00	6.69	6.67	7.38		8.40	7.43	6.89
H1 lead leg	R																
Hechavarria, Zurian (CUB) (1995)	time	6.30	10.33	14.43	18.70	23.13	27.70	32.56	37.70	43.10	48.76		55.21	3 / 4			
	reaction time	0.167															
	interval		4.03	4.10	4.27	4.43	4.57	4.86	5.14	5.40	5.66	6.45			12.40	13.86	16.20
	velocity	7.14	8.68	8.54	8.20	7.90	7.66	7.20	6.81	6.48	6.18	6.20	7.25		8.47	7.58	6.48
H1 lead leg	L																
Linkiewicz, Joanna (POL) (1990)	time	6.66	10.93	15.23	19.76	24.33	29.13	34.06	39.13	44.20	49.56		55.67	9 / 5			
	reaction time	0.157															
	interval		4.27	4.30	4.53	4.57	4.80	4.93	5.07	5.07	5.36	6.11			13.10	14.30	15.50
	velocity	6.76	8.20	8.14	7.73	7.66	7.29	7.10	6.90	6.90	6.53	6.55	7.19		8.02	7.34	6.77
H1 lead leg	L																
Zapletalová, Emma (SVK) (2000)	time	6.50	10.75	14.96	19.36	23.83	28.50	33.36	38.58	44.06	49.60		55.79	2 / 6			
	reaction time	0.136															
	interval		4.25	4.21	4.40	4.47	4.67	4.86	5.22	5.48	5.54	6.19			12.86	14.00	16.24
	velocity	6.92	8.24	8.31	7.95	7.83	7.49	7.20	6.70	6.39	6.32	6.46	7.17		8.16	7.50	6.47
H1 lead leg	R																
Nel, Wenda (RSA) (1988)	time	6.36	10.60	14.96	19.36	23.97	28.70	33.66	38.90	44.26	49.94		56.35	8 / 7			
	reaction time	0.189															
	interval		4.24	4.36	4.40	4.61	4.73	4.96	5.24	5.36	5.68	6.41			13.00	14.30	16.28
	velocity	7.08	8.25	8.03	7.95	7.59	7.40	7.06	6.68	6.53	6.16	6.24	7.10		8.08	7.34	6.45
H1 lead leg	L																
Belle, Tia Adana (BAR) (1996)	time	6.40	10.58	14.63	19.06	23.50	28.26	33.30	38.76	44.83			59.26	7 / 8			
	reaction time	0.146															
	interval		4.18	4.05	4.43	4.44	4.76	5.04	5.46	6.07					12.66	14.24	
	velocity	7.03	8.37	8.64	7.90	7.88	7.35	6.94	6.41	5.77			6.75		8.29	7.37	
H1 lead leg	L																



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field/day-10-evening-session-athletics-tokyo-2020-replays>

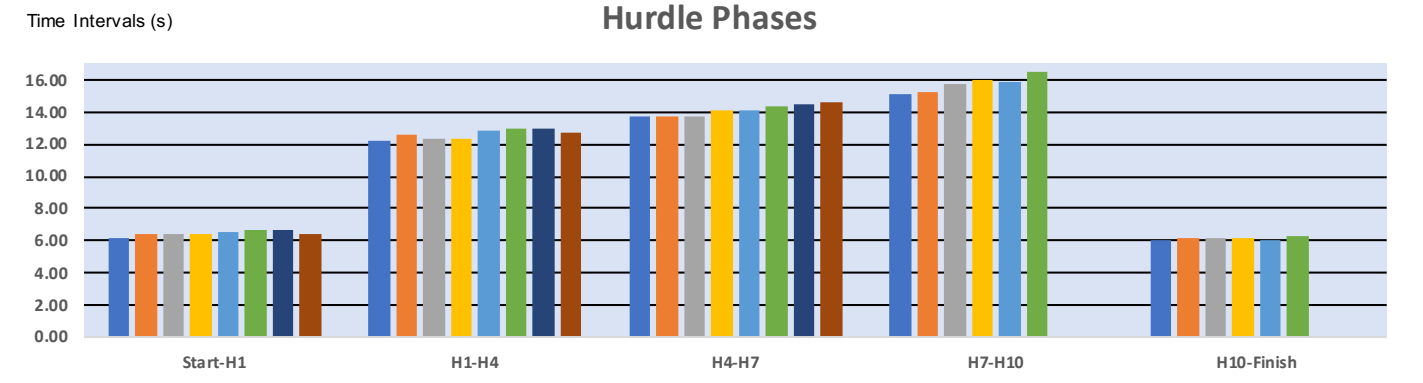
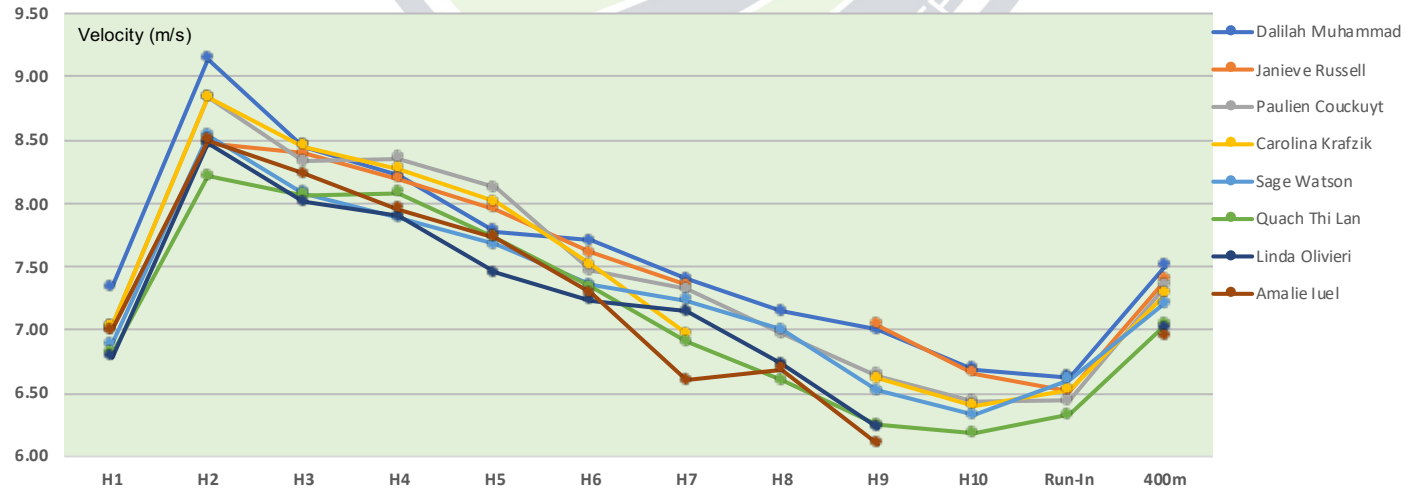
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Women's 400m Hurdles

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	6.13	9.96	14.10	18.36	22.86	27.40	32.13	37.03	42.03	47.26		53.30	7 / 1			
	reaction time	0.186															
	interval velocity	7.34	9.14	8.45	8.22	7.78	7.71	7.40	7.14	7.00	6.69	6.62	7.50		12.23	13.77	15.13
H1 lead leg	R														8.59	7.63	6.94
Russell, Janieve (JAM) (1993)	time	6.43	10.56	14.73	19.00	23.40	28.00	32.76		42.70	47.96		54.10	6 / 2			
	reaction time	0.151															
	interval velocity	7.00	8.47	8.39	8.20	7.95	7.61	7.35		7.04	6.65	6.51	7.39		12.57	13.76	15.20
H1 lead leg	R														8.35	7.63	6.91
Couckuyt, Paulien (BEL) (1997)	time	6.40	10.36	14.56	18.75	23.06	27.75	32.53	37.55	42.82	48.26		54.47	5 / 3			
	reaction time	0.164															
	interval velocity	7.03	8.84	8.33	8.35	8.12	7.46	7.32	6.97	6.64	6.43	6.44	7.34		12.35	13.78	15.73
H1 lead leg	L														8.50	7.62	6.68
Krafzik, Carolina (GER) (1995)	time	6.40	10.36	14.50	18.73	23.10	27.76	32.78		43.36	48.83		54.96	4 / 4			
	reaction time	0.172															
	interval velocity	7.03	8.84	8.45	8.27	8.01	7.51	6.97		6.62	6.40	6.53	7.28		12.33	14.05	16.05
H1 lead leg	L														8.52	7.47	6.54
Watson, Sage (CAN) (1994)	time	6.53	10.63	14.96	19.40	23.96	28.72	33.56	38.56	43.93	49.46		55.51	8 / 5			
	reaction time	0.163															
	interval velocity	6.89	8.54	8.08	7.88	7.68	7.35	7.23	7.00	6.52	6.33	6.61	7.21		12.87	14.16	15.90
H1 lead leg	R														8.16	7.42	6.60
Quach Thi Lan (VIE) (1995)	time	6.60	10.86	15.20	19.53	24.06	28.83	33.90	39.20	44.80	50.46		56.78	3 / 6			
	reaction time	0.188															
	interval velocity	6.82	8.22	8.06	8.08	7.73	7.34	6.90	6.60	6.25	6.18	6.33	7.04		12.93	14.37	16.56
H1 lead leg	L														8.12	7.31	6.34
Olivieri, Linda (ITA) (1998)	time	6.63	10.76	15.13	19.56	24.26	29.10	34.00	39.20	44.82			57.03	9 / 7			
	reaction time	0.120															
	interval velocity	6.79	8.47	8.01	7.90	7.45	7.23	7.14	6.73	6.23			7.01		12.93	14.44	
H1 lead leg	R														8.12	7.27	
luel, Amalie (NOR) (1994)	time	6.43	10.55	14.80	19.20	23.73	28.53	33.83	39.06	44.80			57.61	1 / 8			
	reaction time	0.121															
	interval velocity	7.00	8.50	8.24	7.95	7.73	7.29	6.60	6.69	6.10			6.94		12.77	14.63	
H1 lead leg	L														8.22	7.18	



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field/day-10-evening-session-athletics-tokyo-2020-replays>

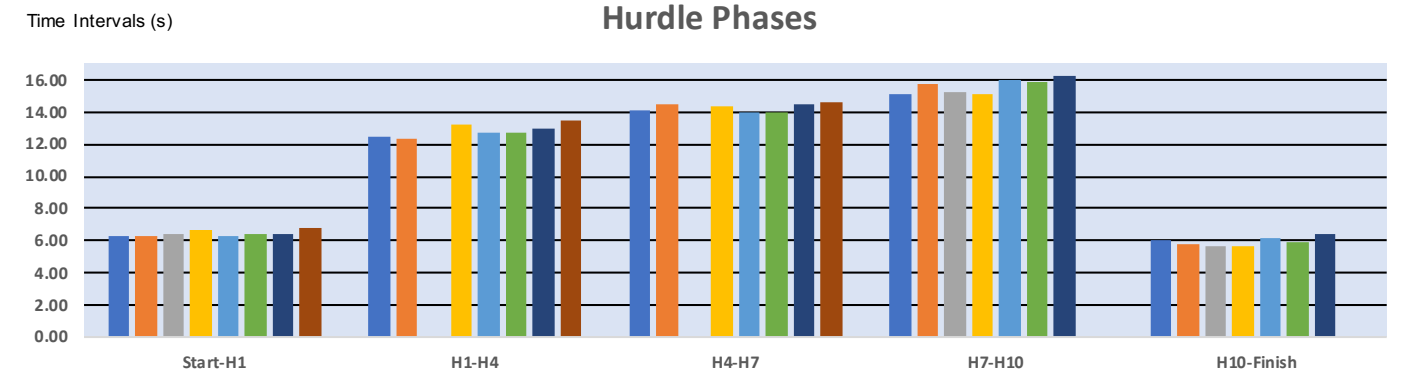
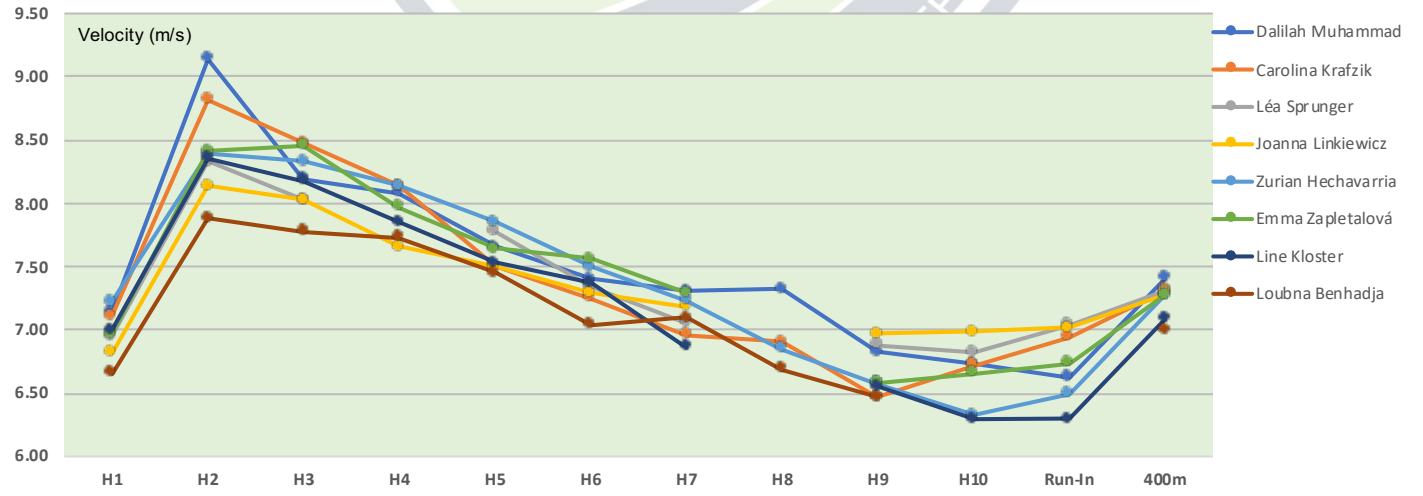
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

