

# 2023 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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**2025.01.20**



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Todd Henson

# 2023 Season Hurdles Report

## Men's 110m Hurdles

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# 2023 Season Hurdles Report

## 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  $\pm 0.12$  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  $\pm 0.03$  second
- For Diamond League meetings, I have included the Diamond League race analysis data provided by Omega Timing. This is done with a timing chip on the back of the athletes bib number, and it set to the actual distance of the hurdle not the touchdown distance of the athlete. Does the time start on the gun or when the athlete passes the 0.0m mark? This is a question I am still hoping to find an answer to.
- 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

## 2023 Top 10 Times - Men's 110m Hurdles

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Tinch, Cordell (USA) (2000)</b>																	
FINAL - 2023 NCAA Division II National Championships (Pueblo, CO) (Altitude) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report				
date	27-May	time	2.50	3.50	4.50	5.48	6.46	7.44	8.41	9.43	10.43	11.46	12.87	5 / 1			
reaction time	interval	7 steps	1.00	1.00	0.98	0.98	0.98	0.97	1.02	1.00	1.03	1.41			2.98	2.93	3.05
wind	6.0 m/s	velocity	5.49	9.14	9.14	9.33	9.33	9.33	9.42	8.96	9.14	8.87	9.94	8.55	9.20	9.36	8.99
<b>Parchment, Hansle (JAM) (1990)</b>																	
FINAL - 2023 Prefontaine Classic (Eugene, OR)													Omega Timing - diamond league race analysis				
date	17-Sep	time	2.47	3.50	4.48	5.47	6.45	7.42	8.40	9.40	10.40	11.41	12.93	5 / 1			
reaction time	0.168	interval	7 steps	1.03	0.98	0.99	0.98	0.97	0.98	1.00	1.00	1.01	1.52	PB	3.00	2.93	3.01
wind	0.9 m/s	velocity	5.55	8.87	9.33	9.23	9.33	9.42	9.33	9.14	9.14	9.05	9.22	8.51	9.14	9.36	9.11
<b>Broadbell, Rasheed (JAM) (2000)</b>																	
FINAL - 2023 Jamaican National Championships (Kingston, JAM) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report				
date	9-Jul	time	2.40	3.55	4.55	5.53	6.53	7.53	8.50	9.50	10.48	11.48	12.94	3 / 1			
reaction time	interval	7 steps	1.05	1.00	0.98	1.00	1.00	0.97	1.00	0.98	1.00	1.46	PB		3.03	2.97	2.98
wind	0.7 m/s	velocity	5.49	8.70	9.14	9.33	9.14	9.14	9.42	9.14	9.33	9.14	9.60	8.50	9.05	9.23	9.20
<b>Tinch, Cordell (USA) (2000)</b>																	
FINAL - 2023 Trackwired Arkansas Grand Prix (Fayetteville, AR) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report				
date	23-Jun	time	2.46	3.50	4.50	5.50	6.48	7.46	8.43	9.47	10.47	11.49	12.96	5 / 1			
reaction time	interval	7 steps	1.04	1.00	1.00	0.98	0.98	0.97	1.04	1.00	1.02	1.47	PB		3.04	2.93	3.06
wind	1.3 m/s	velocity	5.58	8.79	9.14	9.14	9.33	9.33	9.42	8.79	9.14	8.96	9.54	8.49	9.02	9.36	8.96
<b>Holloway, Grant (USA) (1997)</b>																	
FINAL - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report				
date	21-Aug	time	2.44	3.44	4.40	5.36	6.36	7.36	8.36	9.38	10.42	11.52	12.96	5 / 1			
reaction time	0.135	interval	7 steps	1.00	0.96	0.96	1.00	1.00	1.00	1.02	1.04	1.10	1.44		2.92	3.00	3.16
wind	0.0 m/s	velocity	5.62	9.14	9.52	9.52	9.14	9.14	9.14	8.96	8.79	8.31	9.74	8.49	9.39	9.14	8.68
<b>Parchment, Hansle (JAM) (1990)</b>																	
FINAL - 2023 Xiamen Diamond League (Xiamen, CHN)													Omega Timing - diamond league race analysis				
date	2-Sep	time	2.40	3.40	4.40	5.40	6.40	7.40	8.40	9.40	10.40	11.40	12.96	5 / 1			
reaction time	0.163	interval	7 steps	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.56		3.00	3.00	3.00
wind	0.0 m/s	velocity	5.72	9.14	9.14	9.14	9.14	9.14	9.14	9.14	9.14	9.14	8.99	8.49	9.14	9.14	9.14
<b>Tinch, Cordell (USA) (2000)</b>																	
FINAL - 2023 MIAA Championships (Jefferson City, MO) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report				
date	7-May	time	2.40	3.40	4.40	5.37	6.34	7.31	8.34	9.34	10.36	11.40	12.97	4 / 1			
reaction time	interval	7 steps	1.00	1.00	0.97	0.97	0.97	1.03	1.00	1.02	1.04	1.57			2.97	2.97	3.06
wind	3.0 m/s	velocity	5.72	9.14	9.14	9.42	9.42	9.42	8.87	9.14	8.96	8.79	8.93	8.48	9.23	9.23	8.96
<b>Holloway, Grant (USA) (1997)</b>																	
FINAL - 2023 Meeting de Paris (Paris, FRA)													Omega Timing - diamond league race analysis				
date	9-Jun	time	2.30	3.30	4.28	5.25	6.24	7.23	8.24	9.26	10.30	11.36	12.98	6 / 1			
reaction time	0.157	interval	7 steps	1.00	0.98	0.97	0.99	0.99	1.01	1.02	1.04	1.06	1.62		2.95	2.99	3.12
wind	-0.5 m/s	velocity	5.97	9.14	9.33	9.42	9.23	9.23	9.05	8.96	8.79	8.62	8.65	8.47	9.29	9.17	8.79
<b>Britt, Jamal (USA) (1998)</b>																	
FINAL - 2023 USATF Bermuda Grand Prix (Devonshire, BER) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report				
date	25-Jun	time	2.50	3.52	4.53	5.53	6.52	7.52	8.53	9.55	10.60	11.65	12.99	6 / 1			
reaction time	0.124	interval	7 steps	1.02	1.01	1.00	0.99	1.00	1.01	1.02	1.05	1.05	1.34		3.03	3.00	3.12
wind	4.0 m/s	velocity	5.49	8.96	9.05	9.14	9.23	9.14	9.05	8.96	8.70	8.70	10.46	8.47	9.05	9.14	8.79
<b>Holloway, Grant (USA) (1997)</b>																	
FINAL - 2023 Adidas Atlanta City Games (Atlanta, GA) (street) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report				
date	5-May	time	2.40	3.48	4.48	5.48	6.45	7.45	8.47	9.50	10.53	11.60	13.01	3 / 1			
reaction time	0.181	interval	7 steps	0.98	1.00	1.00	0.97	1.00	1.02	1.03	1.03	1.07	1.41		2.98	2.99	3.13
wind	0.0 m/s	velocity	5.49	9.33	9.14	9.14	9.42	9.14	8.96	8.87	8.87	8.54	9.94	8.46	9.20	9.17	8.76
<b>Roberts, Daniel (USA) (1998)</b>																	
FINAL - 2023 USATF New York City Grand Prix (Randalls Island, NY) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report				
date	24-Jun	time	2.47	3.50	4.50	5.50	6.54	7.54	8.56	9.58	10.60	11.61	13.01	3 / 1			
reaction time	0.159	interval	1.03	1.00	1.00	1.04	1.00	1.02	1.02	1.02	1.01	1.40			3.03	3.06	3.05
wind	1.6 m/s	velocity	5.55	8.87	9.14	9.14	8.79	9.14	8.96	8.96	8.96	9.05	10.01	8.46	9.05	8.96	8.99
<b>Holloway, Grant (USA) (1997)</b>																	
FINAL - 2023 London Athletics Meet (London, GBR)													Omega Timing - diamond league race analysis				
date	23-Jul	time	2.36	3.35	4.33	5.30	6.29	7.28	8.29	9.32	10.37	11.43	13.01	5 / 1			
reaction time	0.165	interval	7 steps	0.99	0.98	0.97	0.99	0.99	1.01	1.03	1.05	1.06	1.58		2.94	2.99	3.14
wind	1.3 m/s	velocity	5.81	9.23	9.33	9.42	9.23	9.23	9.05	8.87	8.70	8.62	8.87	8.46	9.33	9.17	8.73
<b>Zhoya, Sasha (FRA) (2002)</b>																	
Heat 2 - 2023 French National Championships (Albi, FRA) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report				
date	29-Jul	time	2.52	3.56	4.58	5.56	6.52	7.52	8.52	9.52	10.54	11.58	13.01	6 / 1			
reaction time	0.173	interval	7 steps	1.04	1.02	0.98	0.96	1.00	1.00	1.00	1.02	1.04	1.43		3.04	2.96	3.06
wind	5.3 m/s	velocity	5.44	8.79	8.96	9.33	9.52	9.14	9.14	9.14	8.96	8.79	9.80	8.46	9.02	9.26	8.96
<b>Zhoya, Sasha (FRA) (2002)</b>																	
FINAL - 2023 French National Championships (Albi, FRA) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report				
date	29-Jul	time	2.50	3.54	4.54	5.52	6.50	7.50	8.52	9.52	10.54	11.58	13.01	6 / 1			
reaction time	0.187	interval	7 steps	1.04	1.00	0.98	0.98	1.00	1.02	1.00	1.02	1.04	1.43		3.02	3.00	3.06
wind	2.3 m/s	velocity	5.49	8.79	9.14	9.33	9.33	9.14	8.96	9.14	8.96	8.79	9.80	8.46	9.08	9.14	8.96
<b>Holloway, Grant (USA) (1997)</b>																	
Semi-Final 2 - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report				
date	21-Aug	time	2.44	3.44	4.42	5.40	6.38	7.38	8.40	9.42	10.46	11.53	13.02	5 / 1			
reaction time	0.137	interval	7 steps	1.00	0.98	0.98	0.98	1.00	1.02	1.02	1.04	1.07	1.49		2.96	3.00	3.13
wind	-0.2 m/s	velocity	5.62	9.14	9.33	9.33	9.33	9.14	8.96	8.96	8.79	8.54	9.41	8.45	9.26	9.14	8.76

2023 Prefontaine Classic (Eugene, OR)

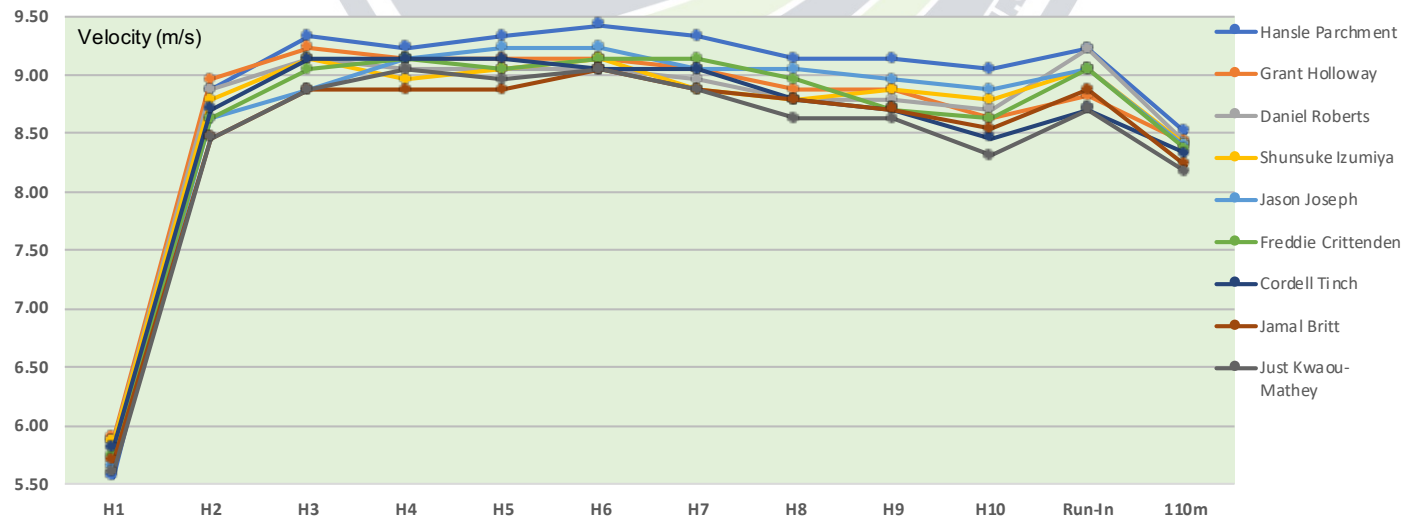
110m Hurdles

Date: 2023.09.17

Wind: 0.9 m/s

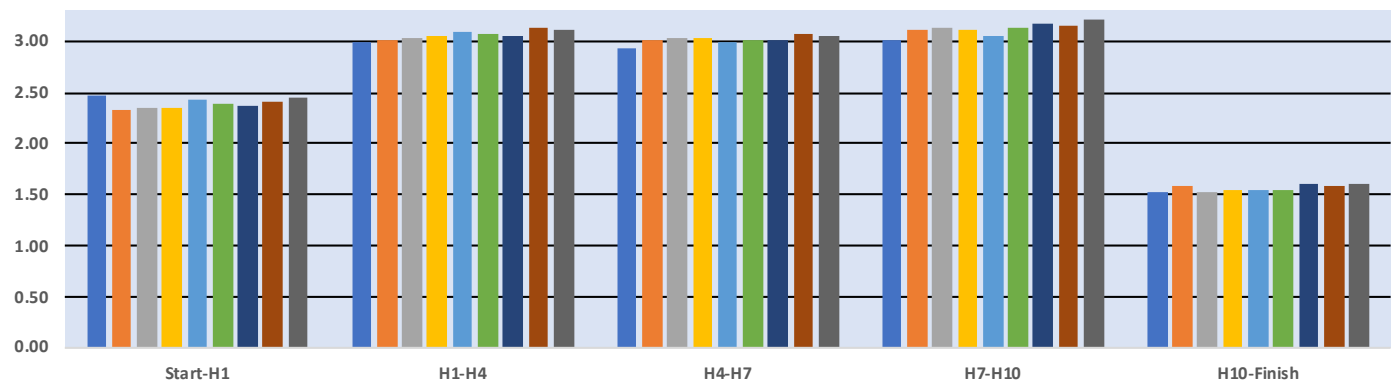
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Parchment, Hansle (JAM) (1990)	time	2.47	3.50	4.48	5.47	6.45	7.42	8.40	9.40	10.40	11.41	12.93		5 / 1			
	reaction time	0.168													3.00	2.93	3.01
	interval	7 steps	1.03	0.98	0.99	0.98	0.97	0.98	1.00	1.00	1.01	1.52	PB		9.14	9.36	9.11
Holloway, Grant (USA) (1997)	time	2.33	3.35	4.34	5.34	6.34	7.34	8.35	9.38	10.41	11.47	13.06		6 / 2			
	reaction time	0.153													3.01	3.01	3.12
	interval	7 steps	1.02	0.99	1.00	1.00	1.00	1.01	1.03	1.03	1.06	1.59			9.11	9.11	8.79
Roberts, Daniel (USA) (1998)	time	2.34	3.37	4.37	5.38	6.39	7.40	8.42	9.46	10.50	11.55	13.07		3 / 3			
	reaction time	0.149													3.04	3.04	3.13
	interval	7 steps	1.03	1.00	1.01	1.01	1.01	1.02	1.04	1.04	1.05	1.52			9.02	9.02	8.76
Izumiya, Shunsuke (JPN) (2000)	time	2.34	3.38	4.38	5.40	6.41	7.41	8.44	9.48	10.51	11.55	13.10		7 / 4			
	reaction time	0.136													3.06	3.04	3.11
	interval	7 steps	1.04	1.00	1.02	1.01	1.00	1.03	1.04	1.03	1.04	1.55			8.96	9.02	8.82
Joseph, Jason (SUI) (1998)	time	2.43	3.49	4.52	5.52	6.51	7.50	8.51	9.52	10.54	11.57	13.12		8 / 5			
	reaction time	0.156													3.09	2.99	3.06
	interval	7 steps	1.06	1.03	1.00	0.99	0.99	1.01	1.01	1.02	1.03	1.55			8.87	9.17	8.96
Crittenden, Freddie (USA) (1994)	time	2.39	3.45	4.46	5.46	6.47	7.47	8.47	9.49	10.54	11.60	13.15		4 / 6			
	reaction time	0.146													3.07	3.01	3.13
	interval	7 steps	1.06	1.01	1.00	1.01	1.00	1.00	1.02	1.05	1.06	1.55			8.93	9.11	8.76
Tinch, Cordell (USA) (2000)	time	2.36	3.41	4.41	5.41	6.41	7.42	8.43	9.47	10.52	11.60	13.21		2 / 7			
	reaction time	0.148													3.05	3.02	3.17
	interval	7 steps	1.05	1.00	1.00	1.00	1.01	1.01	1.04	1.05	1.08	1.61			8.99	9.08	8.65
Britt, Jamal (USA) (1998)	time	2.41	3.49	4.52	5.55	6.58	7.59	8.62	9.66	10.71	11.78	13.36		9 / 8			
	reaction time	0.140													3.14	3.07	3.16
	interval	7 steps	1.08	1.03	1.03	1.03	1.01	1.03	1.04	1.05	1.07	1.58			8.73	8.93	8.68
Kwaou-Mathey, Just (FRA) (1999)	time	2.45	3.53	4.56	5.57	6.59	7.60	8.63	9.69	10.75	11.85	13.46		1 / 9			
	reaction time	0.159													3.12	3.06	3.22
	interval	7 steps	1.08	1.03	1.01	1.02	1.01	1.03	1.06	1.10	1.10	1.61			8.79	8.96	8.52
velocity		5.60	8.46	8.87	9.05	8.96	9.05	8.87	8.62	8.62	8.31	8.71	8.17				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 17 Sep 2023 13:57) - diamond league race analysis  
<https://www.omegatiming.com/File/000203100102100101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=xZ-6pB0DqXs>

2023 Xiamen Diamond League (Xiamen, CHN)

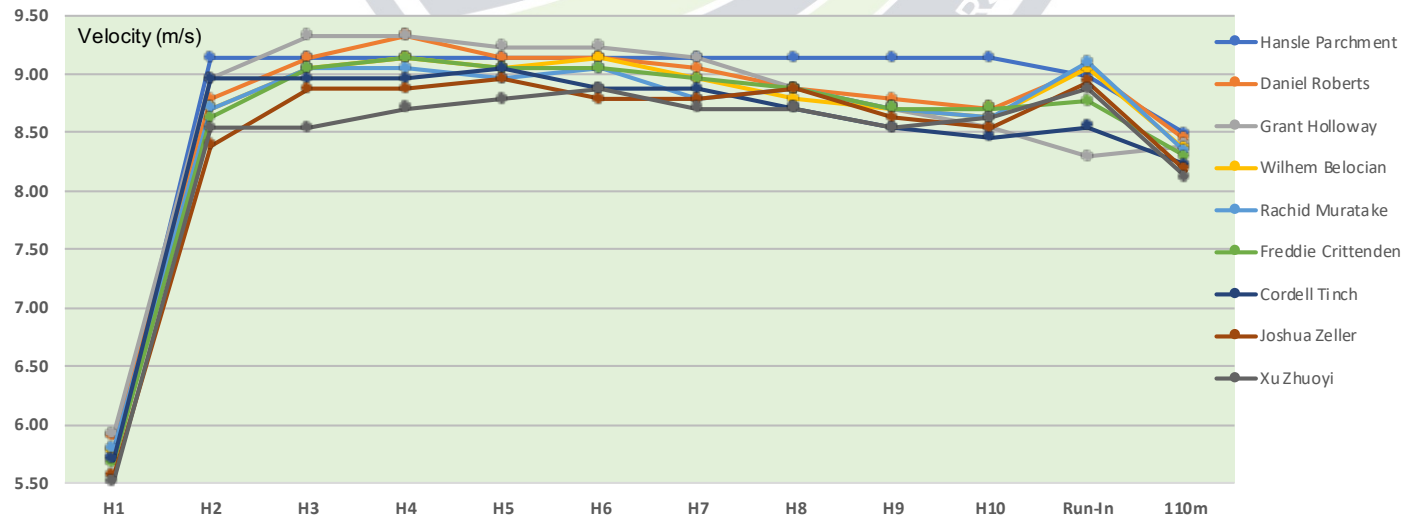
110m Hurdles

Date: 2023.09.02

Wind: 0.0 m/s

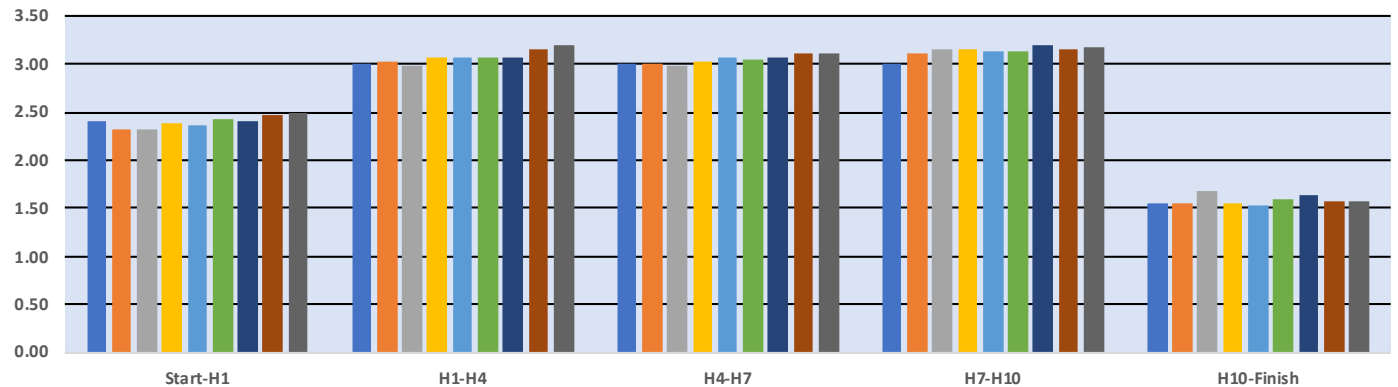
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Parchment, Hansle (JAM) (1990)</b>	time	2.40	3.40	4.40	5.40	6.40	7.40	8.40	9.40	10.40	11.40	12.96	13.03	5 / 1	3.00	3.00	3.00
	reaction time	0.163													9.14	9.14	9.14
	interval	7 steps	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.56					
<b>Roberts, Daniel (USA) (1998)</b>	time	2.33	3.37	4.37	5.35	6.35	7.35	8.36	9.39	10.43	11.48	13.03	13.03	4 / 2	3.02	3.01	3.12
	reaction time	0.140													9.08	9.11	8.79
	interval	5.89	8.79	9.14	9.33	9.14	9.14	9.05	8.87	8.79	8.70	9.05	8.44				
<b>Holloway, Grant (USA) (1997)</b>	time	2.32	3.34	4.32	5.30	6.29	7.28	8.28	9.31	10.36	11.43	13.12	13.12	6 / 3	2.98	2.98	3.15
	reaction time	0.141													9.20	9.20	8.70
	interval	7 steps	1.02	0.98	0.98	0.99	0.99	1.00	1.03	1.05	1.07	1.69					
<b>Belocian, Wilhem (FRA) (1995)</b>	time	2.38	3.43	4.44	5.44	6.45	7.45	8.47	9.51	10.56	11.62	13.17	13.17	3 / 4	3.06	3.03	3.15
	reaction time	0.130													8.96	9.05	8.70
	interval	5.76	8.70	9.05	9.14	9.05	9.14	8.96	8.79	8.70	8.62	9.05	8.35				
<b>Muratake, Rachid (JPN) (2002)</b>	time	2.37	3.42	4.43	5.44	6.46	7.47	8.51	9.54	10.59	11.65	13.19	13.19	2 / 5	3.07	3.07	3.14
	reaction time	0.153													8.93	8.93	8.73
	interval	7 steps	1.05	1.01	1.01	1.02	1.01	1.04	1.03	1.05	1.06	1.54					
<b>Crittenden, Freddie (USA) (1994)</b>	time	2.42	3.48	4.49	5.49	6.50	7.51	8.53	9.56	10.61	11.66	13.26	13.26	7 / 6	3.07	3.04	3.13
	reaction time	0.148													8.93	9.02	8.76
	interval	5.67	8.62	9.05	9.14	9.05	9.05	8.96	8.87	8.70	8.70	8.76	8.30				
<b>Tinch, Cordell (USA) (2000)</b>	time	2.41	3.43	4.45	5.47	6.48	7.51	8.54	9.59	10.66	11.74	13.38	13.38	8 / 7	3.06	3.07	3.20
	reaction time	0.170													8.96	8.93	8.57
	interval	7 steps	1.02	1.02	1.02	1.01	1.03	1.03	1.05	1.07	1.08	1.64					
<b>Pereira, Rafael (BRA) (1997)</b>	0.130	no information available											13.42	10 / 8			
<b>Zeller, Joshua (GBR) (2000)</b>	time	2.47	3.56	4.59	5.62	6.64	7.68	8.72	9.75	10.81	11.88	13.45	13.45	1 / 9	3.15	3.10	3.16
	reaction time	0.147													8.70	8.85	8.68
	interval	5.55	8.39	8.87	8.87	8.96	8.79	8.79	8.87	8.62	8.54	8.93	8.18				
<b>Xu Zhuoyi (CHN) (2003)</b>	time	2.49	3.56	4.63	5.68	6.72	7.75	8.80	9.85	10.92	11.98	13.56	13.56	9 / 10	3.19	3.12	3.18
	reaction time	0.166													8.60	8.79	8.62
	interval	7 steps	1.07	1.07	1.05	1.04	1.03	1.05	1.05	1.07	1.06	1.58					



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sat 2 Sep 2023 21:02) - diamond league race analysis  
<https://www.omegatiming.com/File/0002031101020C0101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=4K6le2LRwPI>



2023 Weltklasse (Zürich, SUI)

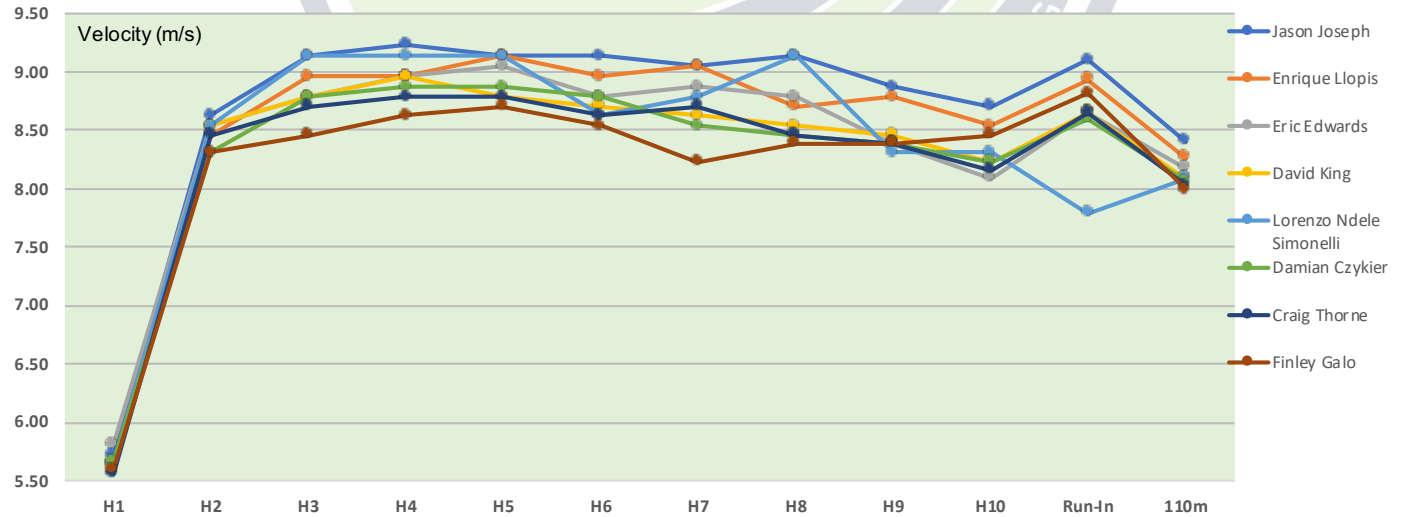
110m Hurdles

Date: 2023.08.31

Wind: -0.1 m/s

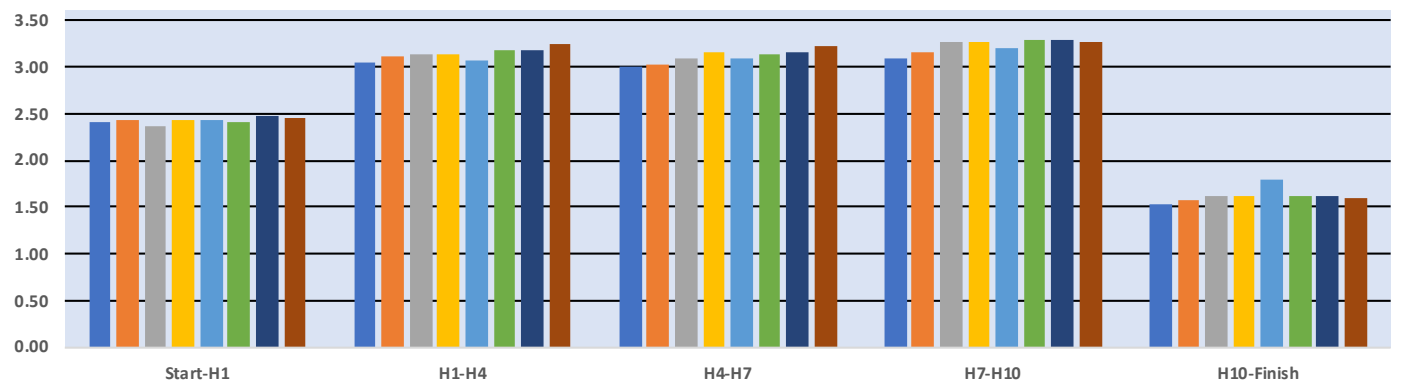
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Joseph, Jason (SUI) (1998)	time	2.40	3.46	4.46	5.45	6.45	7.45	8.46	9.46	10.49	11.54	13.08	13.08	5 / 1			
	reaction time	0.137															
	interval	7 steps	1.06	1.00	0.99	1.00	1.00	1.01	1.00	1.03	1.05	1.54	NR PB		3.05	3.01	3.08
	velocity	5.72	8.62	9.14	9.23	9.14	9.14	9.05	9.14	8.87	8.70	9.10	8.41		8.99	9.11	8.90
Llopis, Enrique (ESP) (2000)	time	2.43	3.51	4.53	5.55	6.55	7.57	8.58	9.63	10.67	11.74	13.31	13.31	3 / 2			
	reaction time	0.117															
	interval	7 steps	1.08	1.02	1.02	1.00	1.02	1.01	1.05	1.04	1.07	1.57			3.12	3.03	3.16
	velocity	5.65	8.46	8.96	8.96	9.14	8.96	9.05	8.70	8.79	8.54	8.93	8.26		8.79	9.05	8.68
Edwards, Eric (USA) (2000)	time	2.36	3.43	4.47	5.49	6.50	7.54	8.57	9.61	10.70	11.83	13.45	13.45	6 / 3			
	reaction time	0.125															
	interval		1.07	1.04	1.02	1.01	1.04	1.03	1.04	1.09	1.13	1.62			3.13	3.08	3.26
	velocity	5.81	8.54	8.79	8.96	9.05	8.79	8.87	8.79	8.39	8.09	8.65	8.18		8.76	8.90	8.41
King, David (GBR) (1994)	time	2.44	3.51	4.55	5.57	6.61	7.66	8.72	9.79	10.87	11.98	13.60	13.60	8 / 4			
	reaction time	0.122															
	interval	7 steps	1.07	1.04	1.02	1.04	1.05	1.06	1.07	1.08	1.11	1.62			3.13	3.15	3.26
	velocity	5.62	8.54	8.79	8.96	8.79	8.70	8.62	8.54	8.46	8.23	8.65	8.09		8.76	8.70	8.41
Simonelli, Lorenzo Ndele (ITA) (1994)	time	2.43	3.50	4.50	5.50	6.50	7.56	8.60	9.60	10.70	11.80	13.60	13.60	4 / 5			
	reaction time	0.142															
	interval	7 steps	1.07	1.00	1.00	1.00	1.06	1.04	1.00	1.10	1.10	1.80			3.07	3.10	3.20
	velocity	5.65	8.54	9.14	9.14	9.14	8.62	8.79	9.14	8.31	8.31	7.79	8.09		8.93	8.85	8.57
Czykier, Damian (POL) (1992)	time	2.42	3.52	4.56	5.59	6.62	7.66	8.73	9.81	10.90	12.01	13.64	13.64	7 / 6			
	reaction time	0.144															
	interval	7 steps	1.10	1.04	1.03	1.03	1.04	1.07	1.08	1.09	1.11	1.63			3.17	3.14	3.28
	velocity	5.67	8.31	8.79	8.87	8.87	8.79	8.54	8.46	8.39	8.23	8.60	8.06		8.65	8.73	8.36
Thorne, Craig (CAN) (2001)	time	2.47	3.55	4.60	5.64	6.68	7.74	8.79	9.87	10.96	12.08	13.70	13.70	2 / 7			
	reaction time	0.148															
	interval		1.08	1.05	1.04	1.04	1.06	1.05	1.08	1.09	1.12	1.62			3.17	3.15	3.29
	velocity	5.55	8.46	8.70	8.79	8.79	8.62	8.70	8.46	8.39	8.16	8.65	8.03		8.65	8.70	8.33
Gaio, Finley (SUI) (1999)	time	2.45	3.55	4.63	5.69	6.74	7.81	8.92	10.01	11.10	12.18	13.77	13.77	9 / 8			
	reaction time	0.154															
	interval	7 steps	1.10	1.08	1.06	1.05	1.07	1.11	1.09	1.09	1.08	1.59			3.24	3.23	3.26
	velocity	5.60	8.31	8.46	8.62	8.70	8.54	8.23	8.39	8.39	8.46	8.82	7.99		8.46	8.49	8.41



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 31 Aug 2023 20:01) - diamond league race analysis

<https://www.omegatiming.com/File/0002030D0102060101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=9wPn3xcHodI>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Decathlon - 110m Hurdles

Date: 2023.08.26 Wind: 0.2 m/s

Heat 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Warner, Damian (CAN) (1989)	time	2.62	3.68	4.76	5.82	6.85	7.90	8.98	10.03	11.10	12.25		13.67	4 / 1			
	reaction time	0.151													3.20	3.16	3.27
	interval	7 steps	1.06	1.08	1.06	1.03	1.05	1.08	1.05	1.07	1.15	1.42			8.57	8.68	8.39
	velocity	5.24	8.62	8.46	8.62	8.87	8.70	8.46	8.70	8.54	7.95	9.87	8.05				
LePage, Pierce (CAN) (1996)	time	2.65	3.76	4.82	5.90	6.98	8.02	9.08	10.16	11.25	12.36		13.77	3 / 2			
	reaction time	0.183													3.25	3.18	3.28
	interval	7 steps	1.11	1.06	1.08	1.08	1.04	1.06	1.08	1.09	1.11	1.41			8.44	8.62	8.36
	velocity	5.18	8.23	8.62	8.46	8.46	8.79	8.62	8.46	8.39	8.23	9.94	7.99				
Garland, Kyle (USA) (2000)	time	2.62	3.68	4.78	5.86	6.96	8.03	9.10	10.22	11.28	12.42		13.93	5 / 3			
	reaction time	0.137													3.24	3.24	3.32
	interval	7 steps	1.06	1.10	1.08	1.10	1.07	1.07	1.12	1.06	1.14	1.51			8.46	8.46	8.26
	velocity	5.24	8.62	8.31	8.46	8.31	8.54	8.54	8.16	8.62	8.02	9.28	7.90				

Date: 2023.08.26 Wind: 0.1 m/s

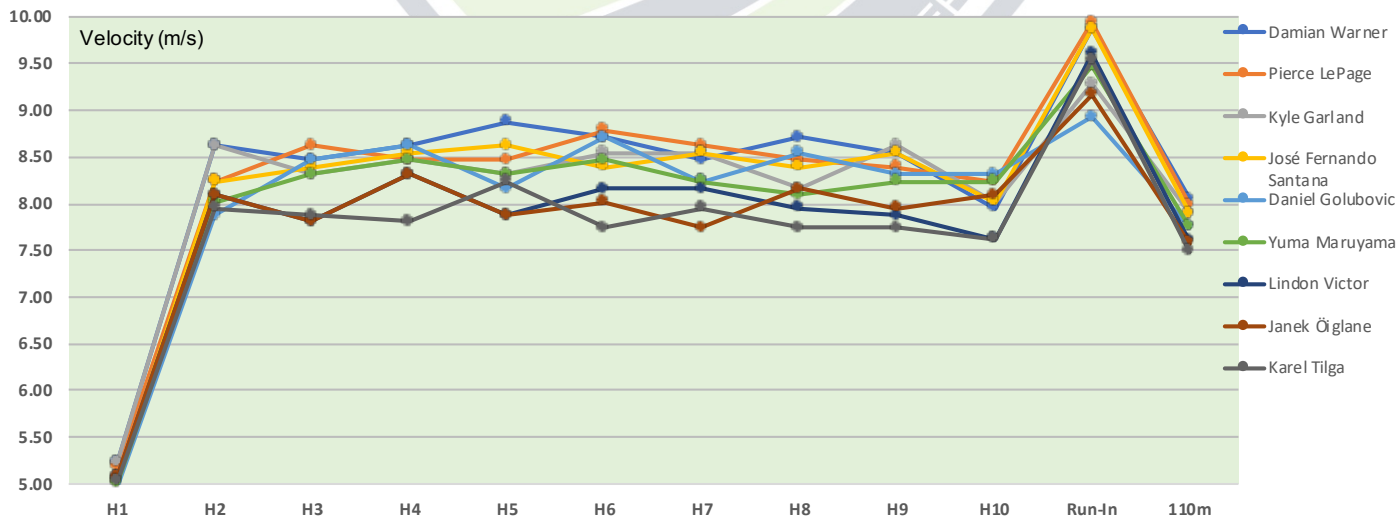
Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Santana, José Fernando (BRA) (1999)	time	2.73	3.84	4.93	6.00	7.06	8.15	9.22	10.31	11.38	12.52		13.94	4 / 1			
	reaction time	0.158													3.27	3.22	3.30
	interval	7 steps	1.11	1.09	1.07	1.06	1.09	1.07	1.09	1.07	1.14	1.42			8.39	8.52	8.31
	velocity	5.03	8.23	8.39	8.54	8.62	8.39	8.54	8.39	8.54	8.02	9.87	7.89				
Golubovic, Daniel (AUS) (1993)	time	2.76	3.92	5.00	6.06	7.18	8.23	9.34	10.41	11.51	12.61		14.18	6 / 2			
	reaction time	0.178													3.30	3.28	3.27
	interval	7 steps	1.16	1.08	1.06	1.12	1.05	1.11	1.07	1.10	1.10	1.57			8.31	8.36	8.39
	velocity	4.97	7.88	8.46	8.62	8.16	8.70	8.23	8.54	8.31	8.31	8.93	7.76				
Maruyama, Yuma (JPN) (1998)	time	2.74	3.88	4.98	6.06	7.16	8.24	9.35	10.48	11.59	12.70		14.18	7 / 2			
	reaction time	0.192													3.32	3.29	3.35
	interval	7 steps	1.14	1.10	1.08	1.10	1.08	1.11	1.13	1.11	1.11	1.48			8.26	8.33	8.19
	velocity	5.01	8.02	8.31	8.46	8.31	8.46	8.23	8.09	8.23	8.23	9.47	7.76				

Date: 2023.08.26 Wind: 0.2 m/s

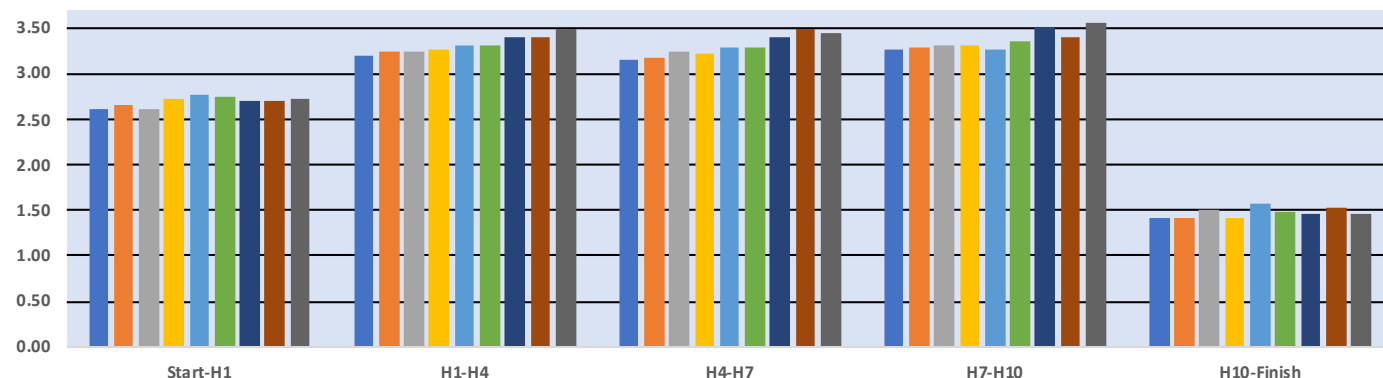
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Victor, Lindon (GRN) (1993)	time	2.70	3.83	5.00	6.10	7.26	8.38	9.50	10.65	11.81	13.01		14.47	7 / 1			
	reaction time	0.149													3.40	3.40	3.51
	interval	7 steps	1.13	1.17	1.10	1.16	1.12	1.12	1.15	1.16	1.20	1.46			8.06	8.06	7.81
	velocity	5.08	8.09	7.81	8.31	7.88	8.16	8.16	7.95	7.88	7.62	9.60	7.60				
Öglane, Janek (EST) (1994)	time	2.70	3.83	5.00	6.10	7.26	8.40	9.58	10.70	11.85	12.98		14.51	6 / 2			
	reaction time	0.143													3.40	3.48	3.40
	interval	7 steps	1.13	1.17	1.10	1.16	1.14	1.18	1.12	1.15	1.13	1.53			8.06	7.88	8.06
	velocity	5.08	8.09	7.81	8.31	7.88	8.02	7.75	8.16	7.95	8.09	9.16	7.58				
Tilga, Karel (EST) (1998)	time	2.73	3.88	5.04	6.21	7.32	8.50	9.65	10.83	12.01	13.21		14.68	8 / 3			
	reaction time	0.166													3.48	3.44	3.56
	interval	7 steps	1.15	1.16	1.17	1.11	1.18	1.15	1.18	1.18	1.20	1.47			7.88	7.97	7.70
	velocity	5.03	7.95	7.88	7.81	8.23	7.75	7.95	7.75	7.75	7.62	9.54	7.49				



Time Intervals (s)

Hurdle Phases



Maruyama, Yuma

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

Source: Matsubayashi, T. (2023). Performance analysis of decathlon athletes in the 2023 season. Bulletin of Studies in Athletics of JAAF, 19, p 161. (in Japanese)  
<https://www.iaaf.or.jp/pdf/about/publish/2023/4-13.pdf>

Source: <https://www.youtube.com/watch?v=sqmNcG6EqNM>

Video: <https://www.youtube.com/watch?v=sqmNcG6EqNM>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

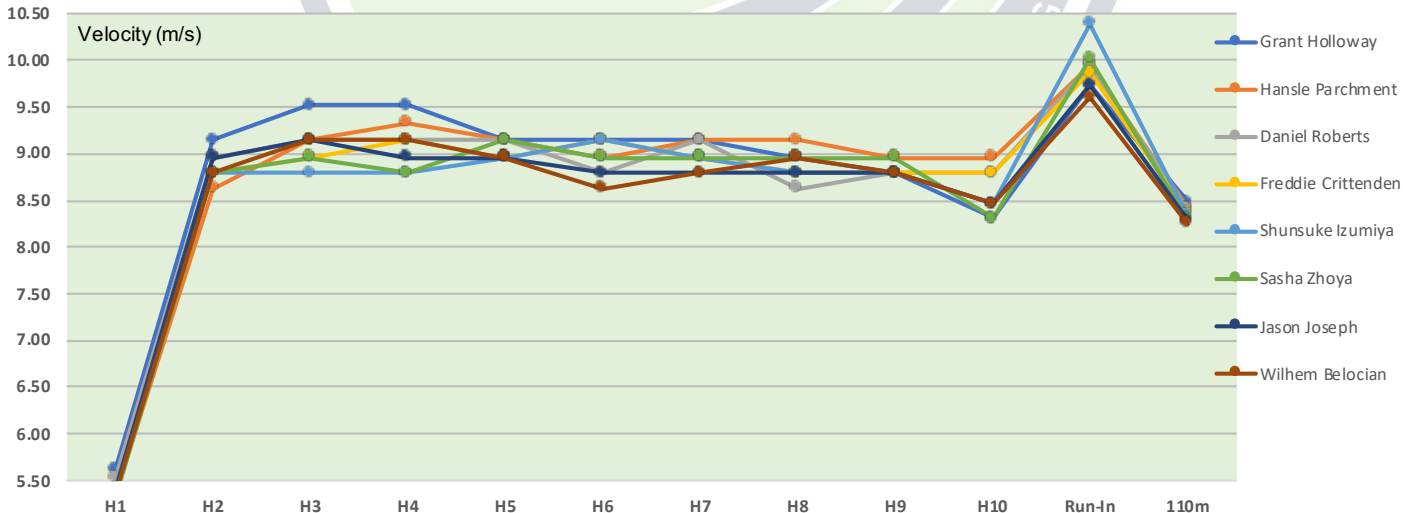
110m Hurdles

Date: 2023.08.21

Wind: 0.0 m/s

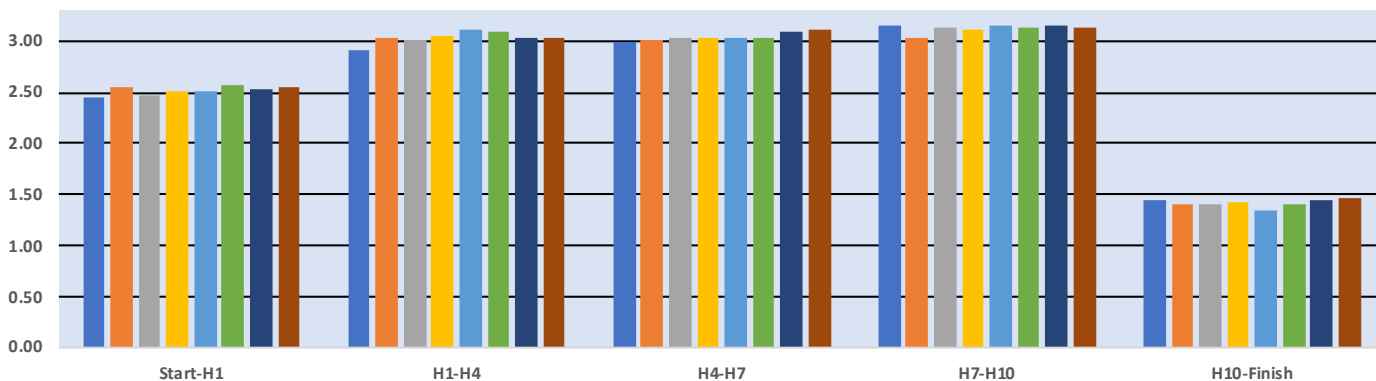
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Holloway, Grant (USA) (1997)</b>	time	2.44	3.44	4.40	5.36	6.36	7.36	8.36	9.38	10.42	11.52	12.96		5 / 1			
	reaction time	0.135													2.92	3.00	3.16
	interval	7 steps	1.00	0.96	0.96	1.00	1.00	1.00	1.02	1.04	1.10	1.44			9.39	9.14	8.68
	velocity	5.62	9.14	9.52	9.52	9.14	9.14	9.14	8.96	8.79	8.31	9.74	8.49				
<b>Parchment, Hansle (JAM) (1990)</b>	time	2.56	3.62	4.62	5.60	6.60	7.62	8.62	9.62	10.64	11.66		13.07	8 / 2			
	reaction time	0.169													3.04	3.02	3.04
	interval	7 steps	1.06	1.00	0.98	1.00	1.02	1.00	1.00	1.02	1.04	1.41			9.02	9.08	9.02
	velocity	5.36	8.62	9.14	9.33	9.14	8.96	9.14	9.14	8.96	8.96	9.94	8.42				
<b>Roberts, Daniel (USA) (1998)</b>	time	2.48	3.50	4.50	5.50	6.50	7.54	8.54	9.60	10.64	11.68		13.09	3 / 3			
	reaction time	0.143													3.02	3.04	3.14
	interval		1.02	1.00	1.00	1.00	1.04	1.00	1.06	1.04	1.04	1.41			9.08	9.02	8.73
	velocity	5.53	8.96	9.14	9.14	9.14	8.79	9.14	8.62	8.79	8.79	9.94	8.40				
<b>Crittenden, Freddie (USA) (1994)</b>	time	2.52	3.56	4.58	5.58	6.60	7.60	8.62	9.66	10.70	11.74		13.16	4 / 4			
	reaction time	0.140													3.06	3.04	3.12
	interval		1.04	1.02	1.00	1.02	1.00	1.02	1.04	1.04	1.04	1.42			8.96	9.02	8.79
	velocity	5.44	8.79	8.96	9.14	8.96	9.14	8.96	8.79	8.79	8.79	9.87	8.36				
<b>Izumiya, Shunsuke (JPN) (2000)</b>	time	2.52	3.56	4.60	5.64	6.66	7.66	8.68	9.72	10.76	11.84		13.19	6 / 5			
	reaction time	0.143													3.12	3.04	3.16
	interval	7 steps	1.04	1.04	1.04	1.02	1.00	1.02	1.04	1.04	1.08	1.35			8.79	9.02	8.68
	velocity	5.44	8.79	8.79	8.79	8.96	9.14	8.96	8.79	8.79	8.46	10.39	8.34				
<b>Zhoya, Sasha (FRA) (2002)</b>	time	2.58	3.62	4.64	5.68	6.68	7.70	8.72	9.74	10.76	11.86		13.26	7 / 6			
	reaction time	0.166													3.10	3.04	3.14
	interval	7 steps	1.04	1.02	1.04	1.00	1.02	1.02	1.02	1.10	1.10	1.40			8.85	9.02	8.73
	velocity	5.32	8.79	8.96	8.79	8.96	8.96	8.96	8.96	8.96	8.31	10.01	8.30				
<b>Joseph, Jason (SUI) (1998)</b>	time	2.54	3.56	4.56	5.58	6.60	7.64	8.68	9.72	10.76	11.84		13.28	9 / 7			
	reaction time	0.143													3.04	3.10	3.16
	interval	7 steps	1.02	1.00	1.02	1.02	1.04	1.04	1.04	1.04	1.08	1.44			9.02	8.85	8.68
	velocity	5.40	8.96	9.14	8.96	8.96	8.79	8.79	8.79	8.79	8.46	9.74	8.28				
<b>Belocian, Wilhem (FRA) (1995)</b>	time	2.56	3.60	4.60	5.60	6.62	7.68	8.72	9.74	10.78	11.86		13.32	2 / 8			
	reaction time	0.158													3.04	3.12	3.14
	interval		1.04	1.00	1.00	1.02	1.06	1.04	1.02	1.04	1.08	1.46			9.02	8.79	8.73
	velocity	5.36	8.79	9.14	9.14	8.96	8.62	8.79	8.96	8.79	8.46	9.60	8.26				



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=ReedOS8lbY4>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

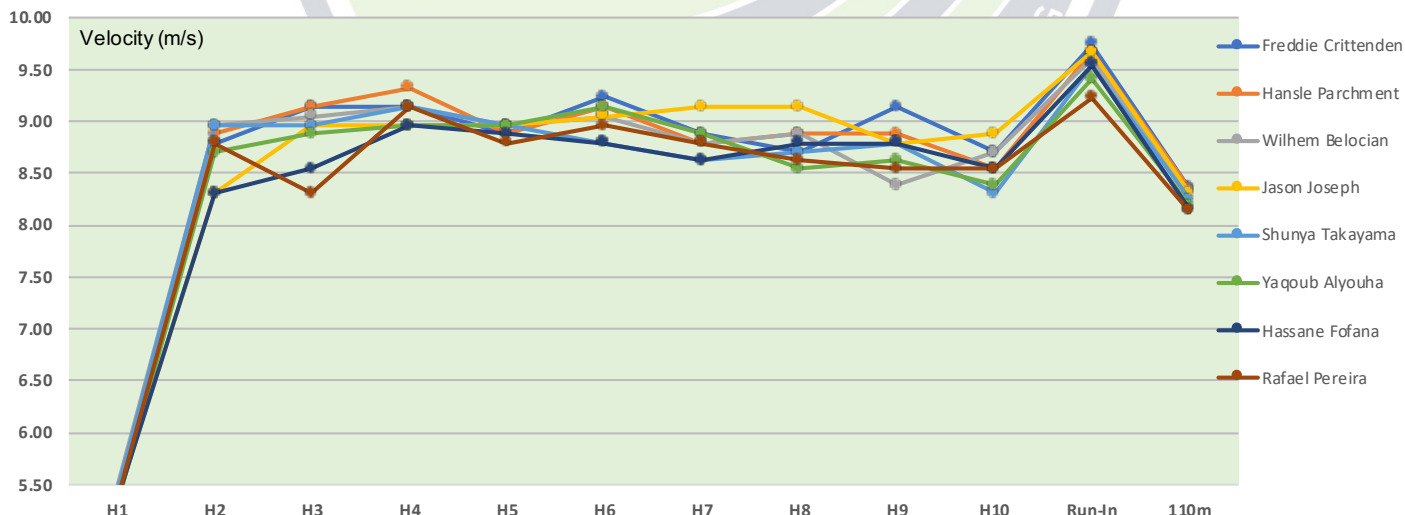
110m Hurdles

Date: 2023.08.21

Wind: -0.1 m/s

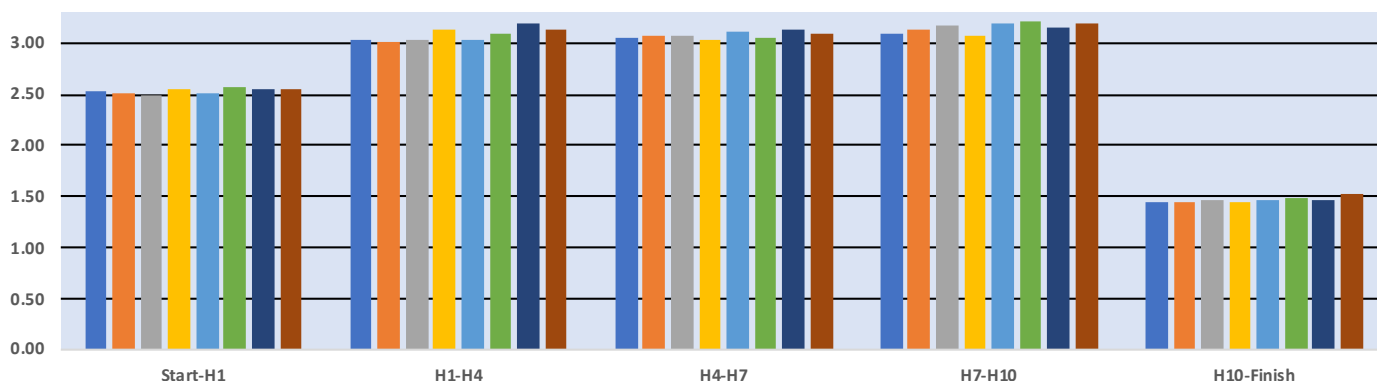
Semi-Final 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Crittenden, Freddie (USA) (1994)</b>	time	2.54	3.58	4.58	5.58	6.61	7.60	8.63	9.68	10.68	11.73	13.17	13.17	6 / 1			
	reaction time	0.156													3.04	3.05	3.10
	interval		1.04	1.00	1.00	1.03	0.99	1.03	1.05	1.00	1.05	1.44			9.02	8.99	8.85
	velocity	5.40	8.79	9.14	9.14	8.87	9.23	8.87	8.70	9.14	8.70	9.74	8.35				
<b>Parchment, Hansle (JAM) (1990)</b>	time	2.52	3.55	4.55	5.53	6.56	7.56	8.60	9.63	10.66	11.73	13.18	13.18	5 / 2			
	reaction time	0.138													3.01	3.07	3.13
	interval		1.03	1.00	0.98	1.03	1.00	1.04	1.03	1.03	1.07	1.45			9.11	8.93	8.76
	velocity	5.44	8.87	9.14	9.33	8.87	9.14	8.79	8.87	8.87	8.54	9.67	8.35				
<b>Belocian, Wilhem (FRA) (1995)</b>	time	2.50	3.52	4.53	5.53	6.55	7.56	8.60	9.63	10.72	11.77	13.23	13.23	4 / 3			
	reaction time	0.140													3.03	3.07	3.17
	interval		1.02	1.01	1.00	1.02	1.01	1.04	1.03	1.09	1.05	1.46			9.05	8.93	8.65
	velocity	5.49	8.96	9.05	9.14	8.96	9.05	8.79	8.87	8.39	8.70	9.60	8.31				
<b>Joseph, Jason (SUI) (1998)</b>	time	2.56	3.66	4.68	5.70	6.72	7.73	8.73	9.73	10.77	11.80	13.25	13.25	8 / 4			
	reaction time	0.163													3.14	3.03	3.07
	interval		1.10	1.02	1.02	1.02	1.01	1.00	1.00	1.04	1.03	1.45			8.73	9.05	8.93
	velocity	5.36	8.31	8.96	8.96	8.96	9.05	9.14	9.14	8.79	8.87	9.67	8.30				
<b>Takayama, Shunya (JPN) (1994)</b>	time	2.52	3.54	4.56	5.56	6.58	7.62	8.68	9.73	10.77	11.87	13.34	13.34	7 / 5			
	reaction time	0.135													3.04	3.12	3.19
	interval		1.02	1.02	1.00	1.02	1.04	1.06	1.05	1.04	1.10	1.47			9.02	8.79	8.60
	velocity	5.44	8.96	8.96	9.14	8.96	8.79	8.62	8.70	8.79	8.31	9.54	8.25				
<b>Alyouha, Yaqoub (KUW) (1993)</b>	time	2.58	3.63	4.66	5.68	6.70	7.70	8.73	9.80	10.86	11.95	13.44	13.44	2 / 6			
	reaction time	0.157													3.10	3.05	3.22
	interval		1.05	1.03	1.02	1.02	1.00	1.03	1.07	1.06	1.09	1.49			8.85	8.99	8.52
	velocity	5.32	8.70	8.87	8.96	8.96	9.14	8.87	8.54	8.62	8.39	9.41	8.18				
<b>Fofana, Hassane (ITA) (1992)</b>	time	2.56	3.66	4.73	5.75	6.78	7.82	8.88	9.92	10.96	12.03	13.50	13.50	9 / 7			
	reaction time	0.147													3.19	3.13	3.15
	interval		1.10	1.07	1.02	1.03	1.04	1.06	1.04	1.04	1.07	1.47			8.60	8.76	8.70
	velocity	5.36	8.31	8.54	8.96	8.87	8.79	8.62	8.79	8.79	8.54	9.54	8.15				
<b>Pereira, Rafael (BRA) (1997)</b>	time	2.56	3.60	4.70	5.70	6.74	7.76	8.80	9.86	10.93	12.00	13.52	13.52	3 / 8			
	reaction time	0.160													3.14	3.10	3.20
	interval		1.04	1.10	1.00	1.04	1.02	1.04	1.06	1.07	1.07	1.52			8.73	8.85	8.57
	velocity	5.36	8.79	8.31	9.14	8.79	8.96	8.79	8.62	8.54	8.54	9.22	8.14				