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	6.30	10.13	14.40	18.73	23.30	28.03	32.82	37.60	42.73	47.93		53.97	3 / 1			
	reaction time		3.83	4.27	4.33	4.57	4.73	4.79	4.78	5.13	5.20	6.04			12.43	14.09	15.11
	velocity	7.14	9.14	8.20	8.08	7.66	7.40	7.31	7.32	6.82	6.73	6.62	7.41		8.45	7.45	6.95
	H1 lead leg	R	22	15	15	15	15	15	15	16	16	19	178				
Krafzik, Carolina (GER) (1995)	time	6.33	10.30	14.43	18.73	23.40	28.23	33.26	38.33	43.74	48.95		54.71	5 / 2			
	reaction time	0.189	3.97	4.13	4.30	4.67	4.83	5.03	5.07	5.41	5.21	5.76	PB		12.40	14.53	15.69
	velocity	7.11	8.82	8.47	8.14	7.49	7.25	6.96	6.90	6.47	6.72	6.94	7.31		8.47	7.23	6.69
	H1 lead leg	L	23	15	15	15	17	17	17	17	17	20	173				
Sprunger, Léa (SUI) (1990)	time	6.47	10.67	15.03		24.03	28.80	33.76		43.93	49.06		54.74	9 / 3			
	reaction time	0.186	4.20	4.36		9.00	4.77	4.96		10.17	5.13	5.68			-6.47	33.76	15.30
	velocity	6.96	8.33	8.03		7.78	7.34	7.06		6.88	6.82	7.04	7.31		-16.23	3.11	6.86
	H1 lead leg	R	21	14			15	15			15	112					
Linkiewicz, Joanna (POL) (1990)	time	6.60	10.90	15.26	19.83	24.50	29.30	34.17		44.22	49.23		54.93	8 / 4			
	reaction time	0.130	4.30	4.36	4.57	4.67	4.80	4.87		10.05	5.01	5.70	PB		13.23	14.34	15.06
	velocity	6.82	8.14	8.03	7.66	7.49	7.29	7.19		6.97	6.99	7.02	7.28		7.94	7.32	6.97
	H1 lead leg	L	24	16	16	16	17	17		17	20	159					
Hechavarría, Zurian (CUB) (1995)	time	6.23	10.40	14.60	18.90	23.36	28.03	32.87	37.98	43.30	48.83		54.99	6 / 5			
	reaction time	0.181	4.17	4.20	4.30	4.46	4.67	4.84	5.11	5.32	5.53	6.16	PB		12.67	13.97	15.96
	velocity	7.22	8.39	8.33	8.14	7.85	7.49	7.23	6.85	6.58	6.33	6.49	7.27		8.29	7.52	6.58
	H1 lead leg	L	23	15	15	15	15	16	16	17	17	21	186				
Zapletalová, Emma (SVK) (2000)	time	6.46	10.62	14.76	19.15	23.73	28.36	33.16		43.80	49.06		55.00	7 / 6			
	reaction time	0.166	4.16	4.14	4.39	4.58	4.63	4.80		10.64	5.26	5.94			12.69	14.01	15.90
	velocity	6.97	8.41	8.45	7.97	7.64	7.56	7.29		6.58	6.65	6.73	7.27		8.27	7.49	6.60
	H1 lead leg	R	23	15	15	15	15	15	16		16	19	164				
Kloster, Line (NOR) (1990)	time	6.43	10.62	14.90	19.36	24.01	28.76	33.86		44.54	50.10		56.45	2 / 7			
	reaction time	0.151	4.19	4.28	4.46	4.65	4.75	5.10		10.68	5.56	6.35			12.93	14.50	16.24
	velocity	7.00	8.35	8.18	7.85	7.53	7.37	6.86		6.55	6.29	6.30	7.09		8.12	7.24	6.47
	H1 lead leg	R	22	15	15	15	15	15	16		17	130					
Benhadja, Loubna (ALG) (2001)	time	6.76	11.20	15.70	20.23	24.93	29.90	34.83	40.06	45.47			57.19	4 / 8			
	reaction time	0.200	4.44	4.50	4.53	4.70	4.97	4.93	5.23	5.41			PB		13.47	14.60	
	velocity	6.66	7.88	7.78	7.73	7.45	7.04	7.10	6.69	6.47			6.99		7.80	7.19	
	H1 lead leg	R	24	16	16	15	16	16	16		17	136					



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field-day-8-morning-session-athletics-tokyo-2020-replays>

Biomechanical Analysis

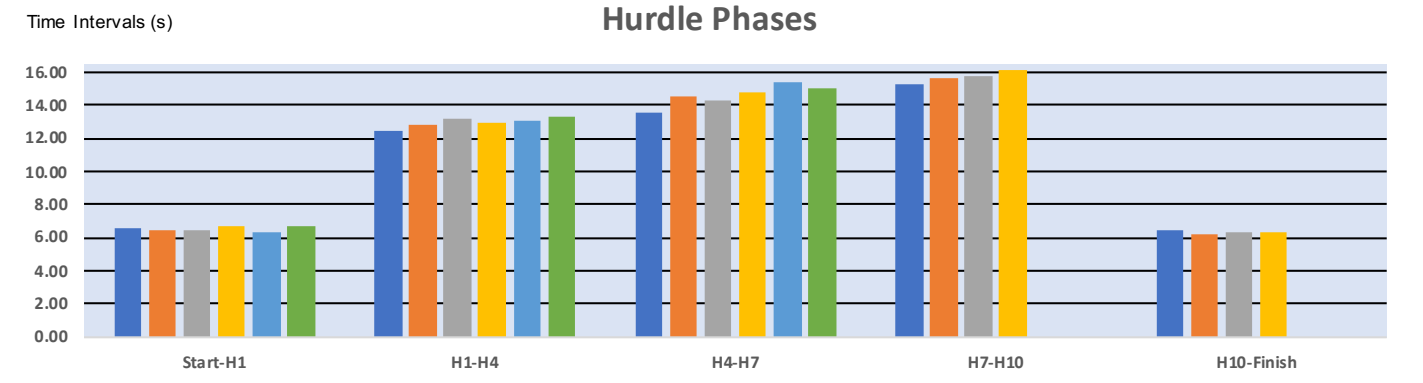
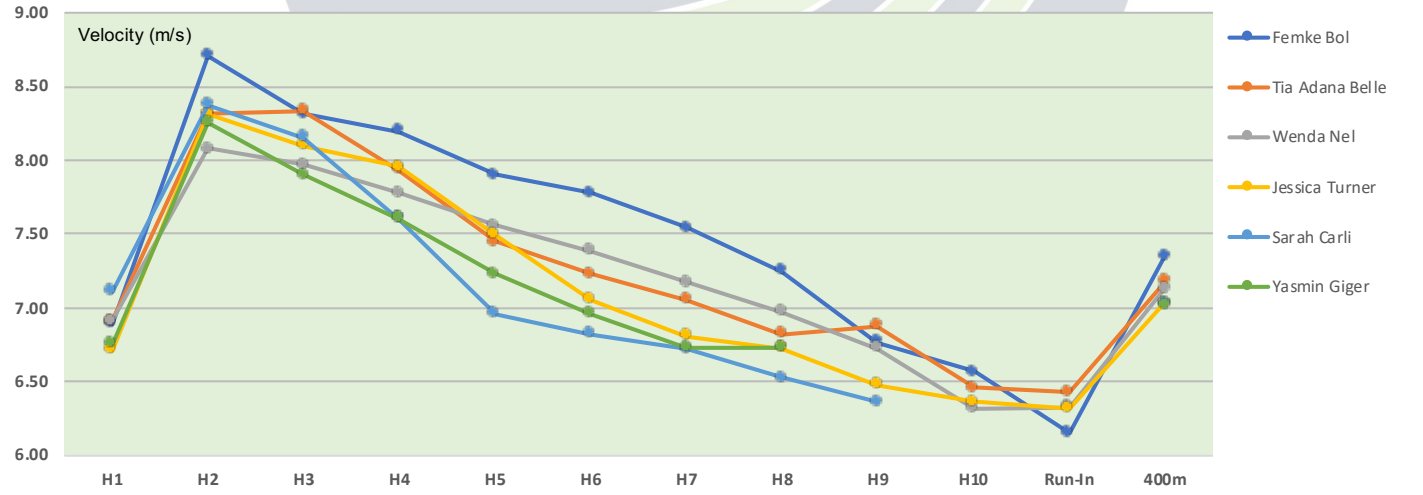
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Women's 400m Hurdles

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	6.53	10.55	14.76	19.03	23.46	27.96	32.60	37.43	42.60	47.93		54.43	8 / 1			
	reaction time	0.194															
	interval		4.02	4.21	4.27	4.43	4.50	4.64	4.83	5.17	5.33	6.50			12.50	13.57	15.33
	velocity	6.89	8.71	8.31	8.20	7.90	7.78	7.54	7.25	6.77	6.57	6.15	7.35		8.40	7.74	6.85
H1 lead leg	L												178				
Belle, Tia Adana (BAR) (1996)	time	6.51	10.72	14.92	19.33	24.03	28.87	33.83	38.96	44.05	49.47		55.69	7 / 2			
	reaction time	0.166															
	interval		4.21	4.20	4.41	4.70	4.84	4.96	5.13	5.09	5.42	6.22			12.82	14.50	15.64
	velocity	6.91	8.31	8.33	7.94	7.45	7.23	7.06	6.82	6.88	6.46	6.43	7.18		8.19	7.24	6.71
H1 lead leg	L												184				
Nel, Wenda (RSA) (1988)	time	6.51	10.84	15.23	19.73	24.36	29.10	33.98	39.00	44.20	49.74		56.06	3 / 3			
	reaction time	0.194															
	interval		4.33	4.39	4.50	4.63	4.74	4.88	5.02	5.20	5.54	6.32			13.22	14.25	15.76
	velocity	6.91	8.08	7.97	7.78	7.56	7.38	7.17	6.97	6.73	6.32	6.33	7.14		7.94	7.37	6.66
H1 lead leg	L												193.7				
Turner, Jessica (GBR) (1995)	time	6.70	10.91	15.23	19.63	24.30	29.26	34.40	39.60	45.00	50.50		56.83	5 / 4			
	reaction time	0.186															
	interval		4.21	4.32	4.40	4.67	4.96	5.14	5.20	5.40	5.50	6.33			12.93	14.77	16.10
	velocity	6.72	8.31	8.10	7.95	7.49	7.06	6.81	6.73	6.48	6.36	6.32	7.04		8.12	7.11	6.52
H1 lead leg	L												190.5				
Carli, Sarah (AUS) (1994)	time	6.33	10.51	14.80	19.40	24.43	29.56	34.77	40.13	45.63			56.93	6 / 5			
	reaction time	0.167															
	interval		4.18	4.29	4.60	5.03	5.13	5.21	5.36	5.50					13.07	15.37	
	velocity	7.11	8.37	8.16	7.61	6.96	6.82	6.72	6.53	6.36			7.03		8.03	6.83	
H1 lead leg	L												150				
Giger, Yasmin (SUI) (1999)	time	6.66	10.90	15.33	19.93	24.77	29.80	35.00	40.20				57.03	9 / 6			
	reaction time	0.165															
	interval		4.24	4.43	4.60	4.84	5.03	5.20	5.20								
	velocity	6.76	8.25	7.90	7.61	7.23	6.96	6.73	6.73				7.01		13.27	15.07	
H1 lead leg	R												131				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field/day-8-morning-session-athletics-tokyo-2020-replays>

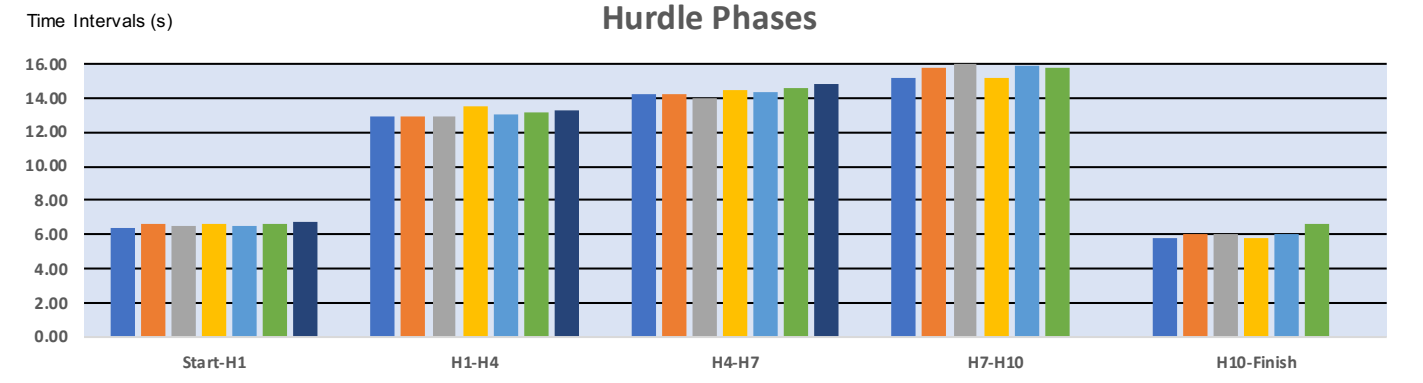
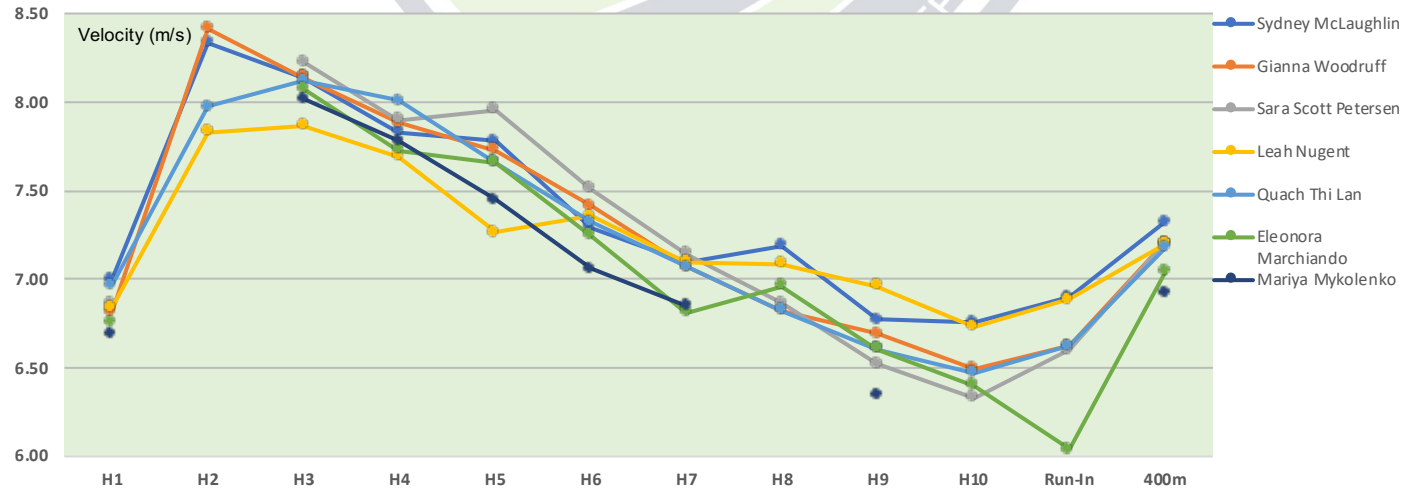
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Women's 400m Hurdles

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	6.43	10.63	14.93	19.40	23.90	28.70	33.63	38.50	43.67	48.85		54.65	5 / 1				
	reaction time	0.180																
	interval		4.20	4.30	4.47	4.50	4.80	4.93	4.87	5.17	5.18	5.80			12.97	14.23	15.22	
	velocity	7.00	8.33	8.14	7.83	7.78	7.29	7.10	7.19	6.77	6.76	6.90	7.32		8.10	7.38	6.90	
H1 lead leg	R		14	14	14	14	15	15	15	16	16	18.5	173.5					
Woodruff, Gianna (PAN) (1993)	time	6.60	10.76	15.06	19.50	24.03	28.75	33.70	38.83	44.06	49.45		55.49	7 / 2				
	reaction time	0.268																
	interval		4.16	4.30	4.44	4.53	4.72	4.95	5.13	5.23	5.39	6.04			12.90	14.20	15.75	
	velocity	6.82	8.41	8.14	7.88	7.73	7.42	7.07	6.82	6.69	6.49	6.62	7.21		8.14	7.39	6.67	
H1 lead leg	L		15	15	15	15	15	15	16	16	17	19	181					
Petersen, Sara Scott (DEN) (1987)	time	6.56		15.07	19.50	23.90	28.56	33.46	38.56	43.93	49.46		55.52	9 / 3				
	reaction time	0.161																
	interval			8.51	4.43	4.40	4.66	4.90	5.10	5.37	5.53	6.06			12.94	13.96	16.00	
	velocity	6.86		8.23	7.90	7.95	7.51	7.14	6.86	6.52	6.33	6.60	7.20		8.11	7.52	6.56	
H1 lead leg	R		15		15	15	15	15	16	17	17	19.7	166.7					
Nugent, Leah (JAM) (1992)	time	6.58	11.05	15.50	20.05	24.87	29.63	34.56	39.50	44.53	49.73		55.54	6 / 4				
	reaction time	0.240																
	interval		4.47	4.45	4.55	4.82	4.76	4.93	4.94	5.03	5.20	5.81	DQ		(no official time given)			
	velocity	6.84	7.83	7.87	7.69	7.26	7.35	7.10	7.09	6.96	6.73	6.88	7.20		13.47	14.51	15.17	
H1 lead leg	R		15	14	14	15	15	15	15	15	15	18.2	173.2		7.80	7.24	6.92	
Quach Thi Lan (VIE) (1995)	time	6.46	10.85	15.16	19.53	24.10	28.88	33.83	38.96	44.26	49.67		55.71	8 / 5				
	reaction time	0.150																
	interval		4.39	4.31	4.37	4.57	4.83	4.95	5.13	5.30	5.41	6.04			13.07	14.30	15.84	
	velocity	6.97	7.97	8.12	8.01	7.66	7.32	7.07	6.82	6.60	6.47	6.62	7.18		8.03	7.34	6.63	
H1 lead leg	R		15	15	15	15	15	15	16	16	16	19	179					
Marchiando, Eleonora (ITA) (1997)	time	6.66		15.33	19.86	24.43	29.26	34.40	39.43	44.73	50.20		56.82	3 / 5				
	reaction time	0.166																
	interval			8.67	4.53	4.37	4.57	4.83	5.14	5.03	5.47	6.62			13.20	14.54	15.80	
	velocity	6.76		8.07	7.73	7.66	7.25	6.81	6.96	6.60	6.40	6.04	7.04		7.95	7.22	6.65	
H1 lead leg	L		24		16	16	16	17	17	17	17	21.2	161.2					
Mykolenko, Mariya (UKR) (1994)	time	6.73		15.46	19.96	24.66	29.62	34.73		45.76		57.86	4 / 6					
	reaction time	0.200																
	interval			8.73	4.50	4.70	4.96	5.11		11.03					13.23	14.77		
	velocity	6.69		8.02	7.78	7.45	7.06	6.85		6.35		6.91			7.94	7.11		
H1 lead leg	R		15		15	15	16	16		16		116						
Knight, Jessie (GBR) (1994)	time	fell into hurdle											dnf	2 / --				
	reaction time	0.160																
	interval																	
	velocity																	
H1 lead leg	R		23									23						



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field/day-8-morning-session-athletics-tokyo-2020-replays>

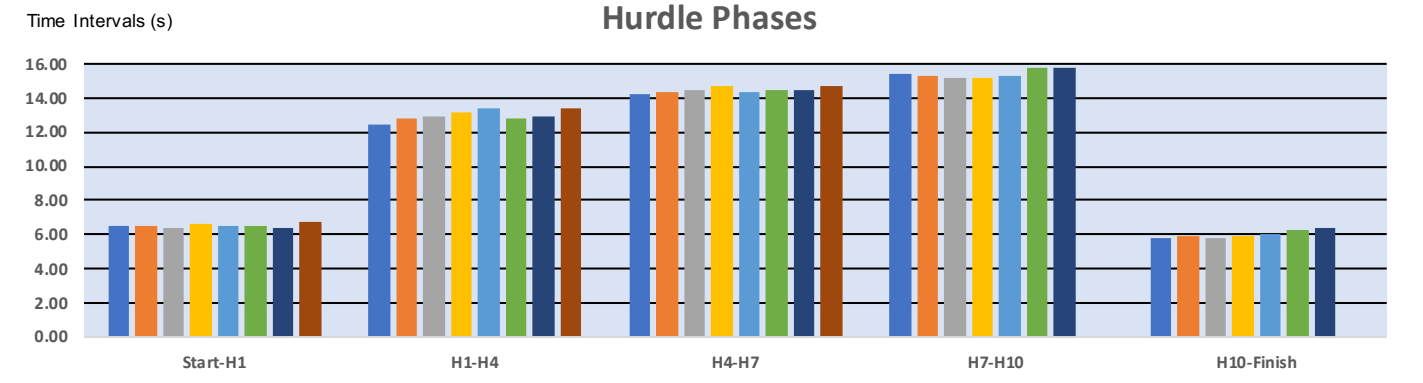
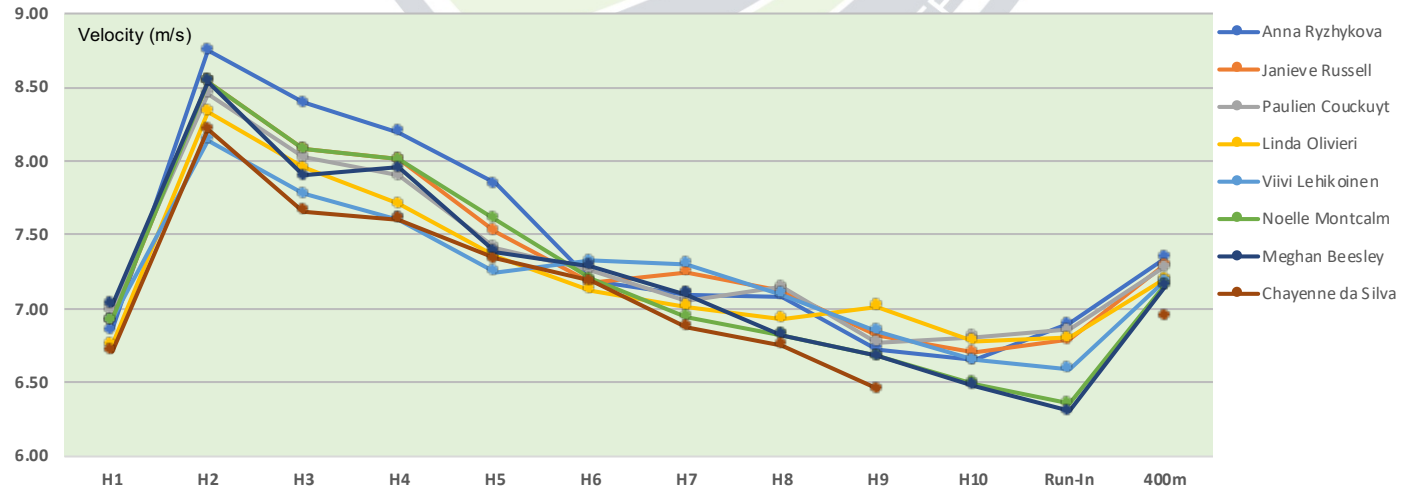
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Women's 400m Hurdles