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=JAak2zaQPzA>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

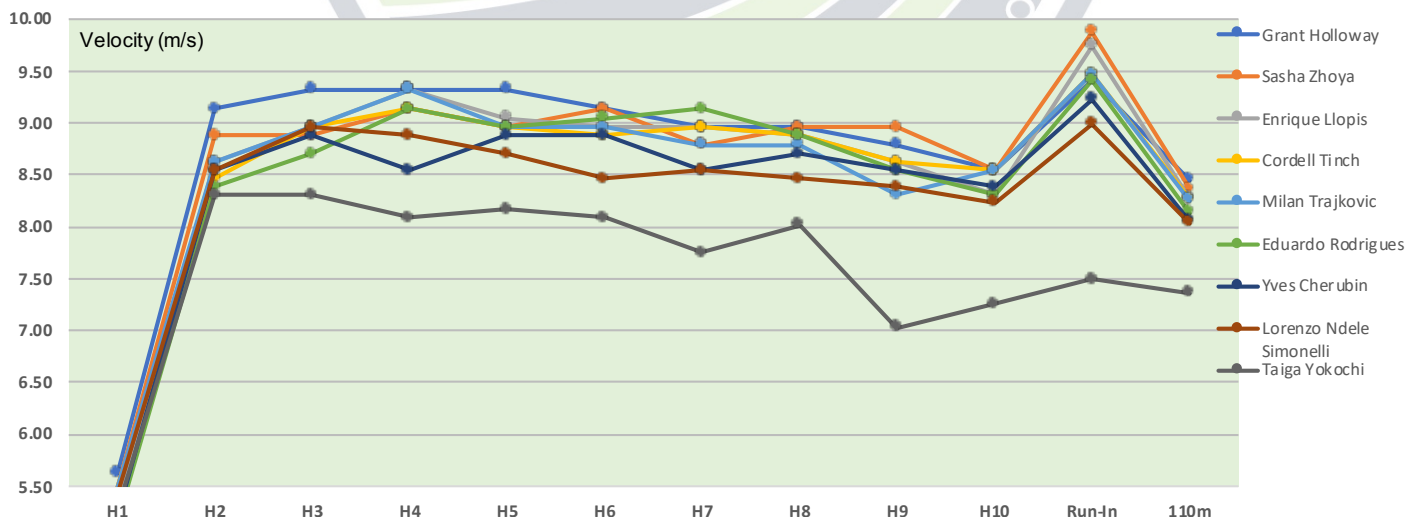
110m Hurdles

Date: 2023.08.21

Wind: -0.2 m/s

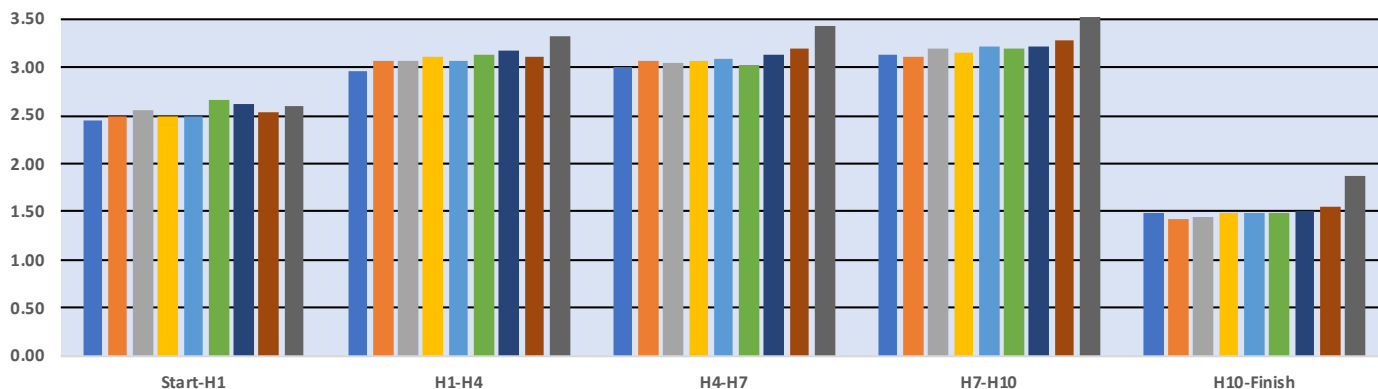
Semi-Final 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Holloway, Grant (USA) (1997)</b>	time	2.44	3.44	4.42	5.40	6.38	7.38	8.40	9.42	10.46	11.53	13.02	13.02	5 / 1			
	reaction time	0.137													2.96	3.00	3.13
	interval	7 steps	1.00	0.98	0.98	0.98	1.00	1.02	1.02	1.04	1.07	1.49			9.26	9.14	8.76
	velocity	5.62	9.14	9.33	9.33	9.33	9.14	8.96	8.96	8.79	8.54	9.41	8.45				
<b>Zhoya, Sasha (FRA) (2002)</b>	time	2.50	3.53	4.56	5.56	6.58	7.58	8.62	9.64	10.66	11.73	13.15	13.15	7 / 2			
	reaction time	0.129													3.06	3.06	3.11
	interval	7 steps	1.03	1.03	1.00	1.02	1.00	1.04	1.02	1.02	1.07	1.42	PB		8.96	8.96	8.82
	velocity	5.49	8.87	8.87	9.14	8.96	9.14	8.79	8.96	8.96	8.54	9.87	8.37				
<b>Llopis, Enrique (ESP) (2000)</b>	time	2.56	3.62	4.64	5.62	6.63	7.65	8.67	9.70	10.76	11.86	13.30	13.30	6 / 3			
	reaction time	0.146													3.06	3.05	3.19
	interval	7 steps	1.06	1.02	0.98	1.01	1.02	1.02	1.03	1.06	1.10	1.44	PB		8.96	8.99	8.60
	velocity	5.36	8.62	8.96	9.33	9.05	8.96	8.96	8.87	8.62	8.31	9.74	8.27				
<b>Tinch, Cordell (USA) (2000)</b>	time	2.50	3.58	4.60	5.60	6.62	7.65	8.67	9.70	10.76	11.83	13.31	13.31	3 / 4			
	reaction time	0.168													3.10	3.07	3.16
	interval	7 steps	1.08	1.02	1.00	1.02	1.03	1.02	1.03	1.06	1.07	1.48			8.85	8.93	8.68
	velocity	5.49	8.46	8.96	9.14	8.96	8.87	8.96	8.87	8.62	8.54	9.47	8.26				
<b>Trajkovic, Milan (CYP) (1992)</b>	time	2.50	3.56	4.58	5.56	6.58	7.60	8.64	9.68	10.78	11.85	13.33	13.33	4 / 5			
	reaction time	0.137													3.06	3.08	3.21
	interval	7 steps	1.06	1.02	0.98	1.02	1.02	1.04	1.04	1.10	1.07	1.48			8.96	8.90	8.54
	velocity	5.49	8.62	8.96	9.33	8.96	8.96	8.79	8.79	8.31	8.54	9.47	8.25				
<b>Rodrigues, Eduardo (BRA) (1995)</b>	time	2.66	3.75	4.80	5.80	6.82	7.83	8.83	9.86	10.93	12.03	13.52	13.52	8 / 6			
	reaction time	0.142													3.14	3.03	3.20
	interval	7 steps	1.09	1.05	1.00	1.02	1.01	1.00	1.03	1.07	1.10	1.49			8.73	9.05	8.57
	velocity	5.16	8.39	8.70	9.14	8.96	9.05	9.14	8.87	8.54	8.31	9.41	8.14				
<b>Cherubin, Yves (HAI) (1999)</b>	time	2.63	3.70	4.73	5.80	6.83	7.86	8.93	9.98	11.05	12.14	13.66	13.66	9 / 7			
	reaction time	0.178													3.17	3.13	3.21
	interval	7 steps	1.07	1.03	1.07	1.03	1.03	1.03	1.07	1.05	1.07	1.52			8.65	8.76	8.54
	velocity	5.22	8.54	8.87	8.54	8.87	8.87	8.54	8.70	8.54	8.39	9.22	8.05				
<b>Simonelli, Lorenzo Ndele (ITA) (2002)</b>	time	2.53	3.60	4.62	5.65	6.70	7.78	8.85	9.93	11.02	12.13	13.69	13.69	2 / 8			
	reaction time	0.151													3.12	3.20	3.28
	interval	7 steps	1.07	1.02	1.03	1.05	1.08	1.07	1.08	1.09	1.11	1.56			8.79	8.57	8.36
	velocity	5.42	8.54	8.96	8.87	8.70	8.46	8.54	8.46	8.39	8.23	8.99	8.04				
<b>Yokochi, Taiga (JPN) (2000)</b>	time	2.60	3.70	4.80	5.93	7.05	8.18	9.36	10.50	11.80	13.06	14.93	14.93	1 / 9			
	reaction time	0.173													3.33	3.43	3.70
	interval	7 steps	1.10	1.10	1.13	1.12	1.13	1.18	1.14	1.30	1.26	1.87			8.23	7.99	7.41
	velocity	5.28	8.31	8.31	8.09	8.16	8.09	7.75	8.02	7.03	7.25	7.50	7.37				



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=JAqk2zaQPzA>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

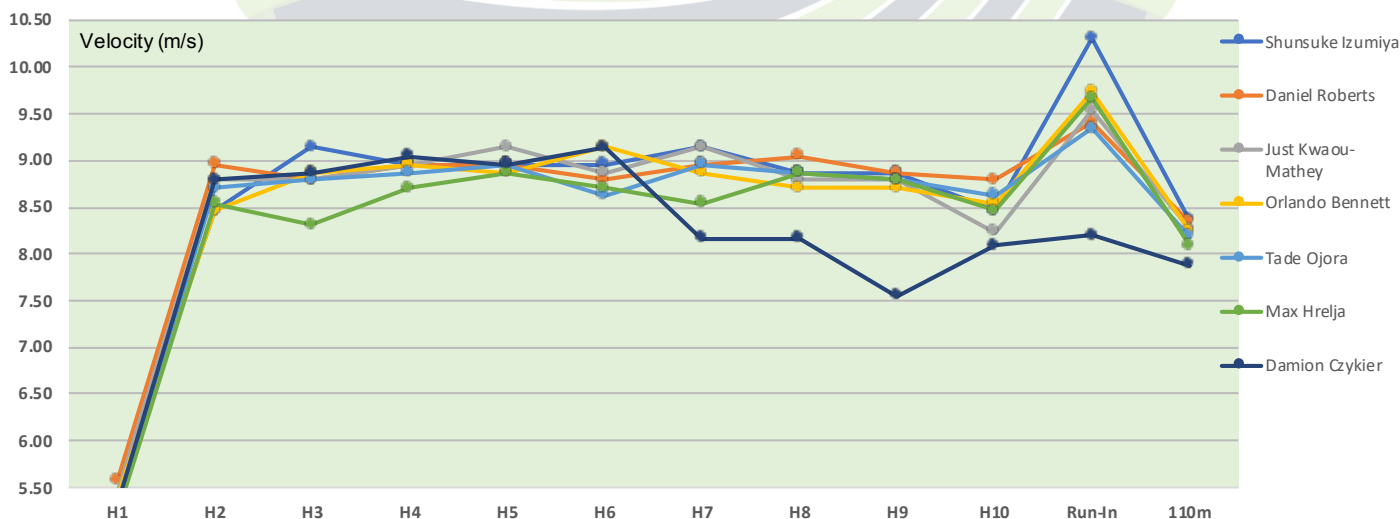
110m Hurdles

Date: 2023.08.21

Wind: -0.2 m/s

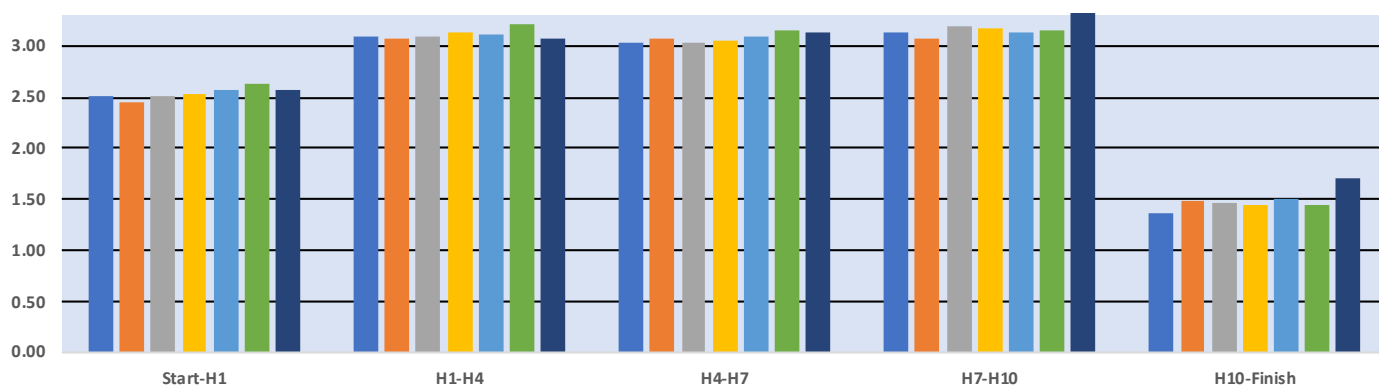
Semi-Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Izumiya, Shunsuke (JPN) (2000)</b>	time	2.52	3.60	4.60	5.62	6.64	7.66	8.66	9.69	10.72	11.80		13.16	6 / 1			
	reaction time	0.129															
	interval	7 steps	1.08	1.00	1.02	1.02	1.02	1.02	1.00	1.03	1.03	1.08	1.36		3.10	3.04	3.14
	velocity	5.44	8.46	9.14	8.96	8.96	8.96	9.14	8.87	8.87	8.46	10.31	8.36		8.85	9.02	8.73
<b>Roberts, Daniel (USA) (1998)</b>	time	2.46	3.48	4.52	5.54	6.56	7.60	8.62	9.63	10.66	11.70		13.19	5 / 2			
	reaction time	0.144															
	interval		1.02	1.04	1.02	1.02	1.04	1.02	1.01	1.03	1.04	1.49			3.08	3.08	3.08
	velocity	5.58	8.96	8.79	8.96	8.96	8.79	8.96	9.05	8.87	8.79	9.41	8.34		8.90	8.90	8.90
<b>Kwaou-Mathey, Just (FRA) (1999)</b>	time	2.52	3.56	4.60	5.62	6.62	7.65	8.65	9.69	10.73	11.84		13.31	2 / 3			
	reaction time	0.165															
	interval	7 steps	1.04	1.04	1.02	1.00	1.03	1.00	1.04	1.04	1.11	1.47			3.10	3.03	3.19
	velocity	5.44	8.79	8.79	8.96	9.14	8.87	9.14	8.79	8.79	8.23	9.54	8.26		8.85	9.05	8.60
<b>Bennett, Orlando (JAM) (1999)</b>	time	2.54	3.62	4.65	5.67	6.70	7.70	8.73	9.78	10.83	11.90		13.34	9 / 4			
	reaction time	0.144															
	interval		1.08	1.03	1.02	1.03	1.00	1.03	1.05	1.05	1.07	1.44			3.13	3.06	3.17
	velocity	5.40	8.46	8.87	8.96	8.87	9.14	8.87	8.70	8.70	8.54	9.74	8.25		8.76	8.96	8.65
<b>Ojora, Tade (GBR) (1999)</b>	time	2.58	3.63	4.67	5.70	6.72	7.78	8.80	9.83	10.87	11.93		13.43	7 / 5			
	reaction time	0.144															
	interval	7 steps	1.05	1.04	1.03	1.02	1.06	1.02	1.03	1.04	1.06	1.50			3.12	3.10	3.13
	velocity	5.32	8.70	8.79	8.87	8.96	8.62	8.96	8.87	8.79	8.62	9.35	8.19		8.79	8.85	8.76
<b>Hrelja, Max (SWE) (1998)</b>	time	2.63	3.70	4.80	5.85	6.88	7.93	9.00	10.03	11.07	12.15		13.60	8 / 6			
	reaction time	0.162															
	interval	7 steps	1.07	1.10	1.05	1.03	1.05	1.07	1.03	1.04	1.08	1.45			3.22	3.15	3.15
	velocity	5.22	8.54	8.31	8.70	8.87	8.70	8.54	8.87	8.79	8.46	9.67	8.09		8.52	8.70	8.70
<b>Czykier, Damian (POL) (1992)</b>	time	2.58	3.62	4.65	5.66	6.68	7.68	8.80	9.92	11.13	12.26		13.97	3 / 7			
	reaction time	0.162															
	interval	7 steps	1.04	1.03	1.01	1.02	1.00	1.12	1.12	1.21	1.13	1.71			3.08	3.14	3.46
	velocity	5.32	8.79	8.87	9.05	8.96	9.14	8.16	8.16	7.55	8.09	8.20	7.87		8.90	8.73	7.92



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=JAqk2zqOPzA>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

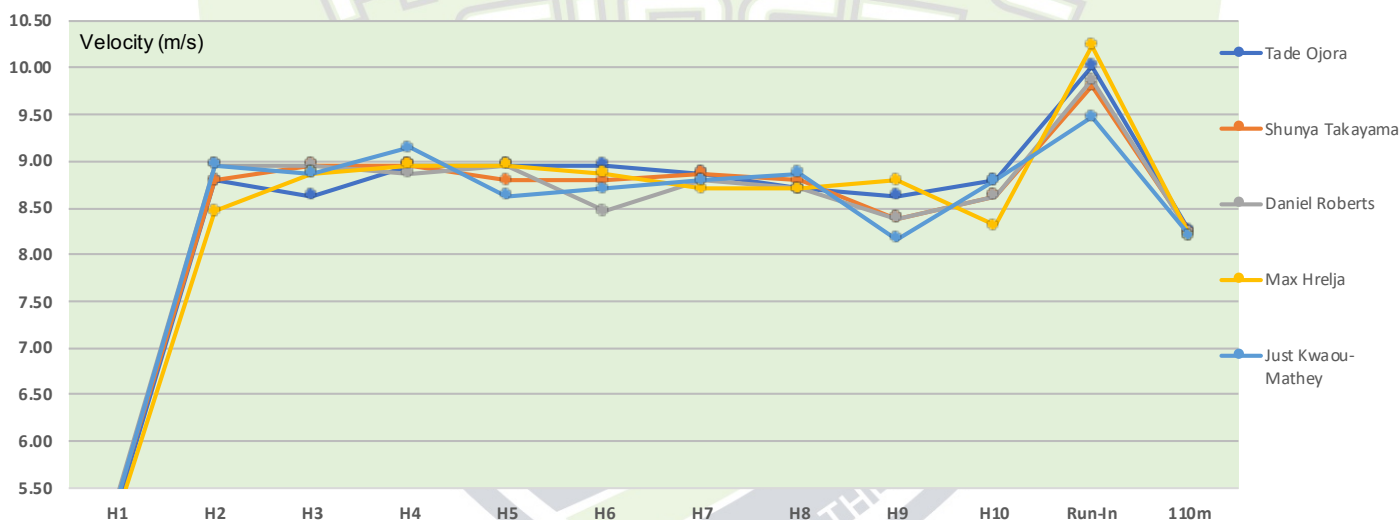
110m Hurdles

Date: 2023.08.20

Wind: -0.9 m/s

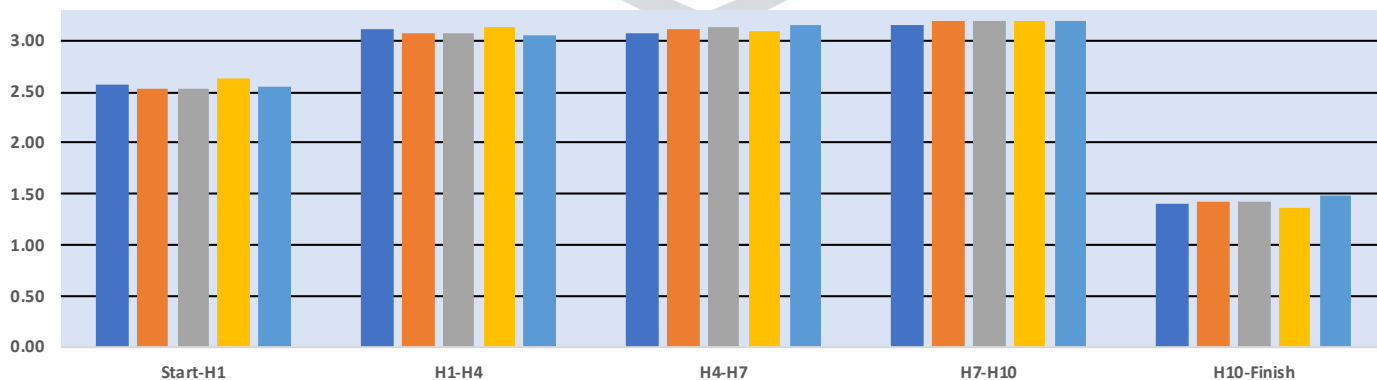
Heat 5

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Ojora, Tade (GBR) (1999)</b>	time	2.58	3.62	4.68	5.70	6.72	7.74	8.77	9.82	10.88	11.92		13.32	2 / 1			
	reaction time	0.148													3.12	3.07	3.15
	interval	7 steps	1.04	1.06	1.02	1.02	1.02	1.02	1.03	1.05	1.06	1.04	1.40		8.79	8.93	8.70
	velocity	5.32	8.79	8.62	8.96	8.96	8.96	8.87	8.70	8.62	8.79	10.01	8.26				
<b>Takayama, Shunya (JPN) (1994)</b>	time	2.54	3.58	4.60	5.62	6.66	7.70	8.73	9.77	10.86	11.92		13.35	9 / 2			
	reaction time	0.146													3.08	3.11	3.19
	interval		1.04	1.02	1.02	1.04	1.04	1.03	1.04	1.09	1.06	1.43			8.90	8.82	8.60
	velocity	5.40	8.79	8.96	8.96	8.79	8.79	8.87	8.79	8.39	8.62	9.80	8.24				
<b>Roberts, Daniel (USA) (1998)</b>	time	2.53	3.55	4.57	5.60	6.62	7.70	8.74	9.79	10.88	11.94		13.36	5 / 3			
	reaction time	0.155													3.07	3.14	3.20
	interval		1.02	1.02	1.03	1.02	1.08	1.04	1.05	1.09	1.06	1.42			8.93	8.73	8.57
	velocity	5.42	8.96	8.96	8.87	8.96	8.46	8.79	8.70	8.39	8.62	9.87	8.23				
<b>Hrelja, Max (SWE) (1998)</b>	time	2.63	3.71	4.74	5.76	6.78	7.81	8.86	9.91	10.95	12.05		13.42	7 / 4			
	reaction time	0.138													3.13	3.10	3.19
	interval	7 steps	1.08	1.03	1.02	1.02	1.03	1.05	1.05	1.04	1.10	1.37	<b>PB</b>		8.76	8.85	8.60
	velocity	5.22	8.46	8.87	8.96	8.96	8.87	8.70	8.70	8.79	8.31	10.23	8.20				
<b>Kwaou-Mathey, Just (FRA) (1999)</b>	time	2.55	3.57	4.60	5.60	6.66	7.71	8.75	9.78	10.90	11.94		13.42	3 / 5			
	reaction time	0.160													3.05	3.15	3.19
	interval	7 steps	1.02	1.03	1.00	1.06	1.05	1.04	1.03	1.12	1.04	1.48			8.99	8.70	8.60
	velocity	5.38	8.96	8.87	9.14	8.62	8.70	8.79	8.87	8.16	8.79	9.47	8.20				



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=W4r-yvIQ5wI&t=72s>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

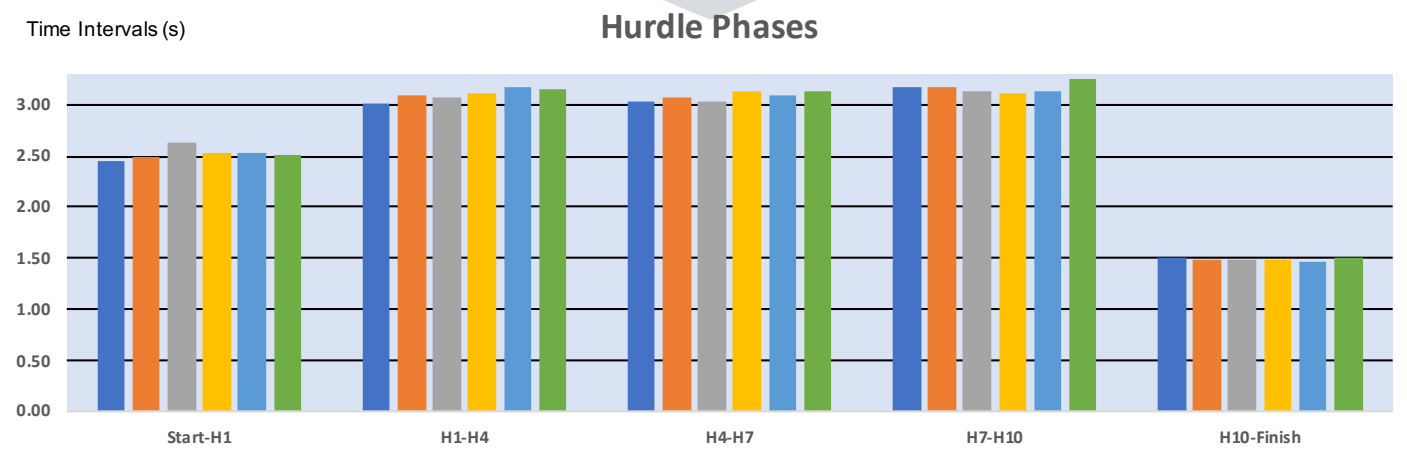
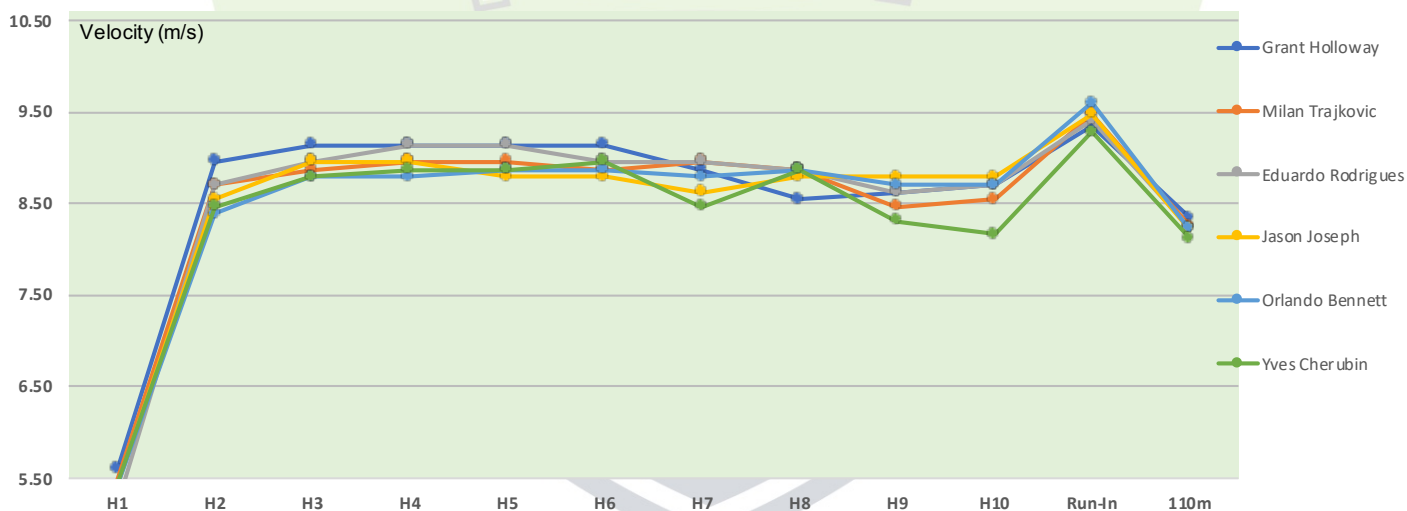
110m Hurdles

Date: 2023.08.20

Wind: -0.6 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
Holloway, Grant (USA) (1997)	time	2.45	3.47	4.47	5.47	6.47	7.47	8.50	9.57	10.63	11.68		13.18	5 / 1			
	reaction time	0.153													3.02	3.03	3.18
	interval	7 steps	1.02	1.00	1.00	1.00	1.00	1.00	1.03	1.07	1.06	1.05	1.50		9.08	9.05	8.62
	velocity	5.60	8.96	9.14	9.14	9.14	9.14	8.87	8.54	8.62	8.70	9.35	8.35				
Trajkovic, Milan (CYP) (1992)	time	2.50	3.55	4.58	5.60	6.62	7.65	8.67	9.70	10.78	11.85		13.33	4 / 2			
	reaction time	0.164													3.10	3.07	3.18
	interval	7 steps	1.05	1.03	1.02	1.02	1.03	1.02	1.03	1.08	1.07	1.48			8.85	8.93	8.62
	velocity	5.49	8.70	8.87	8.96	8.96	8.87	8.96	8.87	8.46	8.54	9.47	8.25				
Rodrigues, Eduardo (BRA) (1995)	time	2.63	3.68	4.70	5.70	6.70	7.72	8.74	9.77	10.83	11.88		13.37	1 / 3			
	reaction time	0.150													3.07	3.04	3.14
	interval	7 steps	1.05	1.02	1.00	1.00	1.02	1.02	1.03	1.06	1.05	1.49			8.93	9.02	8.73
	velocity	5.22	8.70	8.96	9.14	9.14	8.96	8.96	8.87	8.62	8.70	9.41	8.23				
Joseph, Jason (SUI) (1998)	time	2.53	3.60	4.62	5.64	6.68	7.72	8.78	9.82	10.86	11.90		13.38	2 / 4			
	reaction time	0.159													3.11	3.14	3.12
	interval	7 steps	1.07	1.02	1.02	1.04	1.04	1.06	1.04	1.04	1.04	1.48			8.82	8.73	8.79
	velocity	5.42	8.54	8.96	8.96	8.79	8.79	8.62	8.79	8.79	8.79	9.47	8.22				
Bennett, Orlando (JAM) (1999)	time	2.53	3.62	4.66	5.70	6.73	7.76	8.80	9.83	10.88	11.93		13.39	9 / 5			
	reaction time	0.140													3.17	3.10	3.13
	interval		1.09	1.04	1.04	1.03	1.03	1.03	1.04	1.03	1.05	1.05	1.46		8.65	8.85	8.76
	velocity	5.42	8.39	8.79	8.79	8.87	8.87	8.79	8.87	8.70	8.70	9.60	8.22				
Cherubin, Yves (HAI) (1999)	time	2.52	3.60	4.64	5.67	6.70	7.72	8.80	9.83	10.93	12.05		13.56	6 / 6			
	reaction time	0.180													3.15	3.13	3.25
	interval		1.08	1.04	1.03	1.03	1.02	1.08	1.03	1.10	1.12	1.51	<b>PB</b>		8.70	8.76	8.44
	velocity	5.44	8.46	8.79	8.87	8.87	8.96	8.46	8.87	8.31	8.16	9.28	8.11				



Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: First Movement  
 Source: <https://www.youtube.com/watch?v=W4r-vvIQ5wI&t=72s>



2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

110m Hurdles

Date: 2023.08.20

Wind: 0.0 m/s

Heat 3

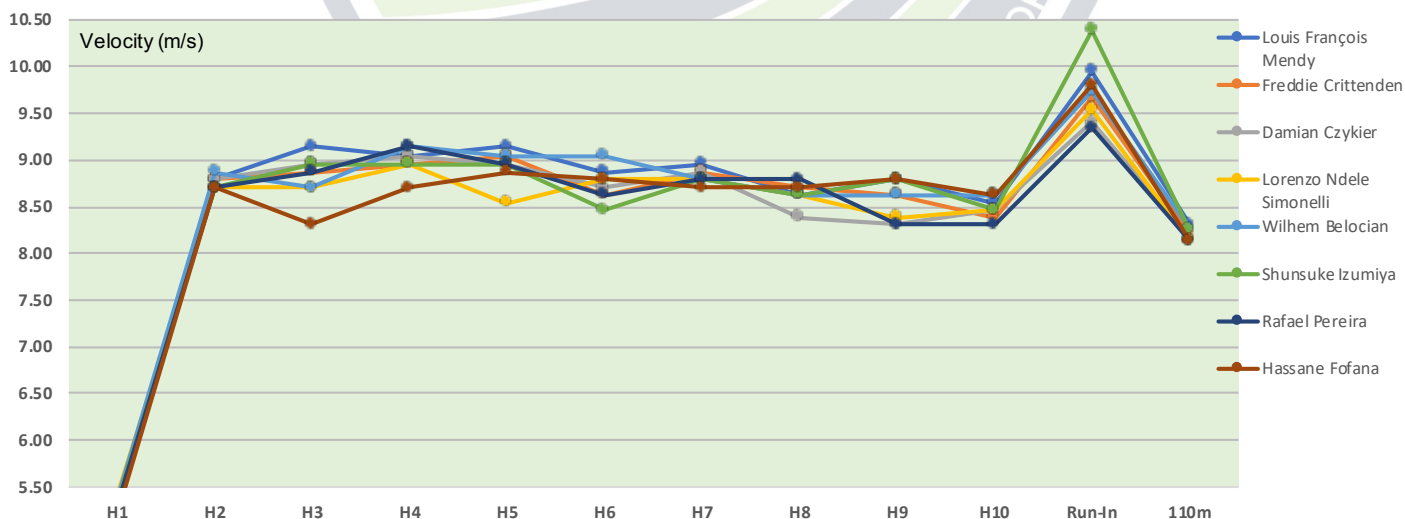
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Mendy, Louis François (SEN) (1999)</b>	time	2.56	3.60	4.60	5.61	6.61	7.64	8.66	9.72	10.76	11.83		13.24	6 / 1			
	reaction time	0.176													3.05	3.05	3.17
	interval		1.04	1.00	1.01	1.00	1.03	1.02	1.06	1.04	1.07	1.41			8.99	8.99	8.65
	velocity	5.36	8.79	9.14	9.05	9.14	8.87	8.96	8.62	8.79	8.54	9.94	8.31				
<b>Crittenden, Freddie (USA) (1994)</b>	time	2.56	3.60	4.63	5.65	6.66	7.72	8.75	9.80	10.86	11.95		13.40	3 / 2			
	reaction time	0.148													3.09	3.10	3.20
	interval		1.04	1.03	1.02	1.01	1.06	1.03	1.05	1.06	1.09	1.45			8.87	8.85	8.57
	velocity	5.36	8.79	8.87	8.96	9.05	8.62	8.87	8.70	8.62	8.39	9.67	8.21				
<b>Czykier, Damian (POL) (1992)</b>	time	2.56	3.60	4.62	5.63	6.65	7.70	8.73	9.82	10.92	12.00		13.49	7 / 3			
	reaction time	0.152													3.07	3.10	3.27
	interval		7 steps	1.04	1.02	1.01	1.02	1.05	1.03	1.09	1.10	1.08	1.49		8.93	8.85	8.39
	velocity	5.36	8.79	8.96	9.05	8.96	8.70	8.87	8.39	8.31	8.46	9.41	8.15				
<b>Simonelli, Lorenzo Ndele (ITA) (2002)</b>	time	2.53	3.58	4.63	5.65	6.72	7.76	8.80	9.86	10.95	12.03		13.50	4 / 4			
	reaction time	0.152													3.12	3.15	3.23
	interval		7 steps	1.05	1.05	1.02	1.07	1.04	1.06	1.09	1.08	1.47			8.79	8.70	8.49
	velocity	5.42	8.70	8.70	8.96	8.54	8.79	8.79	8.62	8.39	8.46	9.54	8.15				

Date: 2023.08.20

Wind: 0.5 m/s

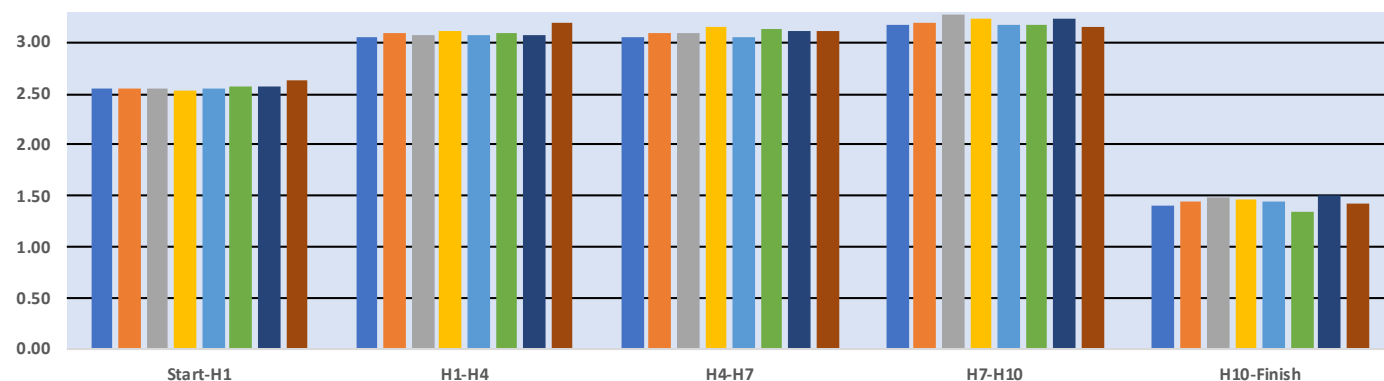
Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Belocian, Wilhem (FRA) (1995)</b>	time	2.55	3.58	4.63	5.63	6.64	7.65	8.69	9.75	10.81	11.87		13.31	9 / 1			
	reaction time	0.156													3.08	3.06	3.18
	interval		1.03	1.05	1.00	1.01	1.01	1.04	1.06	1.06	1.06	1.44			8.90	8.96	8.62
	velocity	5.38	8.87	8.70	9.14	9.05	9.05	8.79	8.62	8.62	8.62	9.74	8.26				
<b>Izumiya, Shunsuke (JPN) (2000)</b>	time	2.57	3.62	4.64	5.66	6.68	7.76	8.80	9.86	10.90	11.98		13.33	6 / 2			
	reaction time	0.146													3.09	3.14	3.18
	interval		7 steps	1.05	1.02	1.02	1.02	1.08	1.04	1.06	1.04	1.08	1.35		8.87	8.73	8.62
	velocity	5.34	8.70	8.96	8.96	8.96	8.46	8.79	8.62	8.79	8.46	10.39	8.25				
<b>Pereira, Rafael (BRA) (1997)</b>	time	2.58	3.63	4.66	5.66	6.68	7.74	8.78	9.82	10.92	12.02		13.52	4 / 3			
	reaction time	0.146													3.08	3.12	3.24
	interval		1.05	1.03	1.00	1.02	1.06	1.04	1.04	1.10	1.10	1.50			8.90	8.79	8.46
	velocity	5.32	8.70	8.87	9.14	8.96	8.62	8.79	8.79	8.31	8.31	9.35	8.14				
<b>Fofana, Hassane (ITA) (1992)</b>	time	2.63	3.68	4.78	5.83	6.86	7.90	8.95	10.00	11.04	12.10		13.53	5 / 4			
	reaction time	0.141													3.20	3.12	3.15
	interval		7 steps	1.05	1.10	1.05	1.03	1.04	1.05	1.05	1.04	1.06	1.43		8.57	8.79	8.70
	velocity	5.22	8.70	8.31	8.70	8.87	8.79	8.70	8.70	8.79	8.62	9.80	8.13				



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=W4r-yvI05wI&t=72s>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

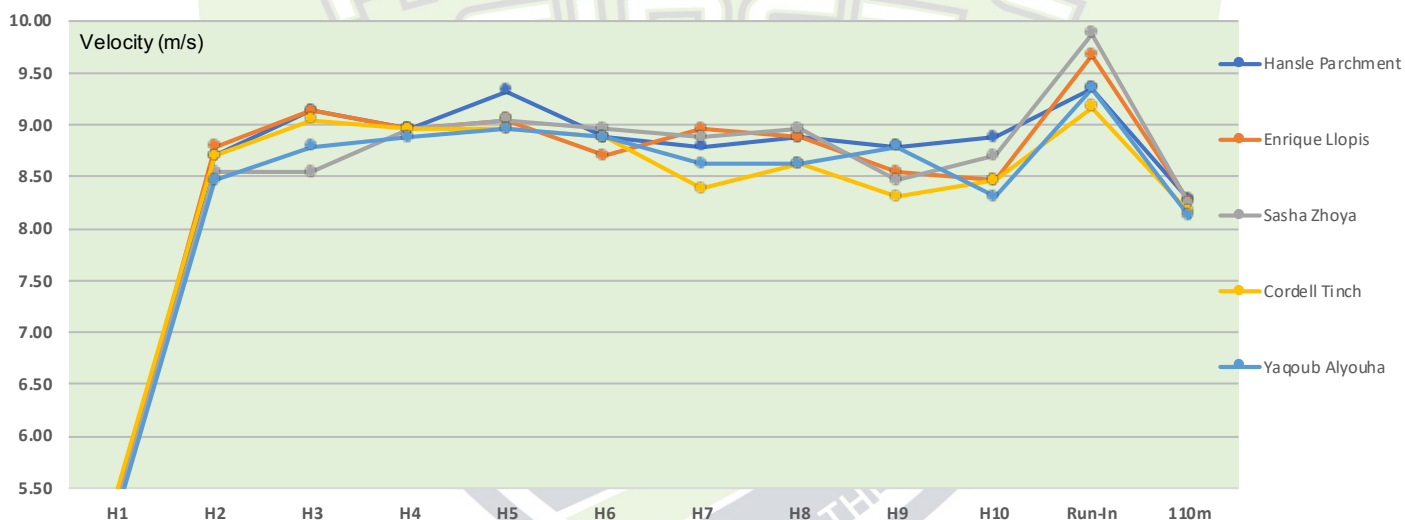
110m Hurdles

Date: 2023.08.20

Wind: -0.3 m/s

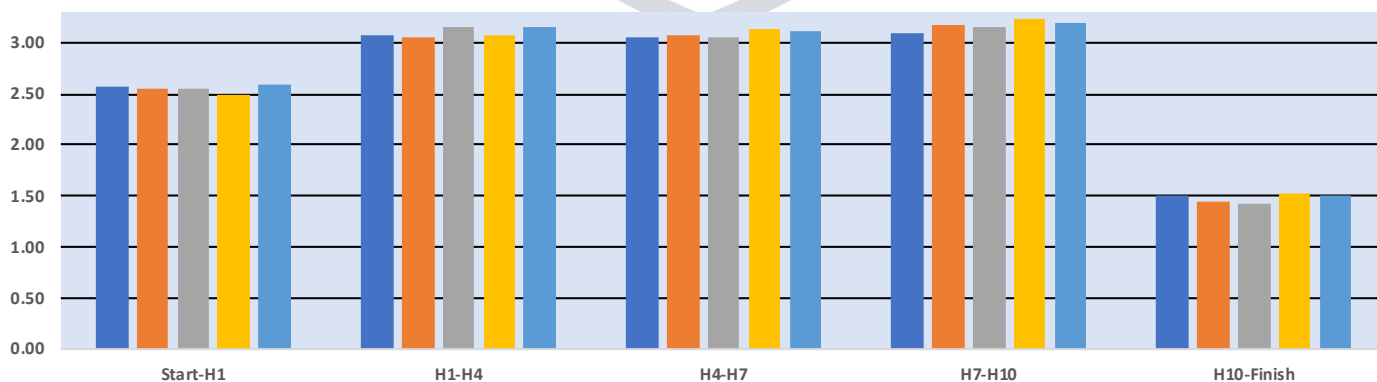
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Parchment, Hansle (JAM) (1990)	time	2.58	3.63	4.63	5.65	6.63	7.66	8.70	9.73	10.77	11.80		13.30	3 / 1			
	reaction time	0.195													3.07	3.05	3.10
	interval	7 steps	1.05	1.00	1.02	0.98	1.03	1.04	1.03	1.04	1.03	1.50			8.93	8.99	8.85
	velocity	5.32	8.70	9.14	8.96	9.33	8.87	8.79	8.87	8.79	8.87	9.35	8.27				
Llopis, Enrique (ESP) (2000)	time	2.56	3.60	4.60	5.62	6.63	7.68	8.70	9.73	10.80	11.88		13.33	2 / 2			
	reaction time	0.136													3.06	3.08	3.18
	interval	7 steps	1.04	1.00	1.02	1.01	1.05	1.02	1.03	1.07	1.08	1.45			8.96	8.90	8.62
	velocity	5.36	8.79	9.14	8.96	9.05	8.70	8.96	8.87	8.54	8.46	9.67	8.25				
Zhoya, Sasha (FRA) (2002)	time	2.56	3.63	4.70	5.72	6.73	7.75	8.78	9.80	10.88	11.93		13.35	7 / 3			
	reaction time	0.157													3.16	3.06	3.15
	interval	7 steps	1.07	1.07	1.02	1.01	1.02	1.03	1.02	1.08	1.05	1.42			8.68	8.96	8.70
	velocity	5.36	8.54	8.54	8.96	9.05	8.96	8.87	8.96	8.46	8.70	9.87	8.24				
Tinch, Cordell (USA) (2000)	time	2.50	3.55	4.56	5.58	6.60	7.63	8.72	9.78	10.88	11.96		13.49	9 / 4			
	reaction time	0.170													3.08	3.14	3.24
	interval	7 steps	1.05	1.01	1.02	1.02	1.03	1.09	1.06	1.10	1.08	1.53			8.90	8.73	8.46
	velocity	5.49	8.70	9.05	8.96	8.96	8.87	8.39	8.62	8.31	8.46	9.16	8.15				
Alyouha, Yaqoub (KUW) (1993)	time	2.60	3.68	4.72	5.75	6.77	7.80	8.86	9.92	10.96	12.06		13.56	1 / 5			
	reaction time	0.140													3.15	3.11	3.20
	interval	7 steps	1.08	1.04	1.03	1.02	1.03	1.06	1.06	1.04	1.10	1.50			8.70	8.82	8.57
	velocity	5.28	8.46	8.79	8.87	8.96	8.87	8.62	8.62	8.79	8.31	9.35	8.11				



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=W4r-yvIQ5wI&t=72s>

2023 French National Championships (Albi, FRA) (TV Analysis)

110m Hurdles

Date: 2023.07.29

Wind: 2.3 m/s

FINAL

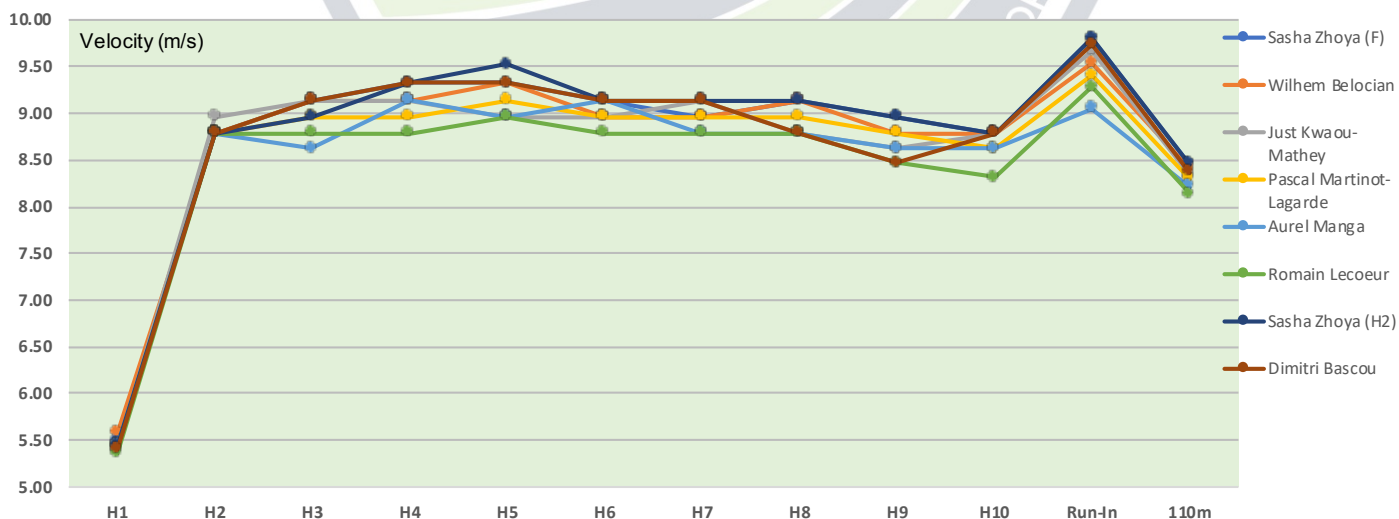
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Zhoya, Sasha (FRA) (2002)	time	2.50	3.54	4.54	5.52	6.50	7.50	8.52	9.52	10.54	11.58		13.01	6 / 1			
	reaction time	0.187													3.02	3.00	3.06
	interval	7 steps	1.04	1.00	0.98	0.98	1.00	1.02	1.00	1.02	1.04	1.43			9.08	9.14	8.96
	velocity	5.49	8.79	9.14	9.33	9.33	9.14	8.96	9.14	8.96	8.79	9.80	8.46				
Belocian, Wilhem (FRA) (1995)	time	2.46	3.50	4.50	5.50	6.48	7.50	8.52	9.52	10.56	11.60		13.07	5 / 2			
	reaction time	0.168													3.04	3.02	3.08
	interval	7 steps	1.04	1.00	0.98	1.00	1.02	1.02	1.00	1.04	1.04	1.47			9.02	9.08	8.90
	velocity	5.58	8.79	9.14	9.14	9.33	8.96	8.96	9.14	8.79	8.79	9.54	8.42				
Kwaou-Mathey, Just (FRA) (1999)	time	2.54	3.56	4.56	5.56	6.58	7.60	8.60	9.64	10.70	11.74		13.19	3 / 3			
	reaction time	0.206													3.02	3.04	3.14
	interval	7 steps	1.02	1.00	1.00	1.02	1.02	1.00	1.04	1.06	1.04	1.45			9.08	9.02	8.73
	velocity	5.40	8.96	9.14	9.14	8.96	8.96	9.14	8.79	8.62	8.79	9.67	8.34				
Martinot-Lagarde, Pascal (FRA) (1991)	time	2.52	3.56	4.58	5.60	6.60	7.62	8.64	9.66	10.70	11.76		13.25	2 / 4			
	reaction time	0.180													3.08	3.04	3.12
	interval	7 steps	1.04	1.02	1.02	1.00	1.02	1.02	1.02	1.04	1.06	1.49			8.90	9.02	8.79
	velocity	5.44	8.79	8.96	8.96	9.14	8.96	8.96	8.96	8.79	8.62	9.41	8.30				
Manga, Aurel (FRA) (1992)	time	2.52	3.56	4.62	5.62	6.64	7.64	8.68	9.72	10.78	11.84		13.39	7 / 5			
	reaction time	0.166													3.10	3.06	3.16
	interval	7 steps	1.04	1.06	1.00	1.02	1.00	1.04	1.04	1.06	1.06	1.55			8.85	8.96	8.68
	velocity	5.44	8.79	8.62	9.14	8.96	9.14	8.79	8.79	8.62	8.62	9.05	8.22				
Lecoeur, Romain (FRA) (1997)	time	2.56	3.60	4.64	5.68	6.70	7.74	8.78	9.82	10.90	12.00		13.51	1 / 6			
	reaction time	0.203													3.12	3.10	3.22
	interval	7 steps	1.04	1.04	1.04	1.02	1.04	1.04	1.04	1.08	1.10	1.51			8.79	8.85	8.52
	velocity	5.36	8.79	8.79	8.79	8.79	8.96	8.79	8.79	8.46	8.31	9.28	8.14				

Date: 2023.07.29

Wind: 5.3 m/s

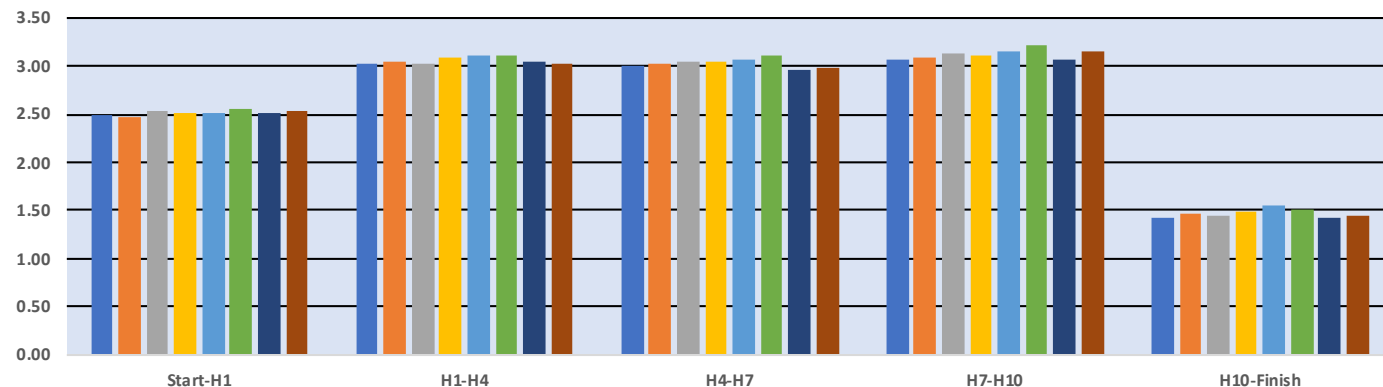
Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Zhoya, Sasha (FRA) (2002)	time	2.52	3.56	4.58	5.56	6.52	7.52	8.52	9.52	10.54	11.58		13.01	6 / 1			
	reaction time	0.173													3.04	2.96	3.06
	interval	7 steps	1.04	1.02	0.98	0.96	1.00	1.00	1.00	1.02	1.04	1.43			9.02	9.26	8.96
	velocity	5.44	8.79	8.96	9.33	9.52	9.14	9.14	9.14	8.96	8.79	9.80	8.46				
Bascou, Dimitri (FRA) (1987)	time	2.54	3.58	4.58	5.56	6.54	7.54	8.54	9.58	10.66	11.70		13.14	3 / 2			
	reaction time	0.162													3.02	2.98	3.16
	interval	7 steps	1.04	1.00	0.98	0.98	1.00	1.00	1.04	1.08	1.04	1.44			9.08	9.20	8.68
	velocity	5.40	8.79	9.14	9.33	9.33	9.14	9.14	8.79	8.46	8.79	9.74	8.37				