Date 2021.07.31

Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Ryzhykova, Anna (UKR) (1989)	time	6.56	10.56	14.73	19.00	23.46	28.33	33.26	38.20	43.40	48.66		54.46	2 / 1			
	reaction time	0.191													12.44	14.26	15.40
	interval		4.00	4.17	4.27	4.46	4.87	4.93	4.94	5.20	5.26	5.80			8.44	7.36	6.82
	velocity	6.86	8.75	8.39	8.20	7.85	7.19	7.10	7.09	6.73	6.65	6.90	7.34				
H1 lead leg	R																
Russell, Janieve (JAM) (1993)	time	6.50	10.60	14.93	19.30	23.95	28.83	33.66	38.57	43.70	48.92		54.81	7 / 2			
	reaction time	0.159													12.80	14.36	15.26
	interval		4.10	4.33	4.37	4.65	4.88	4.83	4.91	5.13	5.22	5.89			8.20	7.31	6.88
	velocity	6.92	8.54	8.08	8.01	7.53	7.17	7.25	7.13	6.82	6.70	6.79	7.30				
H1 lead leg	R																
Couckuyt, Paulien (BEL) (1997)	time	6.43	10.57	14.93	19.36	24.08	28.90	33.86	38.76	43.93	49.07		54.90	9 / 3			
	reaction time	0.182													12.93	14.50	15.21
	interval		4.14	4.36	4.43	4.72	4.82	4.96	4.90	5.17	5.14	5.83	NR PB		8.12	7.24	6.90
	velocity	7.00	8.45	8.03	7.90	7.42	7.26	7.06	7.14	6.77	6.81	6.86	7.29				
H1 lead leg	L																
Olivieri, Linda (ITA) (1998)	time	6.66	10.86	15.26	19.80	24.56	29.47	34.46	39.51	44.50	49.66		55.54	8 / 4			
	reaction time	0.130													13.14	14.66	15.20
	interval		4.20	4.40	4.54	4.76	4.91	4.99	5.05	4.99	5.16	5.88	=PB		7.99	7.16	6.91
	velocity	6.76	8.33	7.95	7.71	7.35	7.13	7.01	6.93	7.01	6.78	6.80	7.20				
H1 lead leg	R																
Lehikoinen, Viivi (FIN) (1999)	time	6.50	10.80	15.30	19.90	24.73	29.51	34.30	39.23	44.34	49.60		55.67	6 / 5			
	reaction time	0.155													13.40	14.40	15.30
	interval		4.30	4.50	4.60	4.83	4.78	4.79	4.93	5.11	5.26	6.07			7.84	7.29	6.86
	velocity	6.92	8.14	7.78	7.61	7.25	7.32	7.31	7.10	6.85	6.65	6.59	7.19				
H1 lead leg	R																
Montcalm, Noelle (CAN) (1988)	time	6.50	10.60	14.93	19.30	23.90	28.76	33.80	38.93	44.17	49.56		55.85	3 / 6			
	reaction time	0.197													12.80	14.50	15.76
	interval		4.10	4.33	4.37	4.60	4.86	5.04	5.13	5.24	5.39	6.29			8.20	7.24	6.66
	velocity	6.92	8.54	8.08	8.01	7.61	7.20	6.94	6.82	6.68	6.49	6.36	7.16				
H1 lead leg	R																
Beesley, Meghan (GBR) (1989)	time	6.40	10.50	14.93	19.33	24.07	28.87	33.80	38.93	44.17	49.57		55.91	5 / 7			
	reaction time	0.165													12.93	14.47	15.77
	interval		4.10	4.43	4.40	4.74	4.80	4.93	5.13	5.24	5.40	6.34			8.12	7.26	6.66
	velocity	7.03	8.54	7.90	7.95	7.38	7.29	7.10	6.82	6.68	6.48	6.31	7.15				
H1 lead leg	L																
da Silva, Chayenne (BRA) (2000)	time	6.70	10.96	15.53	20.13	24.90	29.77	34.86	40.04	45.46			57.55	4 / 8			
	reaction time	0.165													13.43	14.73	
	interval		4.26	4.57	4.60	4.77	4.87	5.09	5.18	5.42					7.82	7.13	
	velocity	6.72	8.22	7.66	7.61	7.34	7.19	6.88	6.76	6.46							
H1 lead leg	L																



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.olympics.com/en/video/track-and-field/day-8-morning-session-athletics-tokyo-2020-replays>

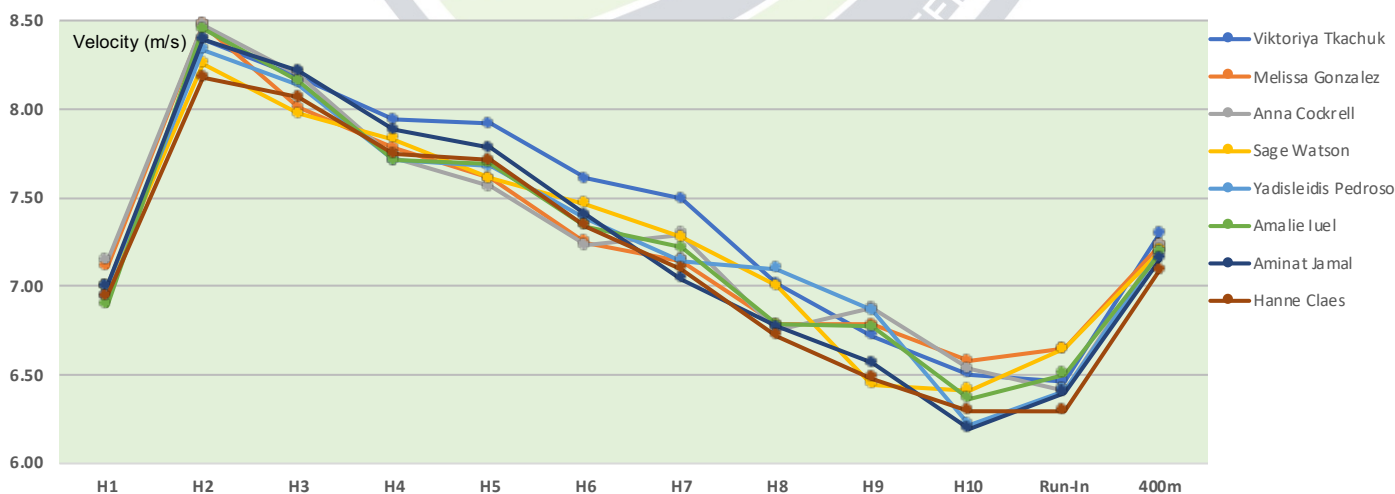
2020 Olympic Games (Tokyo, JPN) (TV Analysis)

Women's 400m Hurdles

Date 2021.07.31

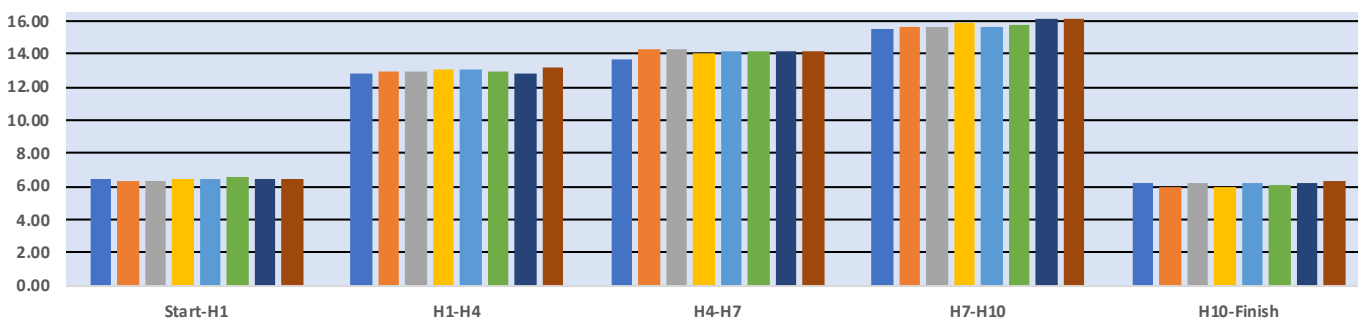
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Tkachuk, Viktoriya (UKR) (1994)	time	6.48	10.65	14.93	19.34	23.76	28.36	33.03	38.02	43.23	48.61		54.80	9 / 1			
	reaction time	0.256															
	interval		4.17	4.28	4.41	4.42	4.60	4.67	4.99	5.21	5.38	6.19			12.86	13.69	15.58
	velocity	6.94	8.39	8.18	7.94	7.92	7.61	7.47	7.01	6.72	6.51	6.46	7.30		8.16	7.67	6.74
H1 lead leg	L												19.5				
Gonzalez, Melissa (COL) (1994)	time	6.33	10.46	14.83	19.33	23.93	28.76	33.66	38.82	43.98	49.30		55.32	3 / 2			
	reaction time	0.146															
	interval		4.13	4.37	4.50	4.60	4.83	4.90	5.16	5.16	5.32	6.02	AR PB		13.00	14.33	15.64
	velocity	7.11	8.47	8.01	7.78	7.61	7.25	7.14	6.78	6.78	6.58	6.64	7.23		8.08	7.33	6.71
H1 lead leg	L												20				
Cockrell, Anna (USA) (1997)	time	6.30	10.43	14.70	19.23	23.86	28.70	33.50	38.68	43.77	49.13		55.37	7 / 3			
	reaction time	0.213															
	interval		4.13	4.27	4.53	4.63	4.84	4.80	5.18	5.09	5.36	6.24			12.93	14.27	15.63
	velocity	7.14	8.47	8.20	7.73	7.56	7.23	7.29	6.76	6.88	6.53	6.41	7.22		8.12	7.36	6.72
H1 lead leg	L												20				
Watson, Sage (CAN) (1994)	time	6.43	10.67	15.06	19.53	24.13	28.82	33.63	38.63	44.06	49.52		55.54	8 / 4			
	reaction time	0.176															
	interval		4.24	4.39	4.47	4.60	4.69	4.81	5.00	5.43	5.46	6.02			13.10	14.10	15.89
	velocity	7.00	8.25	7.97	7.83	7.61	7.46	7.28	7.00	6.45	6.41	6.64	7.20		8.02	7.45	6.61
H1 lead leg	R												181				
Pedroso, Yadisleidis (ITA) (1987)	time	6.43	10.63	14.93	19.47	24.03	28.77	33.67	38.60	43.70	49.33		55.57	6 / 5			
	reaction time	0.186															
	interval		4.20	4.30	4.54	4.56	4.74	4.90	4.93	5.10	5.63	6.24			13.04	14.20	15.66
	velocity	7.00	8.33	8.14	7.71	7.68	7.38	7.14	7.10	6.86	6.22	6.41	7.20		8.05	7.39	6.70
H1 lead leg	R												196.2				
luel, Amalie (NOR) (1994)	time	6.53	10.67	14.96	19.50	24.05	28.82	33.67	38.83	44.00	49.50		55.65	5 / 6			
	reaction time	0.129															
	interval		4.14	4.29	4.54	4.55	4.77	4.85	5.16	5.17	5.50	6.15			12.97	14.17	15.83
	velocity	6.89	8.45	8.16	7.71	7.69	7.34	7.22	6.78	6.77	6.36	6.50	7.19		8.10	7.41	6.63
H1 lead leg	L												182				
Jamal, Aminat (BRN) (1997)	time	6.43	10.60	14.86	19.30	23.80	28.53	33.50	38.67	44.00	49.65		55.90	2 / 7			
	reaction time	0.208															
	interval		4.17	4.26	4.44	4.50	4.73	4.97	5.17	5.33	5.65	6.25			12.87	14.20	16.15
	velocity	7.00	8.39	8.22	7.88	7.78	7.40	7.04	6.77	6.57	6.19	6.40	7.16		8.16	7.39	6.50
H1 lead leg	R												181				
Claes, Hanne (BEL) (1991)	time	6.48	10.76	15.10	19.62	24.16	28.93	33.86	39.07	44.47	50.03		56.38	4 / 8			
	reaction time	0.174															
	interval		4.28	4.34	4.52	4.54	4.77	4.93	5.21	5.40	5.56	6.35			13.14	14.24	16.17
	velocity	6.94	8.18	8.06	7.74	7.71	7.34	7.10	6.72	6.48	6.29	6.30	7.09		7.99	7.37	6.49
H1 lead leg	R												166				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.olympics.com/en/video/track-and-field/day-8-morning-session-athletics-tokyo-2020-replays>

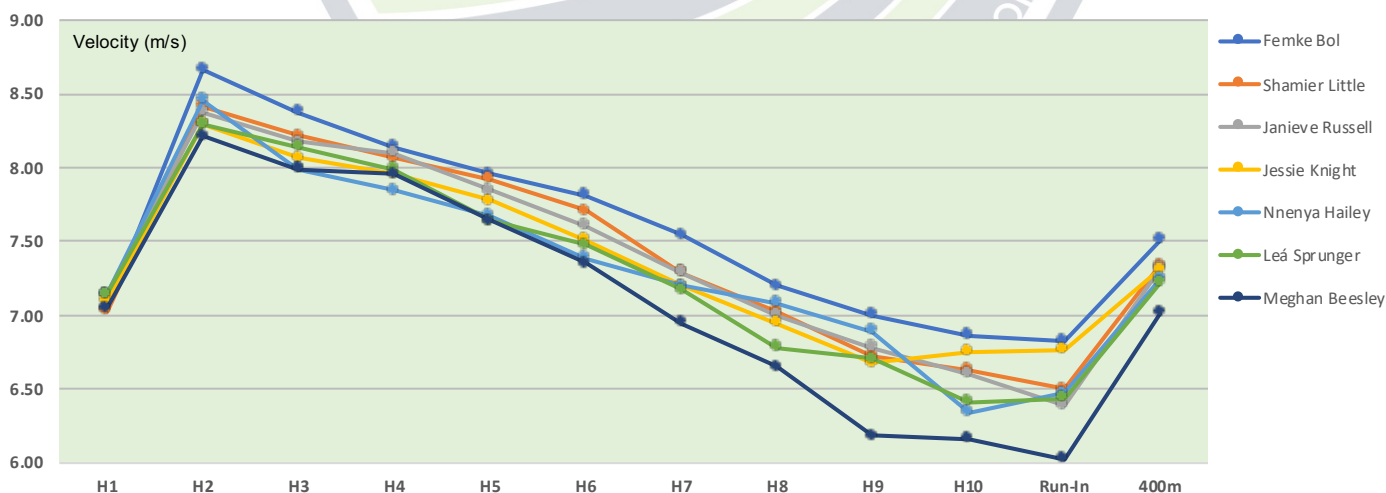
2021 Müller British Grand Prix (Gateshead, GBR) (TV Analysis)

Women's 400m Hurdles

Date 2021.07.13

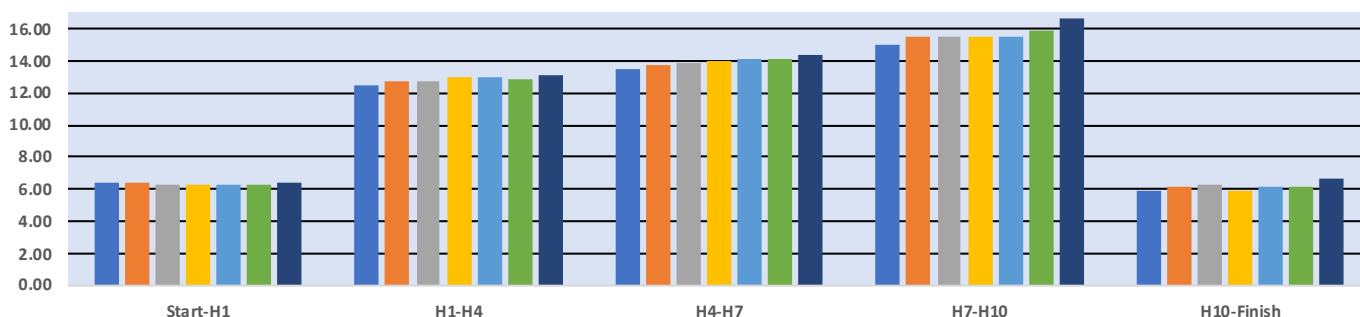
FINAL

		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		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	7.05	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
H1 lead leg	L												176				
Little, Shamier (USA) (1995)	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		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
	velocity	7.03	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											182					
Russell, Janieve (JAM) (1993)	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															
	interval		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	7.14	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											205					
Knight, Jessie (GBR) (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		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	7.10	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
H1 lead leg	R											179					
Hailey, Nnanya (USA) (1994)	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		4.14	4.38	4.46	4.56	4.74	4.88	4.94	5.08	5.52	6.18			12.98	14.16	15.54
	velocity	7.14	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											195.7					
Sprunger, Leá (SUI) (1990)	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															
	interval		4.22	4.30	4.38	4.48	4.68	4.88	5.16	5.22	5.46	6.21			12.90	14.14	15.84
	velocity	7.14	8.29	8.14	7.99	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											173					
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		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	7.05	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
H1 lead leg	L											202					



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=UDuzOssoya0>

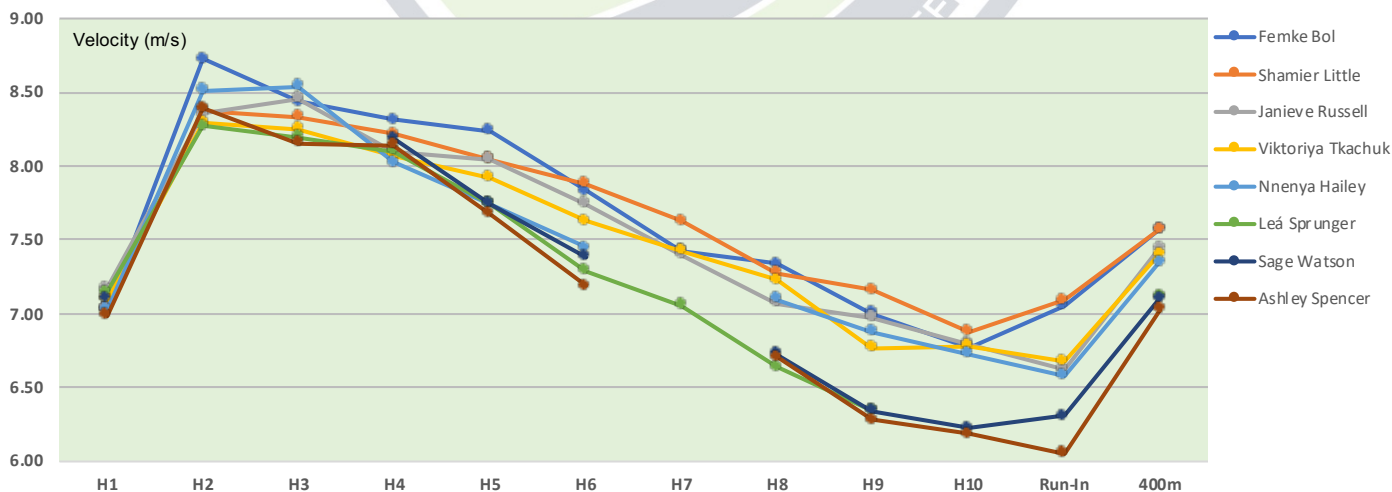
2021 István Gyulai Memorial (Székesfehérvár, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2021.07.06

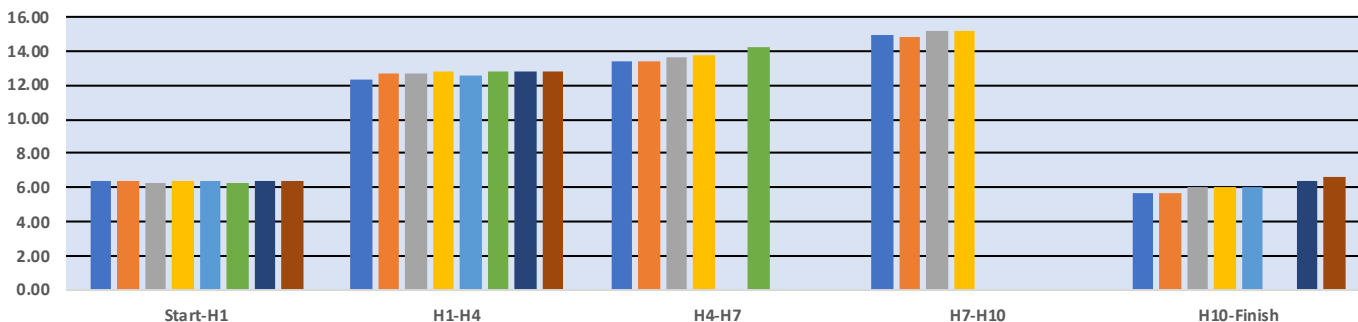
FINAL

		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	7.34	7.00	6.77	7.00	6.77	7.05	7.57	8.49	7.82	7.03
H1 lead leg	L		22	15	15	15	15	15	15	15	15	19.2	161.2				
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
H1 lead leg	R		22	15	15	15	15	16	16	16	19.5	164.5					
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
H1 lead leg	R		23	15	15	15	15	16	16	17	20	167					
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
H1 lead leg	L		15	15	15	15	15	15	16	16	19.2	141.2					
Hailey, Nnanya (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		
H1 lead leg	L		16	16	16	17	17		18	18		118					
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	
H1 lead leg	R		15	14	14	15	15		16	16	17	122					
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		
H1 lead leg	R					15	15		17	17		64					
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	L		15	15	14	14	15		16	16		105					



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=zFVRA0B8Rjw>

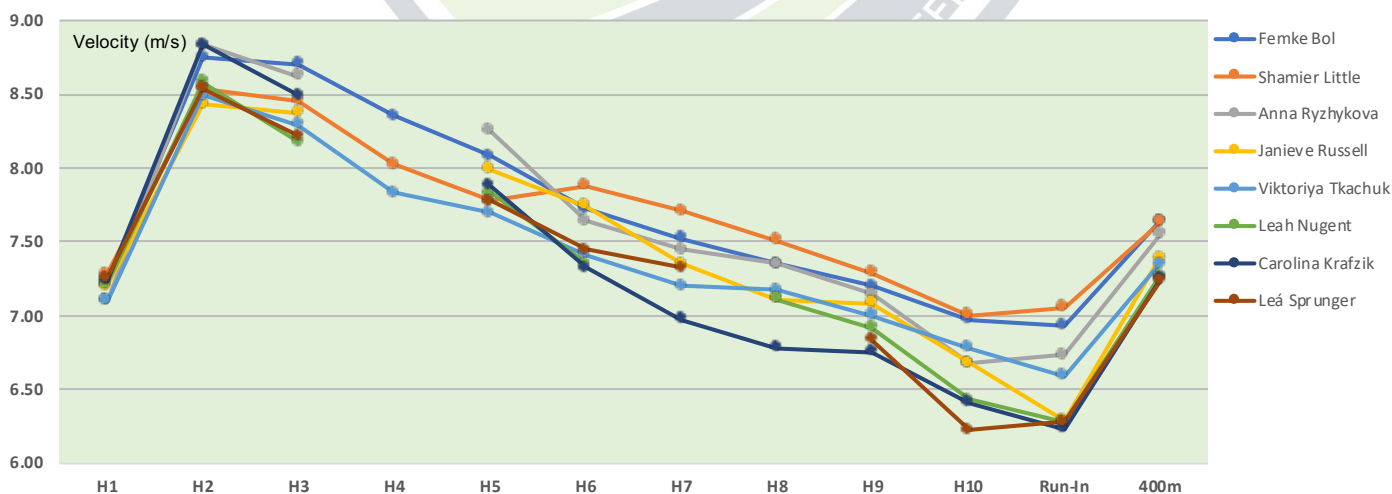
2021 Bauhaus Galan (Stockholm, SWE) (TV Analysis)

Women's 400m Hurdles

Date 2021.07.04

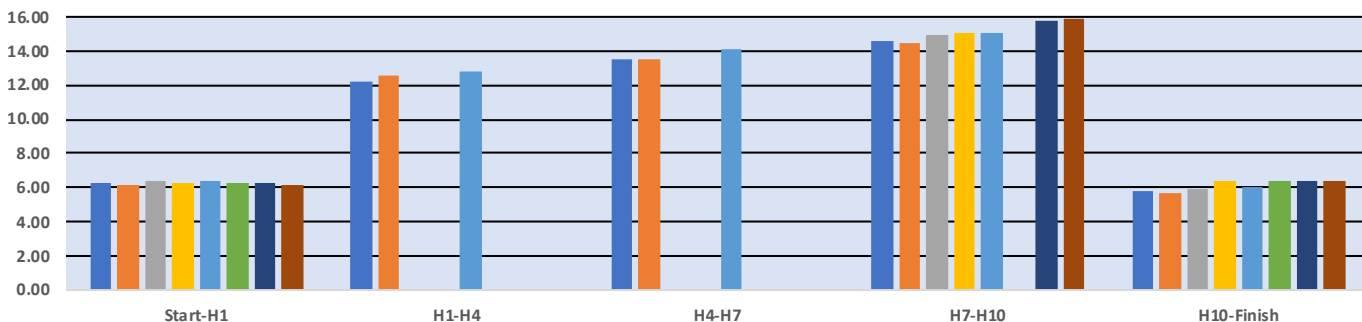
FINAL

		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 velocity	7.21	8.75	8.42	8.35	8.08	7.73	7.53	7.35	7.20	6.97	6.93	7.64		12.21	13.51	14.64
H1 lead leg	L		15	15	15	15	15	15	15	15	15	19	154		8.60	7.77	7.17
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 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		12.60	13.48	14.46
H1 lead leg	R		15	15	15	15	15	15	15	16	16	19.7	156.7		8.33	7.79	7.26
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 velocity	7.10	8.84	8.62		8.25	7.64	7.45	7.35	7.14	6.68	6.73	7.55				14.90
H1 lead leg	R		14	14		15	15	15	15	16	16	19.2	145.2				7.05
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 velocity	7.20	8.43	8.37		7.99	7.74	7.35	7.11	7.09	6.68	6.29	7.40				15.10
H1 lead leg	R		15	15		15	16	16	16	16	20	129					6.95
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 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		12.81	14.13	15.04
H1 lead leg	L		15	15	15	15	15	16	16	16	16	19.2	158.2		8.20	7.43	6.98
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 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 velocity	7.23	8.84	8.50		7.88	7.32	6.97	6.78	6.41	6.23	7.25					15.80
H1 lead leg	L		15	15		16	17	17	17	19	21.7	159.7					6.65
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 velocity	7.26	8.54	8.22		7.78	7.45	7.32		6.84	6.23	6.28	7.24				15.86
H1 lead leg	R		15	14		15	15	15		16	16	90					6.62



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>

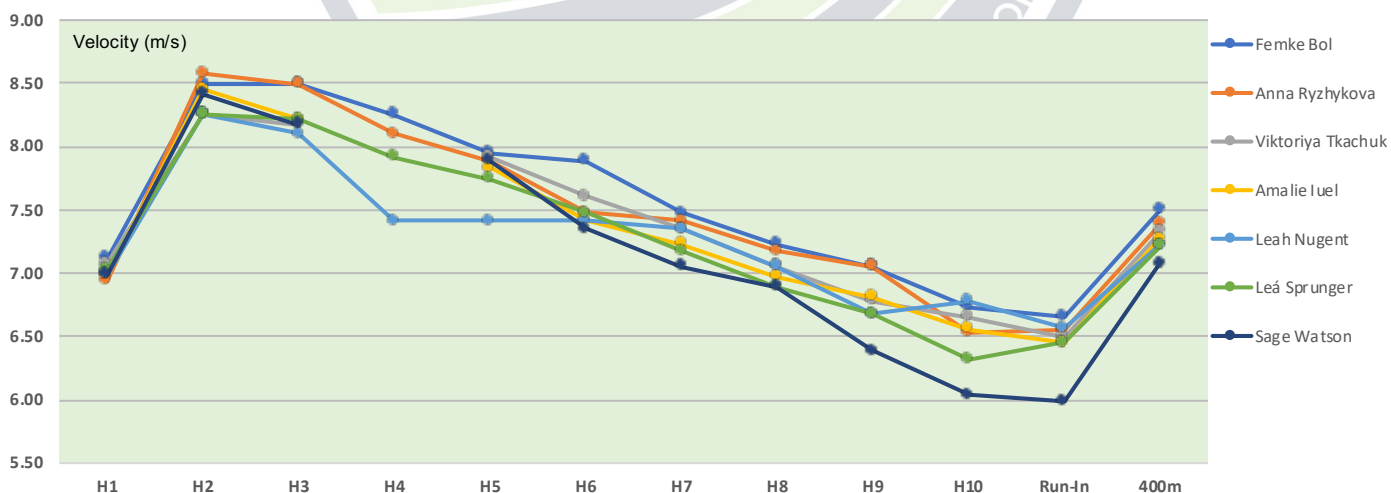
2021 Bislett Games (Oslo, NOR) (TV Analysis)