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=naF7BuaQc6o>

2023 London Athletics Meet (London, GBR)

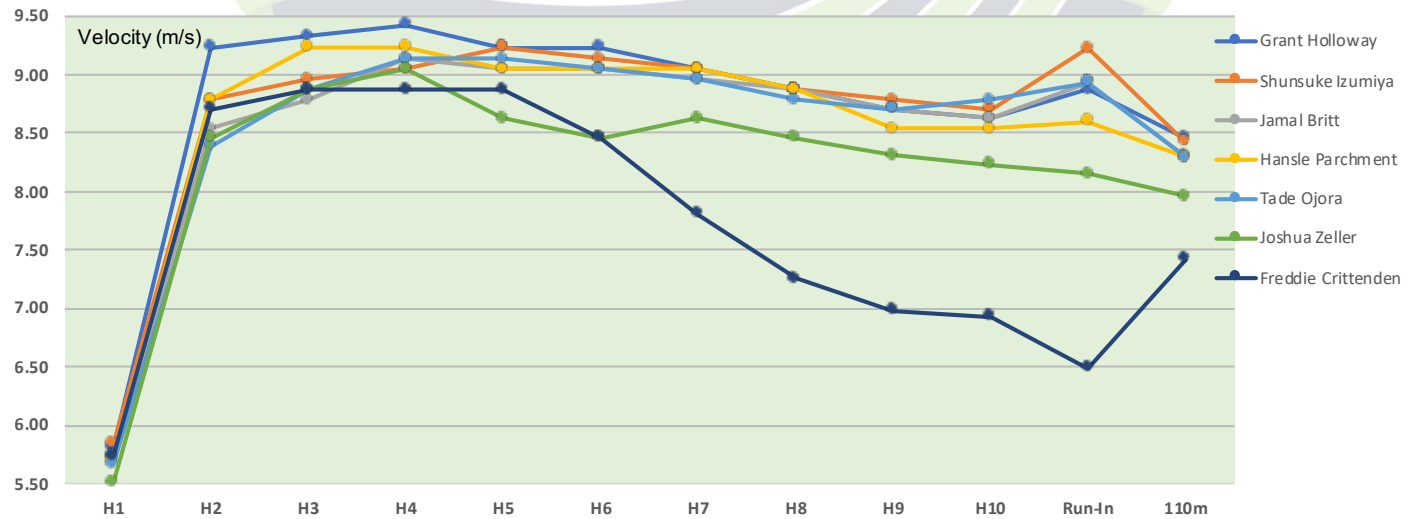
110m Hurdles

Date: 2023.07.23

Wind: 1.3 m/s

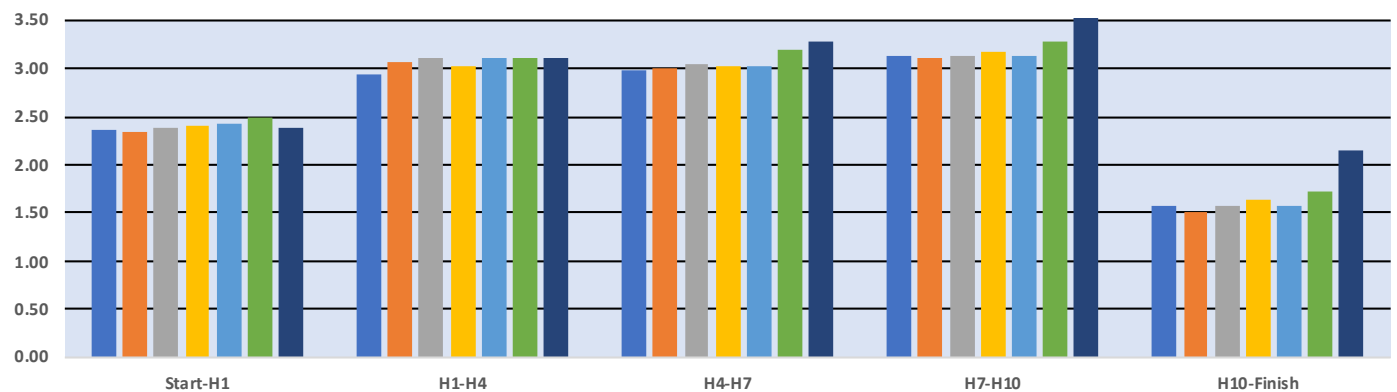
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Holloway, Grant (USA) (1997)</b>	time	2.36	3.35	4.33	5.30	6.29	7.28	8.29	9.32	10.37	11.43		13.01	5 / 1			
	reaction time	0.165													2.94	2.99	3.14
	interval	7 steps	0.99	0.98	0.97	0.99	0.99	0.99	1.01	1.03	1.05	1.06	1.58		9.33	9.17	8.73
	velocity	5.81	9.23	9.33	9.42	9.23	9.23	9.05	8.87	8.70	8.62	8.87	8.46				
<b>Izumiya, Shunsuke (JPN) (2000)</b>	time	2.35	3.39	4.41	5.42	6.41	7.41	8.42	9.45	10.49	11.54		13.06	3 / 2			
	reaction time	0.138													3.07	3.00	3.12
	interval	7 steps	1.04	1.02	1.01	0.99	1.00	1.01	1.03	1.04	1.05	1.52			8.93	9.14	8.79
	velocity	5.84	8.79	8.96	9.05	9.23	9.14	9.05	8.87	8.79	8.70	9.22	8.42				
<b>Britt, Jamal (USA) (1998)</b>	time	2.39	3.46	4.50	5.50	6.51	7.52	8.54	9.57	10.62	11.68		13.25	6 / 3			
	reaction time	0.145													3.11	3.04	3.14
	interval	7 steps	1.07	1.04	1.00	1.01	1.01	1.02	1.03	1.05	1.06	1.57			8.82	9.02	8.73
	velocity	5.74	8.54	8.79	9.14	9.05	9.05	8.96	8.87	8.70	8.62	8.93	8.30				
<b>Parchment, Hansle (JAM) (1990)</b>	time	2.41	3.45	4.44	5.43	6.44	7.45	8.46	9.49	10.56	11.63		13.26	4 / 4			
	reaction time	0.135													3.02	3.03	3.17
	interval	7 steps	1.04	0.99	0.99	1.01	1.01	1.01	1.03	1.07	1.07	1.63			9.08	9.05	8.65
	velocity	5.69	8.79	9.23	9.23	9.05	9.05	9.05	8.87	8.54	8.54	8.60	8.30				
<b>Ojora, Tade (GBR) (1999)</b>	time	2.42	3.51	4.54	5.54	6.54	7.55	8.57	9.61	10.66	11.70		13.27	8 / 5			
	reaction time	0.148													3.12	3.03	3.13
	interval	7 steps	1.09	1.03	1.00	1.00	1.01	1.02	1.04	1.05	1.04	1.57			8.79	9.05	8.76
	velocity	5.67	8.39	8.87	9.14	9.14	9.05	8.96	8.79	8.70	8.79	8.93	8.29				
<b>Zeller, Joshua (GBR) (2000)</b>	time	2.49	3.57	4.60	5.61	6.67	7.75	8.81	9.89	10.99	12.10		13.82	1 / 6			
	reaction time	0.144													3.12	3.20	3.29
	interval		1.08	1.03	1.01	1.06	1.08	1.06	1.08	1.10	1.11	1.72			8.79	8.57	8.33
	velocity	5.51	8.46	8.87	9.05	8.62	8.46	8.62	8.46	8.31	8.23	8.15	7.96				
<b>Crittenden, Freddie (USA) (1994)</b>	time	2.39	3.44	4.47	5.50	6.53	7.61	8.78	10.04	11.35	12.67		14.83	2 / 7			
	reaction time	0.132													3.11	3.28	3.89
	interval		1.05	1.03	1.03	1.03	1.08	1.17	1.26	1.31	1.32	2.16			8.82	8.36	7.05
	velocity	5.74	8.70	8.87	8.87	8.87	8.46	7.81	7.25	6.98	6.92	6.49	7.42				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 23 Jul 2023 14:58) - diamond league race analysis

<https://www.omegaitiming.com/File/0002030C01020C0101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=NX9GeRods4g>

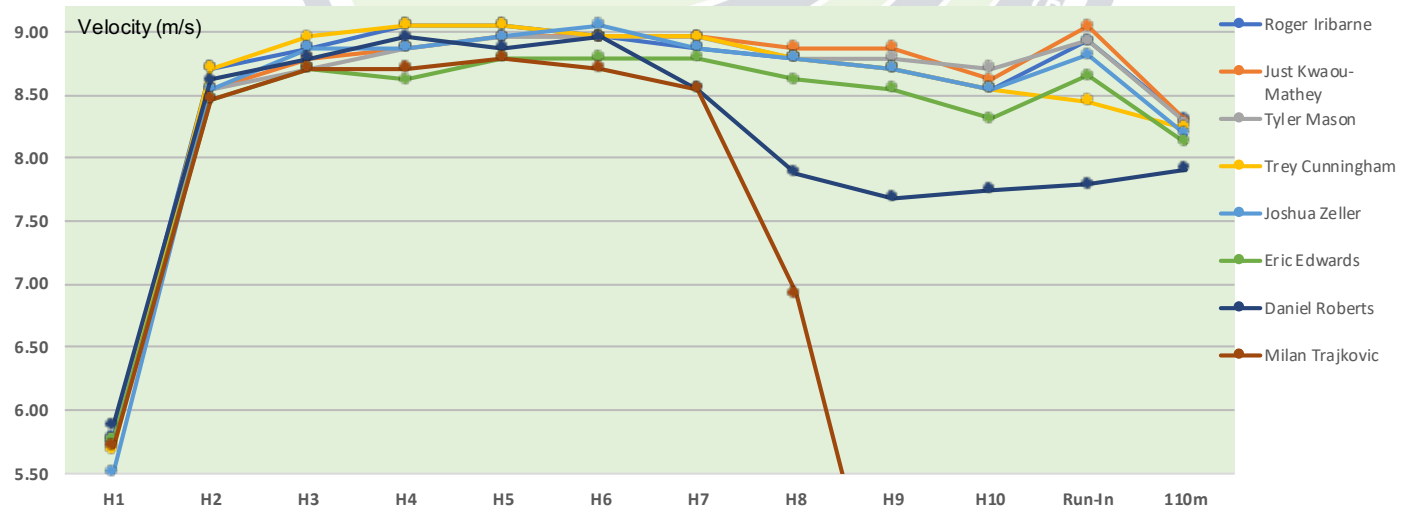
2023 Kamila Skolimowska Memorial (Silesia, POL)

110m Hurdles

Date: 2023.07.16 Wind: 0.3 m/s

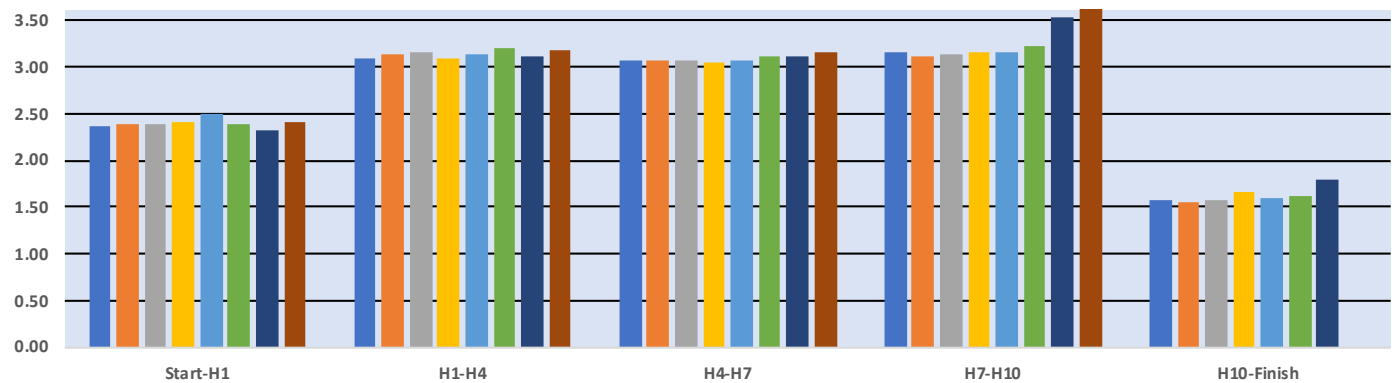
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Iribarne, Roger (CUB) (1996)</b>	time	2.37	3.42	4.45	5.46	6.47	7.49	8.52	9.56	10.61	11.68		13.25	4 / 1			
	reaction time	0.147													3.09	3.06	3.16
	interval	7 steps	1.05	1.03	1.01	1.01	1.02	1.03	1.04	1.05	1.07	1.57			8.87	8.96	8.68
velocity		5.79	8.70	8.87	9.05	9.05	8.96	8.87	8.79	8.70	8.54	8.93	8.30				
<b>Kwaou-Mathey, Just (FRA) (1999)</b>	time	2.39	3.46	4.50	5.53	6.55	7.57	8.59	9.62	10.65	11.71		13.26	7 / 2			
	reaction time	0.157													3.14	3.06	3.12
	interval	7 steps	1.07	1.04	1.03	1.02	1.02	1.02	1.03	1.03	1.06	1.55			8.73	8.96	8.79
velocity		5.74	8.54	8.79	8.87	8.96	8.96	8.96	8.87	8.87	8.62	9.05	8.30				
<b>Mason, Tyler (JAM) (1995)</b>	time	2.38	3.45	4.50	5.53	6.55	7.57	8.59	9.63	10.67	11.72		13.29	5 / 3			
	reaction time	0.138													3.15	3.06	3.13
	interval	7 steps	1.07	1.05	1.03	1.02	1.02	1.02	1.04	1.04	1.05	1.57			8.70	8.96	8.76
velocity		5.76	8.54	8.70	8.87	8.96	8.96	8.96	8.79	8.79	8.70	8.93	8.28				
<b>Cunningham, Trey (USA) (1998)</b>	time	2.41	3.46	4.48	5.49	6.50	7.52	8.54	9.58	10.63	11.70		13.36	3 / 4			
	reaction time	0.147													3.08	3.05	3.16
	interval	7 steps	1.05	1.02	1.01	1.01	1.02	1.02	1.04	1.05	1.07	1.66			8.90	8.99	8.68
velocity		5.69	8.70	8.96	9.05	9.05	8.96	8.96	8.79	8.70	8.54	8.45	8.23				
<b>Zeller, Joshua (GBR) (2000)</b>	time	2.49	3.56	4.59	5.62	6.64	7.65	8.68	9.72	10.77	11.84		13.43	1 / 5			
	reaction time	0.158													3.13	3.06	3.16
	interval		1.07	1.03	1.03	1.02	1.01	1.03	1.04	1.05	1.07	1.59			8.76	8.96	8.68
velocity		5.51	8.54	8.87	8.87	8.96	9.05	8.87	8.79	8.70	8.54	8.82	8.19				
<b>Edwards, Eric (USA) (2000)</b>	time	2.38	3.46	4.51	5.57	6.61	7.65	8.69	9.75	10.82	11.92		13.54	9 / 6			
	reaction time	0.130													3.19	3.12	3.23
	interval		1.08	1.05	1.06	1.04	1.04	1.04	1.06	1.07	1.10	1.62			8.60	8.79	8.49
velocity		5.76	8.46	8.70	8.62	8.79	8.79	8.62	8.54	8.31	8.65	8.12					
<b>Roberts, Daniel (USA) (1998)</b>	time	2.33	3.39	4.43	5.45	6.48	7.50	8.57	9.73	10.92	12.10		13.90	6 / 7			
	reaction time	0.159													3.12	3.12	3.53
	interval		1.06	1.04	1.02	1.03	1.02	1.02	1.07	1.16	1.19	1.18	1.80		8.79	8.79	7.77
velocity		5.89	8.62	8.79	8.96	8.87	8.96	8.54	7.88	7.68	7.75	7.79	7.91				
<b>Trajkovic, Milan (CYP) (1992)</b>	time	2.40	3.48	4.53	5.58	6.62	7.67	8.74	10.06	12.38	20.77			8 / --			
	reaction time	0.159													3.18	3.16	12.03
	interval	7 steps	1.08	1.05	1.05	1.04	1.05	1.07	1.32	2.32	8.39				8.62	8.68	2.28
velocity		5.72	8.46	8.70	8.70	8.79	8.70	8.54	6.92	3.94	1.09						



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 16 Jul 2023 15:53) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030A0102040201FFFFFFFF4D.pdf>

Video: No Video Found

2023 Kamila Skolimowska Memorial (Silesia, POL)

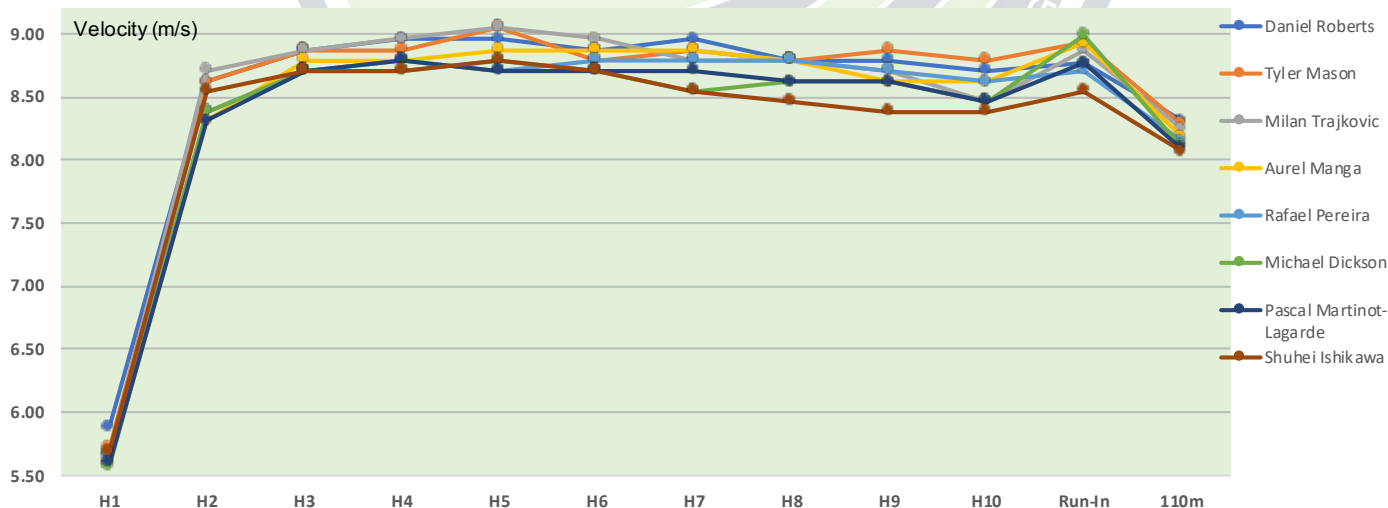
110m Hurdles

Date: 2023.07.16

Wind: -0.2 m/s

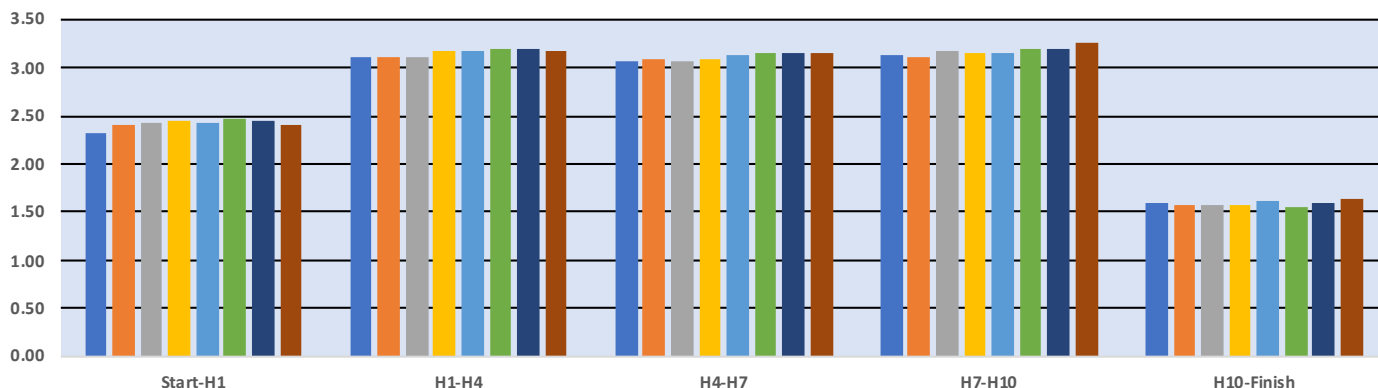
Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Roberts, Daniel (USA) (1998)</b>	time	2.33	3.39	4.42	5.44	6.46	7.49	8.51	9.55	10.59	11.64		13.24	5 / 1			
	reaction time	0.146													3.11	3.07	3.13
	interval		1.06	1.03	1.02	1.02	1.03	1.02	1.04	1.04	1.04	1.05	1.60		8.82	8.93	8.76
	velocity	5.89	8.62	8.87	8.96	8.96	8.87	8.96	8.79	8.79	8.70	8.76	8.31				
<b>Mason, Tyler (JAM) (1995)</b>	time	2.40	3.46	4.49	5.52	6.53	7.57	8.60	9.64	10.67	11.71		13.28	4 / 2			
	reaction time	0.152													3.12	3.08	3.11
	interval		1.06	1.03	1.03	1.01	1.04	1.03	1.04	1.03	1.04	1.57			8.79	8.90	8.82
	velocity	5.72	8.62	8.87	8.87	9.05	8.79	8.87	8.79	8.87	8.79	8.93	8.28				
<b>Trajkovic, Milan (CYP) (1992)</b>	time	2.42	3.47	4.50	5.52	6.53	7.55	8.59	9.63	10.68	11.76		13.34	9 / 3			
	reaction time	0.160													3.10	3.07	3.17
	interval		1.05	1.03	1.02	1.01	1.02	1.04	1.04	1.05	1.08	1.58			8.85	8.93	8.65
	velocity	5.67	8.70	8.87	8.96	9.05	8.96	8.79	8.79	8.70	8.46	8.87	8.25				
<b>Manga, Aurel (FRA) (1992)</b>	time	2.45	3.55	4.59	5.63	6.66	7.69	8.72	9.76	10.82	11.88		13.45	1 / 4			
	reaction time	0.156													3.18	3.09	3.16
	interval		1.10	1.04	1.04	1.03	1.03	1.03	1.04	1.06	1.06	1.57			8.62	8.87	8.68
	velocity	5.60	8.31	8.79	8.79	8.79	8.87	8.87	8.79	8.62	8.62	8.93	8.18				
<b>Pereira, Rafael (BRA) (1997)</b>	time	2.43	3.52	4.57	5.61	6.66	7.70	8.74	9.78	10.83	11.89		13.50	7 / 5			
	reaction time	0.136													3.18	3.13	3.15
	interval		1.09	1.05	1.04	1.05	1.04	1.04	1.04	1.05	1.06	1.61			8.62	8.76	8.70
	velocity	5.65	8.39	8.70	8.79	8.70	8.79	8.79	8.79	8.70	8.62	8.71	8.15				
<b>Dickson, Michael (USA) (1997)</b>	time	2.46	3.55	4.60	5.65	6.69	7.74	8.81	9.87	10.93	12.01		13.57	8 / 6			
	reaction time	0.183													3.19	3.16	3.20
	interval		1.09	1.05	1.05	1.04	1.05	1.07	1.06	1.06	1.08	1.56			8.60	8.68	8.57
	velocity	5.58	8.39	8.70	8.70	8.79	8.70	8.54	8.62	8.62	8.46	8.99	8.11				
<b>Martinot-Lagarde, Pascal (FRA) (1991)</b>	time	2.45	3.55	4.60	5.64	6.69	7.74	8.79	9.85	10.91	11.99		13.59	3 / 7			
	reaction time	0.153													3.19	3.15	3.20
	interval		1.10	1.05	1.04	1.05	1.05	1.05	1.06	1.06	1.08	1.60			8.60	8.70	8.57
	velocity	5.60	8.31	8.70	8.79	8.70	8.70	8.70	8.62	8.62	8.46	8.76	8.09				
<b>Ishikawa, Shuhei (JPN) (1995)</b>	time	2.41	3.48	4.53	5.58	6.62	7.67	8.74	9.82	10.91	12.00		13.64	2 / 8			
	reaction time	0.133													3.17	3.16	3.26
	interval		1.07	1.05	1.05	1.04	1.05	1.07	1.08	1.09	1.09	1.64			8.65	8.68	8.41
	velocity	5.69	8.54	8.70	8.70	8.79	8.70	8.54	8.46	8.39	8.39	8.55	8.06				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 16 Jul 2023 14:43) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030A0102040102FFFFFFFF4D.pdf>

Video: No Video Found

2023 Kamila Skolimowska Memorial (Silesia, POL)

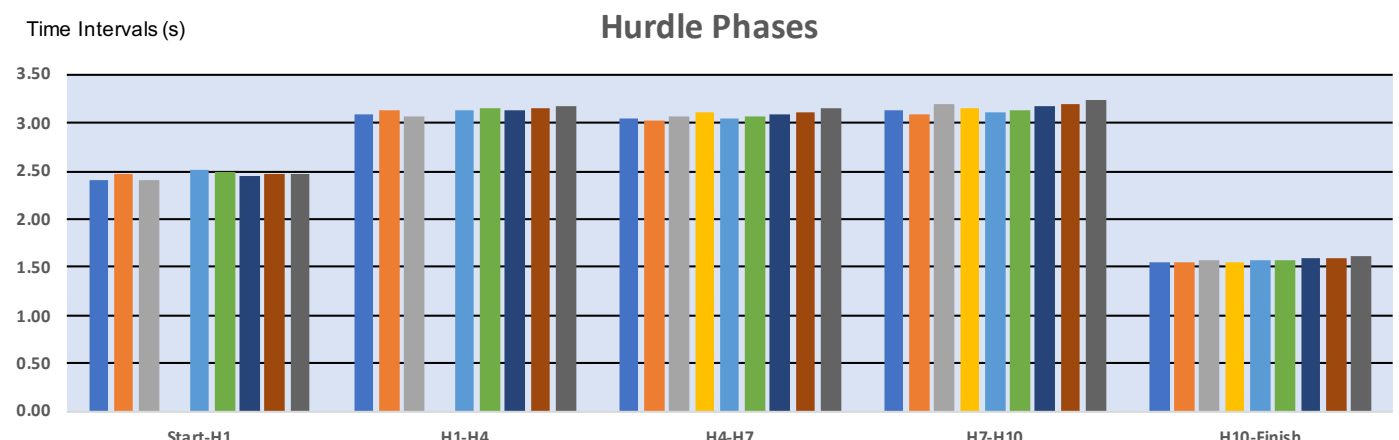
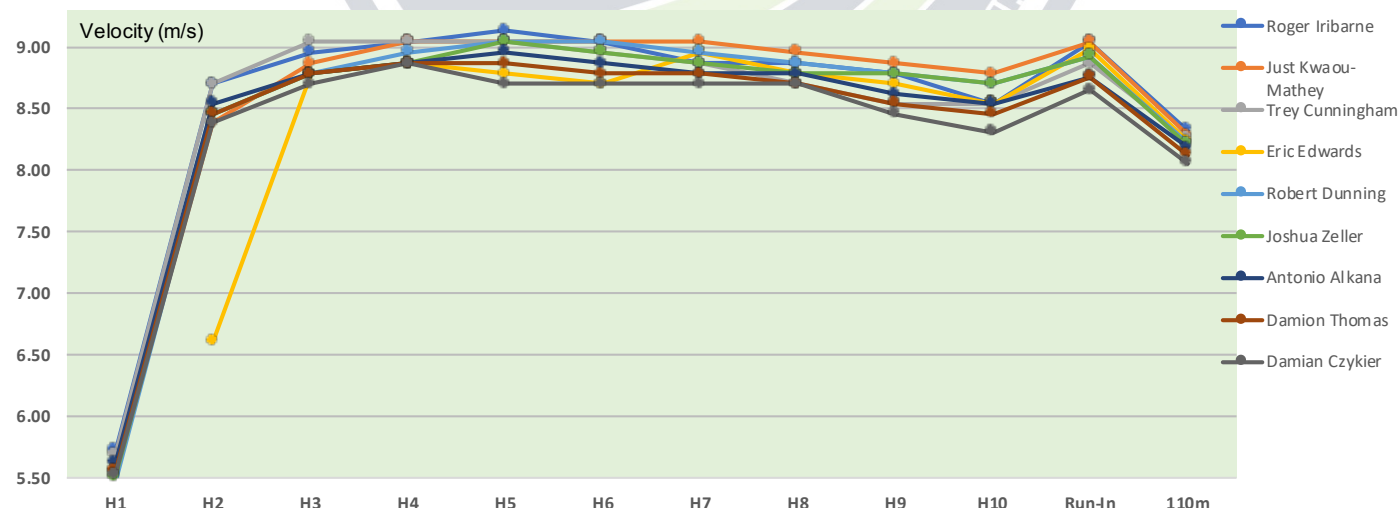
110m Hurdles

Date: 2023.07.16

Wind: 0.3 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
<b>Iribarne, Roger (CUB) (1996)</b>	time	2.40	3.45	4.47	5.48	6.48	7.49	8.52	9.55	10.59	11.66		13.21	2 / 1			
	reaction time	0.157													3.08	3.04	3.14
	interval	7 steps	1.05	1.02	1.01	1.00	1.01	1.03	1.03	1.04	1.07	1.55	PB		8.90	9.02	8.73
	velocity	5.72	8.70	8.96	9.05	9.14	9.05	8.87	8.87	8.79	8.54	9.05	8.33				
<b>Kwaou-Mathey, Just (FRA) (1999)</b>	time	2.47	3.56	4.59	5.60	6.61	7.62	8.63	9.65	10.68	11.72		13.27	6 / 2			
	reaction time	0.169													3.13	3.03	3.09
	interval	7 steps	1.09	1.03	1.01	1.01	1.01	1.01	1.02	1.03	1.04	1.55			8.76	9.05	8.87
	velocity	5.55	8.39	8.87	9.05	9.05	9.05	9.05	8.96	8.87	8.79	9.05	8.29				
<b>Cunningham, Trey (USA) (1998)</b>	time	2.41	3.46	4.47	5.48	6.49	7.51	8.54	9.59	10.66	11.73		13.31	5 / 3			
	reaction time	0.153													3.07	3.06	3.19
	interval	7 steps	1.05	1.01	1.01	1.01	1.02	1.03	1.05	1.07	1.07	1.58			8.93	8.96	8.60
	velocity	5.69	8.70	9.05	9.05	9.05	8.96	8.87	8.70	8.54	8.54	8.87	8.26				
<b>Edwards, Eric (USA) (2000)</b>	time		3.46	4.50	5.53	6.57	7.62	8.64	9.68	10.73	11.80		13.36	3 / 4			
	reaction time	0.137															
	interval		1.04	1.03	1.04	1.05	1.02	1.04	1.05	1.07	1.05	1.56					
	velocity		6.61	8.79	8.87	8.79	8.70	8.96	8.79	8.70	8.54	8.99	8.23			3.11	3.16
<b>Dunning, Robert (USA) (1997)</b>	time	2.51	3.59	4.63	5.65	6.66	7.67	8.69	9.72	10.76	11.81		13.38	4 / 5			
	reaction time	0.140													3.14	3.04	3.12
	interval	7 steps	1.08	1.04	1.02	1.01	1.01	1.02	1.03	1.04	1.05	1.57			8.73	9.02	8.79
	velocity	5.47	8.46	8.79	8.96	9.05	9.05	8.96	8.87	8.79	8.70	8.93	8.22				
<b>Zeller, Joshua (GBR) (2000)</b>	time	2.49	3.57	4.61	5.64	6.65	7.67	8.70	9.74	10.78	11.83		13.40	8 / 6			
	reaction time	0.156													3.15	3.06	3.13
	interval		1.08	1.04	1.03	1.01	1.02	1.03	1.04	1.04	1.05	1.57			8.70	8.96	8.76
	velocity	5.51	8.46	8.79	8.87	9.05	8.96	8.87	8.79	8.79	8.70	8.93	8.21				
<b>Alkana, Antonio (RSA) (1990)</b>	time	2.44	3.51	4.55	5.58	6.60	7.63	8.67	9.71	10.77	11.84		13.44	1 / 7			
	reaction time	0.132													3.14	3.09	3.17
	interval		1.07	1.04	1.03	1.02	1.03	1.04	1.04	1.04	1.06	1.60			8.73	8.87	8.65
	velocity	5.62	8.54	8.79	8.87	8.96	8.87	8.79	8.79	8.62	8.54	8.76	8.18				
<b>Thomas, Damion (JAM) (1999)</b>	time	2.47	3.55	4.59	5.62	6.65	7.69	8.73	9.78	10.85	11.93		13.53	9 / 8			
	reaction time	0.147													3.15	3.11	3.20
	interval	7 steps	1.08	1.04	1.03	1.03	1.04	1.04	1.05	1.07	1.08	1.60			8.70	8.82	8.57
	velocity	5.55	8.46	8.79	8.87	8.87	8.79	8.79	8.70	8.54	8.46	8.76	8.13				
<b>Czykier, Damian (POL) (1992)</b>	time	2.48	3.57	4.62	5.65	6.70	7.75	8.80	9.85	10.93	12.03		13.65	7 / 9			
	reaction time	0.154													3.17	3.15	3.23
	interval	7 steps	1.09	1.05	1.03	1.05	1.05	1.05	1.05	1.08	1.10	1.62			8.65	8.70	8.49
	velocity	5.53	8.39	8.70	8.87	8.70	8.70	8.70	8.70	8.46	8.31	8.65	8.06				



Source: Omega Timing (Sun 16 Jul 2023 14:42) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030A0102040101FFFFFFFFFFFF4D.pdf>

Video: No Video Found

2023 USATF National Championships (Eugene, OR) (TV Analysis)

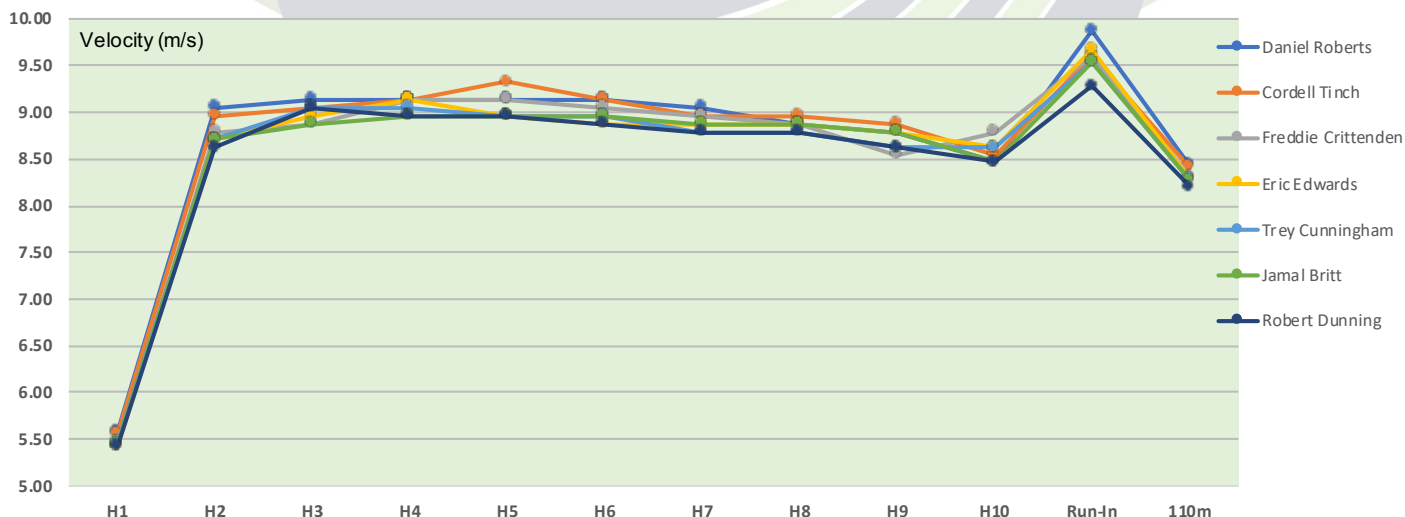
110m Hurdles

Date: 2023.07.09

Wind: -0.2 m/s

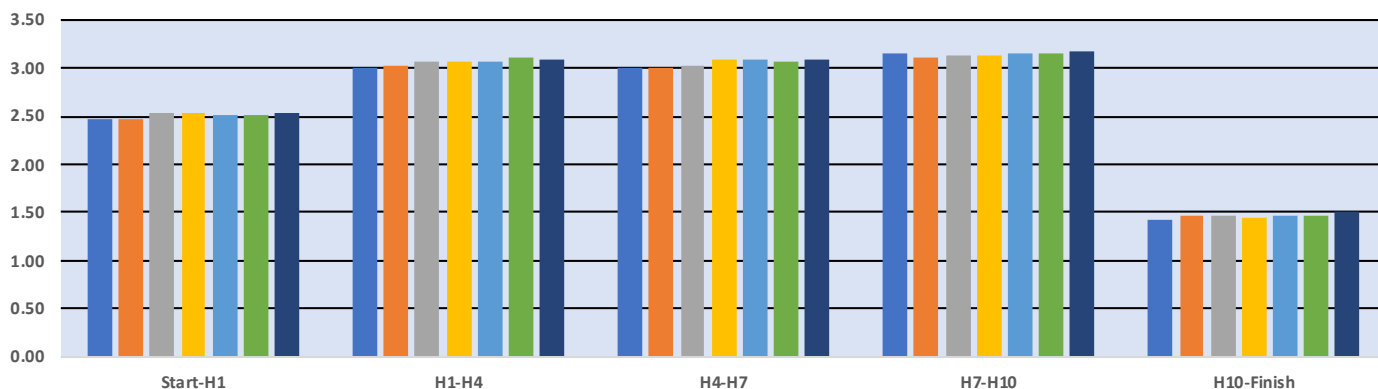
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Roberts, Daniel (USA) (1998)</b>	time	2.46	3.47	4.47	5.47	6.47	7.47	8.48	9.51	10.55	11.63		13.05	6 / 1			
	reaction time		1.01	1.00	1.00	1.00	1.00	1.01	1.03	1.04	1.08	1.42			3.01	3.01	3.15
	velocity	5.58	9.05	9.14	9.14	9.14	9.14	9.05	8.87	8.79	8.46	9.87	8.43		9.11	9.11	8.70
<b>Tinch, Cordell (USA) (2000)</b>	time	2.47	3.49	4.50	5.50	6.48	7.48	8.50	9.52	10.55	11.62		13.08	3 / 2			
	reaction time		1.02	1.01	1.00	0.98	1.00	1.02	1.02	1.03	1.07	1.46			3.03	3.00	3.12
	velocity	5.55	8.96	9.05	9.14	9.33	9.14	8.96	8.96	8.87	8.54	9.60	8.41		9.05	9.14	8.79
<b>Crittenden, Freddie (USA) (1994)</b>	time	2.53	3.57	4.60	5.60	6.60	7.61	8.63	9.66	10.73	11.77		13.23	7 / 3			
	reaction time		1.04	1.03	1.00	1.00	1.01	1.02	1.03	1.07	1.04	1.46			3.07	3.03	3.14
	velocity	5.42	8.79	8.87	9.14	9.14	9.05	8.96	8.87	8.54	8.79	9.60	8.31		8.93	9.05	8.73
<b>Edwards, Eric (USA) (2000)</b>	time	2.53	3.58	4.60	5.60	6.62	7.65	8.68	9.71	10.75	11.81		13.26	1 / 4			
	reaction time		1.05	1.02	1.00	1.02	1.03	1.03	1.03	1.04	1.06	1.45			3.07	3.08	3.13
	velocity	5.42	8.70	8.96	9.14	8.96	8.87	8.87	8.87	8.79	8.62	9.67	8.30		8.93	8.90	8.76
<b>Cunningham, Trey (USA) (1998)</b>	time	2.51	3.56	4.57	5.58	6.60	7.62	8.66	9.70	10.76	11.82		13.29	4 / 5			
	reaction time		1.05	1.01	1.01	1.02	1.02	1.04	1.04	1.06	1.06	1.47			3.07	3.08	3.16
	velocity	5.47	8.70	9.05	9.05	8.96	8.96	8.79	8.79	8.62	8.62	9.54	8.28		8.93	8.90	8.68
<b>Britt, Jamal (USA) (1998)</b>	time	2.52	3.57	4.60	5.62	6.64	7.66	8.69	9.72	10.76	11.84		13.31	8 / 6			
	reaction time		1.05	1.03	1.02	1.02	1.02	1.03	1.03	1.04	1.08	1.47			3.10	3.07	3.15
	velocity	5.44	8.70	8.87	8.96	8.96	8.96	8.87	8.87	8.79	8.46	9.54	8.26		8.85	8.93	8.70
<b>Dunning, Robert (USA) (1997)</b>	time	2.53	3.59	4.60	5.62	6.64	7.67	8.71	9.75	10.81	11.89		13.40	2 / 7			
	reaction time		1.06	1.01	1.02	1.02	1.03	1.04	1.04	1.06	1.08	1.51			3.09	3.09	3.18
	velocity	5.42	8.62	9.05	8.96	8.96	8.87	8.79	8.79	8.62	8.46	9.28	8.21		8.87	8.87	8.62



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=NUzI-Bexx7b4>



2023 Jamaican National Championships (Kingston, JAM) (TV Analysis)

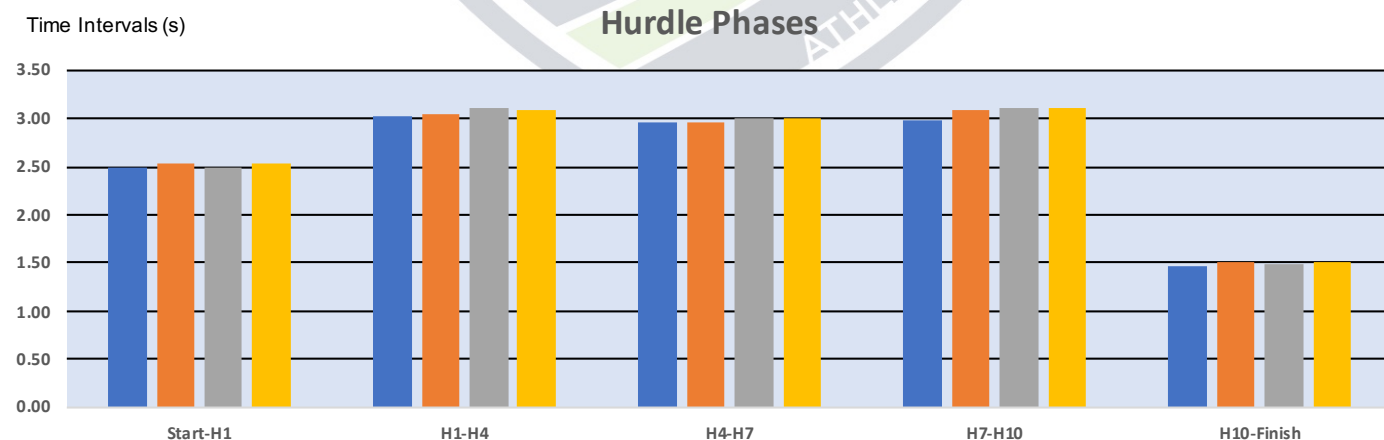
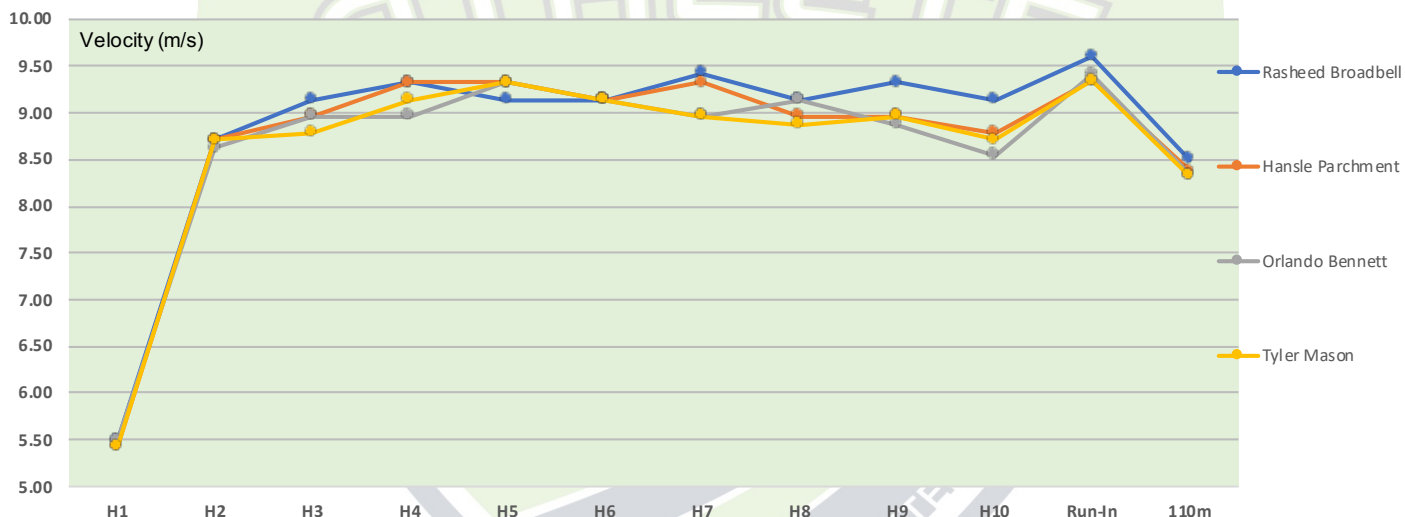
110m Hurdles

Date: 2023.07.09

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
<b>Broadbell, Rasheed (JAM) (2000)</b>	time	2.50	3.55	4.55	5.53	6.53	7.53	8.50	9.50	10.48	11.48	12.94	13.12	3/1			
	reaction time		7 steps	1.05	1.00	0.98	1.00	1.00	0.97	1.00	0.98	1.00	1.46	PB	3.03	2.97	2.98
	velocity	5.49	8.70	9.14	9.33	9.14	9.14	9.42	9.14	9.33	9.14	9.60	8.50		9.05	9.23	9.20
<b>Parchment, Hansle (JAM) (1990)</b>	time	2.53	3.58	4.60	5.58	6.56	7.56	8.54	9.56	10.58	11.62	13.12	13.19	4/2			
	reaction time		7 steps	1.05	1.02	0.98	0.98	1.00	0.98	1.02	1.02	1.04	1.50		3.05	2.96	3.08
	velocity	5.42	8.70	8.96	9.33	9.33	9.14	9.33	8.96	8.96	8.79	9.35	8.38		8.99	9.26	8.90
<b>Bennett, Orlando (JAM) (1999)</b>	time	2.50	3.56	4.58	5.60	6.58	7.58	8.60	9.60	10.63	11.70	13.19	13.19	6/3			
	reaction time		1.06	1.02	1.02	0.98	1.00	1.02	1.00	1.03	1.07	1.49	8.34		3.10	3.00	3.10
	velocity	5.49	8.62	8.96	8.96	9.33	9.14	8.96	9.14	8.87	8.54	9.41	8.34		8.85	9.14	8.85
<b>Mason, Tyler (JAM) (1995)</b>	time	2.53	3.58	4.62	5.62	6.60	7.60	8.62	9.65	10.67	11.72	13.22	13.22	5/4			
	reaction time		7 steps	1.05	1.04	1.00	0.98	1.00	1.02	1.03	1.02	1.05	1.50		3.09	3.00	3.10
	velocity	5.42	8.70	8.79	9.14	9.33	9.14	8.96	8.87	8.96	8.70	9.35	8.32		8.87	9.14	8.85



Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: First Movement  
 Source: <https://www.youtube.com/watch?v=AccCvbSf3eg>

2023 Athletissima (Lausanne, SUI)

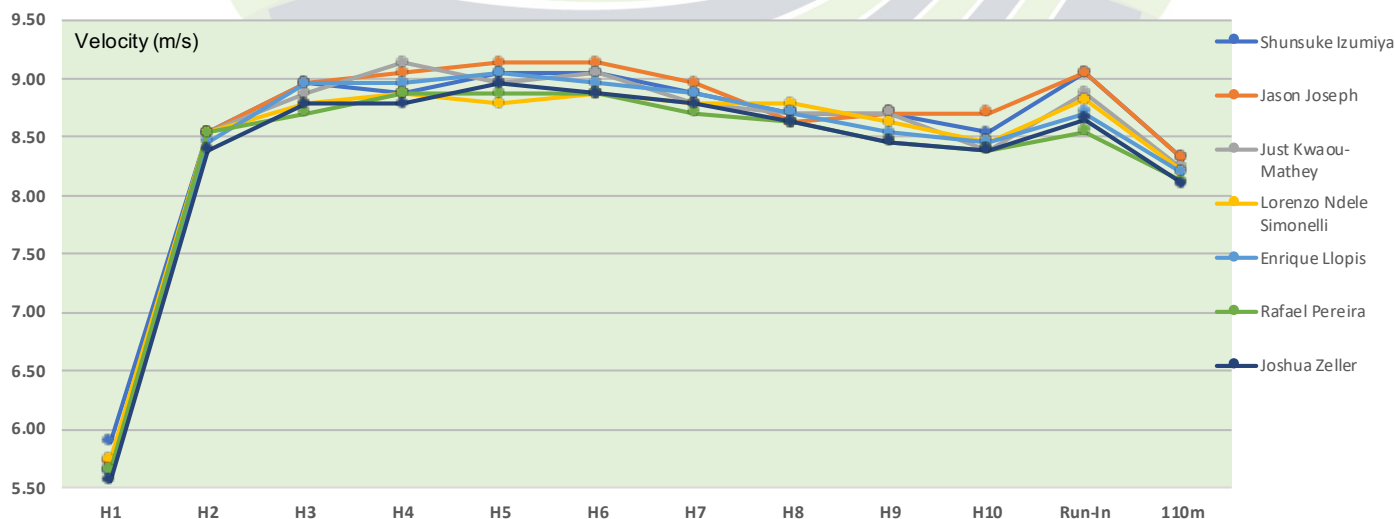
110m Hurdles

Date: 2023.06.30

Wind: -1.0 m/s

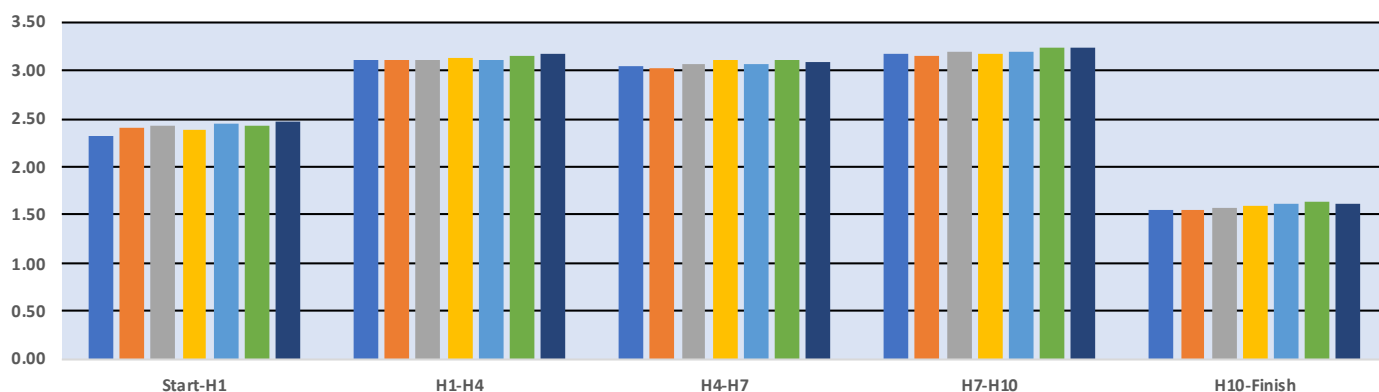
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Izumiya, Shunsuke (JPN) (2000)</b>	time	2.33	3.40	4.42	5.45	6.46	7.47	8.50	9.55	10.60	11.67		13.22	4 / 1			
	reaction time	0.101													3.12	3.05	3.17
	interval velocity	7 steps	1.07	1.02	1.03	1.01	1.01	1.03	1.05	1.05	1.07	1.55			8.79	8.99	8.65
<b>Joseph, Jason (SUI) (1998)</b>	time	2.40	3.47	4.49	5.50	6.50	7.50	8.52	9.58	10.63	11.68		13.23	5 / 2			
	reaction time	0.153													3.10	3.02	3.16
	interval velocity	7 steps	1.07	1.02	1.01	1.00	1.00	1.02	1.06	1.05	1.05	1.55			8.85	9.08	8.68
<b>Kwaou-Mathey, Just (FRA) (1999)</b>	time	2.43	3.50	4.53	5.53	6.55	7.56	8.60	9.65	10.70	11.79		13.37	3 / 3			
	reaction time	0.134													3.10	3.07	3.19
	interval velocity	7 steps	1.07	1.03	1.00	1.02	1.01	1.04	1.05	1.05	1.09	1.58			8.85	8.93	8.60
<b>Simonelli, Lorenzo Ndele (ITA) (2002)</b>	time	2.39	3.46	4.50	5.53	6.57	7.60	8.64	9.68	10.74	11.82		13.41	1 / 4			
	reaction time	0.136													3.14	3.11	3.18
	interval velocity	7 steps	1.07	1.04	1.03	1.04	1.03	1.04	1.04	1.06	1.08	1.59			8.73	8.82	8.62
<b>Llopis, Enrique (ESP) (2000)</b>	time	2.44	3.52	4.54	5.56	6.57	7.59	8.62	9.67	10.74	11.82		13.43	7 / 5			
	reaction time	0.135													3.12	3.06	3.20
	interval velocity	7 steps	1.08	1.02	1.02	1.01	1.02	1.03	1.05	1.07	1.08	1.61			8.79	8.96	8.57
<b>Pereira, Rafael (BRA) (1997)</b>	time	2.43	3.50	4.55	5.58	6.61	7.64	8.69	9.75	10.83	11.92		13.56	2 / 6			
	reaction time	0.153													3.15	3.11	3.23
	interval velocity	5.65	8.54	8.70	8.87	8.87	8.87	8.70	8.62	8.46	8.39	8.55	8.11		8.70	8.82	8.49
<b>Zeller, Joshua (GBR) (2000)</b>	time	2.47	3.56	4.60	5.64	6.66	7.69	8.73	9.79	10.87	11.96		13.58	8 / 7			
	reaction time	0.153													3.17	3.09	3.23
	interval velocity	5.55	8.39	8.79	8.79	8.96	8.87	8.79	8.62	8.46	8.39	8.65	8.10		8.65	8.87	8.49



Time Intervals (s)

Hurdle Phases

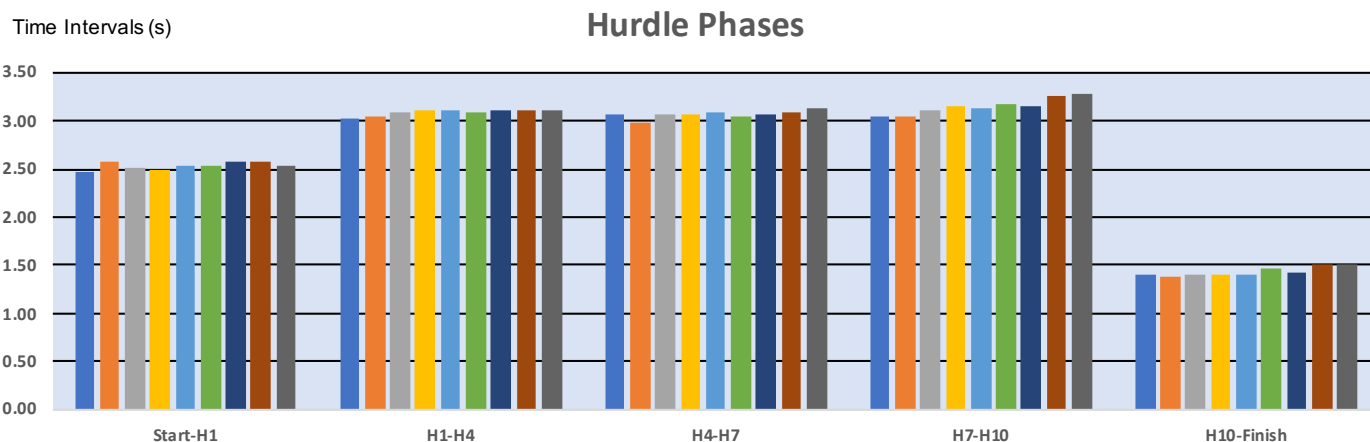
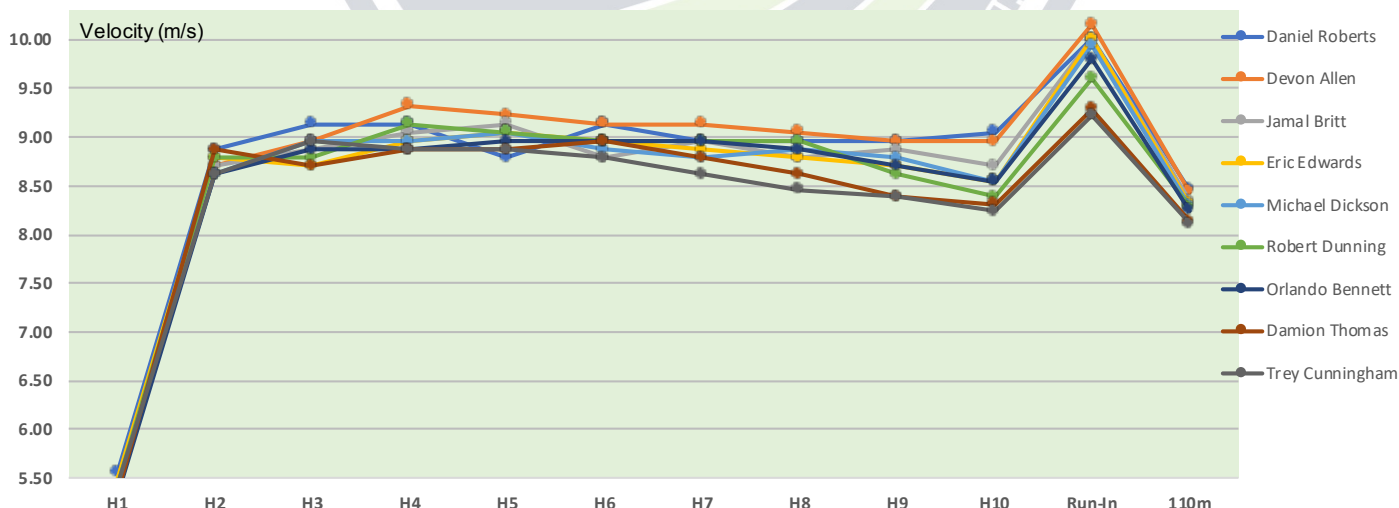


Source: Omega Timing (Fri 30 Jun 2023 20:23) - diamond league race analysis  
<https://www.omegatiming.com/File/000203080102070101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=E-fSK01c-40>

2023 USATF New York City Grand Prix (Randalls Island, NY) (TV Analysis)

110m Hurdles		Date: 2023.06.24	Wind: 1.6 m/s										FINAL				
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Roberts, Daniel (USA) (1998)</b>	time	2.47	3.50	4.50	5.50	6.54	7.54	8.56	9.58	10.60	11.61		13.01	3/1			
	reaction time	0.159													3.03	3.06	3.05
	interval		1.03	1.00	1.00	1.04	1.00	1.02	1.02	1.02	1.01	1.40			9.05	8.96	8.99
	velocity		5.55	8.87	9.14	9.14	8.79	9.14	8.96	8.96	9.05	10.01	8.46				
<b>Allen, Devon (USA) (1994)</b>	time	2.57	3.62	4.64	5.62	6.61	7.61	8.61	9.62	10.64	11.66		13.04	5/2			
	reaction time	0.173													3.05	2.99	3.05
	interval		7 steps 1.05	1.02	0.98	0.99	1.00	1.00	1.01	1.02	1.02	1.38			8.99	9.17	8.99
	velocity		5.34	8.70	8.96	9.33	9.23	9.14	9.14	9.05	8.96	8.96	10.16	8.44			
<b>Britt, Jamal (USA) (1998)</b>	time	2.52	3.57	4.60	5.61	6.61	7.65	8.67	9.71	10.74	11.79		13.19	7/3			
	reaction time	0.169													3.09	3.06	3.12
	interval		7 steps 1.05	1.03	1.01	1.00	1.04	1.02	1.04	1.03	1.05	1.40			8.87	8.96	8.79
	velocity		5.44	8.70	8.87	9.05	9.14	8.79	8.96	8.79	8.87	8.70	10.01	8.34			
<b>Edwards, Eric (USA) (2000)</b>	time	2.50	3.54	4.59	5.61	6.62	7.64	8.67	9.71	10.76	11.83		13.23	8/4			
	reaction time	0.127													3.11	3.06	3.16
	interval		1.04	1.05	1.02	1.01	1.02	1.03	1.04	1.05	1.07	1.40			8.82	8.96	8.68
	velocity		5.49	8.79	8.70	8.96	9.05	8.96	8.87	8.79	8.70	8.54	10.01	8.31			
<b>Dickson, Michael (USA) (1997)</b>	time	2.53	3.59	4.61	5.63	6.64	7.67	8.71	9.74	10.78	11.85		13.26	1/5			
	reaction time	0.212													3.10	3.08	3.14
	interval		7 steps 1.06	1.02	1.02	1.01	1.03	1.04	1.03	1.04	1.07	1.41			8.85	8.90	8.73
	velocity		5.42	8.62	8.96	8.96	9.05	8.87	8.79	8.87	8.79	8.54	9.94	8.30			
<b>Dunning, Robert (USA) (1997)</b>	time	2.53	3.57	4.61	5.61	6.62	7.64	8.66	9.68	10.74	11.83		13.29	6/6			
	reaction time	0.181													3.08	3.05	3.17
	interval		7 steps 1.04	1.04	1.00	1.01	1.02	1.02	1.02	1.06	1.09	1.46			8.90	8.99	8.65
	velocity		5.42	8.79	8.79	9.14	9.05	8.96	8.96	8.62	8.39	9.60	8.28				
<b>Bennett, Orlando (JAM) (1999)</b>	time	2.58	3.64	4.67	5.70	6.72	7.74	8.76	9.79	10.84	11.91		13.34	2/7			
	reaction time	0.150													3.12	3.06	3.15
	interval		1.06	1.03	1.03	1.02	1.02	1.02	1.03	1.05	1.07	1.43			8.79	8.96	8.70
	velocity		5.32	8.62	8.87	8.87	8.96	8.96	8.96	8.87	8.70	8.54	9.80	8.25			
<b>Thomas, Damion (JAM) (1999)</b>	time	2.57	3.60	4.65	5.68	6.71	7.73	8.77	9.83	10.92	12.02		13.53	9/8			
	reaction time	0.163													3.11	3.09	3.25
	interval		7 steps 1.03	1.05	1.03	1.03	1.02	1.04	1.06	1.09	1.10	1.51			8.82	8.87	8.44
	velocity		5.34	8.87	8.70	8.87	8.87	8.96	8.79	8.62	8.39	8.31	9.28	8.13			
<b>Cunningham, Trey (USA) (1998)</b>	time	2.53	3.59	4.61	5.64	6.67	7.71	8.77	9.85	10.94	12.05		13.57	4/9			
	reaction time	0.157													3.11	3.13	3.28
	interval		7 steps 1.06	1.02	1.03	1.03	1.04	1.06	1.08	1.09	1.11	1.52			8.82	8.76	8.36
	velocity		5.42	8.62	8.96	8.87	8.87	8.79	8.62	8.46	8.39	8.23	9.22	8.11			



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

2023 NCAA Championships (Austin, TX) (TV Analysis)

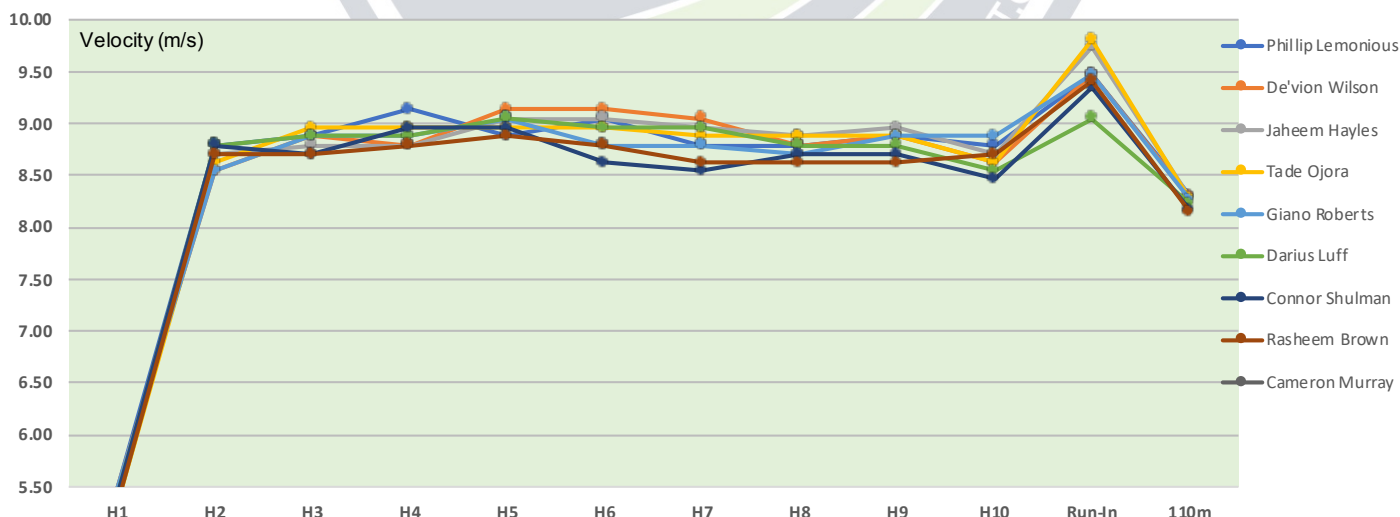
110m Hurdles

Date: 2023.06.09

Wind: 1.8 m/s

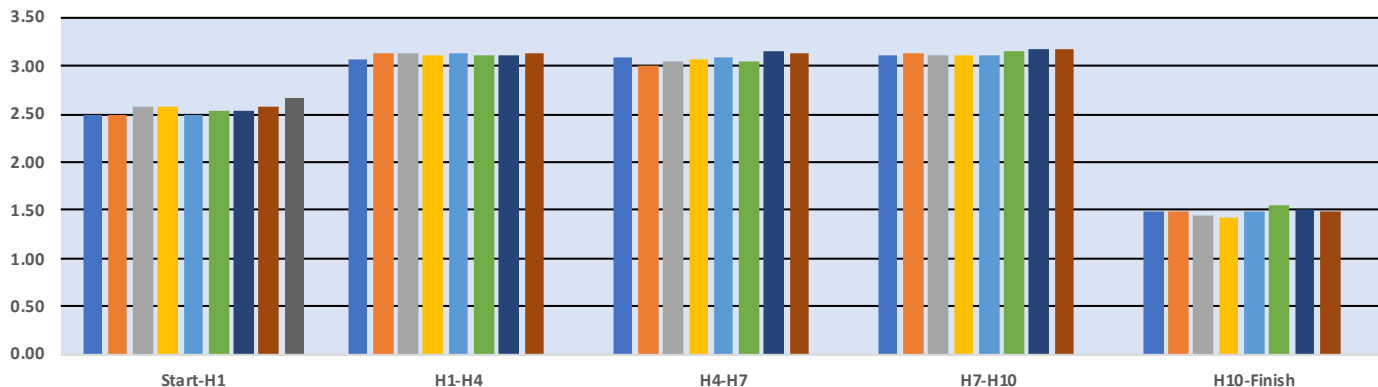
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Lemonious, Phillip (JAM) (1998)</b>	time	2.50	3.54	4.57	5.57	6.60	7.61	8.65	9.69	10.72	11.76		13.24	5/1			
	reaction time														3.07	3.08	3.11
	interval	7 steps	1.04	1.03	1.00	1.03	1.01	1.04	1.04	1.03	1.04	1.48			8.93	8.90	8.82
	velocity	5.49	8.79	8.87	9.14	8.87	9.05	8.79	8.79	8.87	8.79	9.47	8.31				
<b>Wilson, De'vion (USA) (2000)</b>	time	2.50	3.57	4.60	5.64	6.64	7.64	8.65	9.69	10.72	11.78		13.26	2/2			
	reaction time														3.14	3.01	3.13
	interval	7 steps	1.07	1.03	1.04	1.00	1.00	1.01	1.04	1.03	1.06	1.48	PB		8.73	9.11	8.76
	velocity	5.49	8.54	8.87	8.79	9.14	9.14	9.05	8.79	8.87	8.62	9.47	8.30				
<b>Hayles, Jaheem (JAM) (2001)</b>	time	2.57	3.62	4.66	5.70	6.71	7.72	8.74	9.77	10.79	11.84		13.28	9/3			
	reaction time														3.13	3.04	3.10
	interval		1.05	1.04	1.04	1.01	1.01	1.02	1.03	1.02	1.05	1.44	PB		8.76	9.02	8.85
	velocity	5.34	8.70	8.79	8.79	9.05	9.05	8.96	8.87	8.87	8.96	8.70	9.74	8.28			
<b>Ojora, Tade (GBR) (1999)</b>	time	2.57	3.63	4.65	5.67	6.69	7.71	8.74	9.77	10.80	11.86		13.29	3/4			
	reaction time														3.10	3.07	3.12
	interval	7 steps	1.06	1.02	1.02	1.02	1.02	1.03	1.03	1.03	1.06	1.43	PB		8.85	8.93	8.79
	velocity	5.34	8.62	8.96	8.96	8.96	8.96	8.87	8.87	8.87	8.62	9.80	8.28				
<b>Roberts, Giano (JAM) (2000)</b>	time	2.50	3.57	4.60	5.63	6.64	7.68	8.72	9.77	10.80	11.83		13.31	7/5			
	reaction time														3.13	3.09	3.11
	interval		1.07	1.03	1.03	1.01	1.04	1.04	1.05	1.03	1.03	1.48	PB		8.76	8.87	8.82
	velocity	5.49	8.54	8.87	8.87	9.05	8.79	8.79	8.70	8.87	8.87	9.47	8.26				
<b>Luff, Darius (USA) (2001)</b>	time	2.53	3.57	4.60	5.63	6.64	7.66	8.68	9.72	10.76	11.83		13.38	8/6			
	reaction time														3.10	3.05	3.15
	interval		1.04	1.03	1.03	1.01	1.02	1.02	1.04	1.04	1.07	1.55			8.85	8.99	8.70
	velocity	5.42	8.79	8.87	8.87	9.05	8.96	8.96	8.79	8.79	8.54	9.05	8.22				
<b>Shulman, Connor (USA) (2001)</b>	time	2.53	3.57	4.62	5.64	6.66	7.72	8.79	9.84	10.89	11.97		13.47	6/7			
	reaction time														3.11	3.15	3.18
	interval	7 steps	1.04	1.05	1.02	1.02	1.06	1.07	1.05	1.05	1.08	1.50			8.82	8.70	8.62
	velocity	5.42	8.79	8.70	8.96	8.96	8.62	8.54	8.70	8.70	8.46	9.35	8.17				
<b>Brown, Rasheem (CAY) (2000)</b>	time	2.57	3.62	4.67	5.71	6.74	7.78	8.84	9.90	10.96	12.01		13.50	1/8			
	reaction time														3.14	3.13	3.17
	interval		1.05	1.05	1.04	1.03	1.04	1.06	1.06	1.06	1.06	1.05	1.49	PB	8.73	8.76	8.65
	velocity	5.34	8.70	8.70	8.79	8.87	8.79	8.62	8.62	8.62	8.70	9.41	8.15				
<b>Murray, Cameron (USA) (1999)</b>	time	2.67											dnf	4/--			
	reaction time																
	interval	7 steps															
	velocity	5.14															



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=J5li-ZfGDfE>

2023 Meeting de Paris (Paris, FRA)

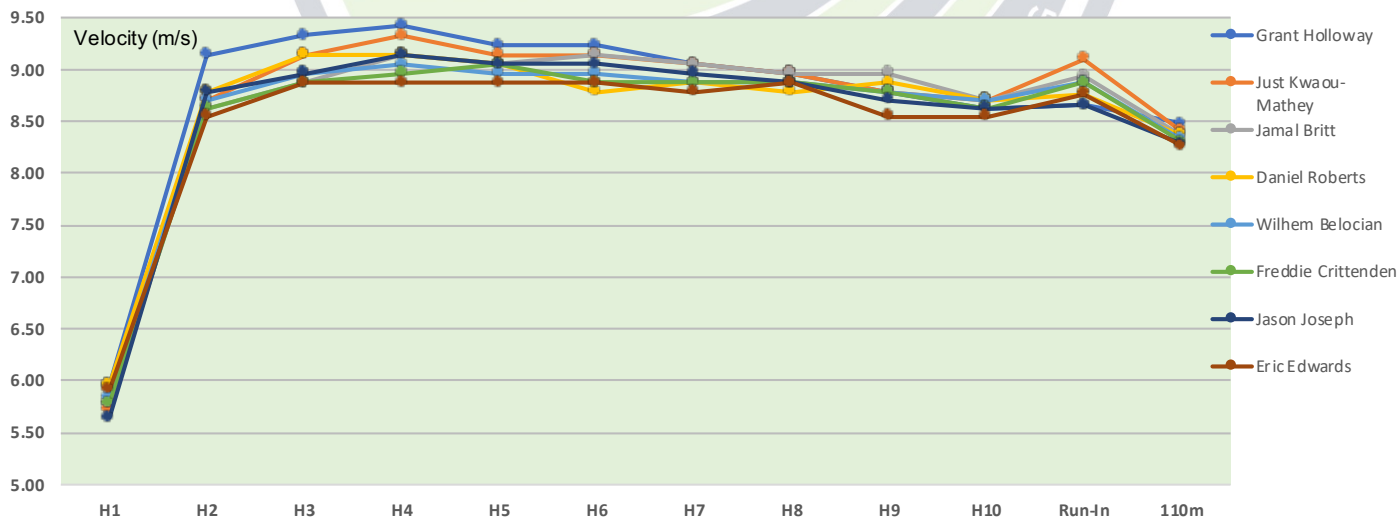
110m Hurdles

Date: 2023.06.09

Wind: -0.5 m/s

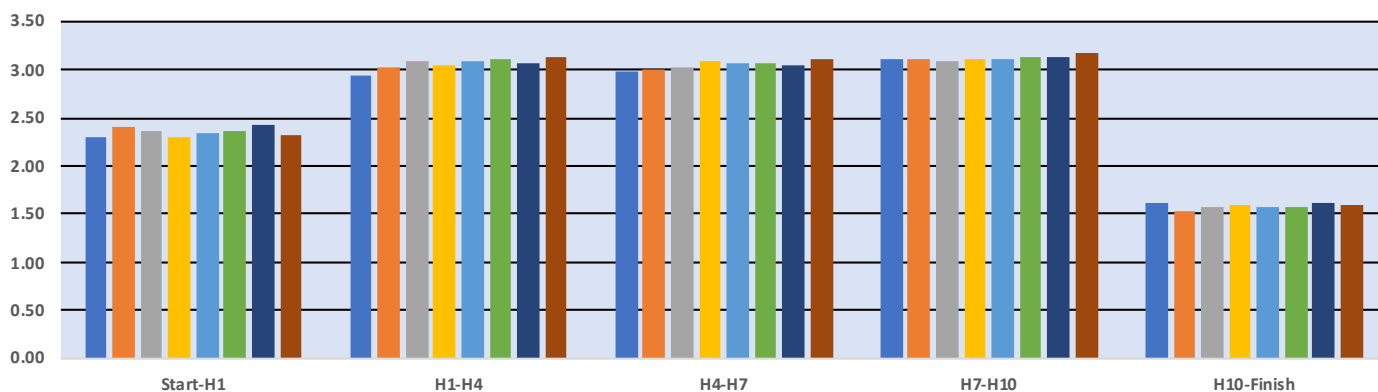
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Holloway, Grant (USA) (1997)</b>	time	2.30	3.30	4.28	5.25	6.24	7.23	8.24	9.26	10.30	11.36		12.98	6 / 1			
	reaction time	0.157													2.95	2.99	3.12
	interval		7 steps	1.00	0.98	0.97	0.99	0.99	1.01	1.02	1.04	1.06	1.62		9.29	9.17	8.79
	velocity	5.97	9.14	9.33	9.42	9.23	9.23	9.05	8.96	8.79	8.62	8.65	8.47				
<b>Kwaou-Mathey, Just (FRA) (1999)</b>	time	2.40	3.45	4.45	5.43	6.43	7.43	8.44	9.46	10.50	11.55		13.09	7 / 2			
	reaction time	0.171													3.03	3.01	3.11
	interval		7 steps	1.05	1.00	0.98	1.00	1.00	1.01	1.02	1.04	1.05	1.54		9.05	9.11	8.82
	velocity	5.72	8.70	9.14	9.33	9.14	9.14	9.05	8.96	8.79	8.70	9.10	8.40				
<b>Britt, Jamal (USA) (1998)</b>	time	2.37	3.43	4.46	5.46	6.47	7.47	8.48	9.50	10.52	11.57		13.14	5 / 3			
	reaction time	0.141													3.09	3.02	3.09
	interval		7 steps	1.06	1.03	1.00	1.01	1.00	1.01	1.02	1.02	1.05	1.57		8.87	9.08	8.87
	velocity	5.79	8.62	8.87	9.14	9.05	9.14	9.05	8.96	8.96	8.70	8.93	8.37				
<b>Roberts, Daniel (USA) (1998)</b>	time	2.30	3.34	4.34	5.34	6.35	7.39	8.42	9.46	10.49	11.54		13.14	4 / 3			
	reaction time	0.154													3.04	3.08	3.12
	interval		1.04	1.00	1.00	1.01	1.04	1.03	1.04	1.03	1.05	1.60		9.02	8.90	8.79	
	velocity	5.97	8.79	9.14	9.14	9.05	8.79	8.87	8.79	8.87	8.70	8.76	8.37				
<b>Belocian, Wilhem (FRA) (1995)</b>	time	2.35	3.40	4.42	5.43	6.45	7.47	8.50	9.53	10.57	11.62		13.20	8 / 5			
	reaction time	0.142													3.08	3.07	3.12
	interval		1.05	1.02	1.01	1.02	1.02	1.03	1.03	1.04	1.05	1.58		8.90	8.93	8.79	
	velocity	5.84	8.70	8.96	9.05	8.96	8.96	8.87	8.87	8.79	8.70	8.87	8.33				
<b>Crittenden, Freddie (USA) (1994)</b>	time	2.37	3.43	4.46	5.48	6.49	7.52	8.55	9.58	10.62	11.68		13.26	2 / 6			
	reaction time	0.136													3.11	3.07	3.13
	interval		1.06	1.03	1.02	1.01	1.03	1.03	1.03	1.04	1.06	1.58		8.82	8.93	8.76	
	velocity	5.79	8.62	8.87	8.96	9.05	8.87	8.87	8.87	8.79	8.62	8.87	8.30				
<b>Joseph, Jason (SUI) (1998)</b>	time	2.43	3.47	4.49	5.49	6.50	7.51	8.53	9.56	10.61	11.67		13.29	3 / 7			
	reaction time	0.195													3.06	3.04	3.14
	interval		7 steps	1.04	1.02	1.00	1.01	1.01	1.02	1.03	1.05	1.06	1.62		8.96	9.02	8.73
	velocity	5.65	8.79	8.96	9.14	9.05	9.05	8.96	8.87	8.70	8.62	8.65	8.28				
<b>Edwards, Eric (USA) (2000)</b>	time	2.32	3.39	4.42	5.45	6.48	7.51	8.55	9.58	10.65	11.72		13.32	1 / 8			
	reaction time	0.130													3.13	3.10	3.17
	interval		1.07	1.03	1.03	1.03	1.03	1.03	1.04	1.03	1.07	1.07	1.60		8.76	8.85	8.65
	velocity	5.91	8.54	8.87	8.87	8.87	8.87	8.79	8.87	8.54	8.54	8.76	8.26				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 9 Jun 2023 22:02) - diamond league race analysis  
<https://www.omegatiming.com/File/000203060101050201FFFFFFFFFFFF4D.pdf>

Video: [https://www.youtube.com/watch?v=lr\\_NsqvV0-I](https://www.youtube.com/watch?v=lr_NsqvV0-I)

2023 Meeting de Paris (Paris, FRA)

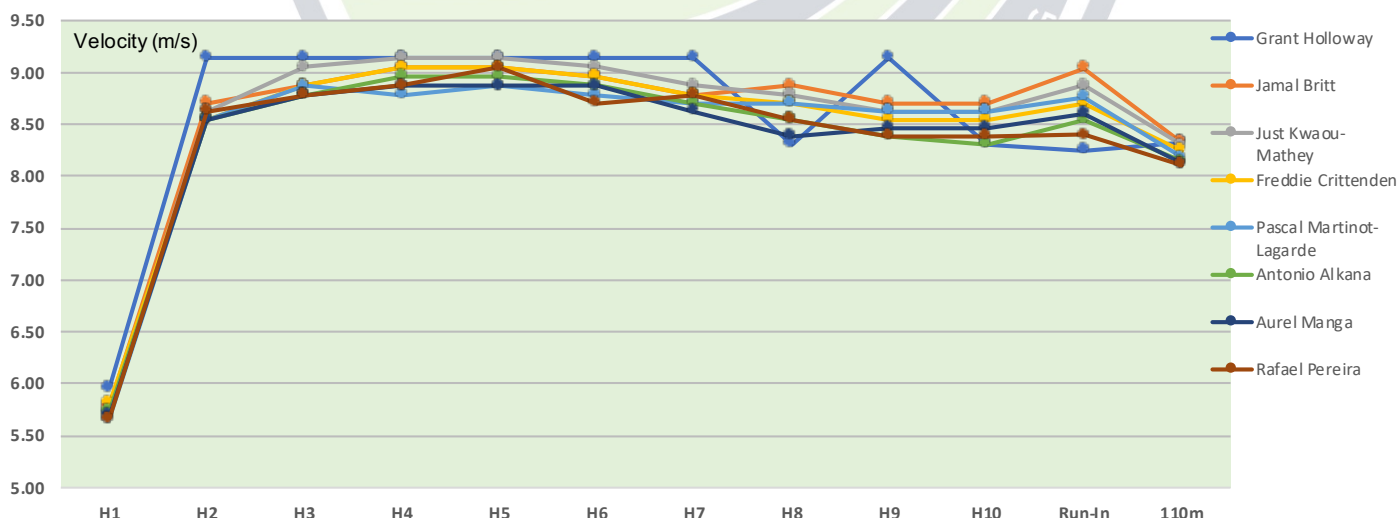
110m Hurdles

Date: 2023.06.09

Wind: -0.6 m/s

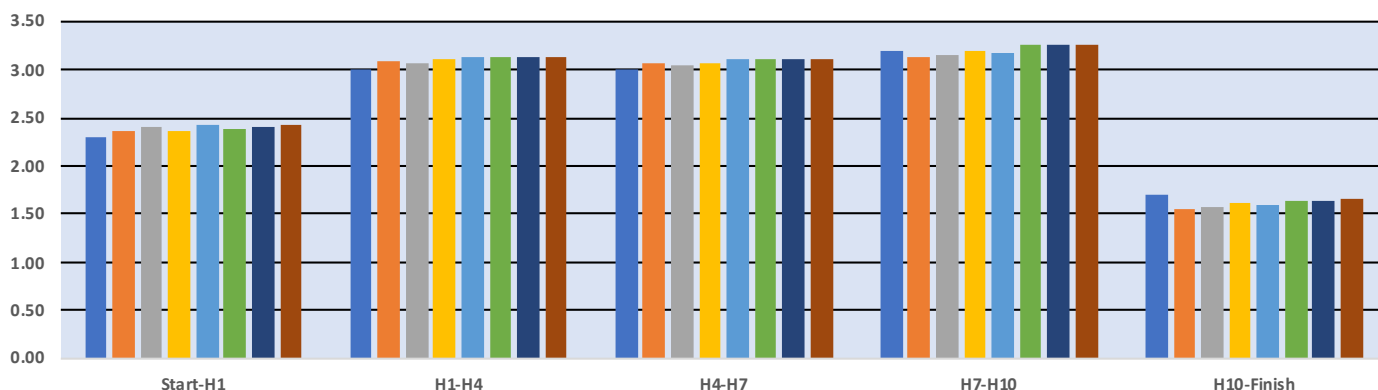
Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Holloway, Grant (USA) (1997)</b>	time	2.30	3.30	4.30	5.30	6.30	7.30	8.30	9.40	10.40	11.50		13.20	6 / 1			
	reaction time	0.147													3.00	3.00	3.20
	interval	7 steps	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.00	1.10	1.70			9.14	9.14	8.57
velocity		5.97	9.14	9.14	9.14	9.14	9.14	9.14	8.31	9.14	8.31	8.25	8.33				
<b>Britt, Jamal (USA) (1998)</b>	time	2.37	3.42	4.45	5.46	6.47	7.49	8.53	9.56	10.61	11.66		13.21	4 / 2			
	reaction time	0.136													3.09	3.07	3.13
	interval	7 steps	1.05	1.03	1.01	1.01	1.02	1.04	1.03	1.05	1.05	1.55			8.87	8.93	8.76
velocity		5.79	8.70	8.87	9.05	9.05	8.96	8.79	8.87	8.70	8.70	9.05	8.33				
<b>Kwaou-Mathey, Just (FRA) (1999)</b>	time	2.40	3.46	4.47	5.47	6.47	7.48	8.51	9.55	10.61	11.67		13.25	5 / 3			
	reaction time	0.171													3.07	3.04	3.16
	interval	7 steps	1.06	1.01	1.00	1.00	1.01	1.03	1.04	1.06	1.06	1.58	<b>PB</b>		8.93	9.02	8.68
velocity		5.72	8.62	9.05	9.14	9.14	9.05	8.87	8.79	8.62	8.62	8.87	8.30				
<b>Crittenden, Freddie (USA) (1994)</b>	time	2.36	3.43	4.46	5.47	6.48	7.50	8.54	9.59	10.66	11.73		13.34	7 / 4			
	reaction time	0.136													3.11	3.07	3.19
	interval		1.07	1.03	1.01	1.01	1.02	1.04	1.05	1.07	1.07	1.61			8.82	8.93	8.60
velocity		5.81	8.54	8.87	9.05	9.05	8.96	8.79	8.70	8.54	8.54	8.71	8.25				
<b>Martinot-Lagarde, Pascal (FRA) (1991)</b>	time	2.42	3.49	4.52	5.56	6.59	7.63	8.68	9.73	10.79	11.85		13.45	3 / 5			
	reaction time	0.156													3.14	3.12	3.17
	interval	7 steps	1.07	1.03	1.04	1.03	1.04	1.05	1.05	1.06	1.06	1.60			8.73	8.79	8.65
velocity		5.67	8.54	8.87	8.79	8.87	8.79	8.70	8.70	8.62	8.62	8.76	8.18				
<b>Alkana, Antonio (RSA) (1990)</b>	time	2.39	3.46	4.50	5.52	6.54	7.57	8.62	9.69	10.78	11.88		13.52	2 / 6			
	reaction time	0.114													3.13	3.10	3.26
	interval		1.07	1.04	1.02	1.02	1.03	1.05	1.07	1.09	1.10	1.64			8.76	8.85	8.41
velocity		5.74	8.54	8.79	8.96	8.96	8.87	8.70	8.54	8.39	8.31	8.55	8.14				
<b>Manga, Aurel (FRA) (1992)</b>	time	2.41	3.48	4.52	5.55	6.58	7.61	8.67	9.76	10.84	11.92		13.55	1 / 7			
	reaction time	0.163													3.14	3.12	3.25
	interval	7 steps	1.07	1.04	1.03	1.03	1.03	1.06	1.09	1.08	1.08	1.63			8.73	8.79	8.44
velocity		5.69	8.54	8.79	8.87	8.87	8.87	8.62	8.39	8.46	8.46	8.60	8.12				
<b>Pereira, Rafael (BRA) (1997)</b>	time	2.42	3.48	4.52	5.55	6.56	7.61	8.65	9.72	10.81	11.90		13.57	8 / 8			
	reaction time	0.149													3.13	3.10	3.25
	interval		1.06	1.04	1.03	1.01	1.05	1.04	1.07	1.09	1.09	1.67			8.76	8.85	8.44
velocity		5.67	8.62	8.79	8.87	9.05	8.70	8.79	8.54	8.39	8.39	8.40	8.11				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 9 Jun 2023 20:31) - diamond league race analysis  
<https://www.omegatiming.com/File/000203060101050102FFFFFFFFF4D.pdf>

Video: No Video Found

2023 Meeting de Paris (Paris, FRA)

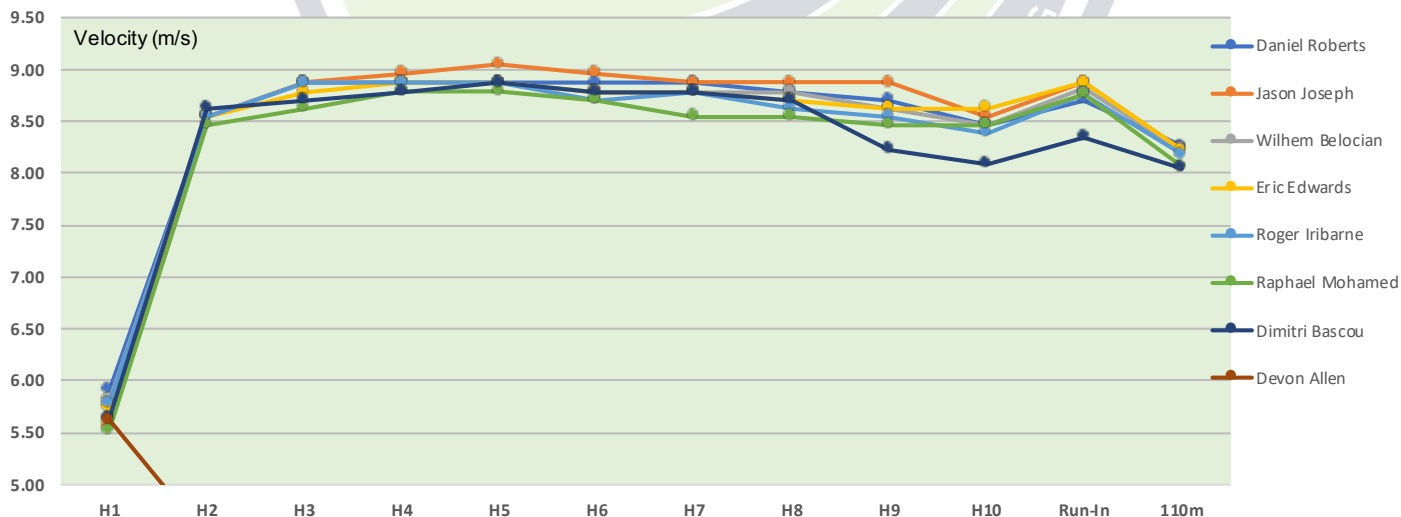
110m Hurdles

Date: 2023.06.09

Wind: -2.0 m/s

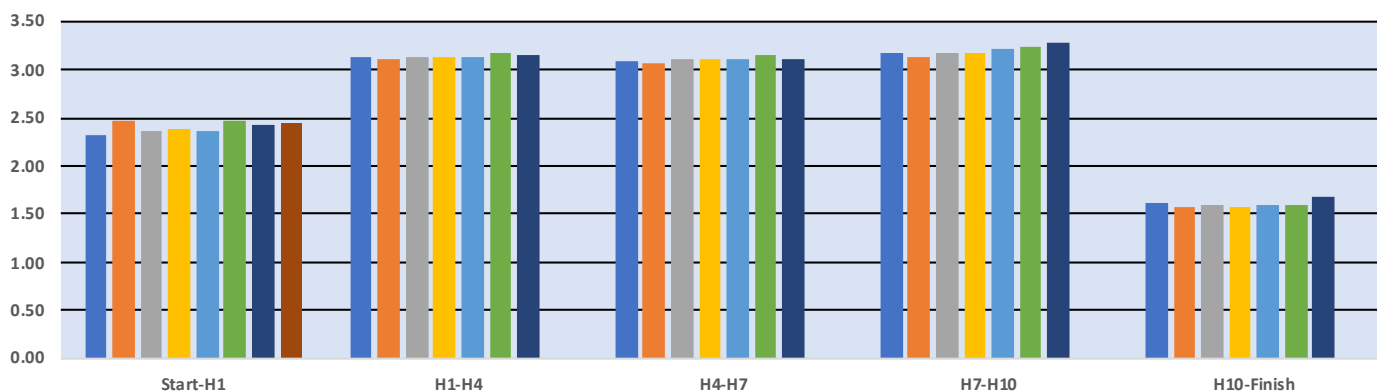
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Roberts, Daniel (USA) (1998)</b>	time	2.32	3.39	4.42	5.45	6.48	7.51	8.54	9.58	10.63	11.71		13.32	3 / 1			
	reaction time	0.153													3.13	3.09	3.17
	interval		1.07	1.03	1.03	1.03	1.03	1.03	1.03	1.04	1.05	1.08	1.61		8.76	8.87	8.65
	velocity	5.91	8.54	8.87	8.87	8.87	8.87	8.87	8.79	8.70	8.46	8.71	8.26				
<b>Joseph, Jason (SUI) (1998)</b>	time	2.47	3.54	4.57	5.59	6.60	7.62	8.65	9.68	10.71	11.78		13.36	4 / 2			
	reaction time	0.201													3.12	3.06	3.13
	interval		7 steps 1.07	1.03	1.02	1.01	1.02	1.03	1.03	1.03	1.07	1.58			8.79	8.96	8.76
	velocity	5.55	8.54	8.87	8.96	9.05	8.96	8.87	8.87	8.87	8.87	8.54	8.87	8.23			
<b>Belocian, Wilhem (FRA) (1995)</b>	time	2.36	3.43	4.46	5.49	6.52	7.56	8.60	9.64	10.70	11.78		13.37	6 / 3			
	reaction time	0.129													3.13	3.11	3.18
	interval		1.07	1.03	1.03	1.03	1.04	1.04	1.04	1.06	1.08	1.59			8.76	8.82	8.62
	velocity	5.81	8.54	8.87	8.87	8.87	8.79	8.79	8.79	8.62	8.46	8.82	8.23				
<b>Edwards, Eric (USA) (2000)</b>	time	2.39	3.46	4.50	5.53	6.56	7.60	8.64	9.69	10.75	11.81		13.39	2 / 4			
	reaction time	0.149													3.14	3.11	3.17
	interval		1.07	1.04	1.03	1.03	1.04	1.04	1.05	1.06	1.06	1.58			8.73	8.82	8.65
	velocity	5.74	8.54	8.79	8.87	8.87	8.79	8.79	8.70	8.62	8.62	8.87	8.22				
<b>Iribarne, Roger (CUB) (1996)</b>	time	2.37	3.44	4.47	5.50	6.53	7.58	8.62	9.68	10.75	11.84		13.44	7 / 5			
	reaction time	0.152													3.13	3.12	3.22
	interval		7 steps 1.07	1.03	1.03	1.03	1.05	1.04	1.06	1.07	1.09	1.60			8.76	8.79	8.52
	velocity	5.79	8.54	8.87	8.87	8.87	8.70	8.79	8.62	8.54	8.39	8.76	8.18				
<b>Mohamed, Raphael (FRA) (1998)</b>	time	2.48	3.56	4.62	5.66	6.70	7.75	8.82	9.89	10.97	12.05		13.65	1 / 6			
	reaction time	0.165													3.18	3.16	3.23
	interval		7 steps 1.08	1.06	1.04	1.04	1.05	1.07	1.07	1.08	1.08	1.60			8.62	8.68	8.49
	velocity	5.53	8.46	8.62	8.79	8.79	8.70	8.54	8.54	8.46	8.46	8.76	8.06				
<b>Bascou, Dimitri (FRA) (1987)</b>	time	2.43	3.49	4.54	5.58	6.61	7.65	8.69	9.74	10.85	11.98		13.66	8 / 7			
	reaction time	0.162													3.15	3.11	3.29
	interval		7 steps 1.06	1.05	1.04	1.03	1.04	1.04	1.05	1.11	1.13	1.68			8.70	8.82	8.33
	velocity	5.65	8.62	8.70	8.79	8.87	8.79	8.79	8.70	8.23	8.09	8.35	8.05				
<b>Allen, Devon (USA) (1994)</b>	time	2.44	4.48										dnf	5 / --			
	reaction time	0.140															
	interval		7 steps 2.04														
	velocity	5.62	4.48														



Time Intervals (s)

Hurdle Phases

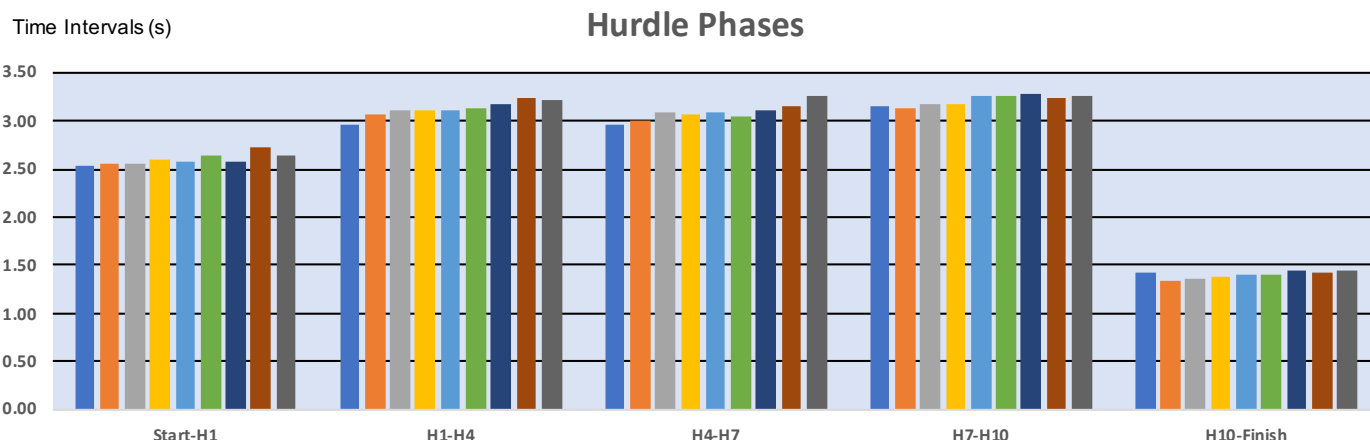
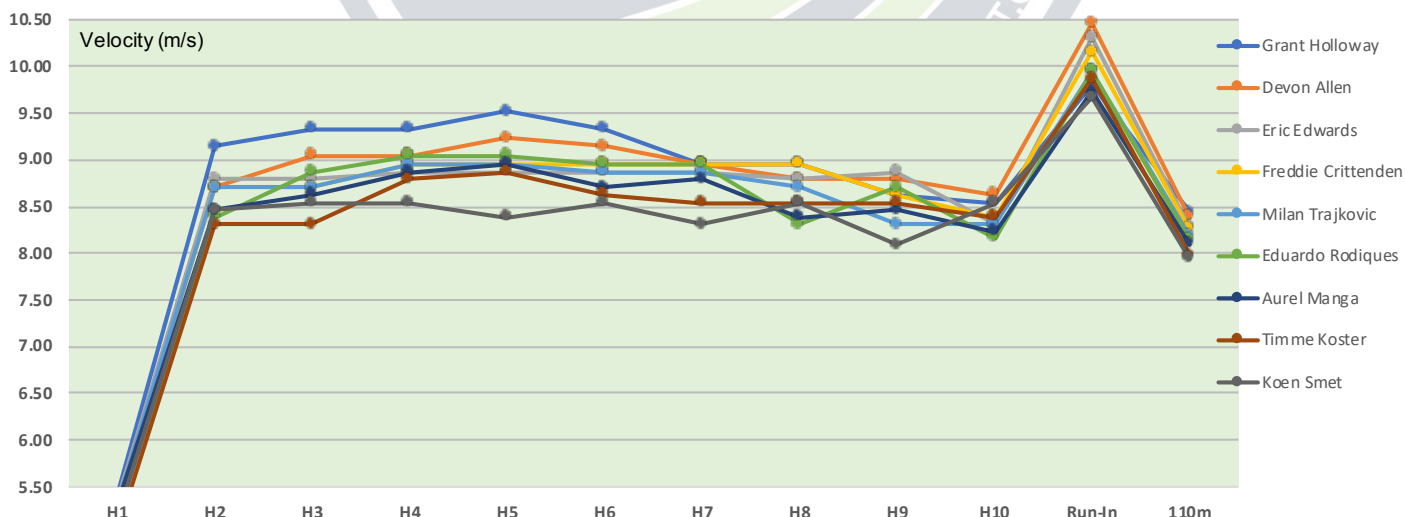


Source: Omega Timing (Fri 9 Jun 2023 20:30) - diamond league race analysis  
<https://www.omegatiming.com/File/000203060101050101FFFFFFFFFFFF4D.pdf>

Video: No Video Found

2023 FBK Games (Hengelo, NED) (TV Analysis)

110m Hurdles		Date: 2023.06.04	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
<b>Holloway, Grant (USA) (1997)</b>	time	2.53	3.53	4.51	5.49	6.45	7.43	8.45	9.47	10.53	11.60		13.03	6 / 1			
	reaction time	0.187													2.96	2.96	3.15
	interval	7 steps	1.00	0.98	0.98	0.96	0.98	1.02	1.02	1.06	1.07	1.43			9.26	9.26	8.70
	velocity	5.42	9.14	9.33	9.33	9.52	9.33	8.96	8.96	8.62	8.54	9.80	8.44				
<b>Allen, Devon (USA) (1994)</b>	time	2.56	3.61	4.62	5.63	6.62	7.62	8.64	9.68	10.72	11.78		13.12	5 / 2			
	reaction time	0.137													3.07	3.01	3.14
	interval	7 steps	1.05	1.01	1.01	0.99	1.00	1.02	1.04	1.06	1.34				8.93	9.11	8.73
	velocity	5.36	8.70	9.05	9.05	9.23	9.14	8.96	8.79	8.79	8.62	10.46	8.38				
<b>Edwards, Eric (USA) (2000)</b>	time	2.56	3.60	4.64	5.67	6.70	7.73	8.76	9.80	10.83	11.93		13.29	3 / 3			
	reaction time	0.129													3.11	3.09	3.17
	interval		1.04	1.04	1.03	1.03	1.03	1.03	1.04	1.03	1.10	1.36			8.82	8.87	8.65
	velocity	5.36	8.79	8.79	8.87	8.87	8.87	8.87	8.79	8.87	8.31	10.31	8.28				
<b>Crittenden, Freddie (USA) (1994)</b>	time	2.60	3.65	4.70	5.72	6.74	7.76	8.78	9.80	10.86	11.95		13.33	4 / 4			
	reaction time	0.145													3.12	3.06	3.17
	interval		1.05	1.05	1.02	1.02	1.02	1.02	1.02	1.06	1.09	1.38			8.79	8.96	8.65
	velocity	5.28	8.70	8.70	8.96	8.96	8.96	8.96	8.96	8.62	8.39	10.16	8.25				
<b>Trajkovic, Milan (CYP) (1992)</b>	time	2.58	3.63	4.68	5.70	6.72	7.75	8.78	9.83	10.93	12.03		13.44	2 / 5			
	reaction time	0.117													3.12	3.08	3.25
	interval	7 steps	1.05	1.05	1.02	1.02	1.03	1.03	1.05	1.10	1.10	1.41			8.79	8.90	8.44
	velocity	5.32	8.70	8.70	8.96	8.96	8.87	8.87	8.70	8.31	8.31	9.94	8.18				
<b>Rodriques, Eduardo (BRA) (1995)</b>	time	2.65	3.74	4.77	5.78	6.79	7.81	8.83	9.93	10.98	12.10		13.51	7 / 6			
	reaction time	0.149													3.13	3.05	3.27
	interval	7 steps	1.09	1.03	1.01	1.01	1.02	1.10	1.10	1.05	1.12	1.41			8.76	8.99	8.39
	velocity	5.18	8.39	8.87	9.05	8.96	8.96	8.96	8.31	8.70	8.16	9.94	8.14				
<b>Manga, Aurel (FRA) (1992)</b>	time	2.58	3.66	4.72	5.75	6.77	7.82	8.86	9.95	11.03	12.14		13.58	8 / 7			
	reaction time	0.151													3.17	3.11	3.28
	interval	7 steps	1.08	1.06	1.03	1.02	1.05	1.04	1.09	1.08	1.11	1.44			8.65	8.82	8.36
	velocity	5.32	8.46	8.62	8.87	8.96	8.70	8.79	8.39	8.46	8.23	9.74	8.10				
<b>Koster, Timme (NED) (2002)</b>	time	2.73	3.83	4.93	5.97	7.00	8.06	9.13	10.20	11.27	12.36		13.78	1 / 8			
	reaction time	0.157													3.24	3.16	3.23
	interval		1.10	1.10	1.04	1.03	1.06	1.07	1.07	1.07	1.09	1.42			8.46	8.68	8.49
	velocity	5.03	8.31	8.31	8.79	8.87	8.62	8.54	8.54	8.54	8.39	9.87	7.98				
<b>Smet, Koen (NED) (1992)</b>	time	2.65	3.73	4.80	5.87	6.96	8.03	9.13	10.20	11.33	12.40		13.85	9 / 9			
	reaction time	0.147													3.22	3.26	3.27
	interval		1.08	1.07	1.07	1.09	1.07	1.10	1.07	1.13	1.07	1.45			8.52	8.41	8.39
	velocity	5.18	8.46	8.54	8.54	8.39	8.54	8.31	8.54	8.09	8.54	9.67	7.94				

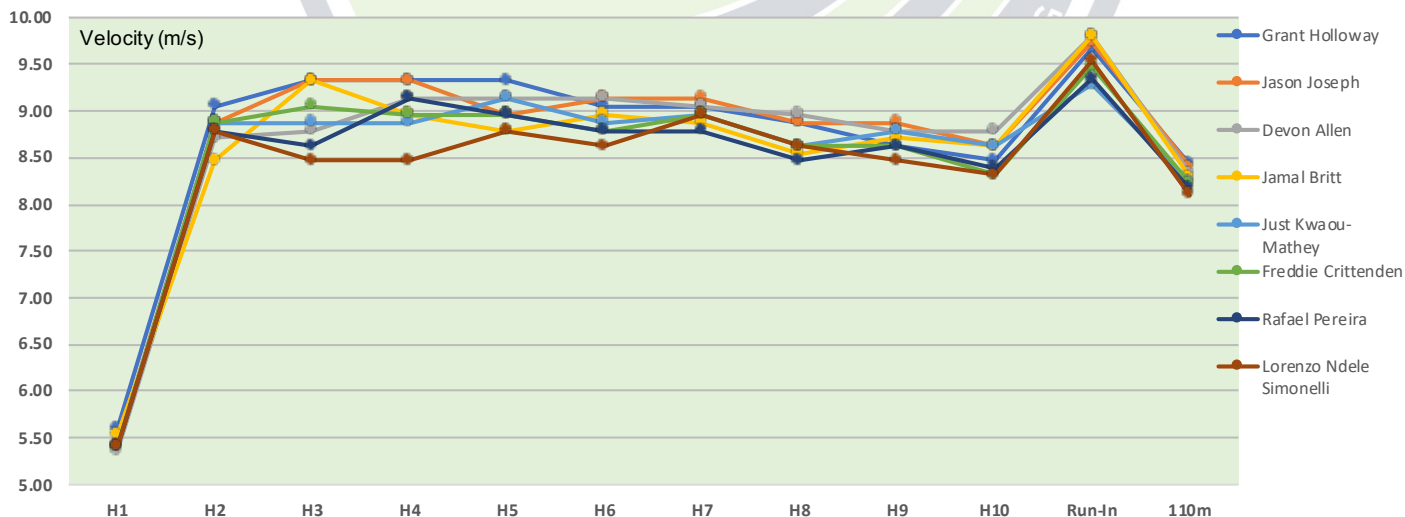


Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1280 x 720 @ 30fps  
 Timing From: First Movement  
 Source: <https://www.youtube.com/watch?v=s1ydEfrTLQ>



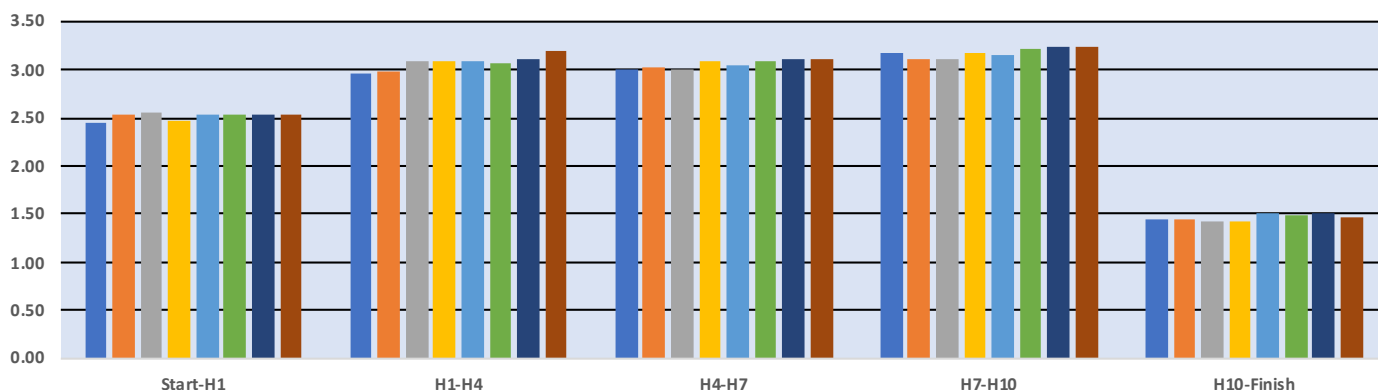
2023 Golden Gala Pietro Mennea (Firenze, ITA) (TV Analysis)

110m Hurdles		Date: 2023.06.02	Wind: -0.2 m/s										FINAL				
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.45	3.46	4.44	5.42	6.40	7.41	8.42	9.45	10.51	11.59	13.04	13.04	6 / 1			
	reaction time	0.152													2.97	3.00	3.17
	interval	7 steps	1.01	0.98	0.98	0.98	1.01	1.01	1.03	1.06	1.08	1.45			9.23	9.14	8.65
	velocity	5.60	9.05	9.33	9.33	9.33	9.05	9.05	8.87	8.62	8.46	9.67	8.44				
Joseph, Jason (SUI) (1998)	time	2.53	3.56	4.54	5.52	6.54	7.54	8.54	9.57	10.60	11.66	13.10	13.10	3 / 2			
	reaction time	0.164													2.99	3.02	3.12
	interval	7 steps	1.03	0.98	0.98	1.02	1.00	1.00	1.03	1.03	1.06	1.44			9.17	9.08	8.79
	velocity	5.42	8.87	9.33	9.33	8.96	9.14	9.14	8.87	8.87	8.62	9.74	8.40				
Allen, Devon (USA) (1994)	time	2.56	3.61	4.65	5.65	6.65	7.65	8.66	9.68	10.72	11.76	13.19	13.19	5 / 3			
	reaction time	0.136													3.09	3.01	3.10
	interval	7 steps	1.05	1.04	1.00	1.00	1.00	1.01	1.02	1.04	1.04	1.43			8.87	9.11	8.85
	velocity	5.36	8.70	8.79	9.14	9.14	9.14	9.05	8.96	8.79	8.79	9.80	8.34				
Britt, Jamal (USA) (1998)	time	2.48	3.56	4.54	5.56	6.60	7.62	8.65	9.72	10.77	11.83	13.26	13.26	7 / 4			
	reaction time	0.134													3.08	3.09	3.18
	interval	7 steps	1.08	0.98	1.02	1.04	1.02	1.03	1.07	1.05	1.06	1.43			8.90	8.87	8.62
	velocity	5.53	8.46	9.33	8.96	8.79	8.96	8.87	8.54	8.70	8.62	9.80	8.30				
Kwaou-Mathey, Just (FRA) (1999)	time	2.54	3.57	4.60	5.63	6.63	7.66	8.68	9.74	10.78	11.84	13.35	13.35	1 / 5			
	reaction time	0.161													3.09	3.05	3.16
	interval	7 steps	1.03	1.03	1.03	1.00	1.03	1.02	1.06	1.04	1.06	1.51			8.87	8.99	8.68
	velocity	5.40	8.87	8.87	8.87	9.14	8.87	8.96	8.62	8.79	8.62	9.28	8.24				
Crittenden, Freddie (USA) (1994)	time	2.54	3.57	4.58	5.60	6.62	7.66	8.68	9.74	10.80	11.90	13.38	13.38	4 / 6			
	reaction time	0.132													3.06	3.08	3.22
	interval	7 steps	1.03	1.01	1.02	1.02	1.04	1.02	1.06	1.06	1.10	1.48			8.96	8.90	8.52
	velocity	5.40	8.87	9.05	8.96	8.96	8.79	8.96	8.62	8.62	8.31	9.47	8.22				
Pereira, Rafael (BRA) (1997)	time	2.54	3.58	4.64	5.64	6.66	7.70	8.74	9.82	10.88	11.97	13.47	13.47	2 / 7			
	reaction time	0.145													3.10	3.10	3.23
	interval	7 steps	1.04	1.06	1.00	1.02	1.04	1.04	1.08	1.06	1.09	1.50			8.85	8.85	8.49
	velocity	5.40	8.79	8.62	9.14	8.96	8.79	8.79	8.46	8.62	8.39	9.35	8.17				
Simonelli, Lorenzo Ndele (ITA) (2002)	time	2.54	3.58	4.66	5.74	6.78	7.84	8.86	9.92	11.00	12.10	13.57	13.57	8 / 8			
	reaction time	0.153													3.20	3.12	3.24
	interval	7 steps	1.04	1.08	1.08	1.04	1.06	1.02	1.06	1.08	1.10	1.47			8.57	8.79	8.46
	velocity	5.40	8.79	8.46	8.46	8.79	8.62	8.96	8.62	8.46	8.31	9.54	8.11				



Time Intervals (s)

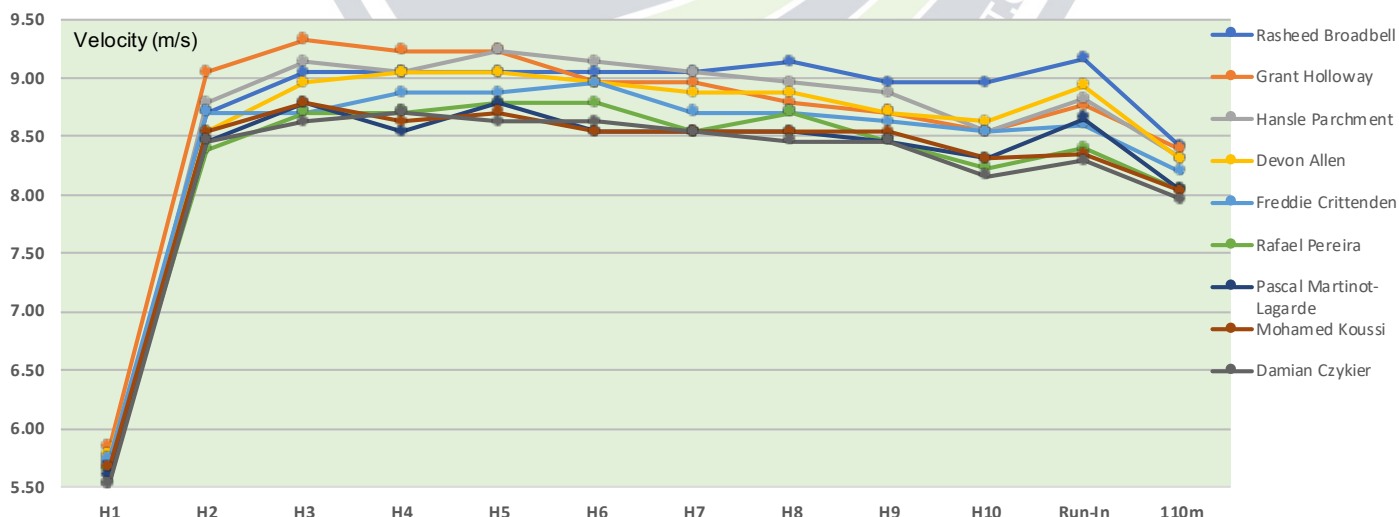
Hurdle Phases



Evaluated with: ObjectVideo  
 Quality & Frame Rate: 1280 x 720 @ 30fps  
 Timing From: First Movement  
 Source: <https://www.youtube.com/watch?v=0onLK-sv6YQ>

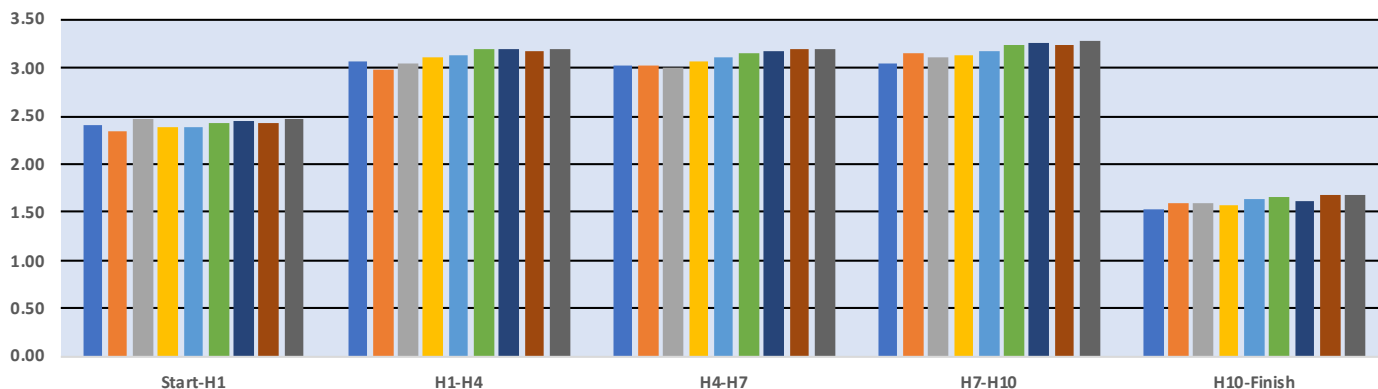
2023 Meeting International Mohammed VI d'Athlétisme (Rabat, MAR)