Women's 400m Hurdles

Date 2021.07.01

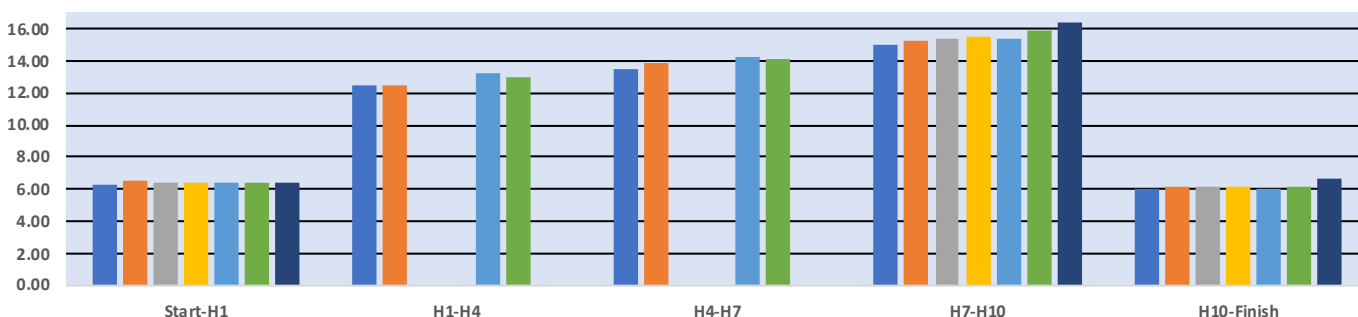
FINAL

		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		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
H1 lead leg	L																
Ryzyhkova, 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		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
H1 lead leg	R																
Tkachuk, Viktoriya (UKR) (1994)	time	6.36	10.60	14.88	19.32	23.72	28.32	33.08	38.04	43.20	48.46		54.62	2 / 3			
	reaction time	0.250															
	interval		4.24	4.28	4.42	4.52	4.68	4.88	5.08	5.24	5.54	6.20					15.38
	velocity	7.08	8.25	8.18	7.92	7.61	7.35	7.06	6.78	6.65	6.49	7.32					6.83
H1 lead leg	L																
luel, Amalie (NOR) (1994)	time	6.44	10.58	14.84	19.32	23.78	28.50	33.34	38.36	43.50	48.84		55.04	7 / 4			
	reaction time	0.150															
	interval		4.14	4.26	4.42	4.52	4.72	4.84	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
H1 lead leg	L																
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		4.24	4.32	4.72	4.72	4.72	4.76	4.96	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
H1 lead leg	R																
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		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
H1 lead leg	R																
Watson, Sage (CAN) (1994)	time	6.44	10.60	14.88	19.32	23.76	28.52	33.48	38.56	44.04	49.84		56.52	8 / 7			
	reaction time	0.204															
	interval		4.16	4.28	4.42	4.52	4.76	4.96	5.08	5.48	5.80	6.68					16.36
	velocity	6.99	8.41	8.18	7.88	7.88	7.35	7.06	6.89	6.39	6.03	5.99	7.08				6.42
H1 lead leg	R																



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>

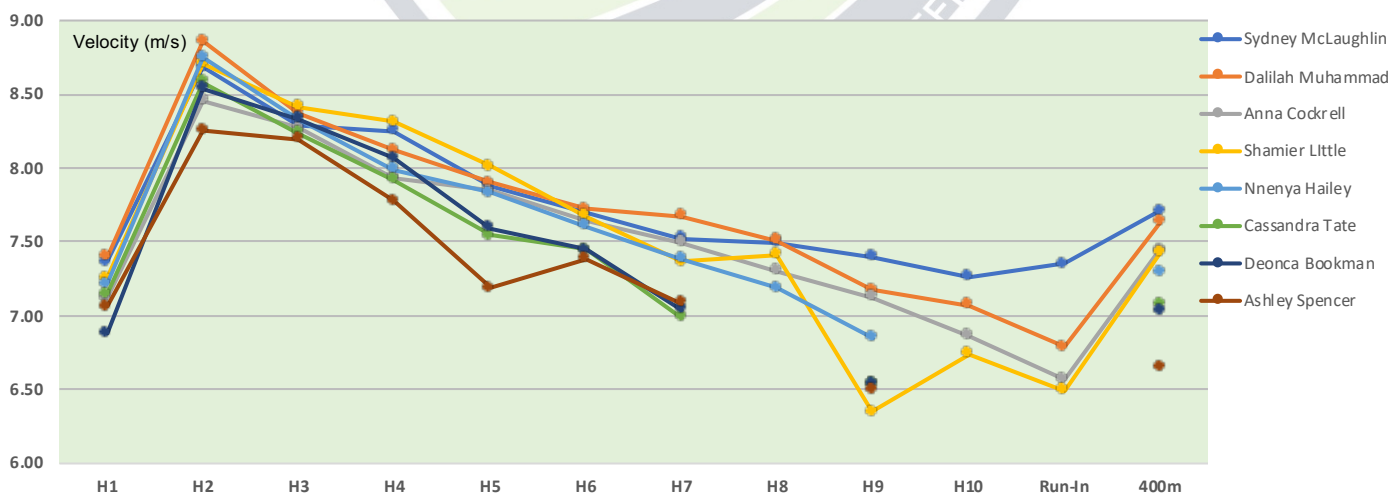
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Women's 400m Hurdles

Date 2021.06.27

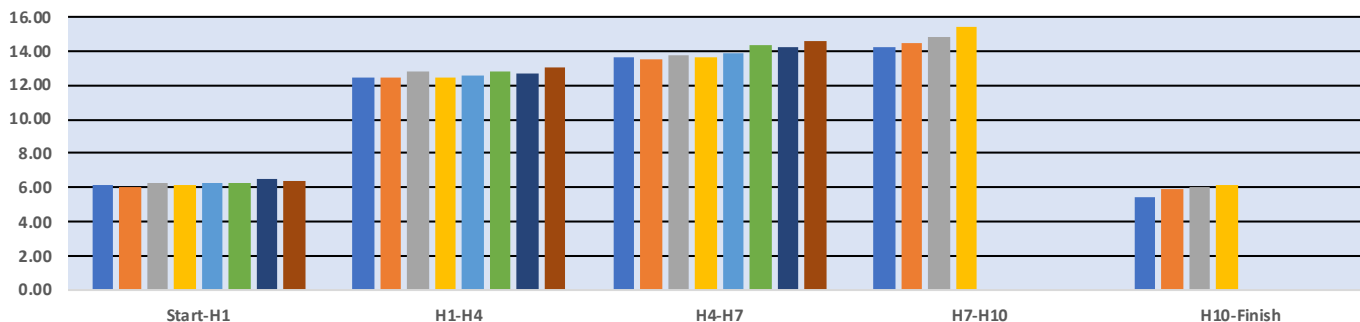
FINAL

		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	7.26	7.26	7.35	7.71		8.41	7.70	7.38
H1 lead leg	R																
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
H1 lead leg	R																
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
H1 lead leg	L																
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
H1 lead leg	R																
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							
	velocity	7.21	8.75	8.33	7.99	7.83	7.61	7.38	7.19	6.85							
H1 lead leg	L																
Tate, Cassandra (USA) (1990)	time	6.30	10.38	14.63	19.05	23.69	28.39	33.40		44.11			56.51	4 / 6-5			
	reaction time	0.194															
	interval		4.08	4.25	4.42	4.64	4.70	5.01		10.71							
	velocity	7.14	8.58	8.24	7.92	7.54	7.45	6.99		6.54							
H1 lead leg	R																
Bookman, Deonca (USA) (1995)	time	6.54	10.64	14.84	19.18	23.79	28.49	33.46		44.17			56.90	2 / 7-6			
	reaction time	0.349															
	interval		4.10	4.20	4.34	4.61	4.70	4.97		10.71							
	velocity	6.88	8.54	8.33	8.06	7.59	7.45	7.04		6.54							
H1 lead leg	R																
Spencer, Ashley (USA) (1993)	time	6.37	10.61	14.88	19.38	24.25	28.99	33.93		44.71			60.19	3 / 8-7			
	reaction time	0.222															
	interval		4.24	4.27	4.50	4.87	4.74	4.94		10.78							
	velocity	7.06	8.25	8.20	7.78	7.19	7.38	7.09		6.49							
H1 lead leg	L																



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/athleetracking/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>

Biomechanical Analysis

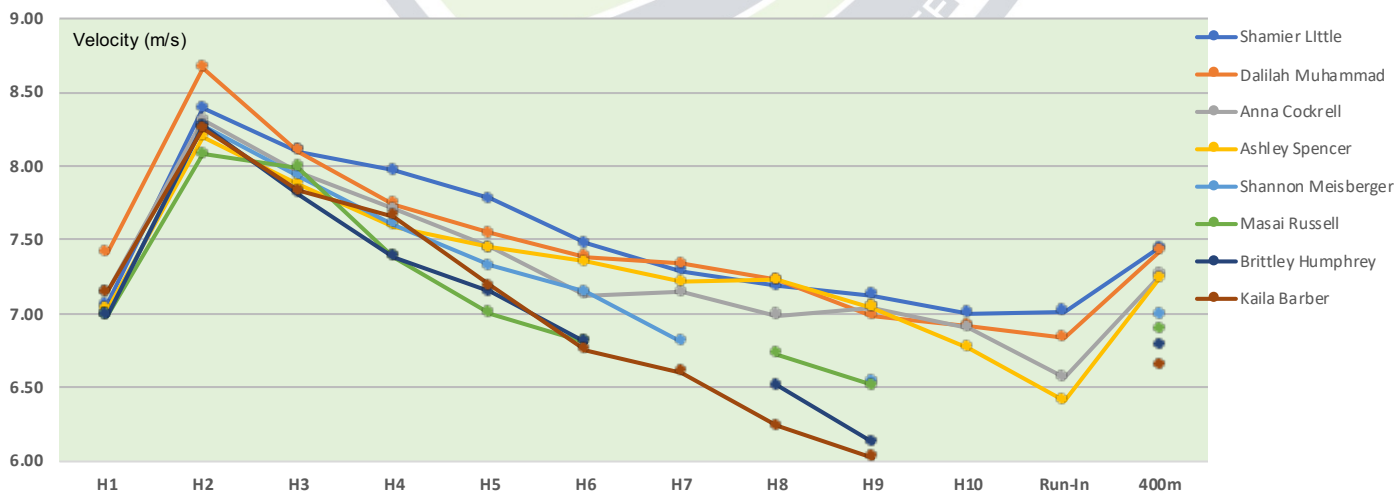
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Women's 400m Hurdles

Date 2021.06.26

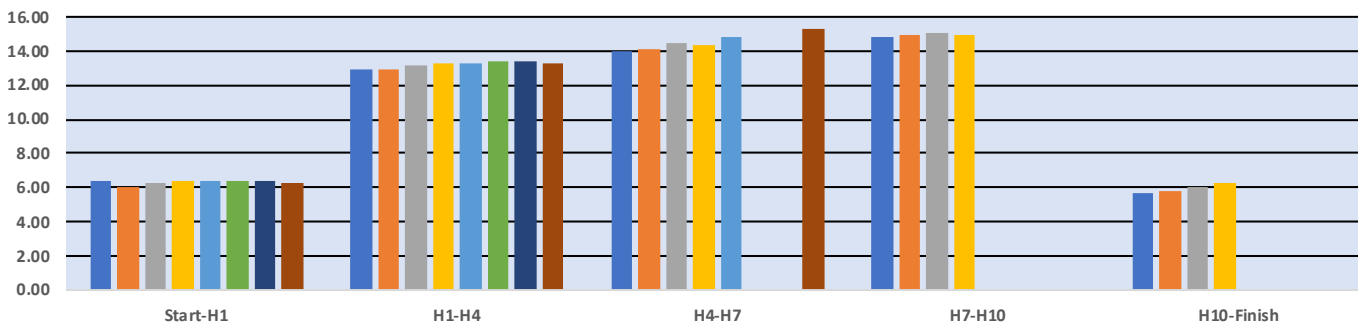
Semi-Final 2

		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 velocity	7.06	8.17	8.10	4.39	4.50	4.68	4.80	4.87	4.91	5.00	5.70			12.88	13.98	14.78
H1 lead leg	R		8.39	8.10	7.78	7.78	7.48	7.29	7.19	7.13	7.00	7.02	7.45		8.15	7.51	7.10
	strides		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 velocity	7.41	8.66	8.10	4.52	4.64	4.74	4.77	4.84	5.01	5.06	5.85			12.88	14.15	14.91
H1 lead leg	R		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
	strides		22	15	15	15	15	15	15	16	16	18.7	177.7				
Cockrell, Anna (USA) (1997)	time	6.30	10.51	14.91	19.45	24.15	29.06	33.96	38.97	43.94	49.01		55.10	8 / 3			
	reaction time	0.177															
	interval velocity	7.14	8.21	4.40	4.54	4.70	4.91	4.90	5.01	4.97	5.07	6.09			13.15	14.51	15.05
H1 lead leg	L		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
	strides		15	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 velocity	7.03	8.27	7.88	7.59	7.45	7.35	7.22	7.23	7.04	6.77	6.41	7.24		13.32	14.31	14.98
H1 lead leg	L		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
	strides		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															
	interval velocity	6.99	8.27	7.94	7.61	7.32	7.14	6.81		6.54			6.99		13.24	14.82	
H1 lead leg	L		8.27	7.94	7.61	7.32	7.14	6.81		6.54		6.99		7.93	7.09		
	strides		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															
	interval velocity	6.99	8.08	7.99	7.38	7.00	6.81		6.72	6.52			6.90		13.45		
H1 lead leg	R		8.08	7.99	7.38	7.00	6.81		6.72	6.52		6.90		7.81			
	strides		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															
	interval velocity	6.99	8.27	7.81	7.38	7.14	6.81		6.52	6.13			6.79		13.45		
H1 lead leg	L		8.27	7.81	7.38	7.14	6.81		6.52	6.13		6.79		7.81			
	strides		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															
	interval velocity	7.14	8.25	7.83	7.66	7.19	6.76	6.60	6.24	6.02			6.65		13.28	15.35	
H1 lead leg	R		8.25	7.83	7.66	7.19	6.76	6.60	6.24	6.02		6.65		7.91	6.84		
	strides		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=SMwV6be7I9A>