110m Hurdles		Date: 2023.05.28	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
<b>Broadbell, Rasheed (JAM) (2000)</b>	time	2.41	3.46	4.47	5.48	6.49	7.50	8.51	9.51	10.53	11.55		13.08	5 / 1			
	reaction time	0.161															
	interval velocity	7 steps	1.05	1.01	1.01	1.01	1.01	1.01	1.00	1.02	1.02	1.53			3.07	3.03	3.04
	velocity	5.69	8.70	9.05	9.05	9.05	9.05	9.05	9.14	8.96	8.96	9.16	8.41		8.93	9.05	9.02
<b>Holloway, Grant (USA) (1997)</b>	time	2.35	3.36	4.34	5.33	6.32	7.34	8.36	9.40	10.45	11.52		13.12	6 / 2			
	reaction time	0.177															
	interval velocity	7 steps	1.01	0.98	0.99	0.99	1.02	1.02	1.04	1.05	1.07	1.60			2.98	3.03	3.16
	velocity	5.84	9.05	9.33	9.23	9.23	8.96	8.96	8.79	8.70	8.54	8.76	8.38		9.20	9.05	8.68
<b>Parchment, Hansle (JAM) (1990)</b>	time	2.48	3.52	4.52	5.53	6.52	7.52	8.53	9.55	10.58	11.65		13.24	4 / 3			
	reaction time	0.157															
	interval velocity	7 steps	1.04	1.00	1.01	0.99	1.00	1.01	1.02	1.03	1.07	1.59			3.05	3.00	3.12
	velocity	5.53	8.79	9.14	9.05	9.23	9.14	9.05	8.96	8.87	8.54	8.82	8.31		8.99	9.14	8.79
<b>Allen, Devon (USA) (1994)</b>	time	2.38	3.45	4.47	5.48	6.49	7.51	8.54	9.57	10.62	11.68		13.25	3 / 4			
	reaction time	0.152															
	interval velocity	7 steps	1.07	1.02	1.01	1.01	1.02	1.03	1.03	1.05	1.06	1.57			3.10	3.06	3.14
	velocity	5.76	8.54	8.96	9.05	9.05	8.96	8.87	8.87	8.70	8.62	8.93	8.30		8.85	8.96	8.73
<b>Crittenden, Freddie (USA) (1994)</b>	time	2.39	3.44	4.49	5.52	6.55	7.57	8.62	9.67	10.73	11.80		13.43	7 / 5			
	reaction time	0.166															
	interval velocity	7 steps	1.05	1.05	1.03	1.03	1.02	1.05	1.05	1.06	1.07	1.63			3.13	3.10	3.18
	velocity	5.74	8.70	8.70	8.87	8.87	8.96	8.70	8.70	8.62	8.54	8.60	8.19		8.76	8.85	8.62
<b>Pereira, Rafael (BRA) (1997)</b>	time	2.43	3.52	4.57	5.62	6.66	7.70	8.77	9.82	10.90	12.01		13.68	8 / 6			
	reaction time	0.165															
	interval velocity	7 steps	1.09	1.05	1.05	1.04	1.04	1.07	1.05	1.08	1.11	1.67			3.19	3.15	3.24
	velocity	5.65	8.39	8.70	8.70	8.70	8.79	8.54	8.70	8.46	8.23	8.40	8.04		8.60	8.70	8.46
<b>Martinot-Lagarde, Pascal (FRA) (1991)</b>	time	2.45	3.53	4.57	5.64	6.68	7.75	8.82	9.89	10.97	12.07		13.69	2 / 7			
	reaction time	0.183															
	interval velocity	7 steps	1.08	1.04	1.07	1.04	1.07	1.07	1.07	1.08	1.10	1.62			3.19	3.18	3.25
	velocity	5.60	8.46	8.79	8.54	8.79	8.54	8.54	8.54	8.46	8.31	8.65	8.04		8.60	8.62	8.44
<b>Koussi, Mohamed (MAR) (1994)</b>	time	2.42	3.49	4.53	5.59	6.64	7.71	8.78	9.85	10.92	12.02		13.70	1 / 8			
	reaction time	0.141															
	interval velocity	7 steps	1.07	1.04	1.06	1.05	1.07	1.07	1.07	1.07	1.10	1.68			3.17	3.19	3.24
	velocity	5.67	8.54	8.79	8.62	8.70	8.54	8.54	8.54	8.54	8.31	8.35	8.03		8.65	8.60	8.46
<b>Czykier, Damian (POL) (1992)</b>	time	2.48	3.56	4.62	5.67	6.73	7.79	8.86	9.94	11.02	12.14		13.83	9 / 9			
	reaction time	0.193															
	interval velocity	7 steps	1.08	1.06	1.05	1.06	1.06	1.07	1.08	1.08	1.12	1.69			3.19	3.19	3.28
	velocity	5.53	8.46	8.62	8.70	8.62	8.62	8.54	8.46	8.46	8.16	8.30	7.95		8.60	8.60	8.36



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 28 May 2023 19:39) - diamond league race analysis  
<https://www.omegatiming.com/File/000203040102070101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=JcmbbEMMdWl>

2023 USATF Bermuda Grand Prix (Devonshire, BER) (TV Analysis)

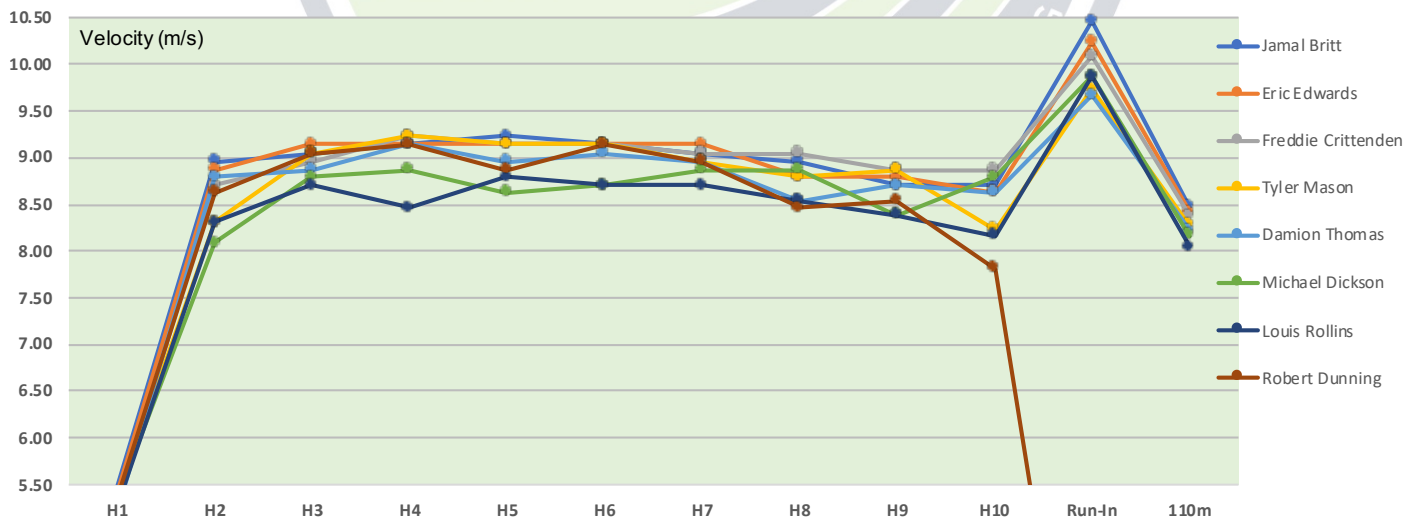
110m Hurdles

Date: 2023.05.21

Wind: 4.0 m/s

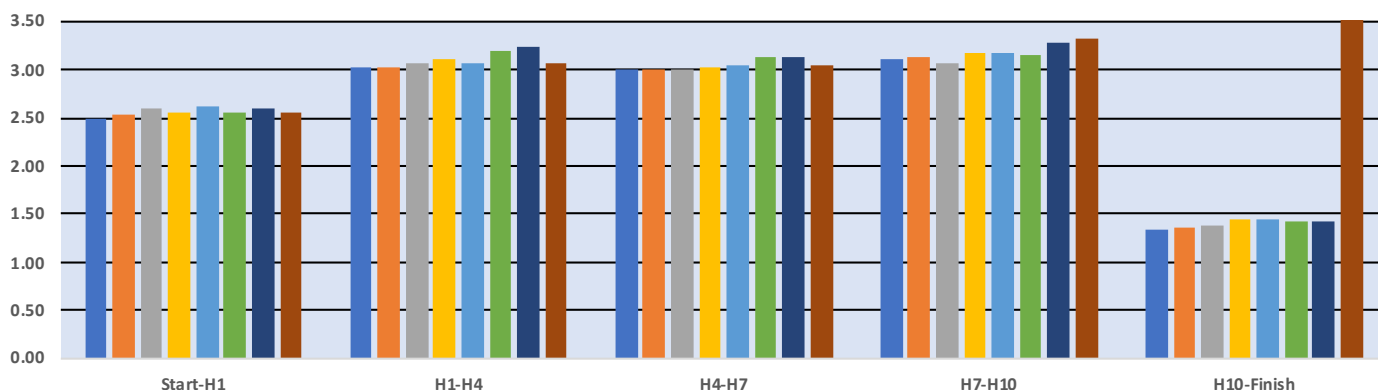
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Britt, Jamal (USA) (1998)	time	2.50	3.52	4.53	5.53	6.52	7.52	8.53	9.55	10.60	11.65	12.99		6 / 1			
	reaction time	0.124													3.03	3.00	3.12
	interval	7 steps	1.02	1.01	1.00	0.99	1.00	1.00	1.01	1.02	1.05	1.05	1.34		9.05	9.14	8.79
	velocity	5.49	8.96	9.05	9.14	9.23	9.14	9.05	8.96	8.70	8.70	10.46	8.47				
Edwards, Eric (USA) (2000)	time	2.53	3.56	4.56	5.56	6.56	7.56	8.56	9.60	10.64	11.70	13.07		2 / 2			
	reaction time	0.122													3.03	3.00	3.14
	interval		1.03	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.06	1.37			9.05	9.14	8.73
	velocity	5.42	8.87	9.14	9.14	9.14	9.14	9.14	8.79	8.79	8.62	10.23	8.42				
Crittenden, Freddie (USA) (1994)	time	2.60	3.65	4.67	5.66	6.66	7.66	8.67	9.68	10.71	11.74	13.13		4 / 3			
	reaction time	0.162													3.06	3.01	3.07
	interval		1.05	1.02	0.99	1.00	1.00	1.01	1.01	1.03	1.03	1.39			8.96	9.11	8.93
	velocity	5.28	8.70	8.96	9.23	9.14	9.14	9.05	9.05	8.87	8.87	10.09	8.38				
Mason, Tyler (JAM) (1995)	time	2.56	3.66	4.67	5.66	6.66	7.66	8.68	9.72	10.75	11.86	13.30		3 / 4			
	reaction time	0.155													3.10	3.02	3.18
	interval	7 steps	1.10	1.01	0.99	1.00	1.00	1.02	1.04	1.03	1.11	1.44			8.85	9.08	8.62
	velocity	5.36	8.31	9.05	9.23	9.14	9.14	8.96	8.79	8.87	8.23	9.74	8.27				
Thomas, Damion (JAM) (1999)	time	2.63	3.67	4.70	5.70	6.72	7.73	8.75	9.82	10.87	11.93	13.38		8 / 5			
	reaction time	0.166													3.07	3.05	3.18
	interval	7 steps	1.04	1.03	1.00	1.02	1.01	1.02	1.07	1.05	1.06	1.45			8.93	8.99	8.62
	velocity	5.22	8.79	8.87	9.14	8.96	9.05	8.96	8.54	8.70	8.62	9.67	8.22				
Dickson, Michael (USA) (1997)	time	2.56	3.69	4.73	5.76	6.82	7.87	8.90	9.93	11.02	12.06	13.48		7 / 6			
	reaction time	0.190													3.20	3.14	3.16
	interval	7 steps	1.13	1.04	1.03	1.06	1.05	1.03	1.03	1.09	1.04	1.42			8.57	8.73	8.68
	velocity	5.36	8.09	8.79	8.87	8.62	8.70	8.87	8.87	8.39	8.79	9.87	8.16				
Rollins, Louis (USA) (1996)	time	2.60	3.70	4.75	5.83	6.87	7.92	8.97	10.04	11.13	12.25	13.67		1 / 7			
	reaction time	0.179													3.23	3.14	3.28
	interval		1.10	1.05	1.08	1.04	1.05	1.05	1.07	1.09	1.12	1.42			8.49	8.73	8.36
	velocity	5.28	8.31	8.70	8.46	8.79	8.70	8.70	8.54	8.39	8.16	9.87	8.05				
Dunning, Robert (USA) (1997)	time	2.56	3.62	4.63	5.63	6.66	7.66	8.68	9.76	10.83	12.00	22.28		5 / 8			
	reaction time	0.152													3.07	3.05	3.32
	interval	7 steps	1.06	1.01	1.00	1.03	1.00	1.02	1.08	1.07	1.17	10.28			8.93	8.99	8.26
	velocity	5.36	8.62	9.05	9.14	8.87	9.14	8.96	8.46	8.54	7.81	1.36	4.94				



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=84HALcmTowc>

2023 NCAA Division II National Championships (Pueblo, CO) (Altitude) (TV Analysis)

110m Hurdles		Date: 2023.05.27	Wind: 6.0 m/s												FINAL		
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Tinch, Cordell (USA) (2000)	time	2.50	3.50	4.50	5.48	6.46	7.44	8.41	9.43	10.43	11.46	12.87	12.96	5 / 1			
	reaction time	interval	7 steps	1.00	1.00	0.98	0.98	0.98	0.97	1.02	1.00	1.03	1.41		2.98	2.93	3.05
	velocity	5.49	9.14	9.14	9.33	9.33	9.33	9.42	8.96	9.14	8.87	9.94	8.55		9.20	9.36	8.99

2023 Trackwired Arkansas Grand Prix (Fayetteville, AR) (TV Analysis)

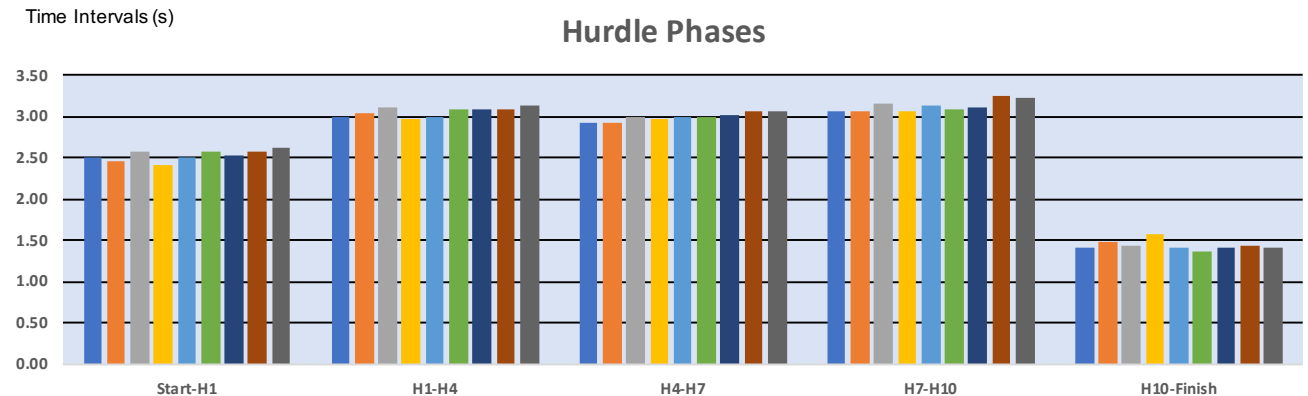
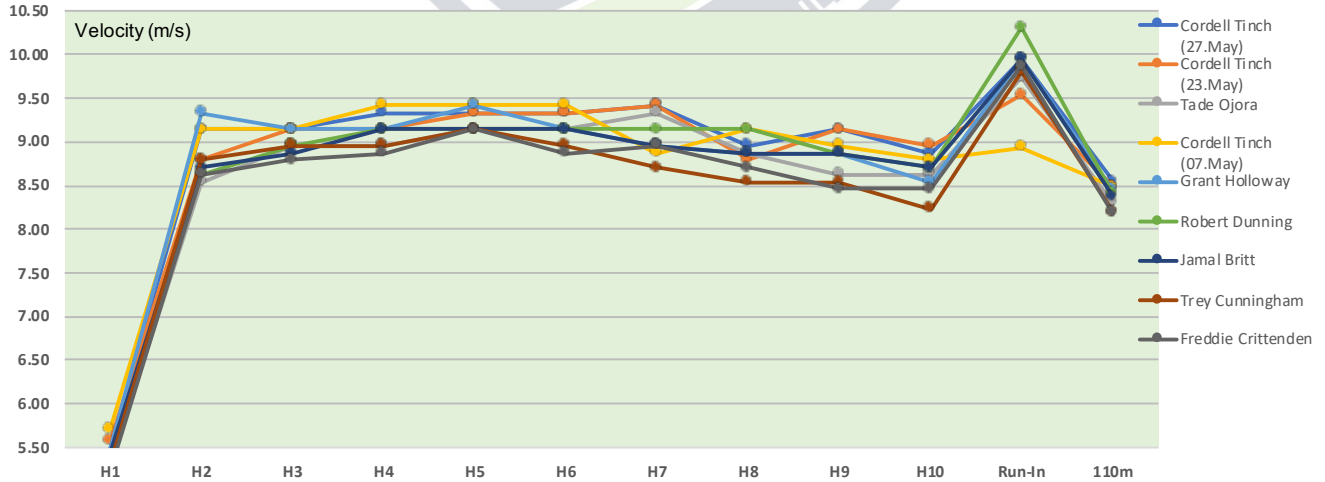
110m Hurdles		Date: 2023.05.23	Wind: 1.3 m/s												FINAL		
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Tinch, Cordell (USA) (2000)	time	2.46	3.50	4.50	5.50	6.48	7.46	8.43	9.47	10.47	11.49	12.96	12.96	5 / 1			
	reaction time	interval	7 steps	1.04	1.00	0.98	0.98	0.97	1.04	1.00	1.02	1.47	PB		3.04	2.93	3.06
	velocity	5.58	8.79	9.14	9.14	9.33	9.33	9.42	8.79	9.14	8.96	9.54	8.49		9.02	9.36	8.96
Ojora, Tade (GBR) (1999)	time	2.58	3.65	4.67	5.69	6.69	7.69	8.67	9.70	10.76	11.82	13.26	13.26	6 / 2			
	reaction time	interval	7 steps	1.07	1.02	1.02	1.00	1.00	0.98	1.03	1.06	1.06	1.44	PB	3.11	2.98	3.15
	velocity	5.32	8.54	8.96	8.96	9.14	9.14	9.33	8.87	8.62	8.62	9.74	8.30		8.82	9.20	8.70

2023 MIAA Championships (Jefferson City, MO) (TV Analysis)

110m Hurdles		Date: 2023.05.07	Wind: 3.0 m/s												FINAL		
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Tinch, Cordell (USA) (2000)	time	2.40	3.40	4.40	5.37	6.34	7.31	8.34	9.34	10.36	11.40	12.97	12.97	4 / 1			
	reaction time	interval	7 steps	1.00	1.00	0.97	0.97	1.03	1.00	1.02	1.04	1.57			2.97	2.97	3.06
	velocity	5.72	9.14	9.14	9.42	9.42	9.42	8.87	9.14	8.96	8.79	8.93	8.48		9.23	9.23	8.96

2023 Adidas Atlanta City Games (Atlanta, GA) (street) (TV Analysis)

110m Hurdles		Date: 2023.05.05	Wind: 0.0 m/s												FINAL			
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10	
Holloway, Grant (USA) (1997)	time	2.50	3.48	4.48	5.48	6.45	7.45	8.47	9.50	10.53	11.60	13.01	13.01	3 / 1				
	reaction time	0.181	interval	7 steps	0.98	1.00	1.00	0.97	1.00	1.02	1.03	1.03	1.07	1.41		2.98	2.99	3.13
	velocity	5.49	9.33	9.14	9.14	9.42	9.14	8.96	8.87	8.87	8.54	9.94	8.46		9.20	9.17	8.76	
Dunning, Robert (USA) (1997)	time	2.57	3.63	4.65	5.65	6.65	7.65	8.65	9.65	10.68	11.73	13.09	13.09	1 / 2				
	reaction time	0.187	interval	7 steps	1.06	1.02	1.00	1.00	1.00	1.00	1.03	1.05	1.36	PB	3.08	3.00	3.08	
	velocity	5.34	8.62	8.96	9.14	9.14	9.14	9.14	9.14	8.87	8.70	10.31	8.40		8.90	9.14	8.90	
Britt, Jamal (USA) (1998)	time	2.52	3.57	4.60	5.60	6.60	7.60	8.62	9.65	10.68	11.73	13.14	13.14	4 / 3				
	reaction time	0.188	interval	7 steps	1.05	1.03	1.00	1.00	1.02	1.03	1.03	1.05	1.41		3.08	3.02	3.11	
	velocity	5.44	8.70	8.87	9.14	9.14	9.14	8.96	8.87	8.87	8.70	9.94	8.37		8.90	9.08	8.82	
Cunningham, Trey (USA) (1998)	time	2.58	3.62	4.64	5.66	6.66	7.68	8.73	9.80	10.87	11.98	13.41	13.41	2 / 4				
	reaction time	0.174	interval	7 steps	1.04	1.02	1.02	1.00	1.02	1.05	1.07	1.11	1.43		3.08	3.07	3.25	
	velocity	5.32	8.79	8.96	8.96	9.14	8.96	8.70	8.54	8.54	8.23	9.80	8.20		8.90	8.93	8.44	
Crittenden, Freddie (USA) (1994)	time	2.62	3.68	4.72	5.75	6.75	7.78	8.80	9.85	10.93	12.01	13.43	13.43	5 / 5				
	reaction time	0.159	interval	1.06	1.04	1.03	1.00	1.03	1.02	1.05	1.08	1.08	1.42		3.13	3.05	3.21	
	velocity	5.24	8.62	8.79	8.87	9.14	8.87	8.87	8.70	8.46	8.46	9.87	8.19		8.76	8.99	8.54	



NCAA Division II National Championships  
 Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: Gun Flash  
 Source: <https://www.youtube.com/watch?v=4nMb81C6e24&t=3s>

Trackwired Arkansas Grand Prix  
 Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: First Movenet  
 Source: [https://www.youtube.com/watch?v=RmydlBb\\_7C0](https://www.youtube.com/watch?v=RmydlBb_7C0)

MIAA Championships  
 Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: First Movenet  
 Source: <https://www.youtube.com/shorts/jr1O7IXSQg>

Adidas Atlanta City Games  
 Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: Gun Flash  
 Source: <https://www.youtube.com/watch?v=Nlrczyol0eY>

# Women's 100m Hurdles

## 2023 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
<b>Camacho-Quinn, Jasmine (PUR) (1996)</b>																
<b>FINAL</b> - 2023 USATF Bermuda Grand Prix (Devonshire, BER) (TV Analysis)																
date 21-May	time 2.50	3.52	4.46	5.40	6.32	7.25	8.19	9.13	10.10	11.06						
reaction time 0.153	interval	1.02	0.94	0.94	0.92	0.93	0.94	0.94	0.97	0.96	1.11			2.90	2.79	2.87
wind 3.5 m/s	velocity	5.20	8.33	9.04	9.04	9.24	9.14	9.04	9.04	8.76	8.85	9.05	8.22	8.79	9.14	8.89
<b>Harrison, Kendra (USA) (1992)</b>																
<b>Heat 3</b> - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																
date 22-Aug	time 2.50	3.47	4.44	5.39	6.31	7.26	8.21	9.15	10.12	11.11						
reaction time 0.132	interval	0.97	0.97	0.95	0.92	0.95	0.95	0.94	0.97	0.99	1.13			2.89	2.82	2.90
wind -0.2 m/s	velocity	5.20	8.76	8.76	8.95	9.24	8.95	8.95	9.04	8.76	8.59	8.89	8.17	8.82	9.04	8.79
<b>Nugent, Ackera (JAM) (2002)</b>																
<b>FINAL</b> - 2023 NCAA Championships (Austin, TX) (TV Analysis)																
date 10-Jun	time 2.44	3.42	4.39	5.32	6.27	7.20	8.15	9.10	10.09	11.08						
reaction time	interval	0.98	0.97	0.93	0.95	0.93	0.95	0.95	0.99	0.99	1.17			2.88	2.83	2.93
wind 3.8 m/s	velocity	5.33	8.67	8.76	9.14	8.95	9.14	8.95	8.95	8.59	8.59	8.59	8.16	8.85	9.01	8.70
<b>Camacho-Quinn, Jasmine (PUR) (1996)</b>																
<b>FINAL</b> - 2023 UNF East Coast Relays (Jacksonville, FL) (TV Analysis)																
date 29-Apr	time 2.56	3.60	4.56	5.50	6.43	7.35	8.30	9.25	10.20	11.20						
reaction time	interval	1.04	0.96	0.94	0.93	0.92	0.95	0.95	0.95	1.00	1.09			2.94	2.80	2.90
wind 3.2 m/s	velocity	5.08	8.17	8.85	9.04	9.14	9.24	8.95	8.95	8.95	9.22	8.14		8.67	9.11	8.79
<b>Harrison, Kendra (USA) (1992)</b>																
<b>FINAL</b> - 2023 USATF New York City Grand Prix (Randalls Island, NY) (TV Analysis)																
date 24-Jun	time 2.53	3.57	4.52	5.45	6.40	7.34	8.28	9.24	10.21	11.20						
reaction time 0.151	interval	1.04	0.95	0.93	0.95	0.94	0.94	0.96	0.97	0.99	1.09			2.92	2.83	2.92
wind 2.8 m/s	velocity	5.14	8.17	8.95	9.14	8.95	9.04	9.04	8.85	8.76	8.59	9.22	8.14	8.73	9.01	8.73
<b>Johnson, Alaysha (USA) (1996)</b>																
<b>FINAL</b> - 2023 USATF New York City Grand Prix (Randalls Island, NY) (TV Analysis)																
date 24-Jun	time 2.55	3.57	4.53	5.47	6.42	7.34	8.29	9.27	10.24	11.22						
reaction time 0.206	interval	1.02	0.96	0.94	0.95	0.92	0.95	0.98	0.97	0.98	1.08			2.92	2.82	2.93
wind 2.8 m/s	velocity	5.10	8.33	8.85	9.04	8.95	9.24	8.95	8.67	8.76	8.67	9.31	8.13	8.73	9.04	8.70
<b>Ali, Nia (USA) (1988)</b>																
<b>FINAL</b> - 2023 Herculis Meeting International d'Athlétisme (Monaco, MON)																
date 21-Jul	time 2.40	3.42	4.39	5.35	6.30	7.25	8.20	9.15	10.13	11.11						
reaction time 0.153	interval	1.02	0.97	0.96	0.95	0.95	0.95	0.95	0.98	0.98	1.19	<b>PB</b>		2.95	2.85	2.91
wind 0.6 m/s	velocity	5.42	8.33	8.76	8.85	8.95	8.95	8.95	8.95	8.67	8.67	8.45	8.13	8.64	8.95	8.76
<b>Armstrong, Alia (USA) (2000)</b>																
<b>Heat 1</b> - 2023 SEC Championships (Baton Rouge, LA)																
date 12-May	time															
reaction time	interval															
wind 2.2 m/s	velocity															
<b>Camacho-Quinn, Jasmine (PUR) (1996)</b>																
<b>FINAL</b> - 2023 USATF Los Angeles Grand Prix (Westwood, CA) (TV Analysis)																
date 27-May	time 2.50	3.52	4.50	5.44	6.38	7.32	8.28	9.24	10.19	11.16						
reaction time 0.158	interval	1.02	0.98	0.94	0.94	0.94	0.96	0.96	0.95	0.97	1.15			2.94	2.84	2.88
wind -0.2 m/s	velocity	5.20	8.33	8.67	9.04	9.04	9.04	8.85	8.85	8.95	8.76	8.74	8.12	8.67	8.98	8.85
<b>Harrison, Kendra (USA) (1992)</b>																
<b>FINAL</b> - 2023 Herculis Meeting International d'Athlétisme (Monaco, MON)																
date 21-Jul	time 2.42	3.44	4.42	5.36	6.30	7.24	8.18	9.13	10.10	11.09						
reaction time 0.165	interval	1.02	0.98	0.94	0.94	0.94	0.94	0.95	0.97	0.99	1.22			2.94	2.82	2.91
wind 0.6 m/s	velocity	5.37	8.33	8.67	9.04	9.04	9.04	8.95	8.76	8.59	8.24	8.12		8.67	9.04	8.76
<b>Russell, Masai (USA)</b>																
<b>FINAL</b> - 2023 NCAA Championships (Austin, TX) (TV Analysis)																
date 10-Jun	time 2.44	3.44	4.47	5.45	6.40	7.35	8.30	9.26	10.22	11.20						
reaction time	interval	1.00	1.03	0.98	0.95	0.95	0.95	0.96	0.96	0.98	1.12			3.01	2.85	2.90
wind 3.8 m/s	velocity	5.33	8.50	8.25	8.67	8.95	8.95	8.95	8.85	8.85	8.67	8.97	8.12	8.47	8.95	8.79
<b>Williams, Danielle (JAM) (1992)</b>																
<b>FINAL</b> - 2023 USATF New York City Grand Prix (Randalls Island, NY) (TV Analysis)																
date 24-Jun	time 2.47	3.50	4.46	5.42	6.37	7.31	8.26	9.22	10.21	11.21						
reaction time 0.331	interval	1.03	0.96	0.96	0.95	0.94	0.95	0.96	0.99	1.00	1.12			2.95	2.84	2.95
wind 2.8 m/s	velocity	5.26	8.25	8.85	8.85	8.95	9.04	8.95	8.85	8.59	8.50	8.97	8.11	8.64	8.98	8.64
<b>Harrison, Kendra (USA) (1992)</b>																
<b>Semi-Final 1</b> - 2023 World Athletics Championships (Budapest, HUN)																
date 23-Aug	time 2.50	3.48	4.45	5.39	6.32	7.25	8.21	9.18	10.15	11.15						
reaction time 0.142	interval	0.98	0.97	0.94	0.93	0.93	0.96	0.97	0.97	1.00	1.18			2.89	2.82	2.94
wind 0.5 m/s	velocity	5.20	8.67	8.76	9.04	9.14	9.14	8.85	8.76	8.76	8.50	8.52	8.11	8.82	9.04	8.67
<b>Amusan, Tobi (NGR) (1997)</b>																
<b>FINAL</b> - 2023 Prefontaine Classic (Eugene, OR)																
date 17-Sep	time 2.42	3.44	4.41	5.37	6.30	7.24	8.18	9.14	10.10	11.09						
reaction time 0.134	interval	1.02	0.97	0.96	0.93	0.94	0.94	0.96	0.96	0.99	1.24			2.95	2.81	2.91
wind 1.8 m/s	velocity	5.37	8.33	8.76	8.85	9.14	9.04	9.04	8.85	8.85	8.59	8.10	8.11	8.64	9.07	8.76

2023 Prefontaine Classic (Eugene, OR)

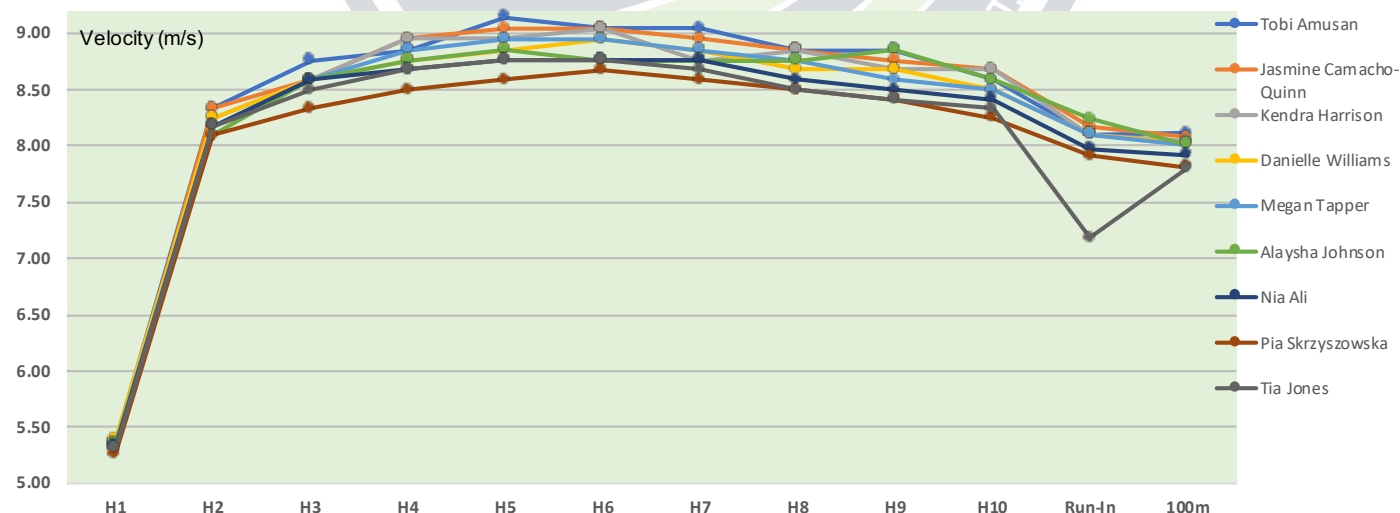
100m Hurdles

Date: 2023.09.17

Wind: 1.8 m/s

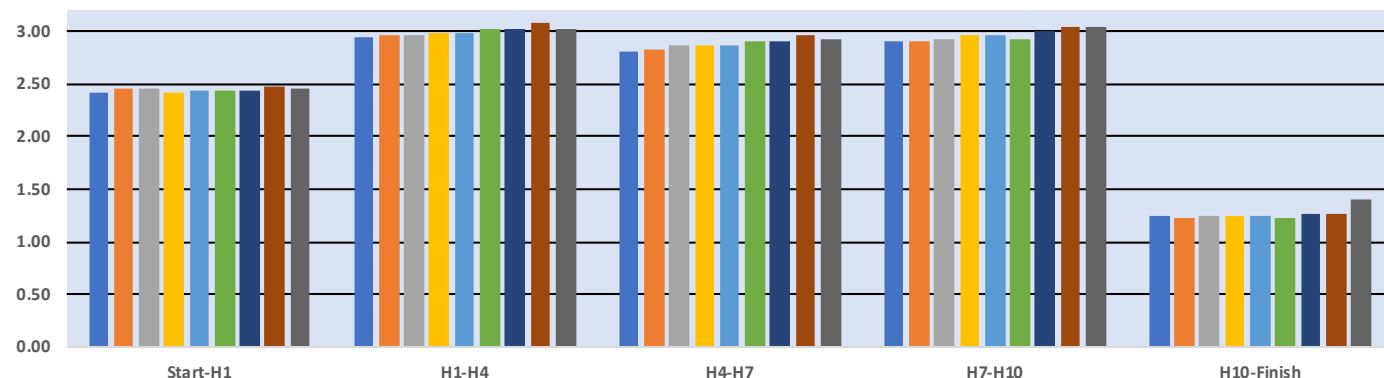
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Amusan, Tobi (NGR) (1997)</b>	time	2.42	3.44	4.41	5.37	6.30	7.24	8.18	9.14	10.10	11.09		12.33	4 / 1			
	reaction time	0.134													2.95	2.81	2.91
	interval velocity		1.02	0.97	0.96	0.93	0.94	0.94	0.96	0.96	0.99	1.24			8.64	9.07	8.76
<b>Camacho-Quinn, Jasmine (PUR) (199)</b>	time	2.45	3.47	4.46	5.41	6.35	7.29	8.24	9.20	10.17	11.15		12.38	5 / 2			
	reaction time	0.140													2.96	2.83	2.91
	interval velocity		1.02	0.99	0.95	0.94	0.94	0.95	0.96	0.97	0.98	1.23			8.61	9.01	8.76
<b>Harrison, Kendra (USA) 1992)</b>	time	2.45	3.48	4.47	5.42	6.37	7.31	8.28	9.24	10.22	11.20		12.44	6 / 3			
	reaction time	0.166													2.97	2.86	2.92
	interval velocity		1.03	0.99	0.95	0.95	0.94	0.97	0.96	0.98	0.98	1.24			8.59	8.92	8.73
<b>Williams, Danielle (JAM) (1992)</b>	time	2.41	3.44	4.43	5.40	6.36	7.31	8.27	9.25	10.23	11.23		12.47	3 / 4			
	reaction time	0.140													2.99	2.87	2.96
	interval velocity		1.03	0.99	0.97	0.96	0.95	0.96	0.98	0.98	1.00	1.24			8.53	8.89	8.61
<b>Tapper, Megan (JAM) (1994)</b>	time	2.43	3.47	4.46	5.42	6.37	7.32	8.28	9.25	10.24	11.24		12.48	9 / 5			
	reaction time	0.148													2.99	2.86	2.96
	interval velocity		1.04	0.99	0.96	0.95	0.95	0.96	0.97	0.99	1.00	1.24			8.53	8.92	8.61
<b>Johnson, Alaysha (USA) (1996)</b>	time	2.43	3.48	4.47	5.44	6.40	7.37	8.34	9.31	10.27	11.26		12.48	7 / 6			
	reaction time	0.152													3.01	2.90	2.92
	interval velocity		1.05	0.99	0.97	0.96	0.97	0.97	0.97	0.96	0.99	1.22			8.47	8.79	8.73
<b>Ali, Nia (USA) (1988)</b>	time	2.44	3.48	4.47	5.45	6.42	7.39	8.36	9.35	10.35	11.36		12.62	2 / 7			
	reaction time	0.153													3.01	2.91	3.00
	interval velocity		1.04	0.99	0.98	0.97	0.97	0.97	0.99	1.00	1.01	1.26			8.47	8.76	8.50
<b>Skrzyszowska, Pia (POL) (2001)</b>	time	2.47	3.52	4.54	5.54	6.53	7.51	8.50	9.50	10.51	11.54		12.81	1 / 8			
	reaction time	0.140													3.07	2.96	3.04
	interval velocity		1.05	1.02	1.00	0.99	0.98	0.99	1.00	1.01	1.03	1.27			8.31	8.61	8.39
<b>Jones, Tia (USA) (2000)</b>	time	2.45	3.49	4.49	5.47	6.44	7.41	8.39	9.39	10.40	11.42		12.82	8 / 9			
	reaction time	0.140													3.02	2.92	3.03
	interval velocity		1.04	1.00	0.98	0.97	0.97	0.98	1.00	1.01	1.02	1.40			8.44	8.73	8.42



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 17 Sep 2023 14:08) - diamond league race analysis  
<https://www.omegatiming.com/File/000203100101100101FFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=3EicMlUJ9k>

2023 Xiamen Diamond League (Xiamen, CHN)

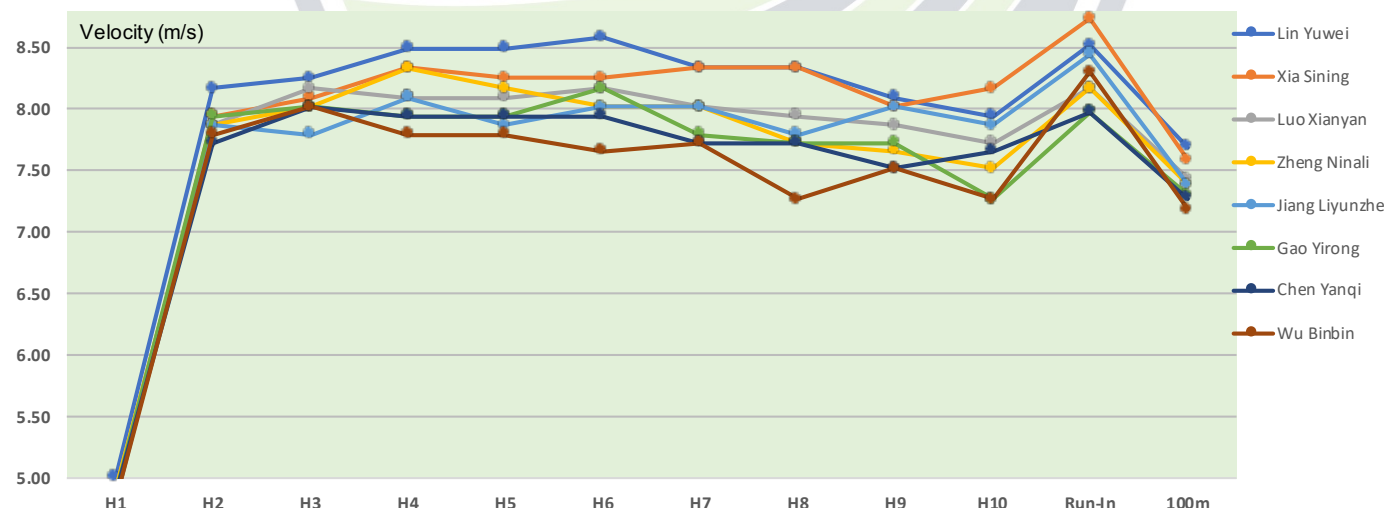
100m Hurdles

Date: 2023.09.02

Wind: 0.1 m/s

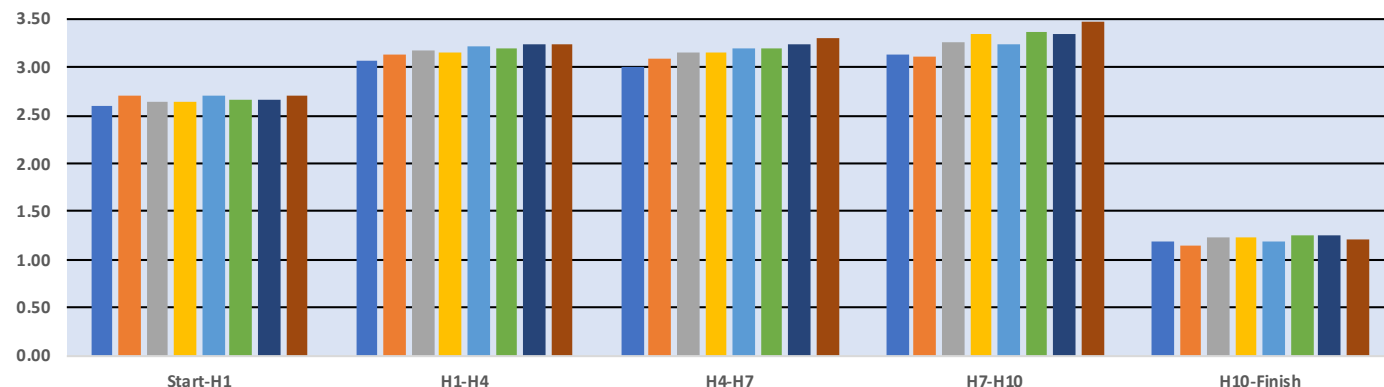
National FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Lin Yuwei (CHN) (1999)	time	2.60	3.64	4.67	5.67	6.67	7.66	8.68	9.70	10.75	11.82		13.00	5 / 1			
	reaction time	0.139													3.07	3.01	3.14
	interval		1.04	1.03	1.00	1.00	0.99	1.02	1.02	1.05	1.07	1.18			8.31	8.47	8.12
	velocity	5.00	8.17	8.25	8.50	8.50	8.59	8.33	8.33	8.10	7.94	8.52	7.69				
Xia Sining (CHN) (2003)	time	2.70	3.77	4.82	5.84	6.87	7.90	8.92	9.94	11.00	12.04		13.19	6 / 2			
	reaction time	0.158													3.14	3.08	3.12
	interval		1.07	1.05	1.02	1.03	1.03	1.02	1.02	1.06	1.04	1.15			8.12	8.28	8.17
	velocity	4.81	7.94	8.10	8.33	8.25	8.25	8.33	8.33	8.02	8.17	8.74	7.58				
Luo Xianyan (CHN) (1997)	time	2.65	3.73	4.77	5.82	6.87	7.91	8.97	10.04	11.12	12.22		13.45	7 / 3			
	reaction time	0.158													3.17	3.15	3.25
	interval		1.08	1.04	1.05	1.05	1.04	1.06	1.07	1.08	1.10	1.23			8.04	8.10	7.85
	velocity	4.91	7.87	8.17	8.10	8.10	8.17	8.02	7.94	7.87	7.73	8.17	7.43				
Zheng Ninali (CHN) (1998)	time	2.65	3.73	4.79	5.81	6.85	7.91	8.97	10.07	11.18	12.31		13.54	2 / 4			
	reaction time	0.169													3.16	3.16	3.34
	interval		1.08	1.06	1.02	1.04	1.06	1.06	1.10	1.11	1.13	1.23			8.07	8.07	7.63
	velocity	4.91	7.87	8.02	8.33	8.17	8.02	8.02	7.73	7.66	7.52	8.17	7.39				
Jiang Liyunzhe (CHN) (2002)	time	2.70	3.78	4.87	5.92	7.00	8.06	9.12	10.21	11.27	12.35		13.54	4 / 5			
	reaction time	0.155													3.22	3.20	3.23
	interval		1.08	1.09	1.05	1.08	1.06	1.06	1.09	1.06	1.08	1.19			7.92	7.97	7.89
	velocity	4.81	7.87	7.80	8.10	7.87	8.02	8.02	7.80	8.02	7.87	8.45	7.39				
Gao Yirong (CHN) (2004)	time	2.67	3.74	4.80	5.87	6.94	7.98	9.07	10.17	11.27	12.44		13.70	8 / 6			
	reaction time	0.161													3.20	3.20	3.37
	interval		1.07	1.06	1.07	1.07	1.04	1.09	1.10	1.10	1.17	1.26			7.97	7.97	7.57
	velocity	4.87	7.94	8.02	7.94	7.94	8.17	7.80	7.73	7.73	7.26	7.98	7.30				
Chen Yanqi (CHN) (2006)	time	2.67	3.77	4.83	5.90	6.97	8.04	9.14	10.24	11.37	12.48		13.74	9 / 7			
	reaction time	0.154													3.23	3.24	3.34
	interval		1.10	1.06	1.07	1.07	1.07	1.10	1.10	1.13	1.11	1.26	PB		7.89	7.87	7.63
	velocity	4.87	7.73	8.02	7.94	7.94	7.94	7.73	7.73	7.52	7.66	7.98	7.28				
Wu Binbin (CHN) (2006)	time	2.70	3.79	4.85	5.94	7.03	8.14	9.24	10.41	11.54	12.71		13.92	3 / 8			
	reaction time	0.159													3.24	3.30	3.47
	interval		1.09	1.06	1.09	1.09	1.11	1.10	1.17	1.13	1.17	1.21			7.87	7.73	7.35
	velocity	4.81	7.80	8.02	7.80	7.80	7.66	7.73	7.26	7.52	7.26	8.31	7.18				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1080 @ 30fps  
 Timing From: First Movement  
 Sources: Video from Coach



2023 Weltklasse (Zürich, SUI)

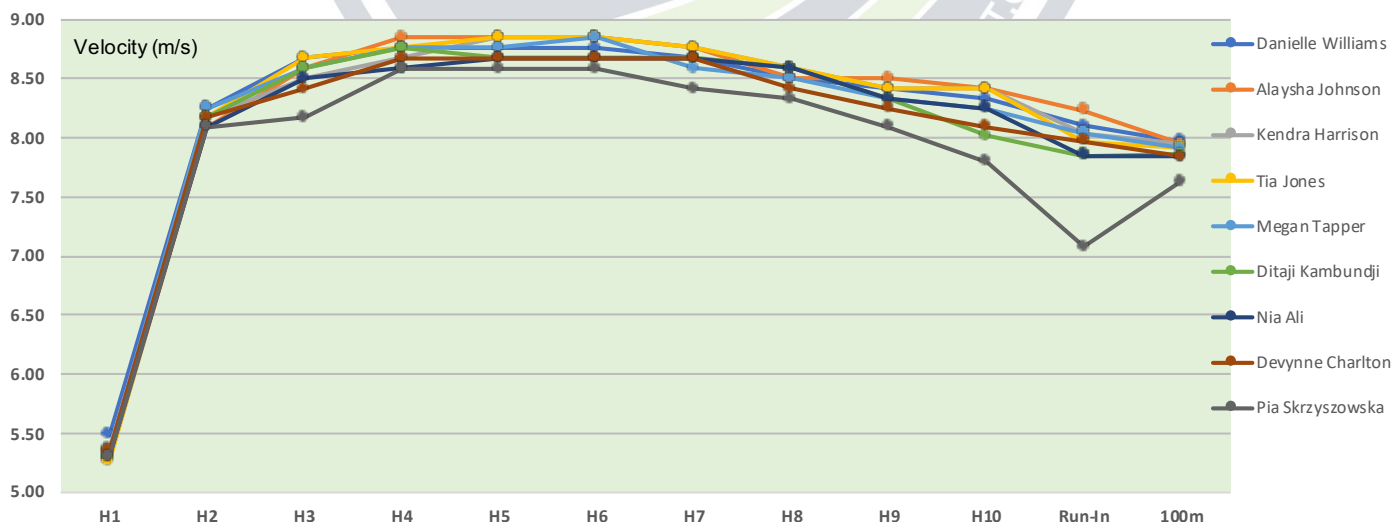
100m Hurdles

Date: 2023.08.31

Wind: -0.2 m/s

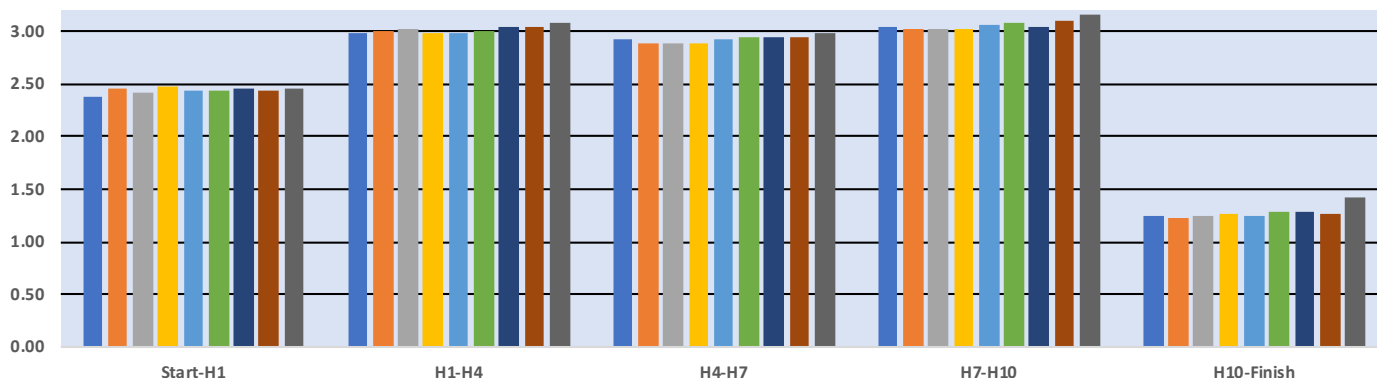
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Williams, Danielle (JAM) (1992)</b>	time	2.37	3.40	4.38	5.35	6.32	7.29	8.27	9.27	10.28	11.30		12.54	3 / 1	2.98	2.92	3.03
	reaction time	0.122															
	interval		1.03	0.98	0.97	0.97	0.97	0.97	0.98	1.00	1.01	1.02	1.24				
	velocity	5.49	8.25	8.67	8.76	8.76	8.76	8.67	8.50	8.42	8.33	8.10	7.97		8.56	8.73	8.42
<b>Johnson, Alaysha (USA) (1996)</b>	time	2.46	3.51	4.50	5.46	6.42	7.38	8.35	9.35	10.35	11.36		12.58	7 / 2	3.00	2.89	3.01
	reaction time	0.151															
	interval		1.05	0.99	0.96	0.96	0.96	0.97	1.00	1.00	1.01	1.22	1.22				
	velocity	5.28	8.10	8.59	8.85	8.85	8.85	8.76	8.50	8.50	8.42	8.24	7.95		8.50	8.82	8.47
<b>Harrison, Kendra (USA) 1992)</b>	time	2.42	3.46	4.46	5.44	6.40	7.36	8.33	9.32	10.33	11.34		12.59	5 / 3	3.02	2.89	3.01
	reaction time	0.145															
	interval		1.04	1.00	0.98	0.96	0.96	0.97	0.99	1.01	1.01	1.25	1.25				
	velocity	5.37	8.17	8.50	8.67	8.85	8.85	8.76	8.59	8.42	8.42	8.04	7.94		8.44	8.82	8.47
<b>Jones, Tia (USA) (2000)</b>	time	2.47	3.51	4.49	5.46	6.42	7.38	8.35	9.34	10.35	11.36		12.62	6 / 4	2.99	2.89	3.01
	reaction time	0.150															
	interval		1.04	0.98	0.97	0.96	0.96	0.97	0.99	1.01	1.01	1.26	1.26				
	velocity	5.26	8.17	8.67	8.76	8.85	8.85	8.76	8.59	8.42	8.42	7.98	7.92		8.53	8.82	8.47
<b>Tapper, Megan (JAM) (1994)</b>	time	2.43	3.46	4.45	5.42	6.39	7.35	8.34	9.34	10.36	11.39		12.64	8 / 5	2.99	2.92	3.05
	reaction time	0.150															
	interval		1.03	0.99	0.97	0.97	0.96	0.99	1.00	1.02	1.03	1.25	1.25				
	velocity	5.35	8.25	8.59	8.76	8.76	8.85	8.59	8.50	8.33	8.25	8.04	7.91		8.53	8.73	8.36
<b>Kambundji, Ditaji (SUI) (2002)</b>	time	2.44	3.48	4.47	5.44	6.42	7.40	8.38	9.37	10.39	11.45		12.73	2 / 6	3.00	2.94	3.07
	reaction time	0.122															
	interval		1.04	0.99	0.97	0.98	0.98	0.98	0.99	1.02	1.06	1.28	1.28				
	velocity	5.33	8.17	8.59	8.76	8.67	8.67	8.67	8.59	8.33	8.02	7.85	7.86		8.50	8.67	8.31
<b>Ali, Nia (USA) (1988)</b>	time	2.45	3.50	4.50	5.49	6.47	7.45	8.43	9.42	10.44	11.47		12.75	4 / 7	3.04	2.94	3.04
	reaction time	0.165															
	interval		1.05	1.00	0.99	0.98	0.98	0.98	0.99	1.02	1.03	1.28	1.28				
	velocity	5.31	8.10	8.50	8.59	8.67	8.67	8.67	8.59	8.33	8.25	7.85	7.84		8.39	8.67	8.39
<b>Charlton, Devynne (BAH) (1995)</b>	time	2.43	3.47	4.48	5.46	6.44	7.42	8.40	9.41	10.44	11.49		12.75	1 / 8	3.03	2.94	3.09
	reaction time	0.152															
	interval		1.04	1.01	0.98	0.98	0.98	0.98	1.01	1.03	1.05	1.26	1.26				
	velocity	5.35	8.17	8.42	8.67	8.67	8.67	8.67	8.42	8.25	8.10	7.98	7.84		8.42	8.67	8.25
<b>Skrzyszowska, Pia (POL) (2001)</b>	time	2.45	3.50	4.54	5.53	6.52	7.51	8.52	9.54	10.59	11.68		13.10	9 / 9	3.08	2.99	3.16
	reaction time	0.134															
	interval		1.05	1.04	0.99	0.99	0.99	1.01	1.02	1.05	1.09	1.42	1.42				
	velocity	5.31	8.10	8.17	8.59	8.59	8.59	8.42	8.33	8.10	7.80	7.08	7.63		8.28	8.53	8.07



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 31 Aug 2023 21:40) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030D01010E0101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=0RN5j9bhKXU>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