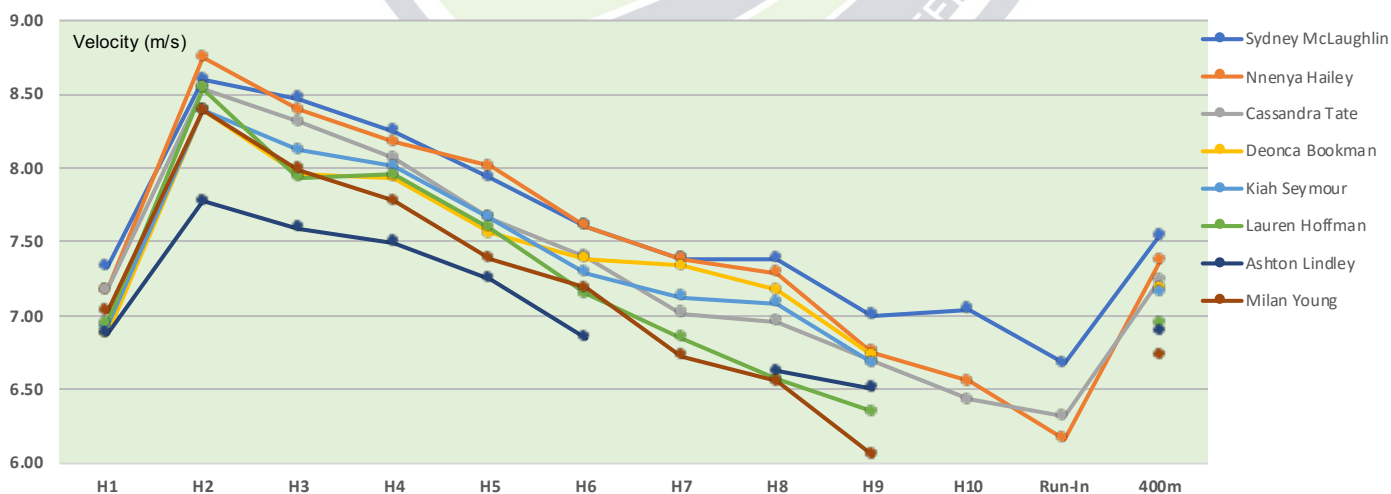
2020 USA Olympic Trials (Eugene, OR) (TV Analysis)

Women's 400m Hurdles

Date 2021.06.26

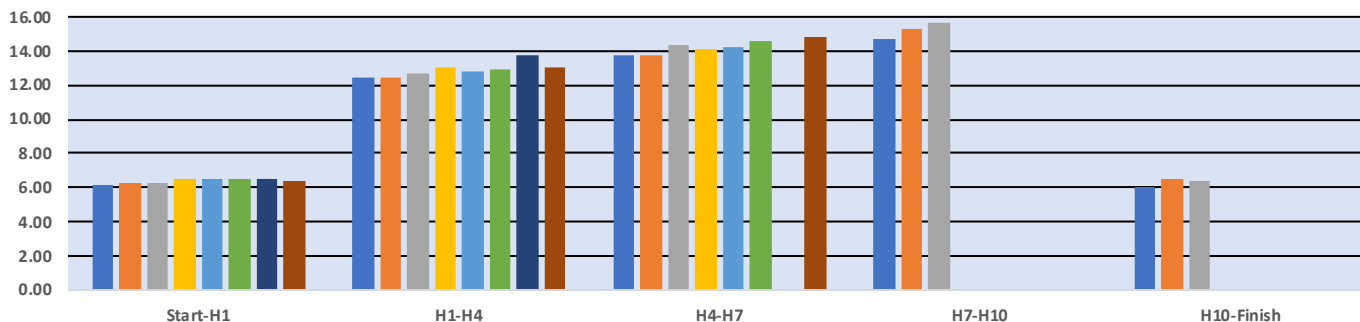
Semi-Final 1

		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 velocity	7.33	8.60	8.47	8.25	7.94	7.61	7.38	7.00	7.04	6.68	7.54			12.44	13.75	14.71
H1 lead leg	R	22	14	14	14	14	15	15	15	16	15	18.2	172.2		8.44	7.64	7.14
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 velocity	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
H1 lead leg	L	16	16	16	15	16	17	17	17	18	18	22.5	172.5		8.43	7.66	6.85
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 velocity	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
H1 lead leg	R	22	14	14	14	15	15	16	15	16	16		157		8.30	7.35	6.69
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 velocity	6.88	8.39	7.95	7.94	7.56	7.38	7.34	7.17	6.73					12.98	14.14	
H1 lead leg	R	17	17	17	17	17	17	17	17	18	18		155		8.09	7.43	
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 velocity	6.92	8.39	8.12	8.01	7.66	7.29	7.13	7.09	6.68					12.85	14.28	
H1 lead leg	R	24	16	16	16	16		17	17	17	18		157		8.17	7.35	
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 velocity	6.96	8.54	7.94	7.95	7.59	7.14	6.85	6.57	6.35					12.91	14.62	
H1 lead leg	L	15	16	16	16	16		17	18	18			116		8.13	7.18	
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 velocity	6.88	7.78	7.59	7.49	7.25	6.85		6.62	6.51					13.78		
H1 lead leg	L	16	16	16	16	16			17				81		7.62		
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 velocity	7.03	8.39	7.99	7.78	7.38	7.19	6.73	6.55	6.06					13.05	14.81	
H1 lead leg	R	22	15	15	15	15		16	16	17			131		8.05	7.09	



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=ZMxvKQ1hg18>

Biomechanical Analysis

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	7.04	6.73	6.60	6.45	6.17	7.21		8.22	7.34
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	7.45	7.14	6.60	6.53	6.38	6.29	7.13		8.08	7.37
H1 lead leg	R																
	strides		14	14	15	15	15	15	16	16	16	19.2	155.2				

Date 2021.06.25

Heat 2

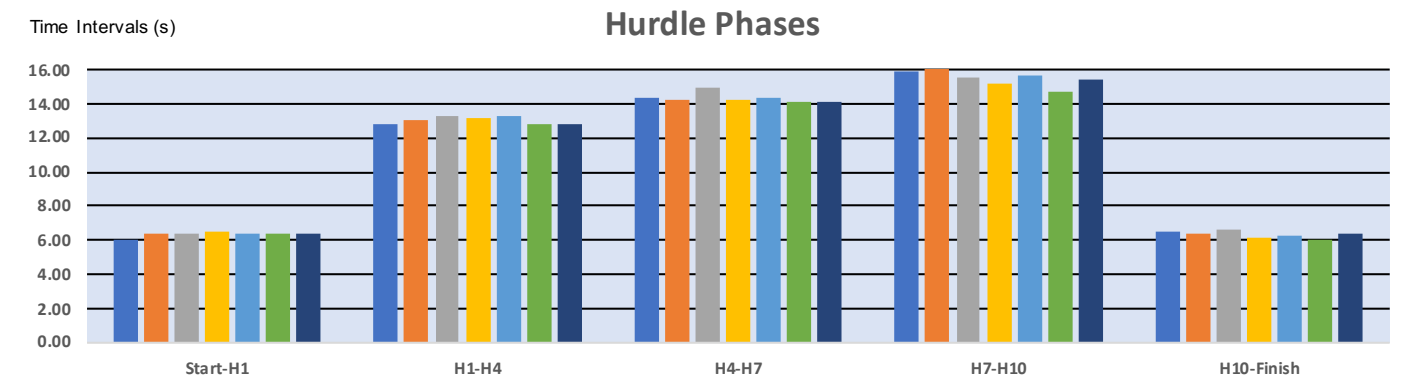
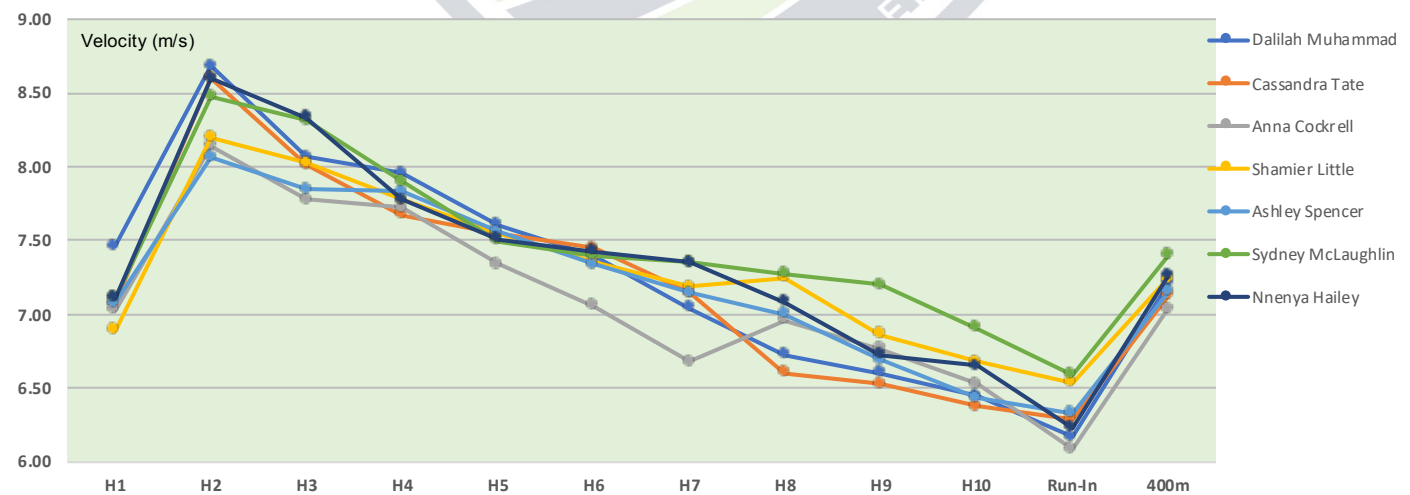
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Little, Shamier (USA) (1995)	time	6.53	10.80	15.16	19.66	24.30	29.06	33.93	38.76	43.86	49.10		55.22	7 / 1			
	reaction time	0.301															
	interval		4.27	4.36	4.50	4.64	4.76	4.87	4.83	5.10	5.24	6.12			13.13	14.27	15.17
	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
H1 lead leg	R																
	strides	23	15	15	15	16	16	16	16	16	16	19	183				

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
H1 lead leg	R																
	strides	22	14	14	15	15	15	15	15	15	16	18.2	174.2				

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
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
H1 lead leg	L																
	strides		16	16	17	17	17	17	17	18	18	22.2	175.2				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=0hAEK8AeHsk&t=95s>