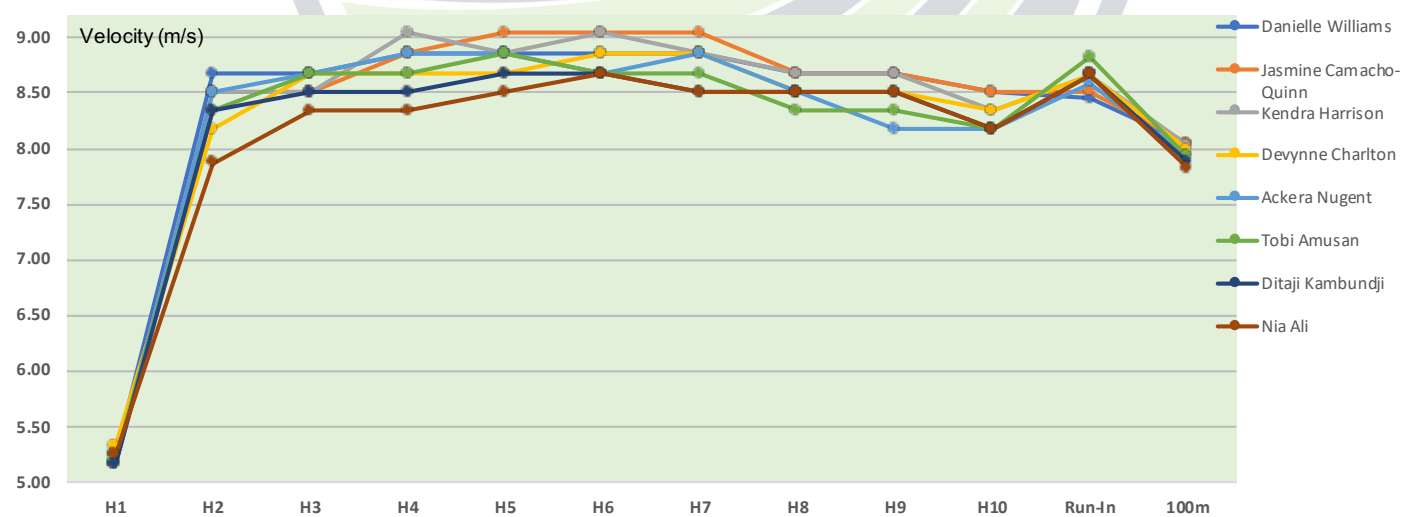
100m Hurdles

Date: 2023.08.24

Wind: -0.2 m/s

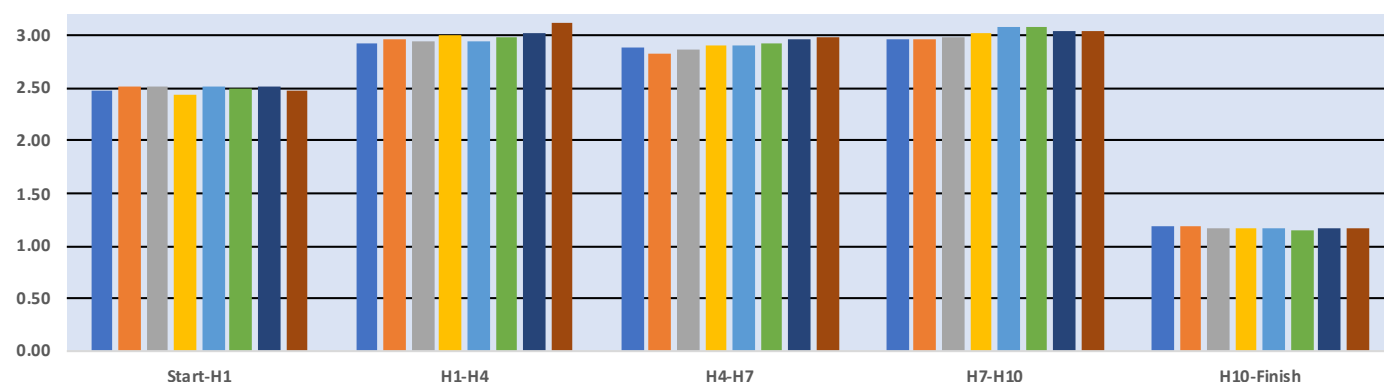
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Williams, Danielle (JAM) (1992)</b>	time	2.48	3.46	4.44	5.40	6.36	7.32	8.28	9.26	10.24	11.24		12.43	2 / 1			
	reaction time	0.132													2.92	2.88	2.96
	interval		0.98	0.98	0.96	0.96	0.96	0.96	0.96	0.98	0.98	1.00	1.19		8.73	8.85	8.61
	velocity	5.24	8.67	8.67	8.85	8.85	8.85	8.85	8.67	8.67	8.50	8.45	8.05				
<b>Camacho-Quinn, Jasmine (PUR) (199)</b>	time	2.52	3.52	4.52	5.48	6.42	7.36	8.30	9.28	10.26	11.26		12.44	7 / 2			
	reaction time	0.164													2.96	2.82	2.96
	interval		1.00	1.00	0.96	0.94	0.94	0.94	0.98	0.98	1.00	1.18			8.61	9.04	8.61
	velocity	5.16	8.50	8.50	8.85	9.04	9.04	9.04	8.67	8.67	8.50	8.52	8.04				
<b>Harrison, Kendra (USA) 1992)</b>	time	2.52	3.52	4.52	5.46	6.42	7.36	8.32	9.30	10.28	11.30		12.46	4 / 3			
	reaction time	0.155													2.94	2.86	2.98
	interval		1.00	1.00	0.94	0.96	0.94	0.96	0.98	0.98	1.02	1.16			8.67	8.92	8.56
	velocity	5.16	8.50	8.50	9.04	8.85	9.04	8.85	8.67	8.67	8.33	8.66	8.03				
<b>Charlton, Devynne (BAH) (1995)</b>	time	2.44	3.48	4.46	5.44	6.42	7.38	8.34	9.34	10.34	11.36		12.52	6 / 4			
	reaction time	0.149													3.00	2.90	3.02
	interval		1.04	0.98	0.98	0.98	0.96	1.00	1.00	1.02	1.04	1.16			8.50	8.79	8.44
	velocity	5.33	8.17	8.67	8.67	8.67	8.85	8.85	8.50	8.50	8.33	8.66	7.99				
<b>Nugent, Ackera (JAM) (2002)</b>	time	2.52	3.52	4.50	5.46	6.42	7.40	8.36	9.36	10.40	11.44		12.61	8 / 5			
	reaction time	0.135													2.94	2.90	3.08
	interval		1.00	0.98	0.96	0.96	0.98	0.96	1.00	1.04	1.04	1.17			8.67	8.79	8.28
	velocity	5.16	8.50	8.67	8.85	8.85	8.67	8.85	8.50	8.17	8.17	8.59	7.93				
<b>Amusan, Tobi (NGR) (1997)</b>	time	2.50	3.52	4.50	5.48	6.44	7.42	8.40	9.42	10.44	11.48		12.62	5 / 6			
	reaction time	0.152													2.98	2.92	3.08
	interval		1.02	0.98	0.98	0.96	0.98	0.98	1.02	1.02	1.04	1.14			8.56	8.73	8.28
	velocity	5.20	8.33	8.67	8.67	8.67	8.85	8.67	8.33	8.33	8.17	8.82	7.92				
<b>Kambundji, Ditaji (SUI) (2002)</b>	time	2.52	3.54	4.54	5.54	6.52	7.50	8.50	9.50	10.50	11.54		12.70	9 / 7			
	reaction time	0.140													3.02	2.96	3.04
	interval		1.02	1.00	1.00	0.98	0.98	1.00	1.00	1.00	1.04	1.16			8.44	8.61	8.39
	velocity	5.16	8.33	8.50	8.50	8.67	8.67	8.50	8.50	8.50	8.17	8.66	7.87				
<b>Ali, Nia (USA) (1988)</b>	time	2.48	3.56	4.58	5.60	6.60	7.58	8.58	9.58	10.58	11.62		12.78	3 / 8			
	reaction time	0.159													3.12	2.98	3.04
	interval		1.08	1.02	1.02	1.00	0.98	1.00	1.00	1.00	1.04	1.16			8.17	8.56	8.39
	velocity	5.24	7.87	8.33	8.33	8.50	8.67	8.50	8.50	8.50	8.17	8.66	7.82				



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=ZP37H2mcdkI>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

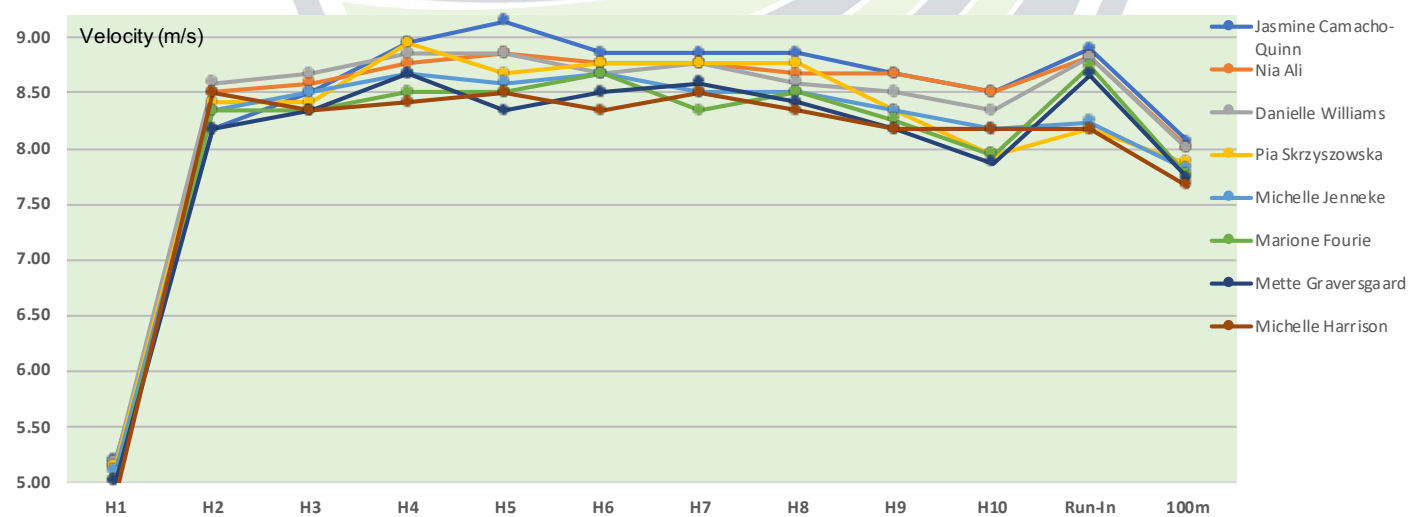
100m Hurdles

Date: 2023.08.23

Wind: -0.4 m/s

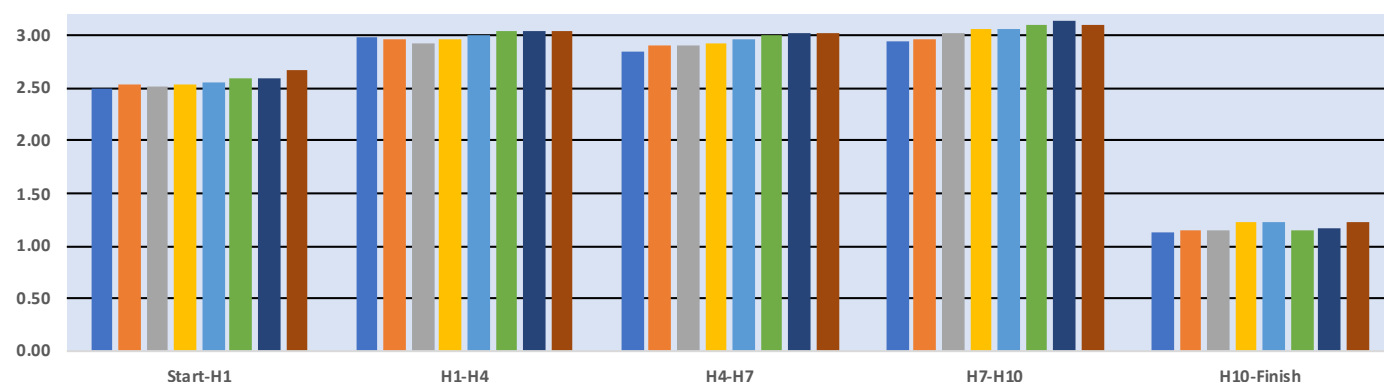
Semi-Final 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Camacho-Quinn, Jasmine (PUR) (199)</b>	time	2.50	3.54	4.54	5.49	6.42	7.38	8.34	9.30	10.28	11.28		12.41	5 / 1			
	reaction time	0.138													2.99	2.85	2.94
	interval		1.04	1.00	0.95	0.93	0.96	0.96	0.96	0.98	1.00	1.13			8.53	8.95	8.67
	velocity	5.20	8.17	8.50	8.95	9.14	8.85	8.85	8.85	8.67	8.50	8.89	8.06				
<b>Ali, Nia (USA) (1988)</b>	time	2.53	3.53	4.52	5.49	6.45	7.42	8.39	9.37	10.35	11.35		12.49	6 / 2			
	reaction time	0.156													2.96	2.90	2.96
	interval		1.00	0.99	0.97	0.96	0.97	0.97	0.98	0.98	1.00	1.14			8.61	8.79	8.61
	velocity	5.14	8.50	8.59	8.76	8.85	8.76	8.76	8.67	8.67	8.50	8.82	8.01				
<b>Williams, Danielle (JAM) (1992)</b>	time	2.51	3.50	4.48	5.44	6.40	7.38	8.35	9.34	10.34	11.36		12.50	4 / 3			
	reaction time	0.133													2.93	2.91	3.01
	interval		0.99	0.98	0.96	0.96	0.98	0.97	0.99	1.00	1.02	1.14			8.70	8.76	8.47
	velocity	5.18	8.59	8.67	8.85	8.85	8.67	8.76	8.59	8.50	8.33	8.82	8.00				
<b>Skrzysowska, Pia (POL) (2001)</b>	time	2.53	3.54	4.55	5.50	6.48	7.45	8.42	9.39	10.41	11.48		12.71	7 / 4			
	reaction time	0.136													2.97	2.92	3.06
	interval		1.01	1.01	0.95	0.98	0.97	0.97	0.97	1.02	1.07	1.23			8.59	8.73	8.33
	velocity	5.14	8.42	8.42	8.95	8.67	8.76	8.76	8.76	8.33	7.94	8.17	7.87				
<b>Jenneke, Michelle (AUS) (1993)</b>	time	2.55	3.57	4.57	5.55	6.54	7.52	8.52	9.52	10.54	11.58		12.80	3 / 5			
	reaction time	0.146													3.00	2.97	3.06
	interval		1.02	1.00	0.98	0.99	0.98	1.00	1.00	1.02	1.04	1.22			8.50	8.59	8.33
	velocity	5.10	8.33	8.50	8.67	8.59	8.67	8.50	8.50	8.33	8.17	8.24	7.81				
<b>Fourie, Marione (RSA) (2002)</b>	time	2.60	3.62	4.64	5.64	6.64	7.62	8.64	9.64	10.67	11.74		12.89	8 / 6			
	reaction time	0.158													3.04	3.00	3.10
	interval		1.02	1.02	1.00	1.00	0.98	1.02	1.00	1.03	1.07	1.15			8.39	8.50	8.23
	velocity	5.00	8.33	8.33	8.50	8.50	8.67	8.33	8.50	8.25	7.94	8.74	7.76				
<b>Graversgaard, Mette (DEN) (1995)</b>	time	2.60	3.64	4.66	5.64	6.66	7.66	8.65	9.66	10.70	11.78		12.94	9 / 7			
	reaction time	0.163													3.04	3.01	3.13
	interval		1.04	1.02	0.98	1.02	1.00	0.99	1.01	1.04	1.08	1.16			8.39	8.47	8.15
	velocity	5.00	8.17	8.33	8.67	8.33	8.50	8.59	8.42	8.17	7.87	8.66	7.73				
<b>Harrison, Michelle (CAN) (1992)</b>	time	2.67	3.67	4.69	5.70	6.70	7.72	8.72	9.74	10.78	11.82		13.05	2 / 8			
	reaction time	0.158													3.03	3.02	3.10
	interval		1.00	1.02	1.01	1.00	1.02	1.00	1.02	1.04	1.04	1.23			8.42	8.44	8.23
	velocity	4.87	8.50	8.33	8.42	8.50	8.33	8.50	8.33	8.17	8.17	8.17	7.66				



Time Intervals (s)

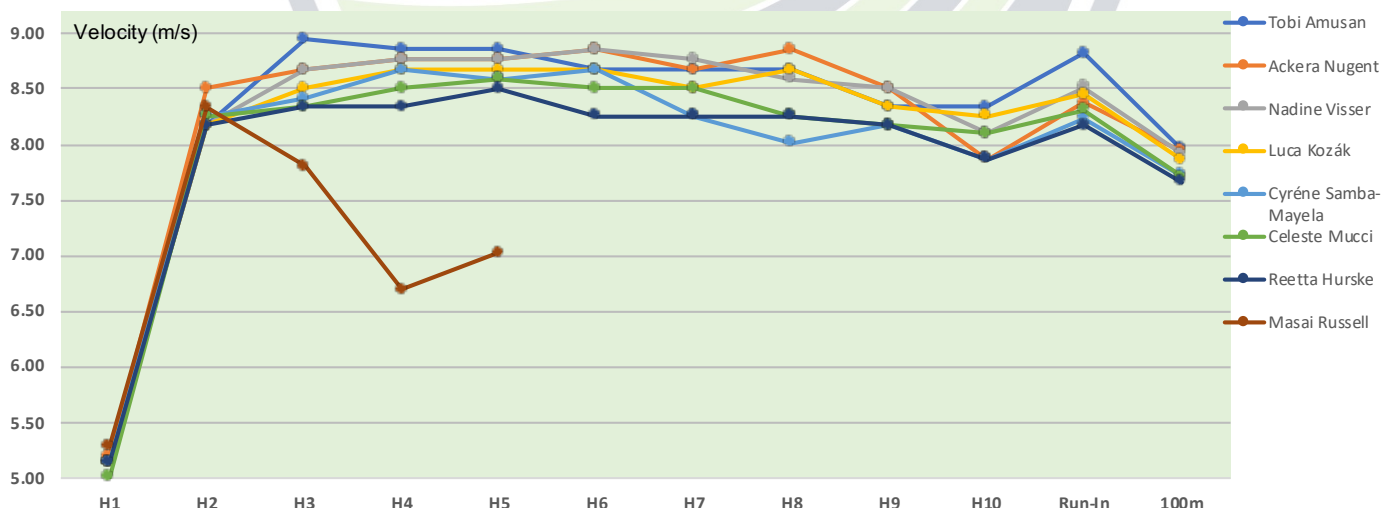
Hurdle Phases



Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: First Movement  
 Source: <https://www.youtube.com/watch?v=Dl7mFHJLP8>

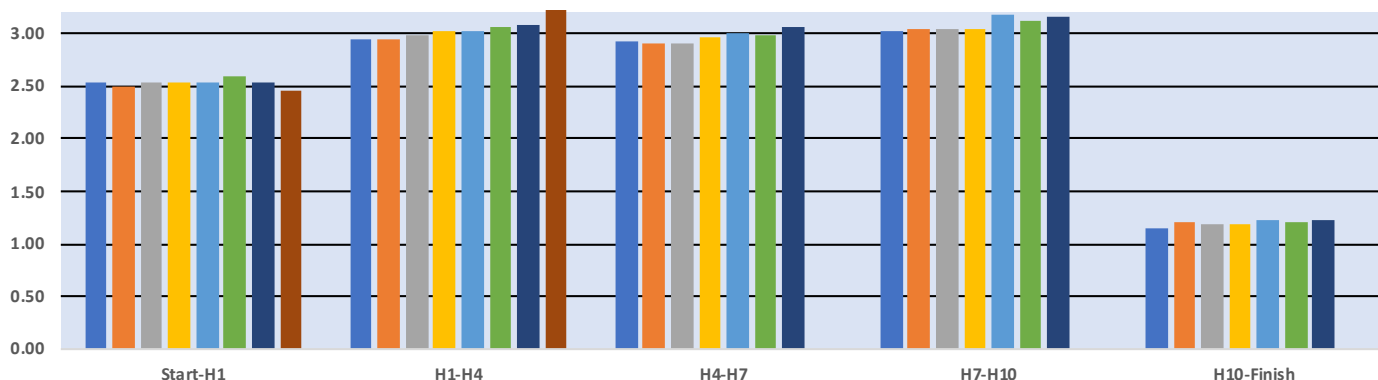
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

100m Hurdles		Date: 2023.08.23	Wind: -0.7 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
Amusan, Tobi (NGR) (1997)	time	0.155	2.53	3.57	4.52	5.48	6.44	7.42	8.40	9.38	10.40	11.42	12.56	12.56	7 / 1	2.95	2.92	3.02
	reaction time	0.155														8.64	8.73	8.44
	interval velocity		5.14	8.17	8.95	8.85	8.85	8.67	8.67	8.67	8.33	8.33	8.82	7.96				
Nugent, Ackera (JAM) (2002)	time	0.130	2.50	3.50	4.48	5.45	6.42	7.38	8.36	9.32	10.32	11.40	12.60	12.60	5 / 2	2.95	2.91	3.04
	reaction time	0.130														8.64	8.76	8.39
	interval velocity		5.20	8.50	8.67	8.76	8.76	8.85	8.67	8.85	8.50	7.87	8.38	7.94				
Visser, Nadine (NED) (1995)	time	0.131	2.53	3.57	4.55	5.52	6.49	7.45	8.42	9.41	10.41	11.46	12.64	12.64	6 / 3	2.99	2.90	3.04
	reaction time	0.131														8.53	8.79	8.39
	interval velocity		5.14	8.17	8.67	8.76	8.76	8.85	8.76	8.59	8.50	8.10	8.52	7.91				
Kozák, Luca (HUN) (1996)	time	0.142	2.53	3.57	4.57	5.55	6.53	7.51	8.51	9.49	10.51	11.54	12.73	12.73	3 / 4	3.02	2.96	3.03
	reaction time	0.142														8.44	8.61	8.42
	interval velocity		5.14	8.17	8.50	8.67	8.67	8.67	8.50	8.67	8.33	8.25	8.45	7.86				
Samba-Mayela, Cyréna (FRA) (2000)	time	0.170	2.53	3.56	4.57	5.55	6.54	7.52	8.55	9.61	10.65	11.73	12.95	12.95	8 / 5	3.02	3.00	3.18
	reaction time	0.170														8.44	8.50	8.02
	interval velocity		5.14	8.25	8.42	8.67	8.59	8.67	8.25	8.02	8.17	7.87	8.24	7.72				
Mucci, Celeste (AUS) (1999)	time	0.175	2.60	3.63	4.65	5.65	6.64	7.64	8.64	9.67	10.71	11.76	12.97	12.97	2 / 6	3.05	2.99	3.12
	reaction time	0.175														8.36	8.53	8.17
	interval velocity		5.00	8.25	8.33	8.50	8.59	8.50	8.50	8.25	8.17	8.10	8.31	7.71				
Hurske, Reetta (FIN) (1995)	time	0.137	2.53	3.57	4.59	5.61	6.61	7.64	8.67	9.70	10.74	11.82	13.05	13.05	9 / 7	3.08	3.06	3.15
	reaction time	0.137														8.28	8.33	8.10
	interval velocity		5.14	8.17	8.33	8.33	8.50	8.25	8.25	8.25	8.17	7.87	8.17	7.66				
Russell, Masai (USA) (2000)	time	dnf	2.46	3.48	4.57	5.84	7.05								4 / --	3.38		
	reaction time	0.152														7.54		
	interval velocity		5.28	8.33	7.80	6.69	7.02											



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=QbrXXJQ-IDY>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

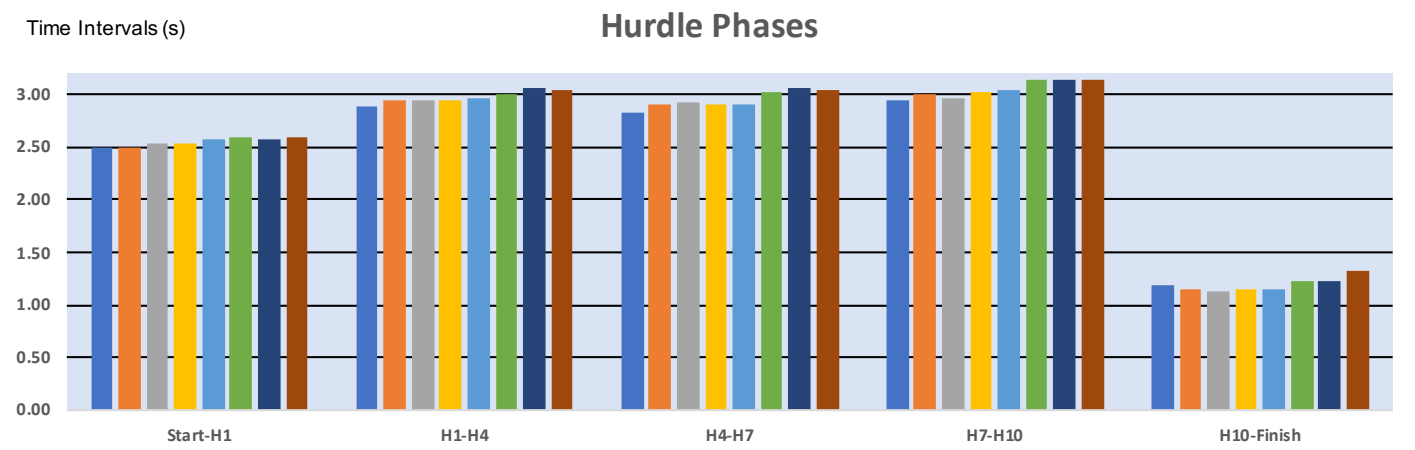
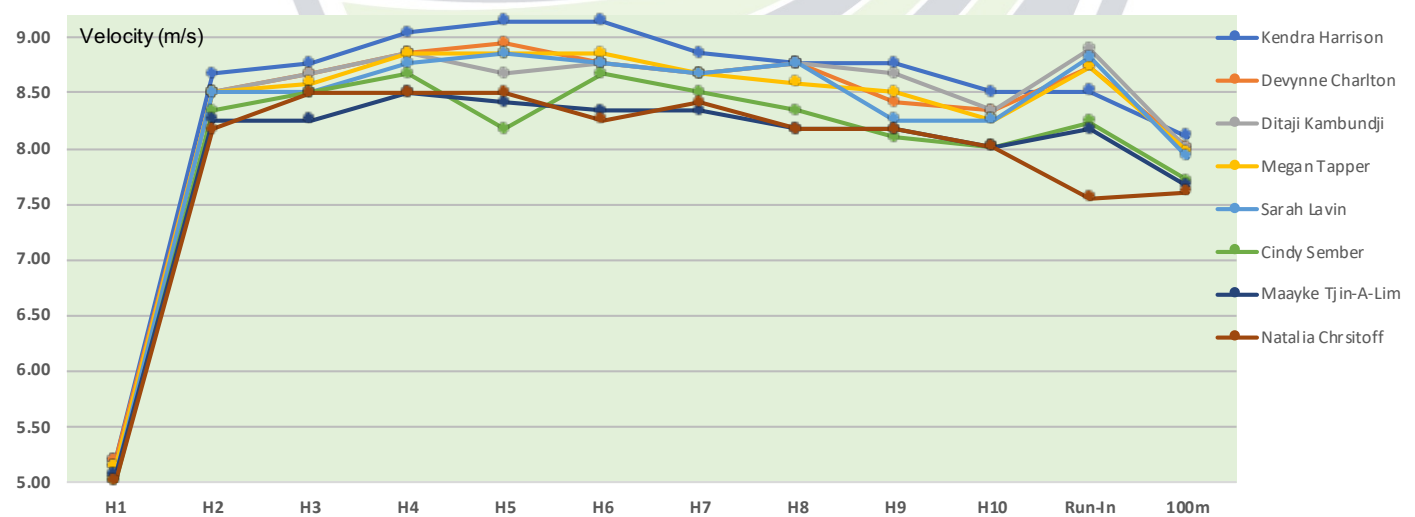
100m Hurdles

Date: 2023.08.23

Wind: 0.5 m/s

Semi-Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.50	3.48	4.45	5.39	6.32	7.25	8.21	9.18	10.15	11.15	12.33		7 / 1			
	reaction time	0.142													2.89	2.82	2.94
	interval		0.98	0.97	0.94	0.93	0.93	0.96	0.97	0.97	1.00	1.18			8.82	9.04	8.67
	velocity	5.20	8.67	8.76	9.04	9.14	9.14	8.85	8.76	8.76	8.50	8.52	8.11				
Charlton, Devynne (BAH) (1995)	time	2.50	3.50	4.48	5.44	6.39	7.36	8.34	9.31	10.32	11.34	12.49		6 / 2			
	reaction time	0.177													2.94	2.90	3.00
	interval		1.00	0.98	0.96	0.95	0.97	0.98	0.97	1.01	1.02	1.15			8.67	8.79	8.50
	velocity	5.20	8.50	8.67	8.85	8.95	8.76	8.67	8.76	8.42	8.33	8.74	8.01				
Kambundji, Ditaji (SUI) (2002)	time	2.53	3.53	4.51	5.47	6.45	7.42	8.40	9.37	10.35	11.37	12.50		3 / 3			
	reaction time	0.141													2.94	2.93	2.97
	interval		1.00	0.98	0.96	0.98	0.97	0.98	0.97	0.98	1.02	1.13			8.67	8.70	8.59
	velocity	5.14	8.50	8.67	8.85	8.67	8.76	8.67	8.76	8.67	8.33	8.89	8.00				
Tapper, Megan (JAM) (1994)	time	2.53	3.53	4.52	5.48	6.44	7.40	8.38	9.37	10.37	11.40	12.55		5 / 4			
	reaction time	0.162													2.95	2.90	3.02
	interval		1.00	0.99	0.96	0.96	0.96	0.98	0.99	1.00	1.03	1.15			8.64	8.79	8.44
	velocity	5.14	8.50	8.59	8.85	8.85	8.85	8.67	8.59	8.50	8.25	8.74	7.97				
Lavin, Sarah (IRL) (1994)	time	2.57	3.57	4.57	5.54	6.50	7.47	8.45	9.42	10.45	11.48	12.62		4 / 5			
	reaction time	0.139													2.97	2.91	3.03
	interval		1.00	1.00	0.97	0.96	0.97	0.98	0.97	1.03	1.03	1.14	NR		8.59	8.76	8.42
	velocity	5.06	8.50	8.50	8.76	8.85	8.76	8.67	8.76	8.25	8.25	8.82	7.92				
Sember, Cindy (GBR) (1994)	time	2.60	3.62	4.62	5.60	6.64	7.62	8.62	9.64	10.69	11.75	12.97		8 / 6			
	reaction time	0.167													3.00	3.02	3.13
	interval		1.02	1.00	0.98	1.04	0.98	1.00	1.02	1.05	1.06	1.22			8.50	8.44	8.15
	velocity	5.00	8.33	8.50	8.67	8.17	8.67	8.50	8.33	8.10	8.02	8.24	7.71				
Tjin-A-Lim, Maayke (NED) (1998)	time	2.57	3.60	4.63	5.63	6.64	7.66	8.68	9.72	10.76	11.82	13.05		2 / 7			
	reaction time	0.135													3.06	3.05	3.14
	interval		1.03	1.03	1.00	1.01	1.02	1.02	1.04	1.04	1.06	1.23			8.33	8.36	8.12
	velocity	5.06	8.25	8.25	8.50	8.42	8.33	8.33	8.17	8.17	8.02	8.17	7.66				
Christofi, Natalia (CYP) (1997)	time	2.60	3.64	4.64	5.64	6.64	7.67	8.68	9.72	10.76	11.82	13.15		9 / 8			
	reaction time	0.155													3.04	3.04	3.14
	interval		1.04	1.00	1.00	1.00	1.03	1.01	1.04	1.04	1.06	1.33			8.39	8.39	8.12
	velocity	5.00	8.17	8.50	8.50	8.50	8.25	8.42	8.17	8.17	8.02	7.56	7.60				

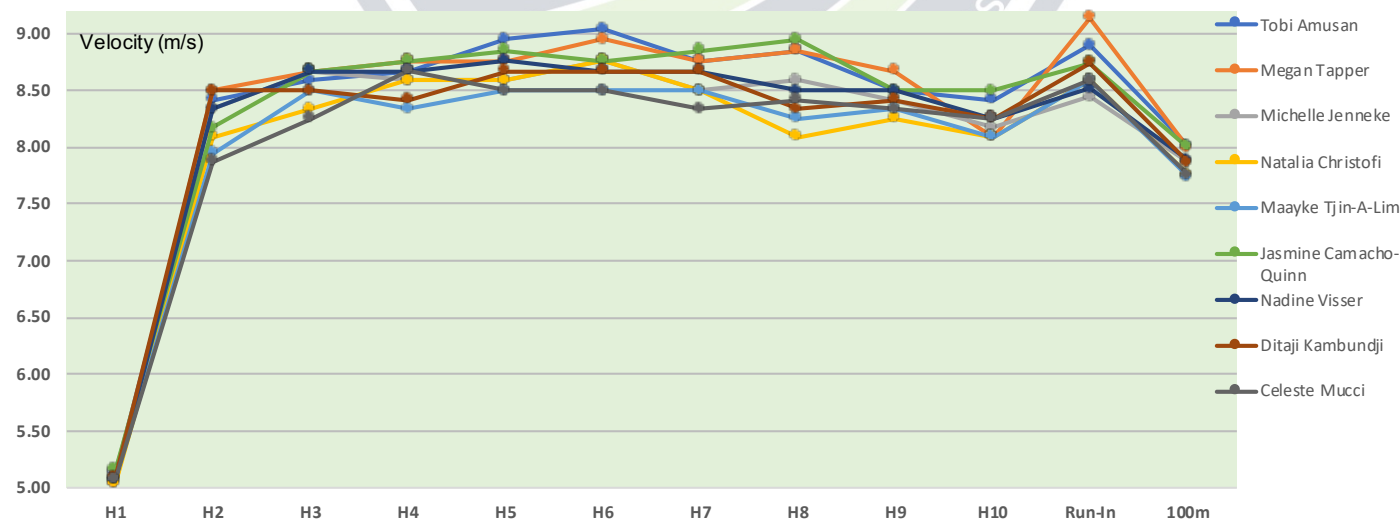


Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: First Movement  
 Source: <https://www.youtube.com/watch?v=fdoMsTTIQIQ>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

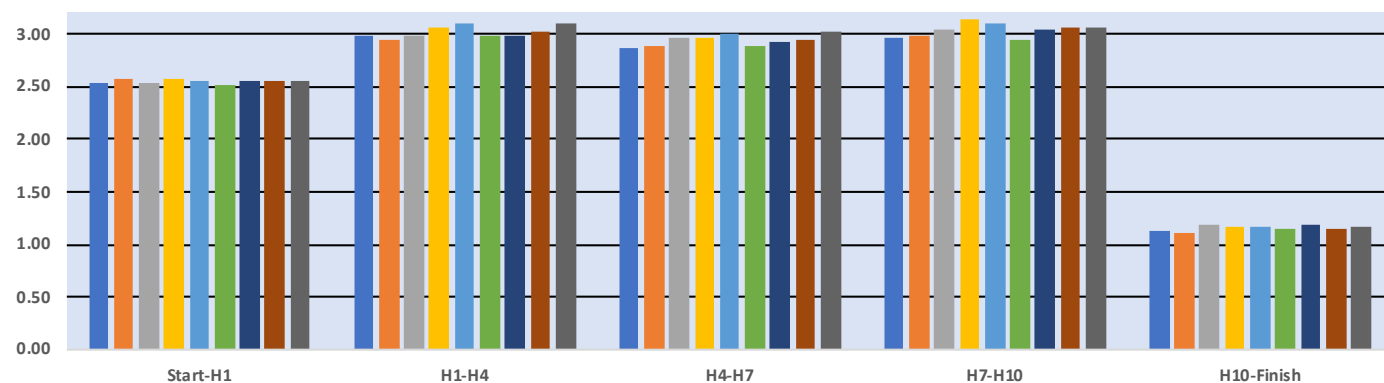
100m Hurdles		Date: 2023.08.22	Wind: 0.4 m/s										Heat 5					
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Amusan, Tobi (NGR) (1997)</b>	time	2.54	3.55	4.54	5.52	6.47	7.41	8.38	9.34	10.34	11.35			12.48	4 / 1			
	reaction time	0.149														2.98	2.86	2.97
	interval velocity		1.01	0.99	0.98	0.95	0.94	0.97	0.96	1.00	1.01	1.13				8.56	8.92	8.59
<b>Tapper, Megan (JAM) (1994)</b>	time	2.58	3.58	4.56	5.53	6.50	7.45	8.42	9.38	10.36	11.41			12.51	3 / 2			
	reaction time	0.168														2.95	2.89	2.99
	interval velocity		1.00	0.98	0.97	0.97	0.95	0.97	0.96	0.98	1.05	1.10				8.64	8.82	8.53
<b>Jenneke, Michelle (AUS) (1993)</b>	time	2.53	3.55	4.53	5.52	6.51	7.48	8.48	9.47	10.48	11.52			12.71	5 / 3			
	reaction time	0.156														2.99	2.96	3.04
	interval velocity		1.02	0.98	0.99	0.99	0.97	1.00	0.99	1.01	1.04	1.19				8.53	8.61	8.39
<b>Christofi, Natalia (CYP) (1997)</b>	time	2.58	3.63	4.65	5.64	6.63	7.60	8.60	9.65	10.68	11.73			12.90	7 / 4			
	reaction time	0.147														3.06	2.96	3.13
	interval velocity		1.05	1.02	0.99	0.99	0.97	1.00	1.05	1.03	1.05	1.17				8.33	8.61	8.15
<b>Tjin-A-Lim, Maayke (NED) (1998)</b>	time	2.56	3.63	4.63	5.65	6.65	7.65	8.65	9.68	10.70	11.75			12.92	2 / 5			
	reaction time	0.155														3.09	3.00	3.10
	interval velocity		1.07	1.00	1.02	1.00	1.00	1.00	1.03	1.02	1.05	1.17				8.25	8.50	8.23

100m Hurdles		Date: 2023.08.22	Wind: 0.0 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
<b>Camacho-Quinn, Jasmine (PUR) (199)</b>	time	2.52	3.56	4.54	5.51	6.47	7.44	8.40	9.35	10.35	11.35			12.50	9 / 1			
	reaction time	0.160														2.99	2.89	2.95
	interval velocity		1.04	0.98	0.97	0.96	0.97	0.96	0.95	1.00	1.00	1.15				8.53	8.82	8.64
<b>Visser, Nadine (NED) (1995)</b>	time	2.56	3.58	4.56	5.54	6.51	7.49	8.47	9.47	10.47	11.50			12.68	4 / 2			
	reaction time	0.146														2.98	2.93	3.03
	interval velocity		1.02	0.98	0.98	0.97	0.98	0.98	1.00	1.00	1.03	1.18				8.56	8.70	8.42
<b>Kambundji, Ditaji (SUI) (2002)</b>	time	2.55	3.55	4.55	5.56	6.54	7.52	8.50	9.52	10.53	11.56			12.71	2 / 3			
	reaction time	0.145														3.01	2.94	3.06
	interval velocity		1.00	1.00	1.01	0.98	0.98	0.98	1.02	1.01	1.03	1.15				8.47	8.67	8.33
<b>Mucci, Celeste (AUS) (1999)</b>	time	2.56	3.64	4.67	5.65	6.65	7.65	8.67	9.68	10.70	11.73			12.90	3 / 4			
	reaction time	0.171														3.09	3.02	3.06
	interval velocity		1.08	1.03	0.98	1.00	1.00	1.02	1.01	1.02	1.03	1.17				8.25	8.44	8.33



Time Intervals (s)

Hurdle Phases

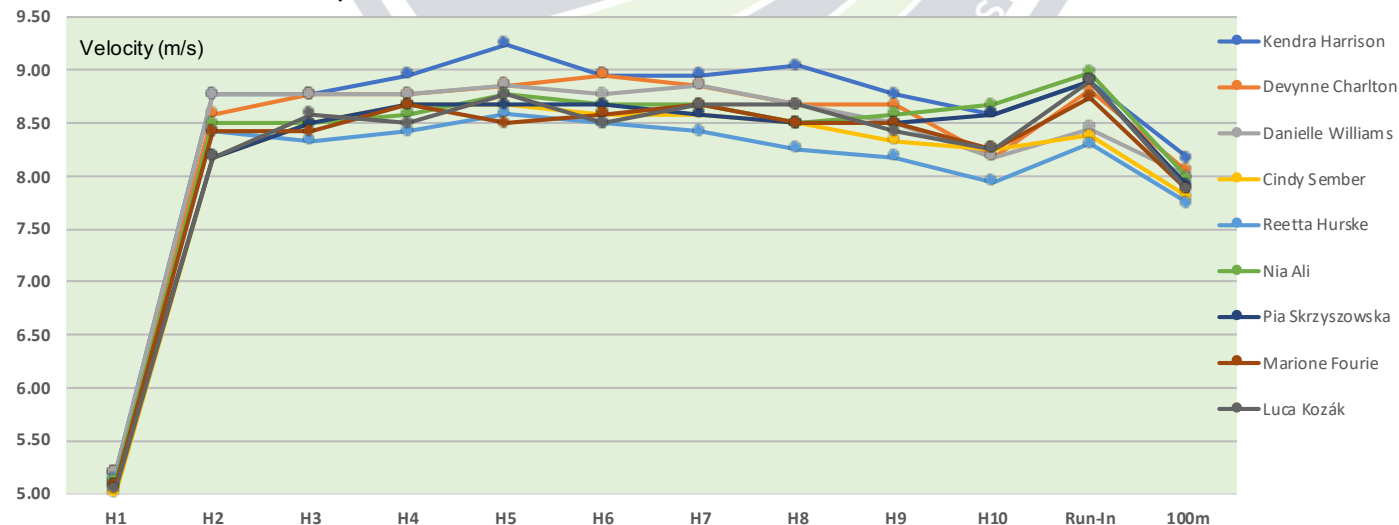


Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: First Movement  
 Source: [https://www.youtube.com/watch?v=j\\_2peRKl4xA&t=195s](https://www.youtube.com/watch?v=j_2peRKl4xA&t=195s)

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

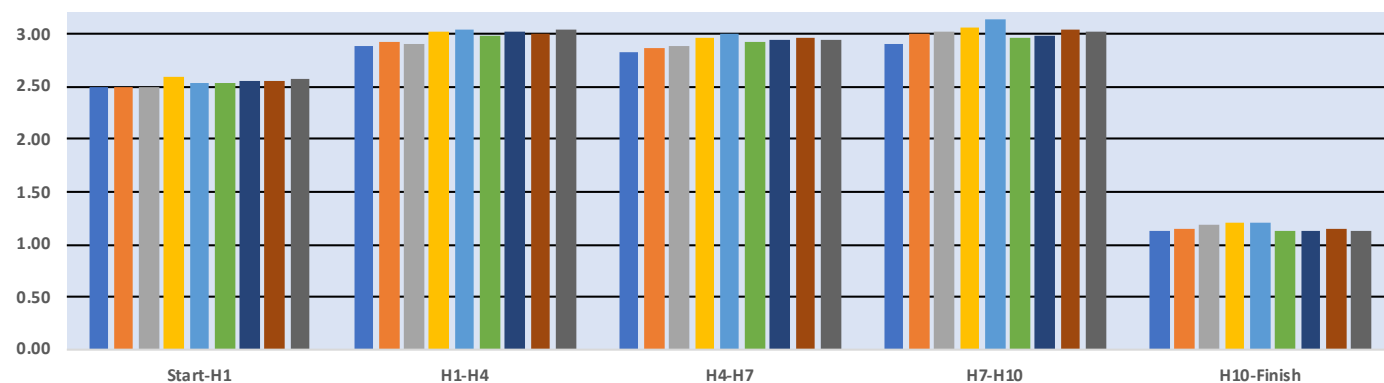
100m Hurdles		Date: 2023.08.22	Wind: 0.1 m/s	Heat 3													
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.50	3.47	4.44	5.39	6.31	7.26	8.21	9.15	10.12	11.11		12.24	4 / 1			
	reaction time	0.155													2.89	2.82	2.90
	velocity	5.20	8.76	8.76	8.95	9.24	8.95	8.95	9.04	8.76	8.59	8.89	8.17		8.82	9.04	8.79
Charlton, Devynne (BAH) (1995)	time	2.50	3.49	4.46	5.43	6.39	7.34	8.30	9.28	10.26	11.30		12.44	9 / 2			
	reaction time	0.159													2.93	2.87	3.00
	velocity	5.20	8.59	8.76	8.76	8.85	8.95	8.85	8.67	8.67	8.17	8.82	8.04		8.70	8.89	8.50
Williams, Danielle (JAM) (1992)	time	2.50	3.47	4.44	5.41	6.37	7.34	8.30	9.28	10.28	11.32		12.51	3 / 3			
	reaction time	0.116													2.91	2.89	3.02
	velocity	5.20	8.76	8.76	8.76	8.85	8.76	8.85	8.67	8.50	8.17	8.45	7.99		8.76	8.82	8.44
Sember, Cindy (GBR) (1994)	time	2.60	3.64	4.64	5.62	6.60	7.59	8.58	9.58	10.60	11.63		12.83	8 / 4			
	reaction time	0.173													3.02	2.96	3.05
	velocity	5.00	8.17	8.50	8.67	8.67	8.59	8.59	8.50	8.33	8.25	8.38	7.79		8.44	8.61	8.36
Hurske, Reetta (FIN) (1995)	time	2.53	3.54	4.56	5.57	6.56	7.56	8.57	9.60	10.64	11.71		12.92	1 / 5			
	reaction time	0.140													3.04	3.00	3.14
	velocity	5.14	8.42	8.33	8.42	8.59	8.50	8.42	8.25	8.17	7.94	8.31	7.74		8.39	8.50	8.12

100m Hurdles		Date: 2023.08.22	Wind: 0.0 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
Ali, Nia (USA) (1988)	time	2.54	3.54	4.54	5.53	6.50	7.48	8.46	9.46	10.45	11.43		12.55	5 / 1			
	reaction time	0.142													2.99	2.93	2.97
	velocity	5.12	8.50	8.50	8.59	8.76	8.67	8.67	8.50	8.59	8.67	8.97	7.97		8.53	8.70	8.59
Skrzysowska, Pia (POL) (2001)	time	2.56	3.60	4.60	5.58	6.56	7.54	8.53	9.53	10.53	11.52		12.65	4 / 2			
	reaction time	0.142													3.02	2.95	2.99
	velocity	5.08	8.17	8.50	8.67	8.67	8.67	8.59	8.50	8.50	8.59	8.89	7.91		8.44	8.64	8.53
Fourie, Marione (RSA) (2002)	time	2.56	3.57	4.58	5.56	6.56	7.55	8.53	9.53	10.53	11.56		12.71	2 / 3			
	reaction time	0.164													3.00	2.97	3.03
	velocity	5.08	8.42	8.42	8.67	8.50	8.59	8.67	8.50	8.50	8.25	8.74	7.87		8.50	8.59	8.42
Kozák, Luca (HUN) (1996)	time	2.58	3.62	4.61	5.61	6.58	7.58	8.56	9.54	10.55	11.58		12.71	6 / 3			
	reaction time	0.149													3.03	2.95	3.02
	velocity	5.04	8.17	8.59	8.50	8.76	8.50	8.67	8.67	8.42	8.25	8.89	7.87		8.42	8.64	8.44



Time Intervals (s)

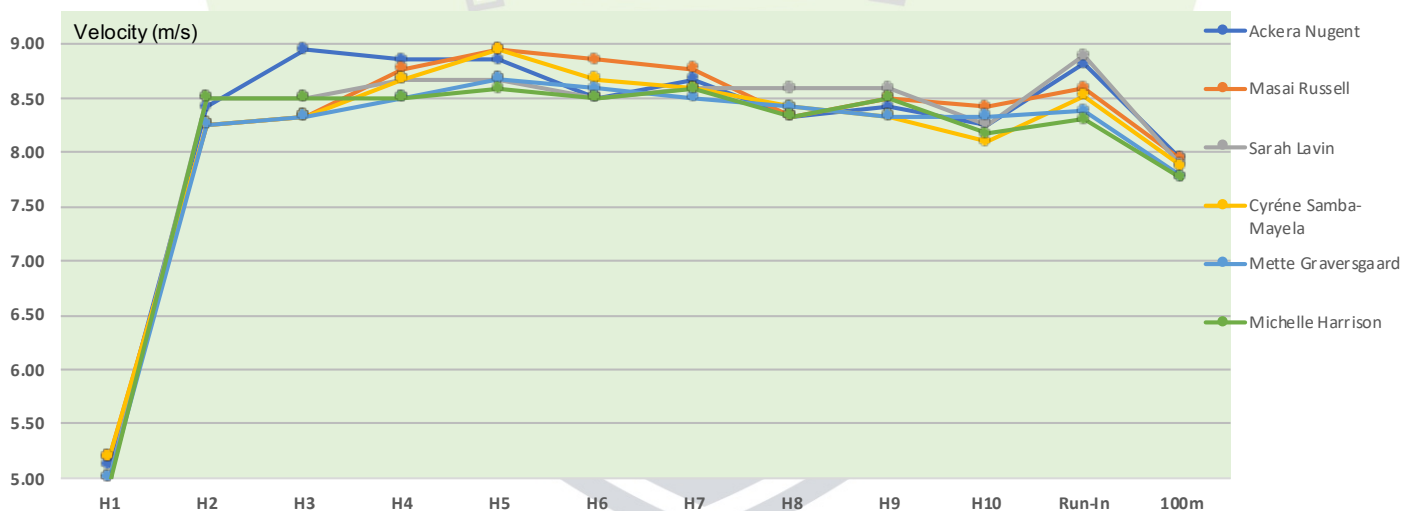
Hurdle Phases



Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: First Movement  
 Source: [https://www.youtube.com/watch?v=j\\_2peRKl4xA&t=195s](https://www.youtube.com/watch?v=j_2peRKl4xA&t=195s)

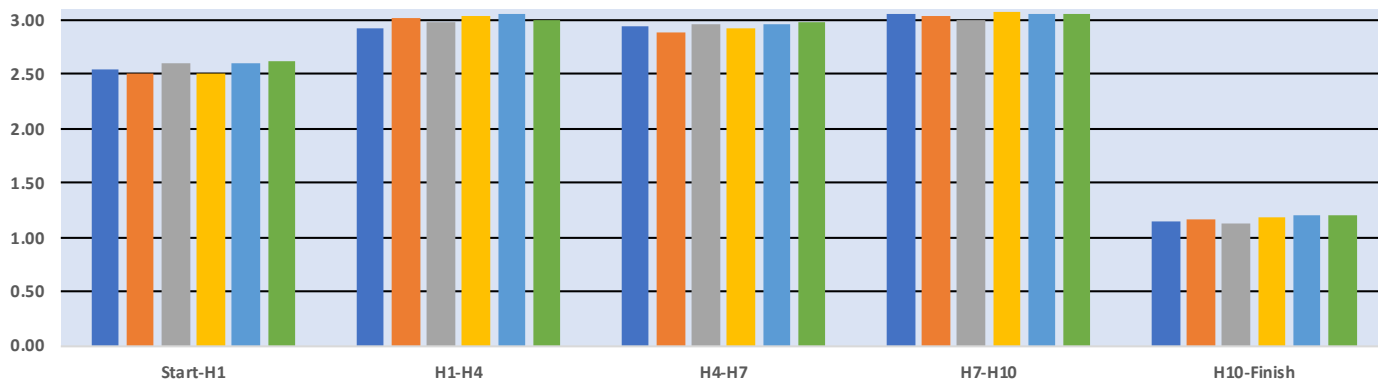
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

100m Hurdles		Date: 2023.08.22	Wind: 0.1 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
<b>Nugent, Ackera (JAM) (2002)</b>	time		2.54	3.55	4.50	5.46	6.42	7.42	8.40	9.42	10.43	11.46		12.60	7 / 1			
	reaction time	0.134														2.92	2.94	3.06
	interval			1.01	0.95	0.96	0.96	1.00	0.98	1.02	1.01	1.03	1.14			8.73	8.67	8.33
	velocity		5.12	8.42	8.95	8.85	8.85	8.50	8.67	8.33	8.42	8.25	8.82	7.94				
<b>Russell, Masai (USA) (2000)</b>	time		2.50	3.53	4.55	5.52	6.47	7.43	8.40	9.42	10.42	11.43		12.60	6 / 2			
	reaction time	0.164														3.02	2.88	3.03
	interval			1.03	1.02	0.97	0.95	0.96	0.97	1.02	1.00	1.01	1.17			8.44	8.85	8.42
	velocity		5.20	8.25	8.33	8.76	8.95	8.85	8.76	8.33	8.50	8.42	8.59	7.94				
<b>Lavin, Sarah (IRL) (1994)</b>	time		2.60	3.60	4.60	5.58	6.56	7.56	8.55	9.54	10.53	11.56		12.69	2 / 3			
	reaction time	0.139														2.98	2.97	3.01
	interval			1.00	1.00	0.98	0.98	1.00	0.99	0.99	0.99	1.03	1.13			8.56	8.59	8.47
	velocity		5.00	8.50	8.50	8.67	8.67	8.50	8.59	8.59	8.59	8.25	8.89	7.88				
<b>Samba-Mayela, Cyréna (FRA) (2000)</b>	time		2.50	3.53	4.55	5.53	6.48	7.46	8.45	9.46	10.48	11.53		12.71	9 / 4			
	reaction time	0.144														3.03	2.92	3.08
	interval			1.03	1.02	0.98	0.95	0.98	0.99	1.01	1.02	1.05	1.18			8.42	8.73	8.28
	velocity		5.20	8.25	8.33	8.67	8.95	8.67	8.59	8.42	8.33	8.10	8.52	7.87				
<b>Graversgaard, Mette (DEN) (1995)</b>	time		2.60	3.63	4.65	5.65	6.63	7.62	8.62	9.63	10.65	11.67		12.87	5 / 5			
	reaction time	0.166														3.05	2.97	3.05
	interval			1.03	1.02	1.00	0.98	0.99	1.00	1.01	1.02	1.02	1.20			8.36	8.59	8.36
	velocity		5.00	8.25	8.33	8.50	8.67	8.59	8.50	8.42	8.33	8.33	8.38	7.77				
<b>Harrison, Michelle (CAN) (1992)</b>	time		2.63	3.63	4.63	5.63	6.62	7.62	8.61	9.63	10.63	11.67		12.88	8 / 6			
	reaction time	0.152														3.00	2.98	3.06
	interval			1.00	1.00	1.00	0.99	1.00	0.99	1.02	1.00	1.04	1.21			8.50	8.56	8.33
	velocity		4.94	8.50	8.50	8.50	8.59	8.50	8.59	8.33	8.50	8.17	8.31	7.76				



Time Intervals (s)

Hurdle Phases

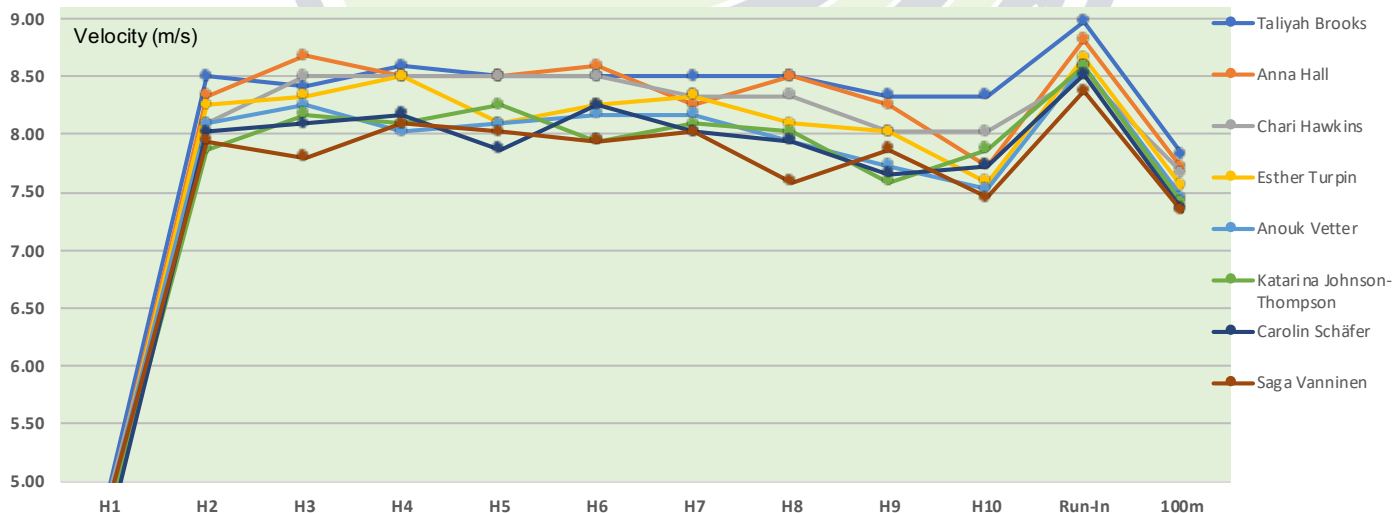


Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: First Movement  
 Source: [https://www.youtube.com/watch?v=j\\_2peRKl4xA&t=195s](https://www.youtube.com/watch?v=j_2peRKl4xA&t=195s)



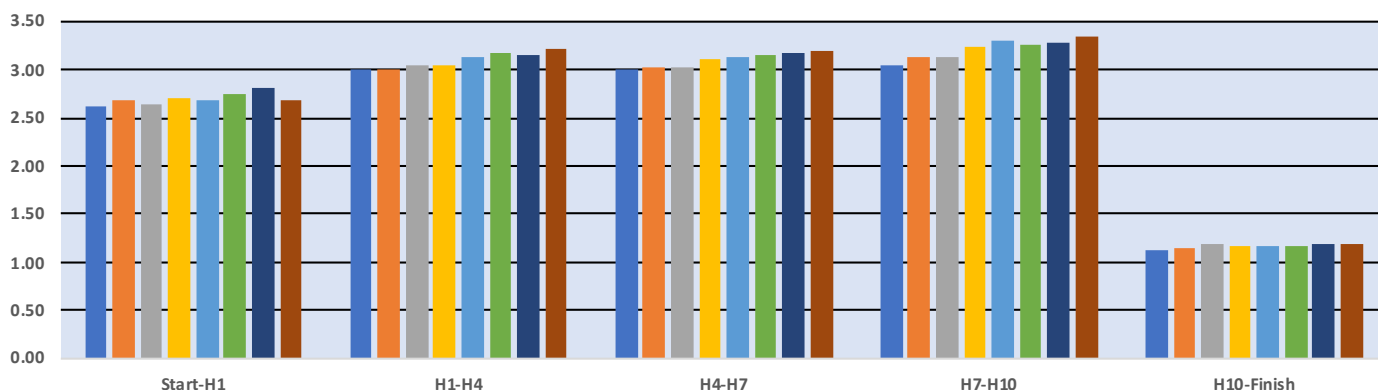
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Heptathlon - 100m Hurdles		Date: 2023.08.19	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
Brooks, Talyah (USA) (1995)	time	2.62	3.62	4.63	5.62	6.62	7.62	8.62	9.62	10.64	11.66	12.78	12.78	8 / 1	3.00	3.00	3.04
	reaction time	0.177															
	interval	7 steps	1.00	1.01	0.99	1.00	1.00	1.00	1.00	1.02	1.02	1.12			8.50	8.50	8.39
	velocity	4.96	8.50	8.42	8.59	8.50	8.50	8.50	8.50	8.33	8.33	8.97	7.82				
Hall, Anna (USA) (2001)	time	2.68	3.70	4.68	5.68	6.68	7.67	8.70	9.70	10.73	11.83	12.97	12.97	5 / 2	3.00	3.02	3.13
	reaction time	0.187															
	interval	7 steps	1.02	0.98	1.00	1.00	0.99	1.03	1.00	1.03	1.10	1.14			8.50	8.44	8.15
	velocity	4.85	8.33	8.67	8.50	8.50	8.59	8.25	8.50	8.25	7.73	8.82	7.71				
Hawkins, Chari (USA) (1991)	time	2.65	3.70	4.70	5.70	6.70	7.70	8.72	9.74	10.80	11.86	13.04	13.04	7 / 3	3.05	3.02	3.14
	reaction time	0.168															
	interval		1.05	1.00	1.00	1.00	1.00	1.02	1.02	1.06	1.06	1.18	PB		8.36	8.44	8.12
	velocity	4.91	8.10	8.50	8.50	8.50	8.50	8.33	8.33	8.02	8.02	8.52	7.67				
Turpin, Esther (FRA) (1996)	time	2.70	3.73	4.75	5.75	6.80	7.83	8.85	9.90	10.96	12.08	13.24	13.24	3 / 4	3.05	3.10	3.23
	reaction time	0.172															
	interval		1.03	1.02	1.00	1.05	1.03	1.02	1.05	1.06	1.12	1.16			8.36	8.23	7.89
	velocity	4.81	8.25	8.33	8.50	8.10	8.25	8.33	8.10	8.02	7.59	8.66	7.55				
Vetter, Anouk (NED) (1993)	time	2.68	3.73	4.76	5.82	6.87	7.91	8.95	10.02	11.12	12.25	13.42	13.42	4 / 5	3.14	3.13	3.30
	reaction time	0.153															
	interval		1.05	1.03	1.06	1.05	1.04	1.04	1.07	1.10	1.13	1.17			8.12	8.15	7.73
	velocity	4.85	8.10	8.25	8.02	8.10	8.17	8.17	7.94	7.73	7.52	8.59	7.45				
Johnson-Thompson, Katarina (GBR)	time	2.75	3.83	4.87	5.92	6.95	8.02	9.07	10.13	11.25	12.33	13.50	13.50	6 / 6	3.17	3.15	3.26
	reaction time	0.185															
	interval	7 steps	1.08	1.04	1.05	1.03	1.07	1.05	1.06	1.12	1.08	1.17			8.04	8.10	7.82
	velocity	4.73	7.87	8.17	8.10	8.25	7.94	8.10	8.02	7.59	7.87	8.59	7.41				
Schäfer, Carolin (GER) (1991)	time	2.82	3.88	4.93	5.97	7.05	8.08	9.14	10.21	11.32	12.42	13.60	13.60	9 / 7	3.15	3.17	3.28
	reaction time	0.151															
	interval		1.06	1.05	1.04	1.08	1.03	1.06	1.07	1.11	1.10	1.18			8.10	8.04	7.77
	velocity	4.61	8.02	8.10	8.17	7.87	8.25	8.02	7.94	7.66	7.73	8.52	7.35				
Vanninen, Saga (FIN) (2003)	time	2.68	3.75	4.84	5.89	6.95	8.02	9.08	10.20	11.28	12.42	13.62	13.62	2 / 8	3.21	3.19	3.34
	reaction time	0.161															
	interval		1.07	1.09	1.05	1.06	1.07	1.06	1.12	1.08	1.14	1.20			7.94	7.99	7.63
	velocity	4.85	7.94	7.80	8.10	8.02	7.94	8.02	7.59	7.87	7.46	8.38	7.34				



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=k9\\_lit\\_wpu8g](https://www.youtube.com/watch?v=k9_lit_wpu8g)

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Heptathlon - 100m Hurdles

Date: 2023.08.19 Wind: -0.2 m/s

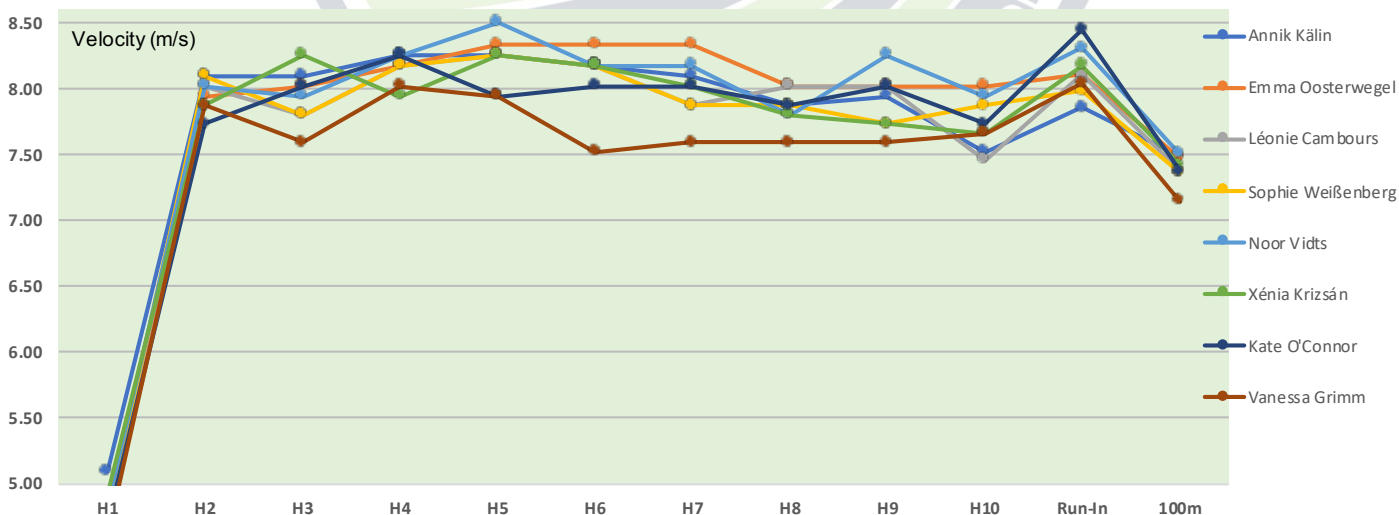
Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Kälin, Annik (SUI) (2000)</b>	time	2.55	3.60	4.65	5.68	6.71	7.75	8.80	9.88	10.95	12.08		13.36	6 / 1			
	reaction time	0.169													3.13	3.12	3.28
	interval		1.05	1.05	1.03	1.03	1.04	1.05	1.08	1.07	1.13	1.28			8.15	8.17	7.77
	velocity	5.10	8.10	8.10	8.25	8.25	8.17	8.10	7.87	7.94	7.52	7.85	7.49				
<b>Oosterwegel, Emma (NED) (1998)</b>	time	2.73	3.80	4.86	5.90	6.92	7.94	8.96	10.02	11.08	12.14		13.38	5 / 2			
	reaction time	0.181													3.17	3.06	3.18
	interval		1.07	1.06	1.04	1.02	1.02	1.02	1.06	1.06	1.06	1.24			8.04	8.33	8.02
	velocity	4.76	7.94	8.02	8.17	8.33	8.33	8.33	8.02	8.02	8.02	8.10	7.47				
<b>Cambours, Léonie (FRA) (2000)</b>	time	2.72	3.78	4.87	5.91	6.94	7.98	9.06	10.12	11.18	12.32		13.56	2 / 3			
	reaction time	0.180													3.19	3.15	3.26
	interval		1.06	1.09	1.04	1.03	1.04	1.08	1.06	1.06	1.14	1.24			7.99	8.10	7.82
	velocity	4.78	8.02	7.80	8.17	8.25	8.17	7.87	8.02	8.02	7.46	8.10	7.37				
<b>Weißenberg, Sophie (GER) (1997)</b>	time	2.73	3.78	4.87	5.91	6.94	7.98	9.06	10.14	11.24	12.32		13.58	3 / 4			
	reaction time	0.182													3.18	3.15	3.26
	interval		7 steps 1.05	1.09	1.04	1.03	1.04	1.08	1.08	1.10	1.08	1.26			8.02	8.10	7.82
	velocity	4.76	8.10	7.80	8.17	8.25	8.17	7.87	7.87	7.73	7.87	7.98	7.36				

Date: 2023.08.19 Wind: -1.1 m/s

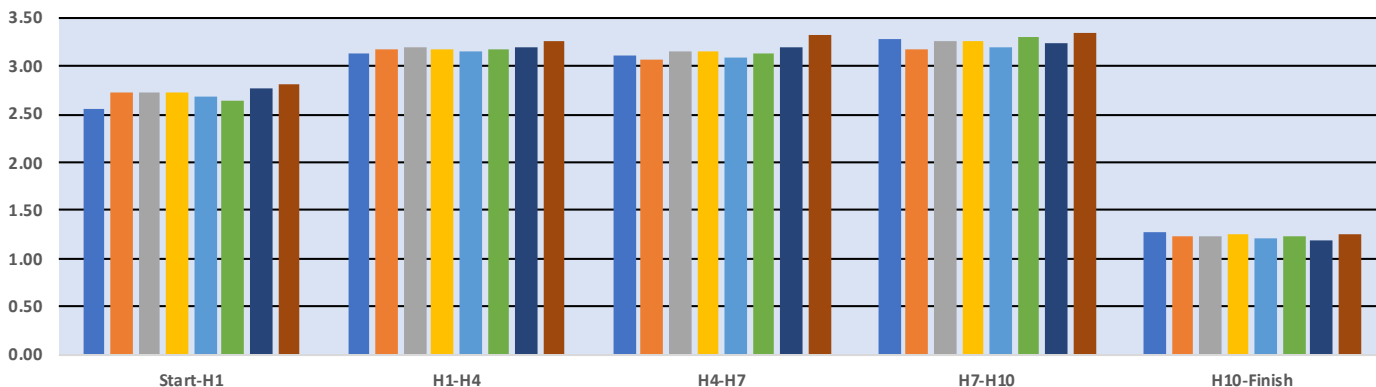
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Vidts, Noor (BEL) (1996)</b>	time	2.69	3.75	4.82	5.85	6.85	7.89	8.93	10.02	11.05	12.12		13.33	4 / 1			
	reaction time	0.176													3.16	3.08	3.19
	interval		1.06	1.07	1.03	1.00	1.04	1.04	1.09	1.03	1.07	1.21			8.07	8.28	7.99
	velocity	4.83	8.02	7.94	8.25	8.50	8.17	8.17	7.80	8.25	7.94	8.31	7.50				
<b>Krizsán, Xénia (HUN) (1993)</b>	time	2.64	3.72	4.75	5.82	6.85	7.89	8.95	10.04	11.14	12.25		13.48	8 / 2			
	reaction time	0.159													3.18	3.13	3.30
	interval		1.08	1.03	1.07	1.03	1.04	1.06	1.09	1.10	1.11	1.23			8.02	8.15	7.73
	velocity	4.92	7.87	8.25	7.94	8.25	8.17	8.02	7.80	7.73	7.66	8.17	7.42				
<b>O'Connor, Kate (IRL) (2000)</b>	time	2.76	3.86	4.92	5.95	7.02	8.08	9.14	10.22	11.28	12.38		13.57	7 / 3			
	reaction time	0.167													3.19	3.19	3.24
	interval		1.10	1.06	1.03	1.07	1.06	1.06	1.08	1.06	1.10	1.19	<b>PB</b>		7.99	7.99	7.87
	velocity	4.71	7.73	8.02	8.25	7.94	8.02	8.02	7.87	8.02	7.73	8.45	7.37				
<b>Grimm, Vanessa (GER) (1997)</b>	time	2.82	3.90	5.02	6.08	7.15	8.28	9.40	10.52	11.64	12.75		14.00	3 / 4			
	reaction time	0.187													3.26	3.32	3.35
	interval		1.08	1.12	1.06	1.07	1.13	1.12	1.12	1.12	1.11	1.25			7.82	7.68	7.61
	velocity	4.61	7.87	7.59	8.02	7.94	7.52	7.59	7.59	7.59	7.66	8.04	7.14				



Time Intervals (s)

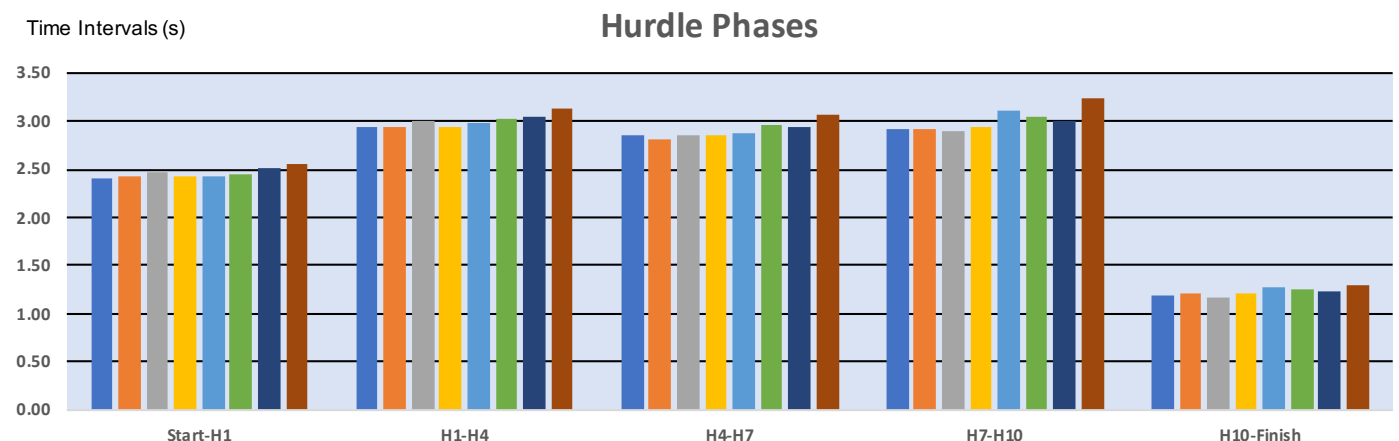
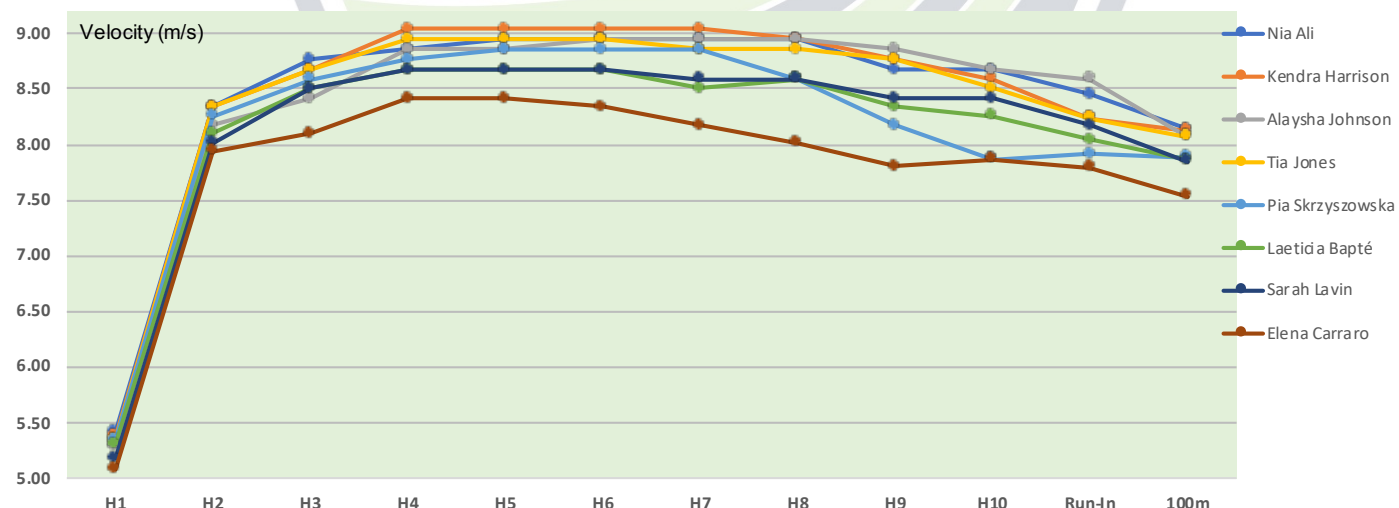
Hurdle Phases



Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: First Movement  
 Source: [https://www.youtube.com/watch?v=k9Jit\\_wpu8g](https://www.youtube.com/watch?v=k9Jit_wpu8g)

2023 Herculis Meeting International d'Athlétisme (Monaco, MON)

100m Hurdles		Date: 2023.07.21	Wind: 0.6 m/s										FINAL				
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Ali, Nia (USA) (1988)	time	2.40	3.42	4.39	5.35	6.30	7.25	8.20	9.15	10.13	11.11		12.30	5 / 1			
	reaction time	0.153											PB		2.95	2.85	2.91
	interval		1.02	0.97	0.96	0.95	0.95	0.95	0.95	0.98	0.98	1.19	8.13		8.64	8.95	8.76
	velocity	5.42	8.33	8.76	8.85	8.95	8.95	8.95	8.95	8.67	8.67	8.45	8.13				
Harrison, Kendra (USA) 1992)	time	2.42	3.44	4.42	5.36	6.30	7.24	8.18	9.13	10.10	11.09		12.31	4 / 2			
	reaction time	0.165											1.22		2.94	2.82	2.91
	interval		1.02	0.98	0.94	0.94	0.94	0.94	0.95	0.97	0.99	1.22	8.12		8.67	9.04	8.76
	velocity	5.37	8.33	8.67	9.04	9.04	9.04	9.04	8.95	8.76	8.59	8.24	8.12				
Johnson, Alaysha (USA) (1996)	time	2.46	3.50	4.51	5.47	6.43	7.38	8.33	9.28	10.24	11.22		12.39	2 / 3			
	reaction time	0.172											1.17		3.01	2.86	2.89
	interval		1.04	1.01	0.96	0.96	0.95	0.95	0.95	0.96	0.98	1.17	8.07		8.47	8.92	8.82
	velocity	5.28	8.17	8.42	8.85	8.85	8.95	8.95	8.95	8.85	8.67	8.59	8.07				
Jones, Tia (USA) (2000)	time	2.43	3.45	4.43	5.38	6.33	7.28	8.24	9.20	10.17	11.17		12.39	7 / 4			
	reaction time	0.156											1.22		2.95	2.86	2.93
	interval		1.02	0.98	0.95	0.95	0.95	0.96	0.96	0.97	1.00	1.22	8.07		8.64	8.92	8.70
	velocity	5.35	8.33	8.67	8.95	8.95	8.95	8.85	8.85	8.76	8.50	8.24	8.07				
Skrzyszowska, Pia (POL) (2001)	time	2.43	3.46	4.45	5.42	6.38	7.34	8.30	9.29	10.33	11.41		12.68	3 / 5			
	reaction time	0.125											1.27		2.99	2.88	3.11
	interval		1.03	0.99	0.97	0.96	0.96	0.96	0.99	1.04	1.08	1.27	7.89		8.53	8.85	8.20
	velocity	5.35	8.25	8.59	8.76	8.85	8.85	8.85	8.59	8.17	7.87	7.91	7.89				
Bapté, Laetitia (FRA) (1999)	time	2.45	3.50	4.50	5.48	6.46	7.44	8.44	9.43	10.45	11.48		12.73	1 / 6			
	reaction time	0.153											PB		3.03	2.96	3.04
	interval		1.05	1.00	0.98	0.98	0.98	1.00	0.99	1.02	1.03	1.25	7.86		8.42	8.61	8.39
	velocity	5.31	8.10	8.50	8.67	8.67	8.67	8.50	8.59	8.33	8.25	8.04	7.86				
Lavin, Sarah (IRL) (1994)	time	2.51	3.57	4.57	5.55	6.53	7.51	8.50	9.49	10.50	11.51		12.74	6 / 7			
	reaction time	0.156											1.23		3.04	2.95	3.01
	interval		1.06	1.00	0.98	0.98	0.98	0.99	0.99	1.01	1.01	1.23	7.85		8.39	8.64	8.47
	velocity	5.18	8.02	8.50	8.67	8.67	8.67	8.59	8.59	8.42	8.42	8.17	7.85				
Carraro, Elena (ITA) (2001)	time	2.56	3.63	4.68	5.69	6.70	7.72	8.76	9.82	10.91	11.99		13.28	8 / 8			
	reaction time	0.172											1.29		3.13	3.07	3.23
	interval		1.07	1.05	1.01	1.01	1.02	1.04	1.06	1.09	1.08	1.29	7.53		8.15	8.31	7.89
	velocity	5.08	7.94	8.10	8.42	8.42	8.33	8.17	8.02	7.80	7.87	7.79	7.53				



Source: Omega Timing (Fri 21 Jul 2023 20:52) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030B0101050101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=it5-iiFFPa4>

2023 Kamila Skolimowska Memorial (Silesia, POL)

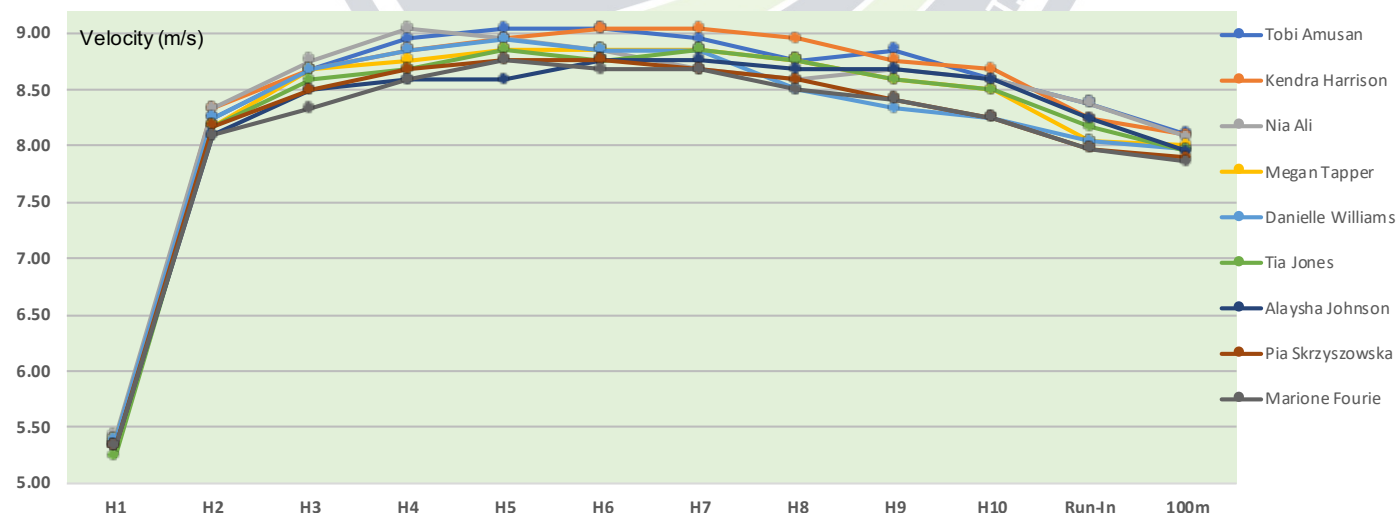
100m Hurdles

Date: 2023.07.16

Wind: 0.9 m/s

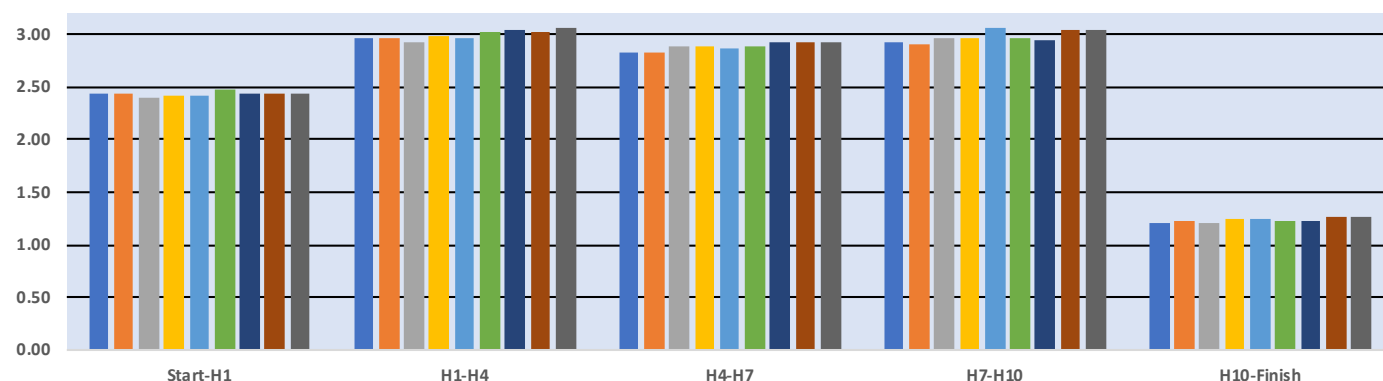
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Amusan, Tobi (NGR) (1997)</b>	time	2.43	3.46	4.44	5.39	6.33	7.27	8.22	9.19	10.15	11.14		12.34	5 / 1			
	reaction time	0.146													2.96	2.83	2.92
	interval		1.03	0.98	0.95	0.94	0.94	0.95	0.97	0.96	0.99	1.20			8.61	9.01	8.73
	velocity	5.35	8.25	8.67	8.95	9.04	9.04	8.95	8.76	8.85	8.59	8.38	8.10				
<b>Harrison, Kendra (USA) 1992</b>	time	2.44	3.46	4.44	5.40	6.35	7.29	8.23	9.18	10.15	11.13		12.35	4 / 2			
	reaction time	0.161													2.96	2.83	2.90
	interval		1.02	0.98	0.96	0.95	0.94	0.94	0.95	0.97	0.98	1.22			8.61	9.01	8.79
	velocity	5.33	8.33	8.67	8.85	8.95	9.04	9.04	8.95	8.76	8.67	8.24	8.10				
<b>Ali, Nia (USA) (1988)</b>	time	2.40	3.42	4.39	5.33	6.28	7.24	8.22	9.21	10.19	11.18		12.38	6 / 3			
	reaction time	0.162													2.93	2.89	2.96
	interval		1.02	0.97	0.94	0.95	0.96	0.98	0.99	0.98	0.99	1.20			8.70	8.82	8.61
	velocity	5.42	8.33	8.76	9.04	8.95	8.85	8.67	8.59	8.67	8.59	8.37	8.08				
<b>Tapper, Megan (JAM) (1994)</b>	time	2.41	3.45	4.43	5.40	6.36	7.32	8.28	9.25	10.24	11.24		12.49	8 / 4			
	reaction time	0.150													2.99	2.88	2.96
	interval		1.04	0.98	0.97	0.96	0.96	0.96	0.97	0.99	1.00	1.25			8.53	8.85	8.61
	velocity	5.39	8.17	8.67	8.76	8.85	8.85	8.85	8.76	8.59	8.50	8.04	8.01				
<b>Williams, Danielle (JAM) (1992)</b>	time	2.41	3.44	4.42	5.38	6.33	7.29	8.25	9.25	10.27	11.30		12.55	9 / 5			
	reaction time	0.141													2.97	2.87	3.05
	interval		1.03	0.98	0.96	0.95	0.96	0.96	1.00	1.02	1.03	1.25			8.59	8.89	8.36
	velocity	5.39	8.25	8.67	8.85	8.95	8.85	8.85	8.50	8.33	8.25	8.04	7.97				
<b>Jones, Tia (USA) (2000)</b>	time	2.48	3.52	4.51	5.49	6.45	7.42	8.38	9.35	10.34	11.34		12.57	2 / 6			
	reaction time	0.175													3.01	2.89	2.96
	interval		1.04	0.99	0.98	0.96	0.97	0.96	0.97	0.99	1.00	1.23			8.47	8.82	8.61
	velocity	5.24	8.17	8.59	8.67	8.85	8.76	8.85	8.76	8.59	8.50	8.17	7.96				
<b>Johnson, Alaysha (USA) (1996)</b>	time	2.44	3.49	4.49	5.48	6.47	7.44	8.41	9.39	10.37	11.36		12.58	3 / 7			
	reaction time	0.151													3.04	2.93	2.95
	interval		1.05	1.00	0.99	0.99	0.97	0.97	0.98	0.98	0.99	1.22			8.39	8.70	8.64
	velocity	5.33	8.10	8.50	8.59	8.59	8.76	8.76	8.67	8.67	8.59	8.24	7.95				
<b>Skrzyszowska, Pia (POL) (2001)</b>	time	2.44	3.48	4.48	5.46	6.43	7.40	8.38	9.37	10.38	11.41		12.67	7 / 8			
	reaction time	0.130													3.02	2.92	3.03
	interval		1.04	1.00	0.98	0.97	0.97	0.98	0.99	1.01	1.03	1.26			8.44	8.73	8.42
	velocity	5.33	8.17	8.50	8.67	8.76	8.76	8.67	8.59	8.42	8.25	7.98	7.89				
<b>Fourie, Marione (RSA) (2002)</b>	time	2.44	3.49	4.51	5.50	6.47	7.45	8.43	9.43	10.44	11.47		12.73	1 / 9			
	reaction time	0.148													3.06	2.93	3.04
	interval		1.05	1.02	0.99	0.97	0.98	0.98	1.00	1.01	1.03	1.26			8.33	8.70	8.39
	velocity	5.33	8.10	8.33	8.59	8.76	8.67	8.67	8.50	8.42	8.25	7.98	7.86				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 16 Jul 2023 16:50) - diamond league race analysis

<https://www.omegatiming.com/File/0002030A0101080101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=7rhVdx1la3I>

2023 USATF National Championships (Eugene, OR) (TV Analysis)

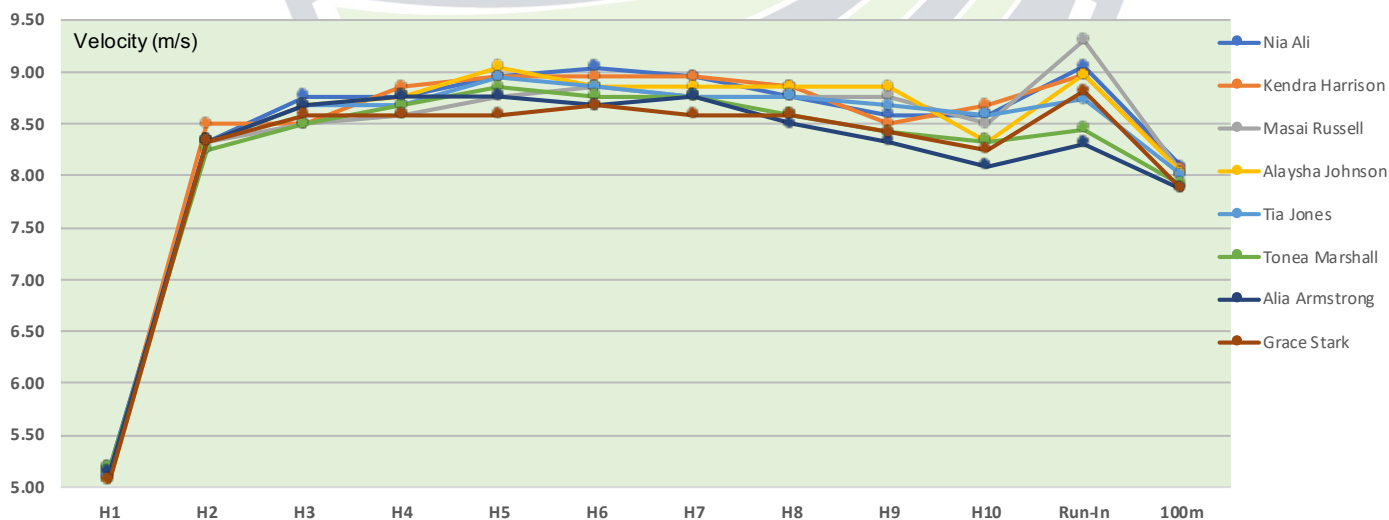
100m Hurdles

Date: 2023.07.08

Wind: 0.4 m/s

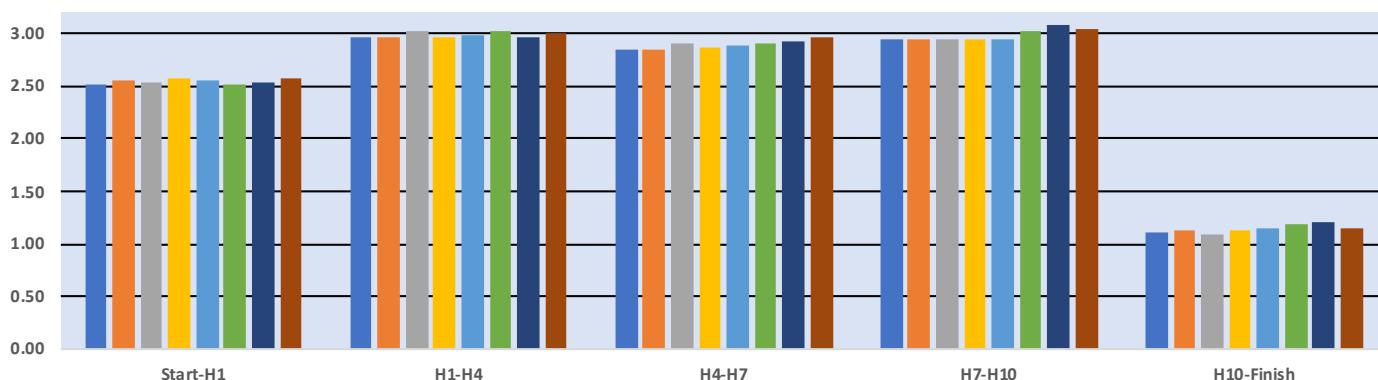
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Ali, Nia (USA) (1988)	time	2.51	3.53	4.50	5.47	6.42	7.36	8.31	9.28	10.27	11.26		12.37	4 / 1			
	reaction time											1.11			2.96	2.84	2.95
	interval		1.02	0.97	0.97	0.95	0.94	0.95	0.97	0.99	0.99	1.11			8.61	8.98	8.64
Harrison, Kendra (USA) 1992	time	2.55	3.55	4.55	5.51	6.46	7.41	8.36	9.32	10.32	11.30		12.42	6 / 2			
	reaction time											1.12			2.96	2.85	2.94
	interval		1.00	1.00	0.96	0.95	0.95	0.95	0.96	1.00	0.98	1.12			8.61	8.95	8.67
Russell, Masai (USA) (2000)	time	2.53	3.55	4.55	5.54	6.51	7.47	8.44	9.41	10.38	11.38		12.46	2 / 3			
	reaction time											1.08			3.01	2.90	2.94
	interval		1.02	1.00	0.99	0.97	0.96	0.97	0.97	0.97	1.00	1.08			8.47	8.79	8.67
Johnson, Alaysha (USA) (1996)	time	2.57	3.59	4.57	5.54	6.48	7.44	8.40	9.36	10.32	11.34		12.46	3 / 4			
	reaction time											1.12			2.97	2.86	2.94
	interval		1.02	0.98	0.97	0.94	0.96	0.96	0.96	0.96	1.02	1.12			8.59	8.92	8.67
Jones, Tia (USA) (2000)	time	2.55	3.57	4.55	5.53	6.48	7.44	8.41	9.38	10.36	11.35		12.50	7 / 5			
	reaction time											1.15			2.98	2.88	2.94
	interval		1.02	0.98	0.98	0.95	0.96	0.97	0.97	0.98	0.99	1.15			8.56	8.85	8.67
Marshall, Tonea (USA) (1998)	time	2.51	3.54	4.54	5.52	6.48	7.45	8.42	9.41	10.42	11.44		12.63	5 / 6			
	reaction time											1.19			3.01	2.90	3.02
	interval		1.03	1.00	0.98	0.96	0.97	0.97	0.99	1.01	1.02	1.19			8.47	8.79	8.44
Armstrong, Alia (USA) (2000)	time	2.53	3.55	4.53	5.50	6.47	7.45	8.42	9.42	10.44	11.49		12.70	1 / 7			
	reaction time											1.21			2.97	2.92	3.07
	interval		1.02	0.98	0.97	0.97	0.98	0.97	0.97	1.00	1.02	1.21			8.59	8.73	8.31
Stark, Grace (USA) (2001)	time	2.57	3.59	4.58	5.57	6.56	7.54	8.53	9.52	10.53	11.56		12.70	8 / 8			
	reaction time											1.14			3.00	2.96	3.03
	interval		1.02	0.99	0.99	0.99	0.98	0.99	0.99	1.01	1.03	1.14			8.50	8.61	8.42
	velocity	5.14	8.33	8.67	8.76	8.76	8.67	8.76	8.50	8.33	8.10	8.31	7.87				
	velocity	5.06	8.33	8.59	8.59	8.59	8.67	8.59	8.59	8.42	8.25	8.82	7.87				
	velocity	5.06	8.33	8.59	8.59	8.59	8.67	8.59	8.59	8.42	8.25	8.82	7.87				



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=TFEtfFDEd00&t=2s>

2023 Bauhaus Galan (Stockholm, SWE)

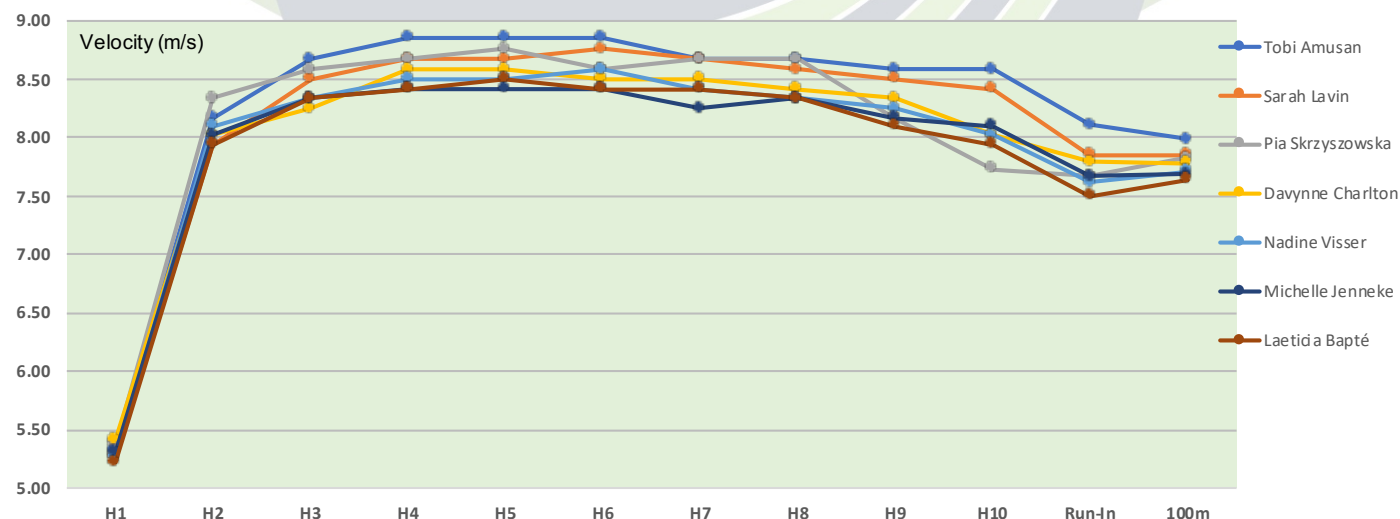
100m Hurdles

Date: 2023.07.02

Wind: 0.9 m/s

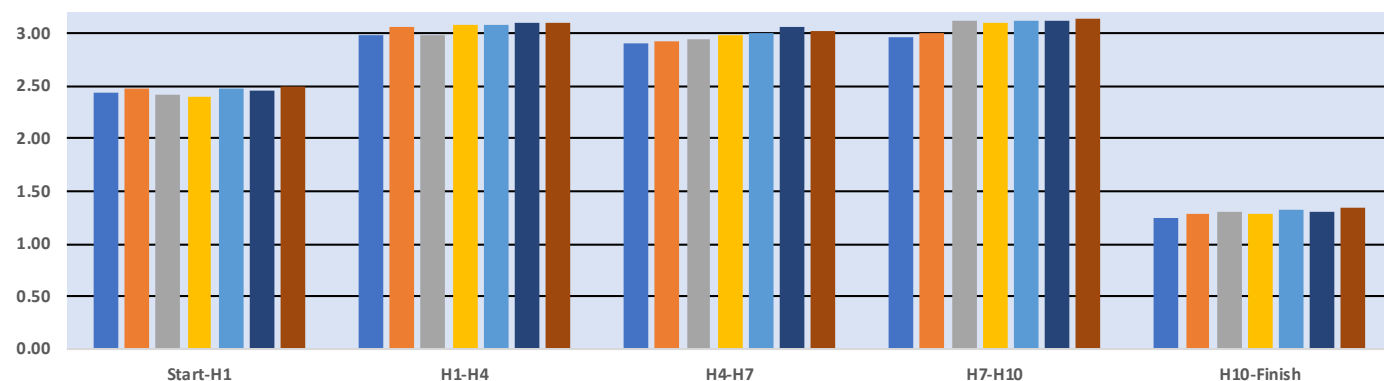
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Amusan, Tobi (NGR) (1997)	time	2.44	3.48	4.46	5.42	6.38	7.34	8.32	9.30	10.29	11.28		12.52	4 / 1			
	reaction time	0.145													2.98	2.90	2.96
	interval		1.04	0.98	0.96	0.96	0.96	0.98	0.98	0.98	0.99	0.99	1.24		8.56	8.79	8.61
	velocity	5.33	8.17	8.67	8.85	8.85	8.85	8.67	8.67	8.59	8.59	8.10	7.99				
Lavin, Sarah (IRL) (1994)	time	2.47	3.54	4.54	5.52	6.50	7.47	8.45	9.44	10.44	11.45		12.73	1 / 2			
	reaction time	0.139													3.05	2.93	3.00
	interval		1.07	1.00	0.98	0.98	0.97	0.98	0.99	1.00	1.01	1.28			8.36	8.70	8.50
	velocity	5.26	7.94	8.50	8.67	8.67	8.76	8.67	8.59	8.50	8.42	7.85	7.86				
Skrzyszowska, Pia (POL) (2001)	time	2.42	3.44	4.43	5.41	6.38	7.37	8.35	9.33	10.37	11.47		12.78	5 / 3			
	reaction time	0.132													2.99	2.94	3.12
	interval		1.02	0.99	0.98	0.97	0.99	0.98	0.98	1.04	1.10	1.31			8.53	8.67	8.17
	velocity	5.37	8.33	8.59	8.67	8.76	8.59	8.67	8.67	8.17	7.73	7.67	7.82				
Charlton, Devynne (BAH) (1995)	time	2.40	3.46	4.49	5.48	6.47	7.47	8.47	9.48	10.50	11.56		12.85	3 / 4			
	reaction time	0.141													3.08	2.99	3.09
	interval		1.06	1.03	0.99	0.99	1.00	1.00	1.01	1.02	1.06	1.29			8.28	8.53	8.25
	velocity	5.42	8.02	8.25	8.59	8.59	8.50	8.50	8.42	8.33	8.02	7.79	7.78				
Visser, Nadine (NED) (1995)	time	2.47	3.52	4.54	5.54	6.54	7.53	8.54	9.56	10.59	11.65		12.97	6 / 5			
	reaction time	0.149													3.07	3.00	3.11
	interval		1.05	1.02	1.00	1.00	0.99	1.01	1.02	1.03	1.06	1.32			8.31	8.50	8.20
	velocity	5.26	8.10	8.33	8.50	8.50	8.59	8.42	8.33	8.25	8.02	7.61	7.71				
Hurske, Reetta (FIN) (1995)	0.122	no information available											12.98	2 / 6			
Jenneke, Michelle (AUS) (1993)	time	2.45	3.51	4.53	5.54	6.55	7.56	8.59	9.61	10.65	11.70		13.01	7 / 7			
	reaction time	0.145													3.09	3.05	3.11
	interval		1.06	1.02	1.01	1.01	1.01	1.03	1.02	1.04	1.05	1.31			8.25	8.36	8.20
	velocity	5.31	8.02	8.33	8.42	8.42	8.42	8.25	8.33	8.17	8.10	7.67	7.69				
Bapté, Laetitia (FRA) (1999)	time	2.49	3.56	4.58	5.59	6.59	7.60	8.61	9.63	10.68	11.75		13.09	8 / 8			
	reaction time	0.171													3.10	3.02	3.14
	interval		1.07	1.02	1.01	1.00	1.01	1.01	1.02	1.05	1.07	1.34			8.23	8.44	8.12
	velocity	5.22	7.94	8.33	8.42	8.50	8.42	8.42	8.33	8.10	7.94	7.50	7.64				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 2 Jul 2023 19:04) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030901010A0101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=zGzBLE6GAP8>

2023 Bauhaus Galan (Stockholm, SWE)

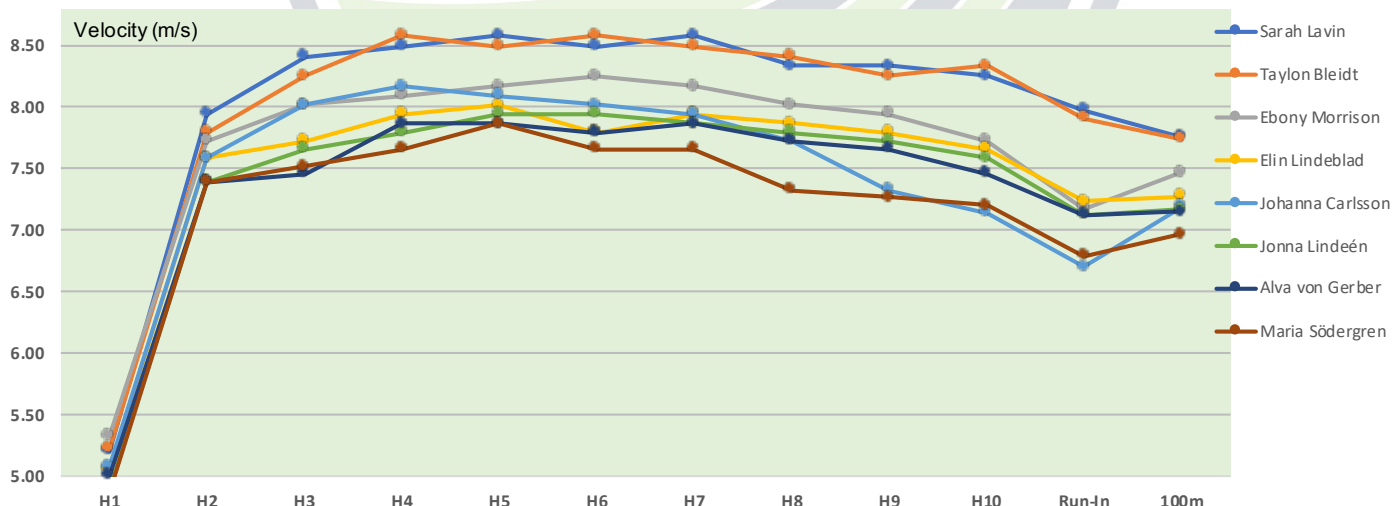
100m Hurdles

Date: 2023.07.02

Wind: 0.6 m/s

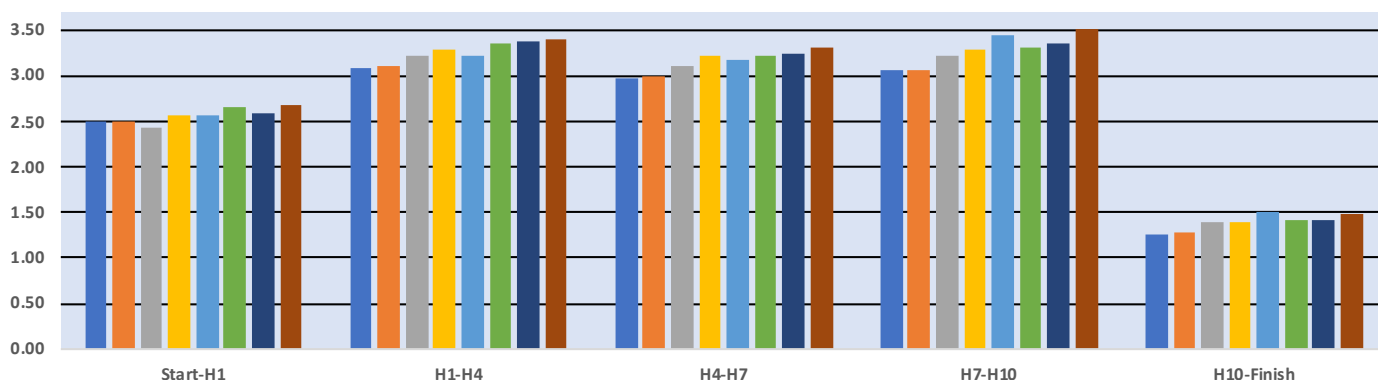
National FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Lavin, Sarah (IRL) (1994)	time	2.50	3.57	4.58	5.58	6.57	7.57	8.56	9.58	10.60	11.63	12.89		3/1	3.08	2.98	3.07
	reaction time	0.140													8.28	8.56	8.31
	interval velocity	5.20	7.94	8.42	8.50	8.59	8.50	8.59	8.33	8.33	8.25	7.98	7.76				
Bieldt, Taylon (RSA) (1998)	time	2.49	3.58	4.61	5.60	6.60	7.59	8.59	9.60	10.63	11.65	12.92		4/2	3.11	2.99	3.06
	reaction time	0.141										1.27			8.20	8.53	8.33
	interval velocity	5.22	7.80	8.25	8.59	8.50	8.59	8.50	8.42	8.25	8.33	7.91	7.74				
Morrison, Ebony (LBR) (1994)	time	2.44	3.54	4.60	5.65	6.69	7.72	8.76	9.82	10.89	11.99	13.39		6/3	3.21	3.11	3.23
	reaction time	0.137										1.40			7.94	8.20	7.89
	interval velocity	5.33	7.73	8.02	8.10	8.17	8.25	8.17	8.02	7.94	7.73	7.18	7.47				
Lindeblad, Elin (SWE) (1995)	time	2.57	3.69	4.79	5.86	6.92	8.01	9.08	10.16	11.25	12.36	13.75		5/4	3.29	3.22	3.28
	reaction time	0.140										1.39			7.75	7.92	7.77
	interval velocity	5.06	7.59	7.73	7.94	8.02	7.80	7.94	7.87	7.80	7.66	7.23	7.27				
Carlsson, Johanna (SWE) (1994)	time	2.56	3.68	4.74	5.78	6.83	7.89	8.96	10.06	11.22	12.41	13.91		1/5	3.22	3.18	3.45
	reaction time	0.149										1.50	<b>PB</b>		7.92	8.02	7.39
	interval velocity	5.08	7.59	8.02	8.17	8.10	8.02	7.94	7.73	7.33	7.14	6.70	7.19				
Lindeén, Jonna (SWE) (1996)	time	2.66	3.81	4.92	6.01	7.08	8.15	9.23	10.32	11.42	12.54	13.95		7/6	3.35	3.22	3.31
	reaction time	0.195										1.41			7.61	7.92	7.70
	interval velocity	4.89	7.39	7.66	7.80	7.94	7.94	7.87	7.80	7.73	7.59	7.13	7.17				
von Gerber, Alva (SWE) (2000)	time	2.60	3.75	4.89	5.97	7.05	8.14	9.22	10.32	11.43	12.57	13.98		2/7	3.37	3.25	3.35
	reaction time	0.141										1.41			7.57	7.85	7.61
	interval velocity	5.00	7.39	7.46	7.87	7.87	7.80	7.87	7.73	7.66	7.46	7.13	7.15				
Södergren, Maria (SWE) (1998)	time	2.67	3.82	4.95	6.06	7.14	8.25	9.36	10.52	11.69	12.87	14.35		8/8	3.39	3.30	3.51
	reaction time	0.140										1.48			7.52	7.73	7.26
	interval velocity	4.87	7.39	7.52	7.66	7.87	7.66	7.66	7.33	7.26	7.20	6.79	6.97				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 2 Jul 2023 16:36) - diamond league race analysis  
<https://www.omegatiming.com/File/000203090101030101FFFFFFFFFFFF4D.pdf>

Video: No Video Found

2023 Athletissima (Lausanne, SUI)

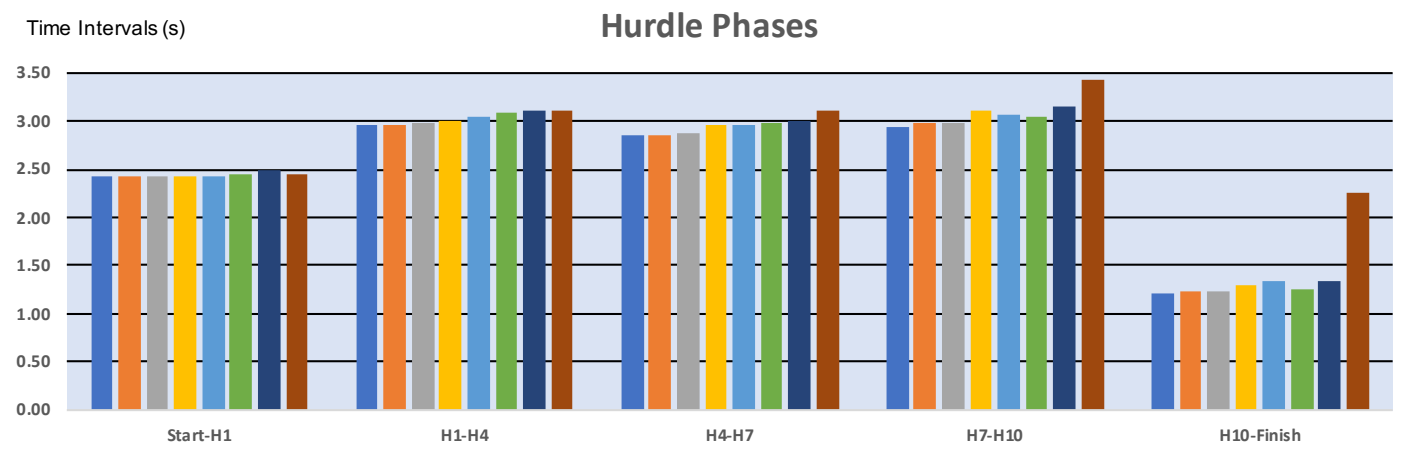
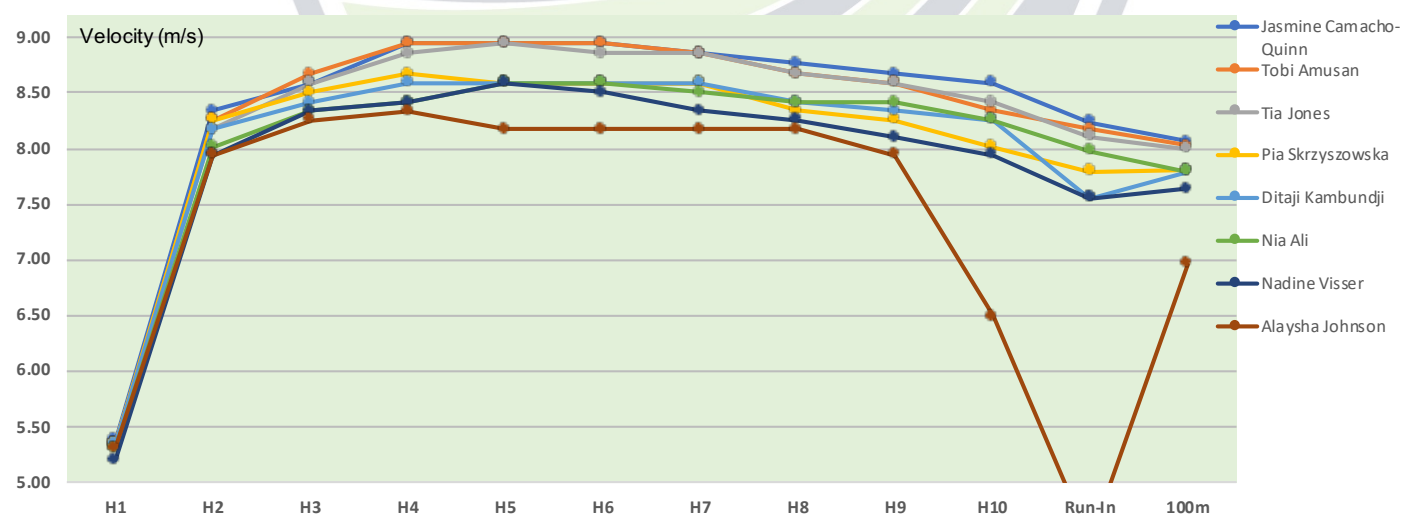
100m Hurdles