Biomechanical Analysis

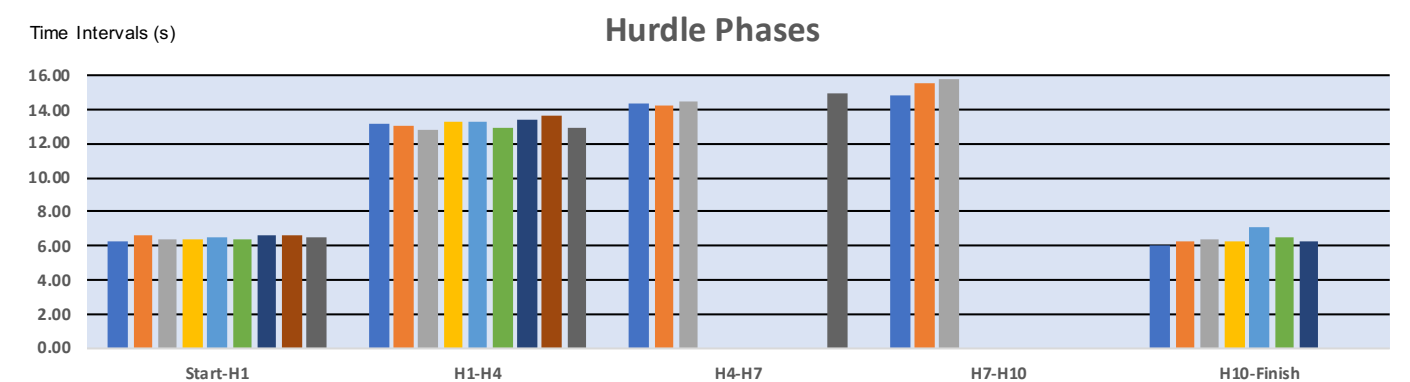
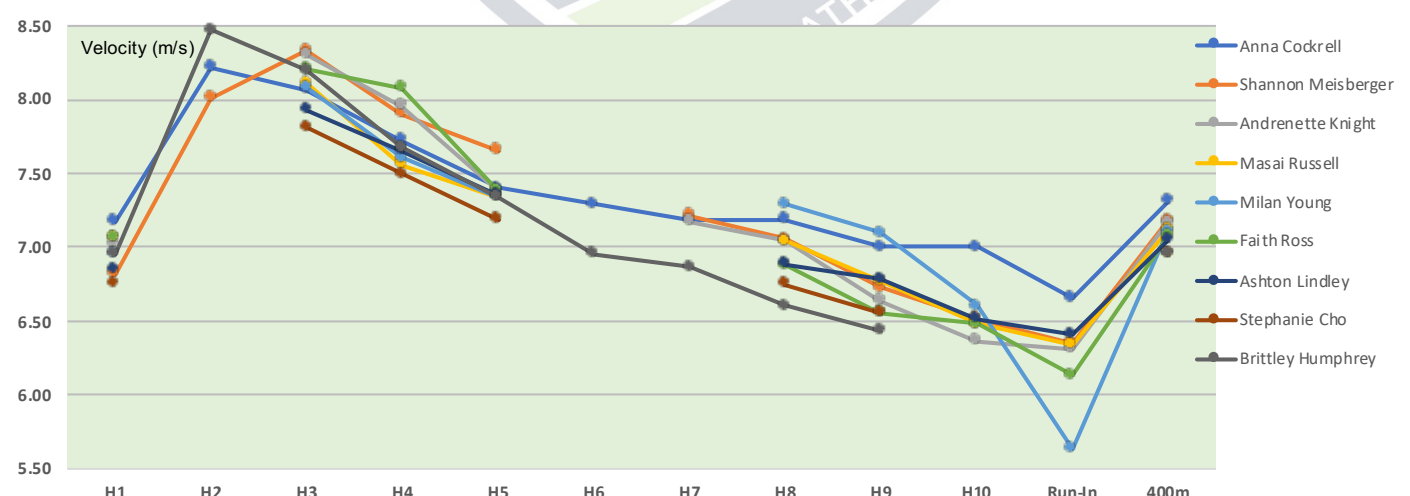
2021 NCAA Championships (Eugene, OR) (TV Analysis)

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 velocity	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
	H1 lead leg	L	strides	22	15	15	15	15	15	15	16	16	19.7	178.7		8.00	7.29
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 velocity	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
	H1 lead leg	R	strides	23	15	15	15	16	7.22	7.06	6.73	6.52	6.35	7.18		8.08	7.36
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 velocity			8.43	4.40	4.74		9.76	4.97	5.27	5.50	6.34			12.83	14.50	15.74
	H1 lead leg	R	strides	23	15	16		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 velocity			8.63	4.63	4.77		14.90	5.17	5.40	6.31	PB			13.26		
	H1 lead leg	R	strides	24	15	16		7.05	6.77	6.48	6.34	7.12	109		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 velocity			8.66	4.60	4.77		14.40	4.93	5.30	7.10	PB			13.26		
	H1 lead leg	R	strides	23	15	15		7.29	7.10	6.60	5.63	7.11	105.5		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 velocity			8.53	4.33	4.74		15.26	5.34	5.40	6.52	PB			12.86		
	H1 lead leg	L	strides	24	15	15		6.88	6.55	6.48	6.13	7.08	109.2		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 velocity			8.83	4.67	4.76		15.24	5.16	5.37	6.24	PB			13.40		
	H1 lead leg	L	strides	23	16	16		6.89	6.78	6.52	6.41	7.05	89		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 velocity			8.96	4.67	4.87		15.56	5.34			PB			13.63		
	H1 lead leg	R	strides	22	15	15		6.75	6.55	6.48	6.13	7.08	68		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 velocity		4.13	4.27	4.56	4.77	5.03	5.10	5.30	5.44					12.96	14.90	
	H1 lead leg	L	strides	23	15	15	15	16	16	16	16	16	147		8.10	7.05	



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 24fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=9ImRZ3Vlomg>

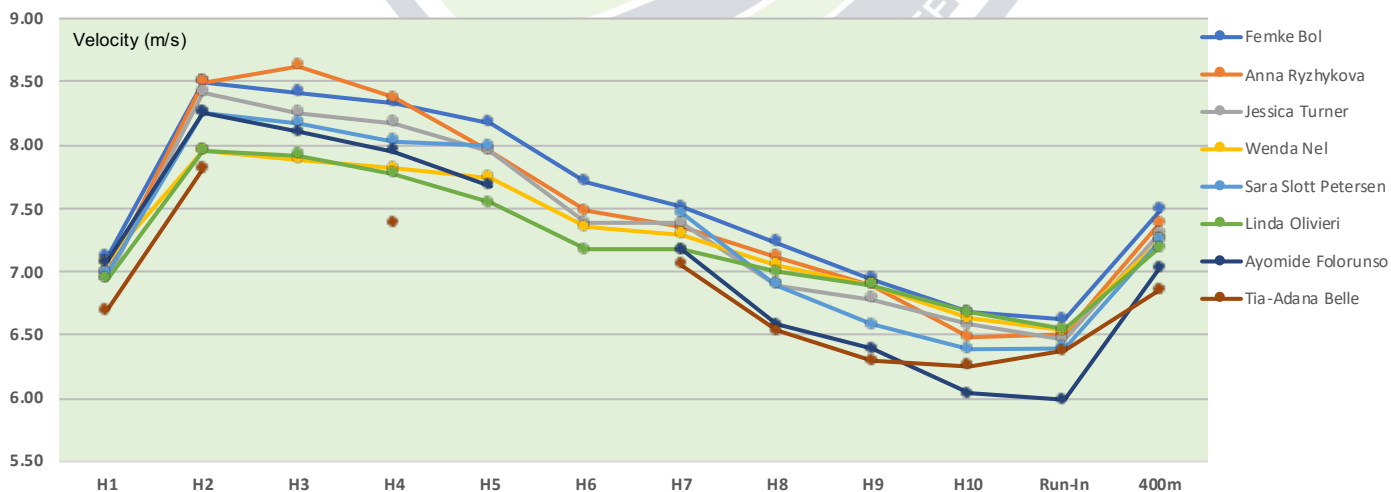
2021 Golden Gala Pietro Mennea (Florence, ITA) (TV Analysis)

Women's 400m Hurdles

Date 2021.06.10

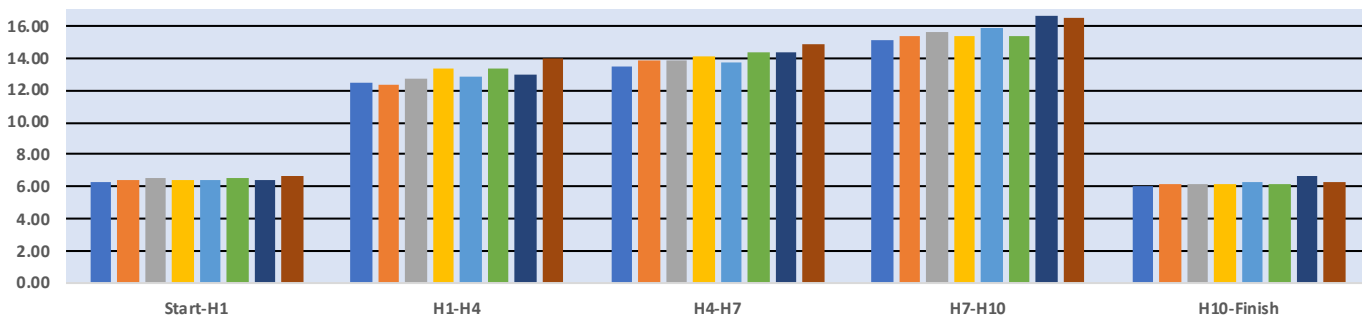
FINAL

		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
H1 lead leg	L																
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
H1 lead leg	R																
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	7.30		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
H1 lead leg	L																
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	4.96	5.08	5.28	6.12	7.25		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
H1 lead leg	L																
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	7.25		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
H1 lead leg	R																
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	7.19		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
H1 lead leg	R																
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	7.03		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
H1 lead leg	L																
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	6.85		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																



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												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												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	16	16	16	19.2	180.2				

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

Date 2018.05.13

FINAL

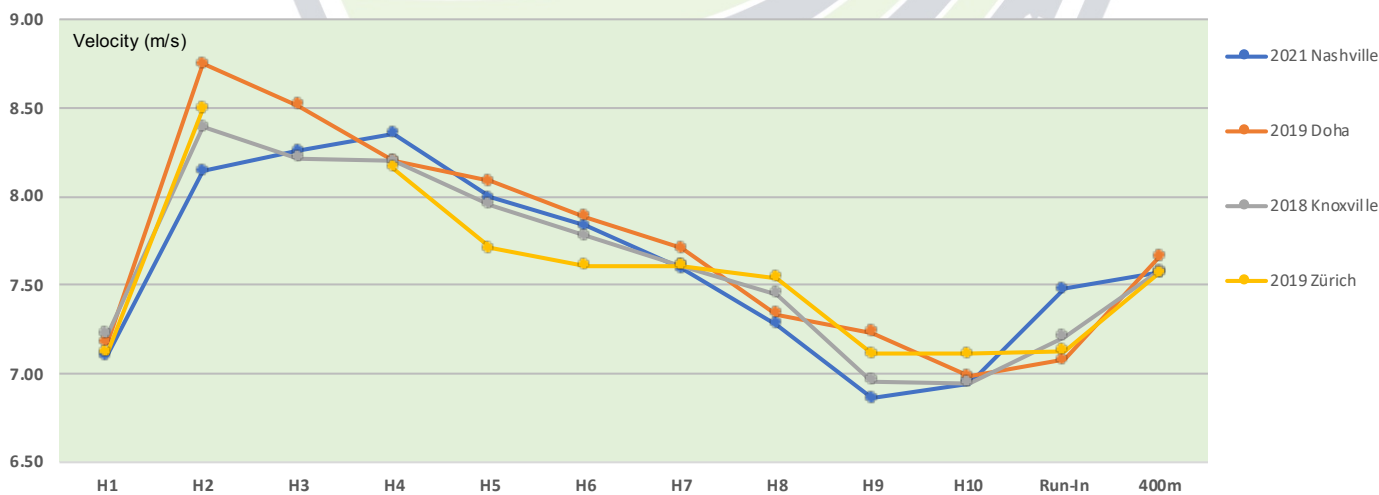
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin, Sydney (USA) (1999)	time	6.23	10.40	14.66	18.93	23.33	27.83	32.43	37.13	42.16	47.20		52.75	5 / 1			
	reaction time		interval												12.70	13.50	14.77
	velocity	7.22	8.39	8.22	8.20	7.95	7.78	7.61	7.45	6.96	6.94	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

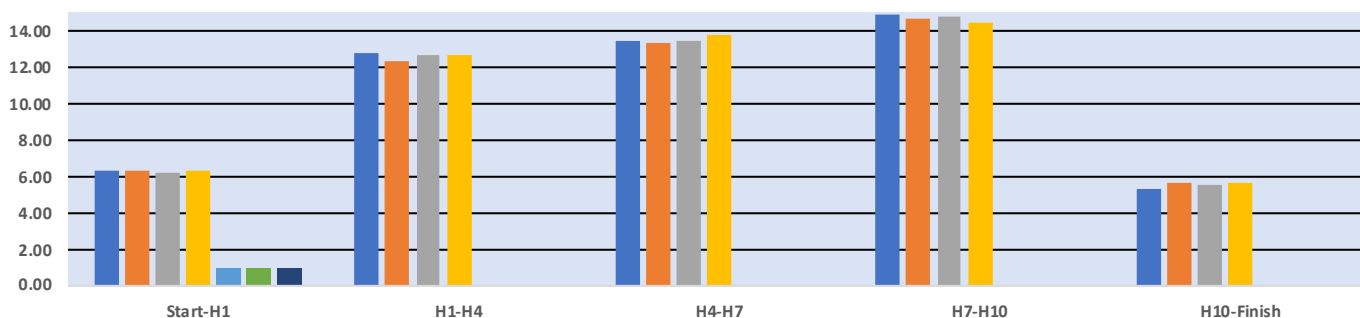
FINAL

		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												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