Date: 2023.06.30

Wind: -1.4 m/s

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10				
<b>Camacho-Quinn, Jasmine (PUR) (199)</b>	time	2.42	3.44	4.43	5.38	6.33	7.28	8.24	9.21	10.19	11.18		12.40	5 / 1	2.96	2.86	2.94				
	reaction time	0.139																			
	interval		1.02	0.99	0.95	0.95	0.95	0.96	0.97	0.98	0.99	1.22							8.61	8.92	8.67
	velocity	5.37	8.33	8.59	8.95	8.95	8.95	8.85	8.76	8.67	8.59	8.24	8.06								
<b>Amusan, Tobi (NGR) (1997)</b>	time	2.43	3.46	4.44	5.39	6.34	7.29	8.25	9.23	10.22	11.24		12.47	4 / 2	2.96	2.86	2.99				
	reaction time	0.133																			
	interval		1.03	0.98	0.95	0.95	0.95	0.96	0.98	0.99	1.02	1.23							8.61	8.92	8.53
	velocity	5.35	8.25	8.67	8.95	8.95	8.95	8.85	8.67	8.59	8.33	8.17	8.02								
<b>Jones, Tia (USA) (2000)</b>	time	2.43	3.47	4.46	5.42	6.37	7.33	8.29	9.27	10.26	11.27		12.51	3 / 3	2.99	2.87	2.98				
	reaction time	0.139																			
	interval		1.04	0.99	0.96	0.95	0.96	0.96	0.98	0.99	1.01	1.24							8.53	8.89	8.56
	velocity	5.35	8.17	8.59	8.85	8.95	8.85	8.85	8.67	8.59	8.42	8.10	7.99								
<b>Skrzysowska, Pia (POL) (2001)</b>	time	2.43	3.46	4.46	5.44	6.43	7.42	8.41	9.43	10.46	11.52		12.81	8 / 4	3.01	2.97	3.11				
	reaction time	0.139																			
	interval		1.03	1.00	0.98	0.99	0.99	0.99	1.02	1.03	1.06	1.29							8.47	8.59	8.20
	velocity	5.35	8.25	8.50	8.67	8.59	8.59	8.59	8.33	8.25	8.02	7.79	7.81								
<b>Kambundji, Ditaji (SUI) (2002)</b>	time	2.43	3.47	4.48	5.47	6.46	7.45	8.44	9.45	10.47	11.50		12.83	7 / 5	3.04	2.97	3.06				
	reaction time	0.142																			
	interval		1.04	1.01	0.99	0.99	0.99	0.99	1.01	1.02	1.03	1.33							8.39	8.59	8.33
	velocity	5.35	8.17	8.42	8.59	8.59	8.59	8.59	8.42	8.33	8.25	7.56	7.79								
<b>Ali, Nia (USA) (1988)</b>	time	2.45	3.51	4.53	5.54	6.53	7.52	8.52	9.53	10.54	11.57		12.83	2 / 6	3.09	2.98	3.05				
	reaction time	0.154																			
	interval		1.06	1.02	1.01	0.99	0.99	1.00	1.01	1.01	1.03	1.26							8.25	8.56	8.36
	velocity	5.31	8.02	8.33	8.42	8.59	8.59	8.50	8.42	8.42	8.25	7.98	7.79								
<b>Visser, Nadine (NED) (1995)</b>	time	2.50	3.57	4.59	5.60	6.59	7.59	8.61	9.64	10.69	11.76		13.09	1 / 7	3.10	3.01	3.15				
	reaction time	0.182																			
	interval		1.07	1.02	1.01	0.99	1.00	1.02	1.03	1.05	1.07	1.33							8.23	8.47	8.10
	velocity	5.20	7.94	8.33	8.42	8.59	8.50	8.33	8.25	8.10	7.94	7.56	7.64								
<b>Johnson, Alaysha (USA) (1996)</b>	time	2.45	3.52	4.55	5.57	6.61	7.65	8.69	9.73	10.80	12.11		14.36	6 / 8	3.12	3.12	3.42				
	reaction time	0.139																			
	interval		1.07	1.03	1.02	1.04	1.04	1.04	1.04	1.07	1.31	2.25							8.17	8.17	7.46
	velocity	5.31	7.94	8.25	8.33	8.17	8.17	8.17	8.17	7.94	6.49	4.47	6.96								



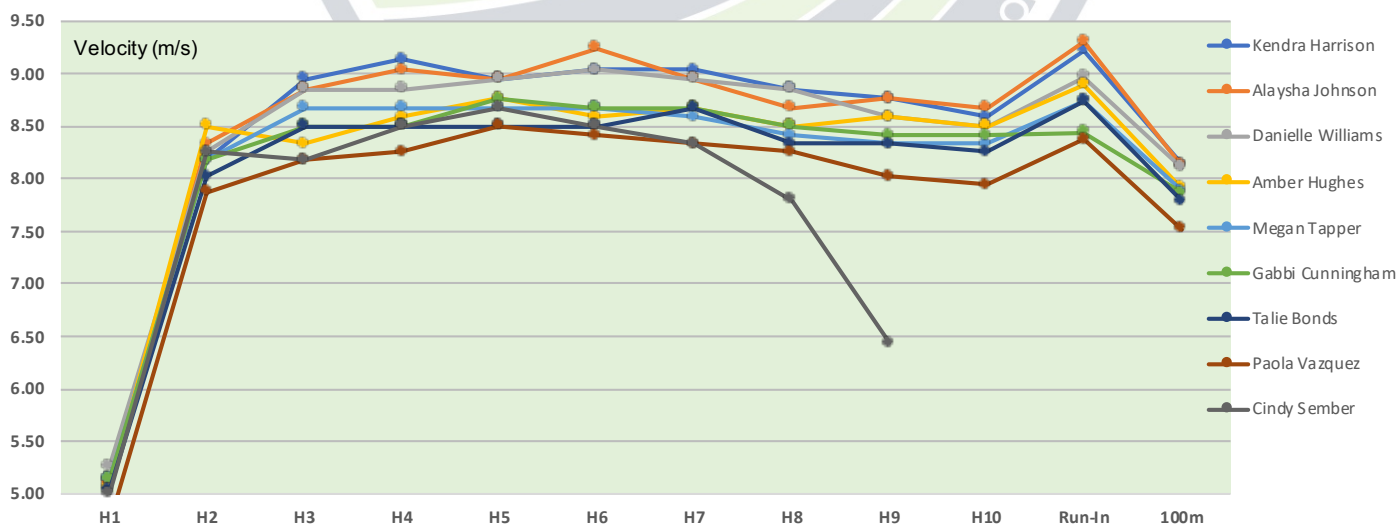
Source: Omega Timing (Fri 30 Jun 2023 21:22) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030801010C0101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=BMdhf13hvAA>



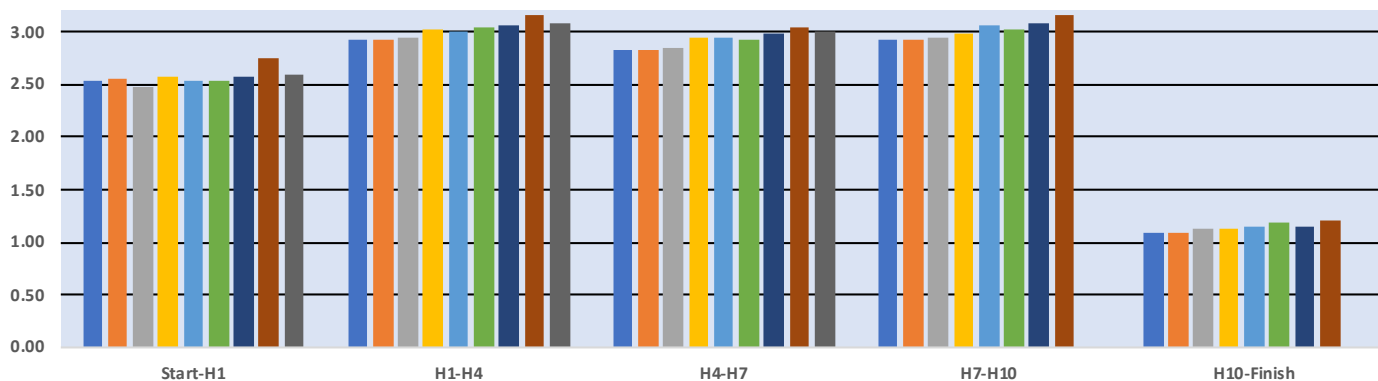
2023 USATF New York City Grand Prix (Randalls Island, NY) (TV Analysis)

100m Hurdles		Date: 2023.06.24	Wind: 2.8 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	2.53	3.57	4.52	5.45	6.40	7.34	8.28	9.24	10.21	11.20		12.29	5 / 1			
	reaction time	0.151													2.92	2.83	2.92
	interval velocity		1.04	0.95	0.93	0.95	0.94	0.94	0.96	0.97	0.99	1.09			8.73	9.01	8.73
	velocity	5.14	8.17	8.95	9.14	8.95	9.04	9.04	8.85	8.76	8.59	9.22	8.14				
Johnson, Alaysha (USA) (1996)	time	2.55	3.57	4.53	5.47	6.42	7.34	8.29	9.27	10.24	11.22		12.30	4 / 2			
	reaction time	0.206													2.92	2.82	2.93
	interval velocity		1.02	0.96	0.94	0.95	0.92	0.95	0.98	0.97	0.98	1.08			8.73	9.04	8.70
	velocity	5.10	8.33	8.85	9.04	8.95	9.24	8.95	8.67	8.76	8.67	9.31	8.13				
Williams, Danielle (JAM) (1992)	time	2.47	3.50	4.46	5.42	6.37	7.31	8.26	9.22	10.21	11.21		12.33	3 / 3			
	reaction time	0.331													2.95	2.84	2.95
	interval velocity		1.03	0.96	0.96	0.95	0.94	0.95	0.96	0.99	1.00	1.12			8.64	8.98	8.64
	velocity	5.26	8.25	8.85	8.85	8.95	9.04	8.95	8.85	8.59	8.50	8.97	8.11				
Hughes, Amber (USA) (1994)	time	2.57	3.57	4.59	5.58	6.55	7.54	8.52	9.52	10.51	11.51		12.64	2 / 4			
	reaction time	0.147													3.01	2.94	2.99
	interval velocity		1.00	1.02	0.99	0.97	0.99	0.98	1.00	0.99	1.00	1.13			8.47	8.67	8.53
	velocity	5.06	8.50	8.33	8.59	8.76	8.59	8.67	8.50	8.59	8.50	8.89	7.91				
Tapper, Megan (JAM) (1994)	time	2.53	3.57	4.55	5.53	6.51	7.49	8.48	9.49	10.51	11.53		12.68	6 / 5			
	reaction time	0.216													3.00	2.95	3.05
	interval velocity		1.04	0.98	0.98	0.98	0.98	0.99	1.01	1.02	1.02	1.15			8.50	8.64	8.36
	velocity	5.14	8.17	8.67	8.67	8.67	8.67	8.59	8.42	8.33	8.33	8.74	7.89				
Cunningham, Gabbi (USA) (1998)	time	2.53	3.57	4.57	5.57	6.54	7.52	8.50	9.50	10.51	11.52		12.71	1 / 6			
	reaction time	0.506													3.04	2.93	3.02
	interval velocity		1.04	1.00	1.00	0.97	0.98	0.98	1.00	1.01	1.01	1.19			8.39	8.70	8.44
	velocity	5.14	8.17	8.50	8.50	8.76	8.67	8.67	8.50	8.42	8.42	8.45	7.87				
Bonds, Talie (USA) (1998)	time	2.58	3.64	4.64	5.64	6.64	7.64	8.62	9.64	10.66	11.69		12.84	8 / 7			
	reaction time	0.164													3.06	2.98	3.07
	interval velocity		1.06	1.00	1.00	1.00	1.00	0.98	1.02	1.02	1.03	1.15			8.33	8.56	8.31
	velocity	5.04	8.02	8.50	8.50	8.50	8.50	8.67	8.33	8.33	8.25	8.74	7.79				
Vazquez, Paola (PUR) (1998)	time	2.75	3.83	4.87	5.90	6.90	7.91	8.93	9.96	11.02	12.09		13.29	9 / 8			
	reaction time	0.251													3.15	3.03	3.16
	interval velocity		1.08	1.04	1.03	1.00	1.01	1.02	1.03	1.06	1.07	1.20			8.10	8.42	8.07
	velocity	4.73	7.87	8.17	8.25	8.50	8.42	8.33	8.25	8.02	7.94	8.38	7.52				
Sember, Cindy (GBR) (1994)	time	2.60	3.63	4.67	5.67	6.65	7.65	8.67	9.76	11.08			dnf	7 / --			
	reaction time	0.201													3.07	3.00	-8.67
	interval velocity		1.03	1.04	1.00	0.98	1.00	1.02	1.09	1.32					8.31	8.50	-2.94
	velocity	5.00	8.25	8.17	8.50	8.67	8.50	8.33	7.80	6.44							



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=IAQgl\\_hhCgIQ&t=5s](https://www.youtube.com/watch?v=IAQgl_hhCgIQ&t=5s)

2023 NCAA Championships (Austin, TX) (TV Analysis)

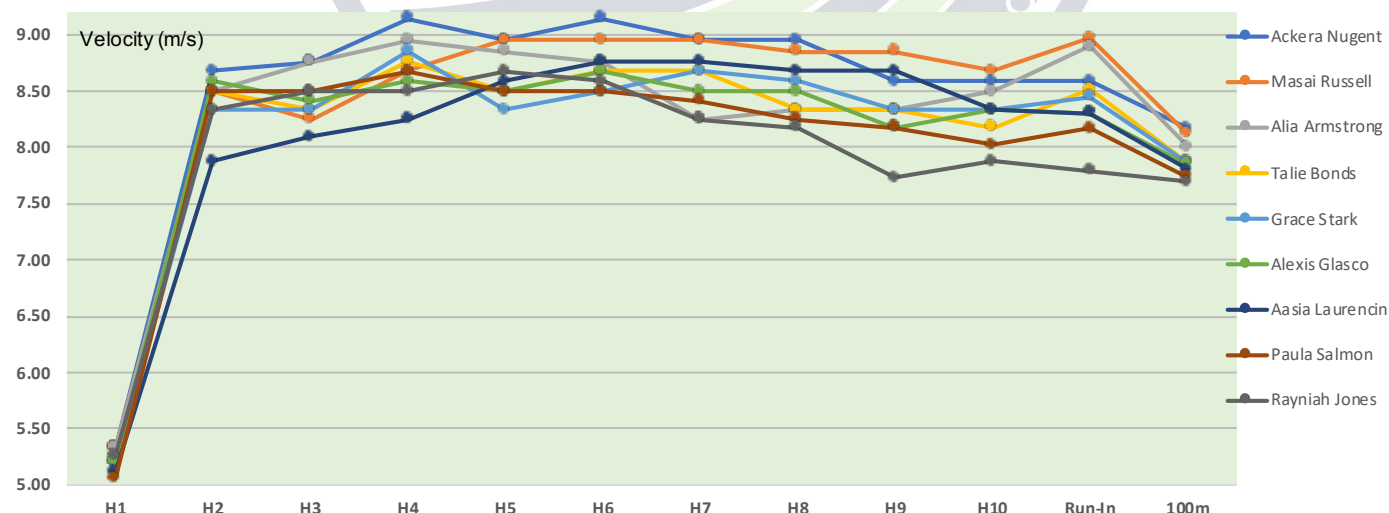
100m Hurdles

Date: 2023.06.10

Wind: 3.8 m/s

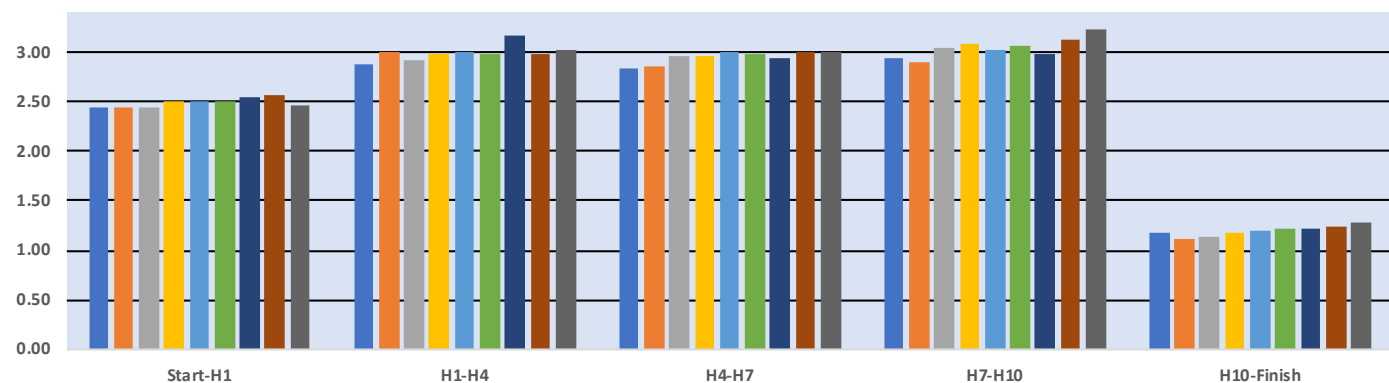
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Nugent, Ackera (JAM) (2002)</b>	time	2.44	3.42	4.39	5.32	6.27	7.20	8.15	9.10	10.09	11.08		12.25	6 / 1			
	reaction time														2.88	2.83	2.93
	interval		0.98	0.97	0.93	0.95	0.93	0.95	0.95	0.99	0.99	1.17			8.85	9.01	8.70
	velocity	5.33	8.67	8.76	9.14	8.95	9.14	8.95	8.95	8.59	8.59	8.59	8.16				
<b>Russell, Masai (USA) (2000)</b>	time	2.44	3.44	4.47	5.45	6.40	7.35	8.30	9.26	10.22	11.20		12.32	4 / 2			
	reaction time														3.01	2.85	2.90
	interval		1.00	1.03	0.98	0.95	0.95	0.95	0.96	0.96	0.98	1.12			8.47	8.95	8.79
	velocity	5.33	8.50	8.25	8.67	8.95	8.95	8.95	8.85	8.85	8.67	8.97	8.12				
<b>Armstrong, Alia (USA) (2000)</b>	time	2.44	3.44	4.41	5.36	6.32	7.29	8.32	9.34	10.36	11.36		12.49	5 / 3			
	reaction time														2.92	2.96	3.04
	interval		1.00	0.97	0.95	0.96	0.97	1.03	1.02	1.02	1.00	1.13			8.73	8.61	8.39
	velocity	5.33	8.50	8.76	8.95	8.85	8.76	8.25	8.33	8.33	8.50	8.89	8.01				
<b>Bonds, Talie (USA) (1998)</b>	time	2.50	3.50	4.52	5.49	6.49	7.47	8.45	9.47	10.49	11.53		12.71	7 / 4			
	reaction time														2.99	2.96	3.08
	interval		1.00	1.02	0.97	1.00	0.98	0.98	1.02	1.02	1.04	1.18			8.53	8.61	8.28
	velocity	5.20	8.50	8.33	8.76	8.50	8.67	8.67	8.33	8.33	8.17	8.52	7.87				
<b>Stark, Grace (USA) (2001)</b>	time	2.50	3.52	4.54	5.50	6.52	7.52	8.50	9.49	10.51	11.53		12.72	2 / 5			
	reaction time														3.00	3.00	3.03
	interval		1.02	1.02	0.96	1.02	1.00	0.98	0.99	1.02	1.02	1.19			8.50	8.50	8.42
	velocity	5.20	8.33	8.33	8.85	8.33	8.50	8.67	8.59	8.33	8.33	8.45	7.86				
<b>Glasco, Alexis (USA) (2002)</b>	time	2.50	3.49	4.50	5.49	6.49	7.47	8.47	9.47	10.51	11.53		12.74	3 / 6			
	reaction time														2.99	2.98	3.06
	interval		0.99	1.01	0.99	1.00	0.98	1.00	1.00	1.04	1.02	1.21			8.53	8.56	8.33
	velocity	5.20	8.59	8.42	8.59	8.50	8.67	8.50	8.50	8.17	8.33	8.31	7.85				
<b>Laurencin, Aasia (USA) (2002)</b>	time	2.54	3.62	4.67	5.70	6.69	7.66	8.63	9.61	10.59	11.61		12.82	9 / 7			
	reaction time														3.16	2.93	2.98
	interval		1.08	1.05	1.03	0.99	0.97	0.97	0.98	0.98	1.02	1.21			8.07	8.70	8.56
	velocity	5.12	7.87	8.10	8.25	8.59	8.76	8.76	8.67	8.67	8.33	8.31	7.80				
<b>Salmon, Paula (USA) (1999)</b>	time	2.57	3.57	4.57	5.55	6.55	7.55	8.56	9.59	10.63	11.69		12.92	1 / 8			
	reaction time														2.98	3.01	3.13
	interval		1.00	1.00	0.98	1.00	1.00	1.01	1.03	1.04	1.06	1.23			8.56	8.47	8.15
	velocity	5.06	8.50	8.50	8.67	8.50	8.50	8.42	8.25	8.17	8.02	8.17	7.74				
<b>Jones, Rayniah (USA) (2001)</b>	time	2.47	3.49	4.49	5.49	6.47	7.46	8.49	9.53	10.63	11.71		13.00	8 / 9			
	reaction time														3.02	3.00	3.22
	interval		1.02	1.00	1.00	0.98	0.99	0.99	1.03	1.04	1.10	1.08	1.29		8.44	8.50	7.92
	velocity	5.26	8.33	8.50	8.50	8.67	8.59	8.25	8.17	7.73	7.87	7.79	7.69				



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=-fk3TRy0s5c>

2023 FBK Games (Hengelo, NED)

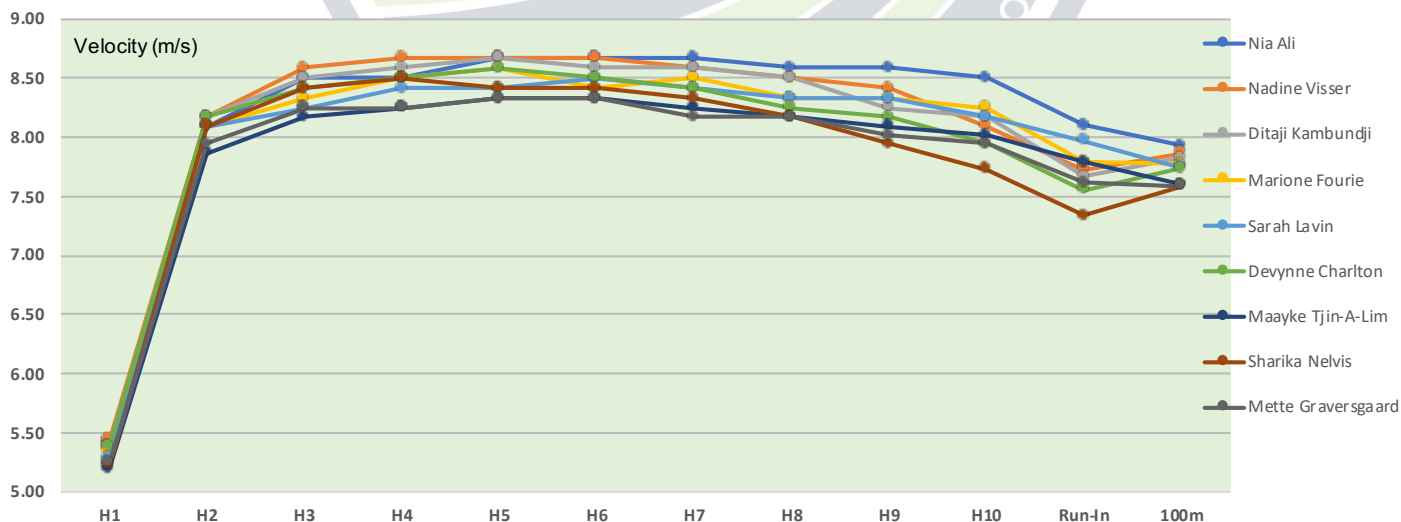
100m Hurdles

Date: 2023.06.04

Wind: 0.2 m/s

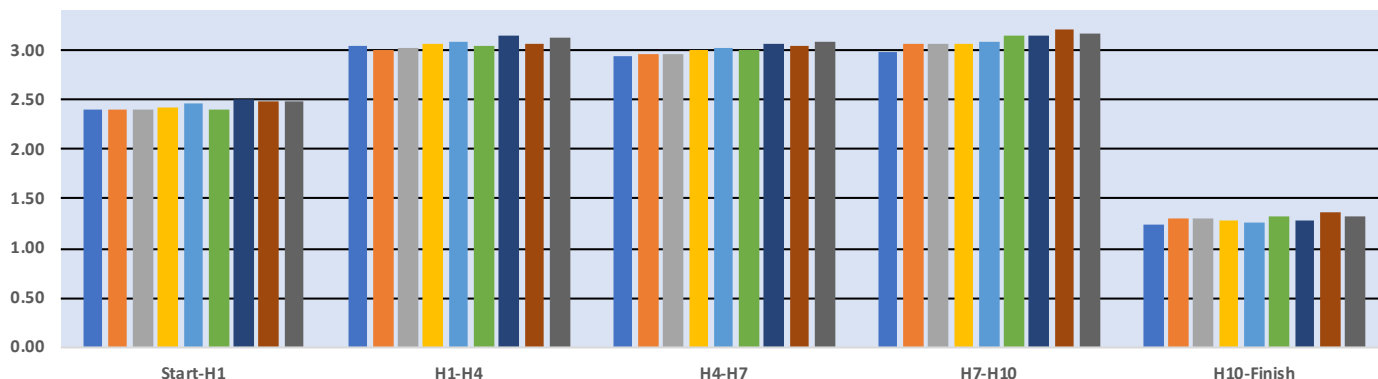
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Ali, Nia (USA) (1988)	time	2.40	3.45	4.45	5.45	6.43	7.41	8.39	9.38	10.37	11.37		12.61	5 / 1			
	reaction time	0.156													3.05	2.94	2.98
	interval		1.05	1.00	1.00	0.98	0.98	0.98	0.99	0.99	1.00	1.24			8.36	8.67	8.56
Visser, Nadine (NED) (1995)	time	2.39	3.43	4.42	5.40	6.38	7.36	8.35	9.35	10.36	11.41		12.71	4 / 2			
	reaction time	0.133													3.01	2.95	3.06
	interval		1.04	0.99	0.98	0.98	0.98	0.99	1.00	1.01	1.05	1.30			8.47	8.64	8.33
Kambundji, Ditaji (SUI) (2002)	time	2.41	3.45	4.45	5.44	6.42	7.41	8.40	9.40	10.43	11.47		12.78	7 / 3			
	reaction time	0.134													3.03	2.96	3.07
	interval		1.04	1.00	0.99	0.98	0.99	0.99	1.00	1.03	1.04	1.31			8.42	8.61	8.31
Fourie, Marione (RSA) (2002)	time	2.43	3.48	4.50	5.50	6.49	7.50	8.50	9.52	10.54	11.57		12.86	8 / 4			
	reaction time	0.143													3.07	3.00	3.07
	interval		1.05	1.02	1.00	0.99	1.01	1.00	1.02	1.02	1.03	1.29	=PB		8.31	8.50	8.31
Lavin, Sarah (IRL) (1994)	time	2.46	3.51	4.54	5.55	6.56	7.56	8.57	9.59	10.61	11.65		12.91	1 / 5			
	reaction time	0.139													3.09	3.02	3.08
	interval		1.05	1.03	1.01	1.01	1.00	1.01	1.02	1.02	1.04	1.26			8.25	8.44	8.28
Charlton, Devynne (BAH) (1995)	time	2.41	3.45	4.46	5.46	6.45	7.45	8.46	9.49	10.53	11.60		12.93	6 / 6			
	reaction time	0.155													3.05	3.00	3.14
	interval		1.04	1.01	1.00	0.99	1.00	1.01	1.03	1.04	1.07	1.33			8.36	8.50	8.12
Tjin-A-Lim, Maayke (NED) (1998)	time	2.50	3.58	4.62	5.65	6.67	7.69	8.72	9.76	10.81	11.87		13.16	2 / 7			
	reaction time	0.149													3.15	3.07	3.15
	interval		1.08	1.04	1.03	1.02	1.02	1.03	1.04	1.05	1.06	1.29			8.10	8.31	8.10
Nelvis, Sharika (USA) (1990)	time	2.49	3.54	4.55	5.55	6.56	7.57	8.59	9.63	10.70	11.80		13.17	9 / 8			
	reaction time	0.142													3.06	3.04	3.21
	interval		1.05	1.01	1.00	1.01	1.01	1.02	1.04	1.07	1.10	1.37			8.33	8.39	7.94
Graversgaard, Mette (DEN) (1995)	time	2.48	3.55	4.58	5.61	6.63	7.65	8.69	9.73	10.79	11.86		13.18	3 / 9			
	reaction time	0.132													3.13	3.08	3.17
	interval		1.07	1.03	1.03	1.02	1.02	1.04	1.04	1.06	1.07	1.32			8.15	8.28	8.04
	velocity	5.24	7.94	8.25	8.25	8.33	8.33	8.17	8.17	8.02	7.94	7.61	7.59				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 4 Jun 2023 18:16) - continental tour race analysis

<https://www.omegaitiming.com/File/0002030101010A0101FFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=s1ydEfrnTLQ>

2023 USATF Los Angeles Grand Prix (Westwood, CA) (TV Analysis)

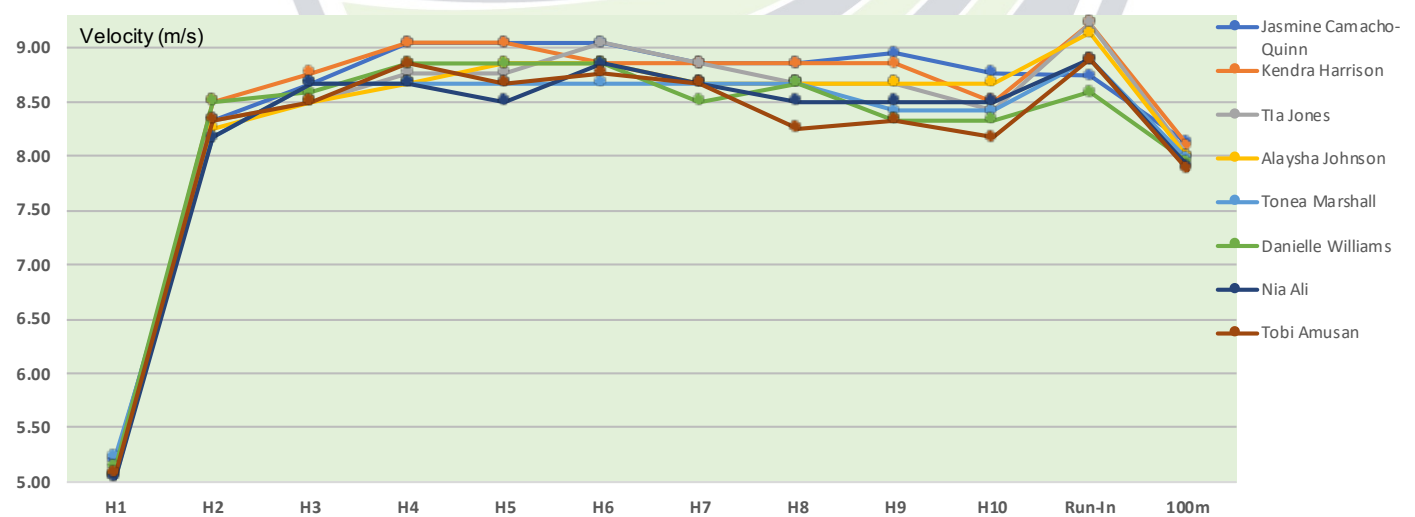
100m Hurdles

Date: 2023.05.27

Wind: -0.2 m/s

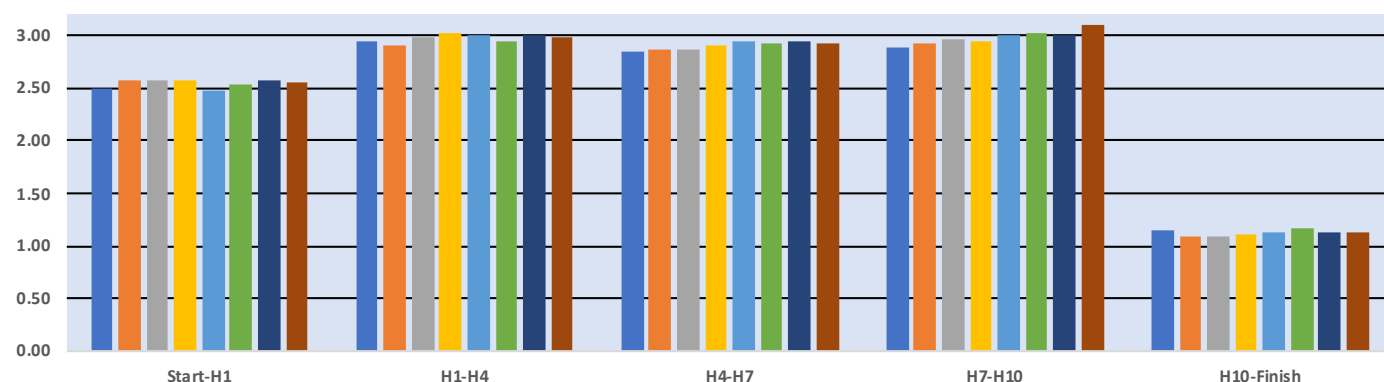
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Camacho-Quinn, Jasmine (PUR) (199)</b>	time	2.50	3.52	4.50	5.44	6.38	7.32	8.28	9.24	10.19	11.16		12.31	5 / 1			
	reaction time	0.158													2.94	2.84	2.88
	interval		1.02	0.98	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.97	1.15		8.67	8.98	8.85
	velocity	5.20	8.33	8.67	9.04	9.04	9.04	8.85	8.85	8.95	8.76	8.74	8.12				
<b>Harrison, Kendra (USA) 1992)</b>	time	2.57	3.57	4.54	5.48	6.42	7.38	8.34	9.30	10.26	11.26		12.35	6 / 2			
	reaction time	0.207													2.91	2.86	2.92
	interval		1.00	0.97	0.94	0.94	0.96	0.96	0.96	0.96	1.00	1.09			8.76	8.92	8.73
	velocity	5.06	8.50	8.76	9.04	9.04	8.85	8.85	8.85	8.85	8.50	9.22	8.10				
<b>Jones, Tia (USA) (2000)</b>	time	2.58	3.60	4.60	5.57	6.54	7.48	8.44	9.42	10.40	11.41		12.50	7 / 3			
	reaction time	0.186													2.99	2.87	2.97
	interval		1.02	1.00	0.97	0.97	0.94	0.96	0.98	0.98	1.01	1.09			8.53	8.89	8.59
	velocity	5.04	8.33	8.50	8.76	8.76	9.04	8.85	8.67	8.67	8.42	9.22	8.00				
<b>Johnson, Alaysha (USA) (1996)</b>	time	2.57	3.60	4.60	5.58	6.54	7.50	8.48	9.46	10.44	11.42		12.52	2 / 4			
	reaction time	0.178													3.01	2.90	2.94
	interval		1.03	1.00	0.98	0.96	0.96	0.98	0.98	0.98	1.02	1.10			8.47	8.79	8.67
	velocity	5.06	8.25	8.50	8.67	8.85	8.85	8.67	8.67	8.67	8.67	9.14	7.99				
<b>Marshall, Tonea (USA) (1998)</b>	time	2.48	3.52	4.50	5.48	6.46	7.44	8.42	9.40	10.41	11.42		12.55	8 / 5			
	reaction time	0.202													3.00	2.94	3.00
	interval		1.04	0.98	0.98	0.98	0.98	0.98	0.98	1.01	1.01	1.13			8.50	8.67	8.50
	velocity	5.24	8.17	8.67	8.67	8.67	8.67	8.67	8.67	8.42	8.42	8.89	7.97				
<b>Williams, Danielle (JAM) (1992)</b>	time	2.53	3.53	4.52	5.48	6.44	7.40	8.40	9.38	10.40	11.42		12.59	1 / 6			
	reaction time	0.437													2.95	2.92	3.02
	interval		1.00	0.99	0.96	0.96	0.96	1.00	0.98	1.02	1.02	1.17			8.64	8.73	8.44
	velocity	5.14	8.50	8.59	8.85	8.85	8.85	8.50	8.67	8.33	8.33	8.59	7.94				
<b>Ali, Nia (USA) (1988)</b>	time	2.58	3.62	4.60	5.58	6.58	7.54	8.52	9.52	10.52	11.52		12.65	3 / 7			
	reaction time	0.185													3.00	2.94	3.00
	interval		1.04	0.98	0.98	1.00	0.96	0.98	1.00	1.00	1.00	1.13			8.50	8.67	8.50
	velocity	5.04	8.17	8.67	8.67	8.50	8.85	8.67	8.50	8.50	8.50	8.89	7.91				
<b>Amusan, Tobi (NGR) (1997)</b>	time	2.56	3.58	4.58	5.54	6.52	7.49	8.47	9.50	10.52	11.56		12.69	4 / 8			
	reaction time	0.184													2.98	2.93	3.09
	interval		1.02	1.00	0.96	0.98	0.97	0.98	1.03	1.02	1.04	1.13			8.56	8.70	8.25
	velocity	5.08	8.33	8.50	8.85	8.67	8.76	8.67	8.25	8.33	8.17	8.89	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=RAivxrcYsv0>

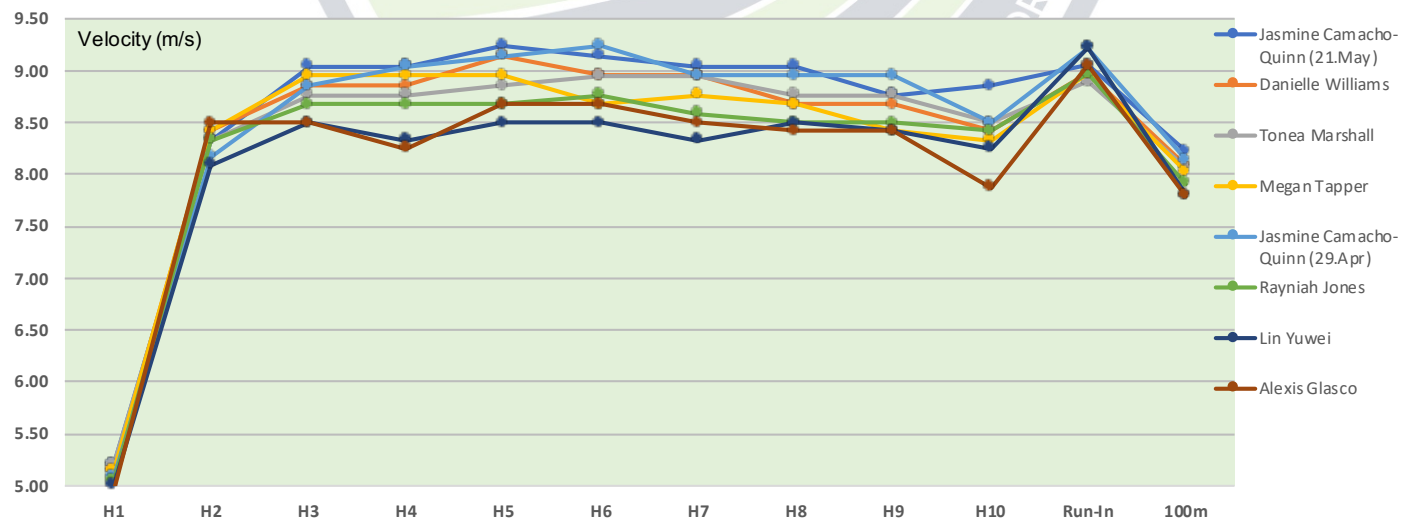
Biomechanical Analysis

2023 USATF Bermuda Grand Prix (Devonshire, BER) (TV Analysis)

		Date: 2023.05.21										Wind: 3.5 m/s	FINAL				
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Camacho-Quinn, Jasmine (PUR) (199)</b>	time	2.50	3.52	4.46	5.40	6.32	7.25	8.19	9.13	10.10	11.06	12.17	12.17	5 / 1			
	reaction time	0.153															
	interval velocity	5.20	8.33	9.04	9.04	9.24	9.14	9.04	9.04	0.97	0.96	1.11	9.05	8.22	2.90	2.79	2.87
<b>Williams, Danielle (JAM) (1992)</b>	time	2.53	3.54	4.50	5.46	6.39	7.34	8.29	9.27	10.25	11.26	12.38	12.38	4 / 2			
	reaction time	0.521															
	interval velocity	5.14	8.42	8.85	8.85	9.14	8.95	8.95	8.67	8.67	8.42	8.97	8.08	8.08	2.93	2.83	2.97
<b>Marshall, Tonia (USA) (1998)</b>	time	2.50	3.52	4.49	5.46	6.42	7.37	8.32	9.29	10.26	11.26	12.39	12.39	3 / 3			
	reaction time	0.176															
	interval velocity	5.20	8.33	8.76	8.76	8.85	8.95	8.95	8.76	8.76	8.50	1.13	8.89	8.07	2.96	2.86	2.94
<b>Tapper, Megan (JAM) (1994)</b>	time	2.53	3.54	4.49	5.44	6.39	7.37	8.34	9.32	10.33	11.35	12.47	12.47	6 / 4			
	reaction time	0.183															
	interval velocity	5.14	8.42	8.95	8.95	8.95	8.67	8.76	8.67	8.42	8.33	8.97	8.02	8.02	2.91	2.90	3.01

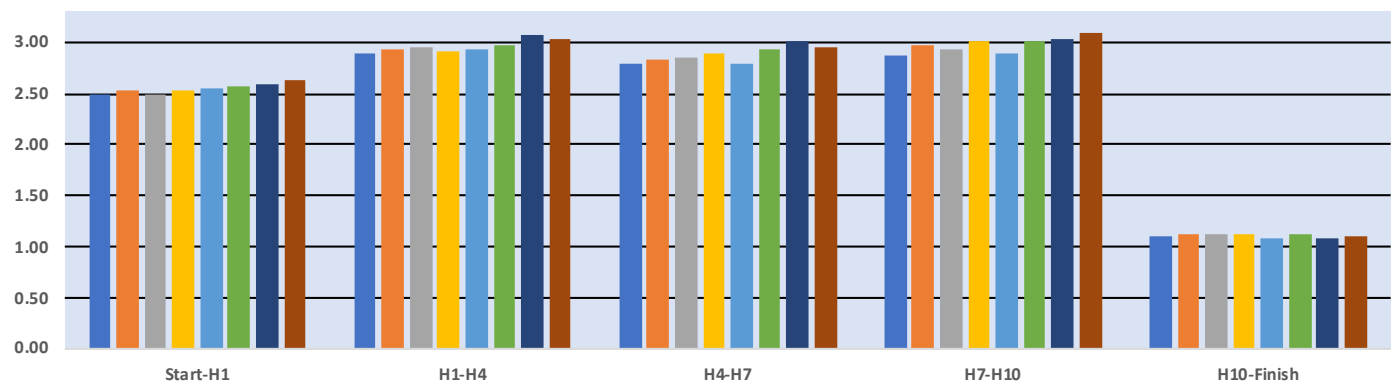
2023 UNF East Coast Relays (Jacksonville, FL)

		Date: 2023.04.29										Wind: 3.2 m/s	FINAL				
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
<b>Camacho-Quinn, Jasmine (PUR) (199)</b>	time	2.56	3.60	4.56	5.50	6.43	7.35	8.30	9.25	10.20	11.20	12.29	12.29	5 / 1			
	reaction time																
	interval velocity	5.08	8.17	8.85	9.04	9.14	9.24	8.95	8.95	8.95	8.50	1.09	9.22	8.14	2.94	2.80	2.90
<b>Jones, Rayniah (USA) (2001)</b>	time	2.58	3.60	4.58	5.56	6.54	7.51	8.50	9.50	10.50	11.51	12.63	12.63	6 / 2			
	reaction time																
	interval velocity	5.04	8.33	8.67	8.67	8.67	8.76	8.59	8.50	8.50	8.50	1.12	8.97	7.92	2.98	2.94	3.01
<b>Lin Yuwei (CHN) (1999)</b>	time	2.60	3.65	4.65	5.67	6.67	7.67	8.69	9.69	10.70	11.73	12.82	12.82	4 / 3			
	reaction time																
	interval velocity	5.00	8.10	8.50	8.33	8.50	8.50	8.33	8.50	8.42	8.25	9.22	7.80	7.80	3.07	3.02	3.04
<b>Glasco, Alexis (USA) (2002)</b>	time	2.63	3.63	4.63	5.66	6.64	7.62	8.62	9.63	10.64	11.72	12.83	12.83	3 / 4			
	reaction time																
	interval velocity	4.94	8.50	8.50	8.25	8.67	8.67	8.50	8.42	8.42	7.87	9.05	7.79	7.79	3.03	2.96	3.10



Time Intervals (s)

Hurdle Phases



USATF Bermuda Grand Prix

Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: First Movement  
 Source: <https://www.youtube.com/watch?v=K9s370LAArM>

UNF East Coast Relays

Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: Gun Flash  
 Sources: <https://www.youtube.com/watch?v=vZQoX3f96w>  
 Video from Coach - 1080 @ 30fps

2023 Doha Diamond League (Doha, QAT) (TV Analysis)

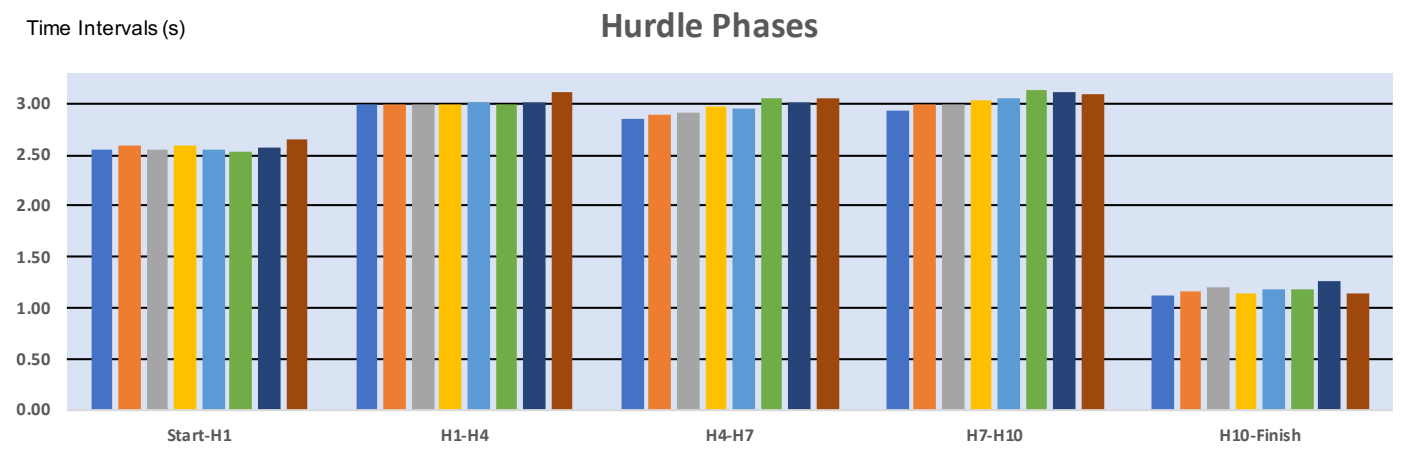
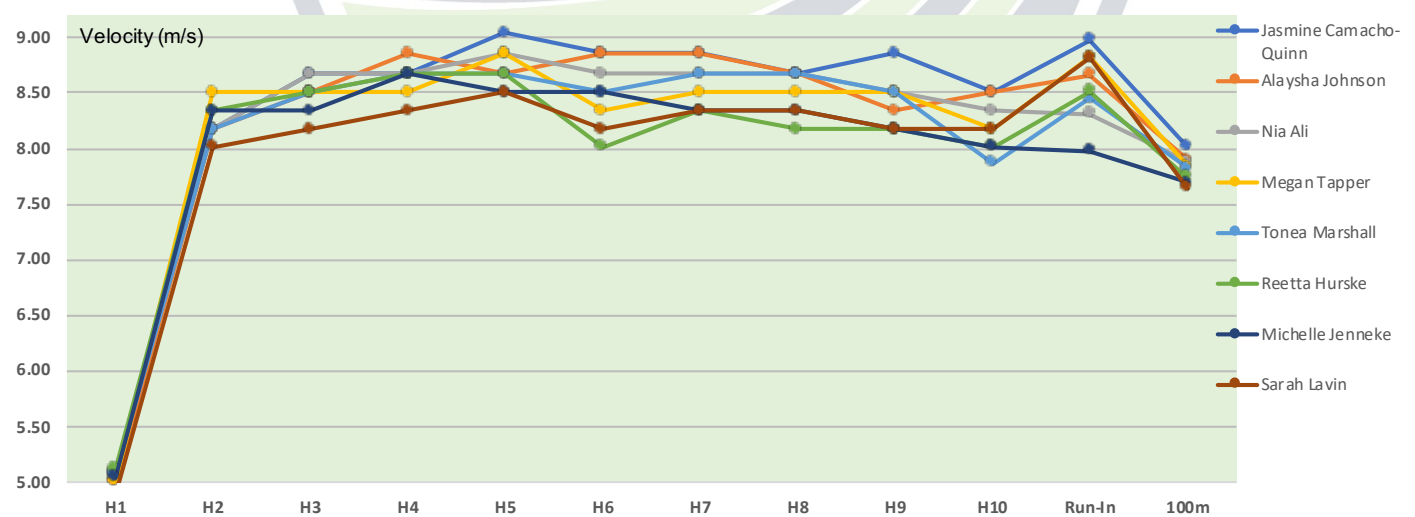
100m Hurdles

Date: 2023.05.05

Wind: 1.1 m/s

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10				
<b>Camacho-Quinn, Jasmine (PUR) (199)</b>	time	2.56	3.60	4.58	5.56	6.50	7.46	8.42	9.40	10.36	11.36		12.48	4 / 1	3.00	2.86	2.94				
	reaction time	0.148																			
	interval velocity	5.08	8.17	8.67	8.67	9.04	8.85	8.85	8.67	8.85	8.50	8.97	8.01						8.50	8.92	8.67
<b>Johnson, Alaysha (USA) (1996)</b>	time	2.60	3.64	4.64	5.60	6.58	7.54	8.50	9.48	10.50	11.50		12.66	5 / 2	3.00	2.90	3.00				
	reaction time	0.165																			
	interval velocity	5.00	8.17	8.50	8.85	8.67	8.85	8.85	8.67	8.33	8.50	8.66	7.90						8.50	8.79	8.50
<b>Ali, Nia (USA) (1988)</b>	time	2.56	3.60	4.58	5.56	6.52	7.50	8.48	9.46	10.46	11.48		12.69	3 / 3	3.00	2.92	3.00				
	reaction time	0.167																			
	interval velocity	5.08	8.17	8.67	8.67	8.85	8.67	8.67	8.67	8.50	8.33	8.31	7.88						8.50	8.73	8.50
<b>Tapper, Megan (JAM) (1994)</b>	time	2.60	3.60	4.60	5.60	6.56	7.58	8.58	9.58	10.58	11.62		12.76	8 / 4	3.00	2.98	3.04				
	reaction time	0.163																			
	interval velocity	5.00	8.50	8.50	8.50	8.96	8.85	8.33	8.50	8.50	1.00	1.04	8.17					7.84	8.50	8.56	8.39
<b>Marshall, Tonia (USA) (1998)</b>	time	2.56	3.60	4.60	5.58	6.56	7.56	8.54	9.52	10.52	11.60		12.79	2 / 5	3.02	2.96	3.06				
	reaction time	0.129																			
	interval velocity	5.08	8.17	8.50	8.67	8.67	8.50	8.67	8.67	8.50	1.00	1.08	1.19					7.82	8.44	8.61	8.33
<b>Hurske, Reetta (FIN) (1995)</b>	time	2.54	3.56	4.56	5.54	6.52	7.58	8.60	9.64	10.68	11.74		12.92	6 / 6	3.00	3.06	3.14				
	reaction time	0.132																			
	interval velocity	5.12	8.33	8.50	8.67	8.67	8.02	8.33	8.17	8.17	1.04	1.06	1.18					7.74	8.50	8.33	8.12
<b>Jenneke, Michelle (AUS) (1993)</b>	time	2.58	3.60	4.62	5.60	6.60	7.60	8.62	9.64	10.68	11.74		13.00	1 / 7	3.02	3.02	3.12				
	reaction time	0.154																			
	interval velocity	5.04	8.33	8.33	8.67	8.50	8.50	8.33	8.33	8.17	8.02	7.98	7.69						8.44	8.44	8.17
<b>Lavin, Sarah (IRL) (1994)</b>	time	2.66	3.72	4.76	5.78	6.78	7.82	8.84	9.86	10.90	11.94		13.08	7 / 8	3.12	3.06	3.10				
	reaction time	0.137																			
	interval velocity	4.89	8.02	8.17	8.33	8.50	8.17	8.33	8.33	8.17	8.17	8.82	7.65						8.17	8.33	8.23



Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: First Movement  
 Source: <https://www.youtube.com/watch?v=9exSPMzGN2w>

# Men's 400m Hurdles

## Biomechanical Analysis

## 2023 Top 10 Times - Men's 400m Hurdles

Runner	Event	Date	Time	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
<b>Benjamin, Rai (USA) (1997)</b>	<b>FINAL - 2023 Prefontaine Classic (Eugene, OR)</b>	16-Sep	5.74	9.40	13.10	16.86	20.68	24.61	28.60	32.70	36.97	41.36	46.39	5/1	46.39	5/1	11.12	11.74	12.76	
	reaction time	0.154	interval	3.66	3.70	3.76	3.82	3.93	3.99	4.10	4.27	4.39	5.03				9.44	8.94	8.23	
	H1 lead leg	R	velocity	7.84	9.56	9.46	9.31	9.16	8.91	8.77	8.54	8.20	7.97	7.95	8.62					
			strides	20	13	13	12	12	13	13	13	13	13	17	152					
<b>Warholm, Karsten (NOR) (1996)</b>	<b>FINAL - 2023 Herculis Meeting International d'Athlétisme (Monaco, MON)</b>	21-Jul	5.55	9.05	12.62	16.26	20.02	23.95	28.03	32.24	36.65	41.21	46.51	7/1	46.51	7/1	10.71	11.77	13.18	
	reaction time	0.146	interval	3.50	3.57	3.64	3.76	3.93	4.08	4.21	4.41	4.56	5.30				9.80	8.92	7.97	
	H1 lead leg	L	velocity	8.11	10.00	9.80	9.62	9.31	8.91	8.58	8.31	7.94	7.68	7.55	8.60					
			strides	20	13	13	13	13	13	13	13	13	15	17.7	156.7					
<b>Warholm, Karsten (NOR) (1996)</b>	<b>FINAL - 2023 Prefontaine Classic (Eugene, OR)</b>	16-Sep	5.59	9.17	12.80	16.46	20.22	24.10	28.12	32.37	36.62	41.18	46.53	7/2	46.53	7/2	10.87	11.66	13.06	
	reaction time	0.135	interval	3.58	3.63	3.66	3.76	3.88	4.02	4.25	4.25	4.56	5.35				9.66	9.01	8.04	
	H1 lead leg	L	velocity	8.05	9.78	9.64	9.56	9.31	9.02	8.71	8.24	8.24	7.68	7.48	8.60					
			strides	20	13	13	13	13	13	13	13	13	15	18	157					
<b>Warholm, Karsten (NOR) (1996)</b>	<b>FINAL - 2023 Bislett Games (Oslo, NOR)</b>	15-Jun	5.59	9.16	12.76	16.41	20.17	24.05	28.07	32.27	36.63	41.20	46.52	7/1	46.52	7/1	10.82	11.66	13.13	
	reaction time	0.162	interval	3.57	3.60	3.65	3.76	3.88	4.02	4.20	4.36	4.57	5.32				9.70	9.01	8.00	
	H1 lead leg	L	velocity	8.05	9.80	9.72	9.59	9.31	9.02	8.71	8.33	8.03	7.66	7.52	8.60					
			strides	20	13	13	13	13	13	13	13	13	15	17.7	156.7					
<b>Benjamin, Rai (USA) (1997)</b>	<b>FINAL - 2023 USA TF National Championships (Eugene, OR) (TV Analysis)</b>	9-Jul	5.81	9.44	13.14	16.92	20.75	24.70	28.69	32.76	37.00	41.47	46.62	5/1	46.62	5/1	11.11	11.77	12.78	
	reaction time	interval	3.63	3.70	3.78	3.83	3.95	3.99	4.07	4.24	4.47	5.15					9.45	8.92	8.22	
	H1 lead leg	R	velocity	7.75	9.64	9.46	9.26	9.14	8.86	8.77	8.60	8.25	7.83	7.77	8.58					
			strides	20	13	13	13	13	13	13	13	13	13	17	154					
<b>Warholm, Karsten (NOR) (1996)</b>	<b>FINAL - 2023 Norwegian National Championships (Jessheim, NOR)</b>	6-Jul											46.76	/1	46.76	/1				
	reaction time	interval	no information available																	
	H1 lead leg	strides											8.55							
<b>Warholm, Karsten (NOR) (1996)</b>	<b>FINAL - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)</b>	23-Aug	5.81	9.46	12.90	16.52	20.29	24.25	28.29	32.50	36.93	41.61	46.89	7/1	46.89	7/1	10.71	11.77	13.32	
	reaction time	0.171	interval	3.65	3.44	3.62	3.77	3.96	4.04	4.21	4.43	4.68	5.28				9.80	8.92	7.88	
	H1 lead leg	L	velocity	7.75	9.59	10.17	9.67	9.28	8.84	8.66	8.31	7.90	7.48	7.58	8.53					
			strides	20	13	13	13	13	13	13	13	13	15	18	157					
<b>Warholm, Karsten (NOR) (1996)</b>	<b>Semi-Final 3 - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)</b>	21-Aug	5.77	9.44	13.08	16.61	20.42	24.36	28.42	32.63	37.25	41.97	47.09	5/1	47.09	5/1	10.84	11.81	13.55	
	reaction time	0.162	interval	3.67	3.64	3.53	3.81	3.94	4.06	4.21	4.62	4.72	5.12				9.69	8.89	7.75	
	H1 lead leg	L	velocity	7.80	9.54	9.62	9.92	9.19	8.88	8.62	8.31	7.58	7.42	7.81	8.49					
			strides	20	13	13	13	13	13	13	13	15	15	17	158					
<b>Benjamin, Rai (USA) (1997)</b>	<b>Semi-Final 2 - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)</b>	21-Aug	5.77	9.54	13.08	16.92	20.82	24.82	28.93	33.21	37.61	42.14	47.24	7/1	47.24	7/1	11.15	12.01	13.21	
	reaction time	0.169	interval	3.77	3.54	3.84	3.90	4.00	4.11	4.28	4.40	4.53	5.10				9.42	8.74	7.95	
	H1 lead leg	R	velocity	7.80	9.28	9.89	9.11	8.97	8.75	8.52	8.18	7.95	7.73	7.84	8.47					
			strides	20	13	13	13	13	13	13	13	13	13	16.5	153.5					
<b>McMaster, Kyrion (IVB) (1997)</b>	<b>FINAL - 2023 P-T-S Meeting (Banská Bystrica, SVK) (TV Analysis)</b>	20-Jul	5.78	9.32	13.00	16.78	20.66	24.66	28.80	33.10	37.58	42.12	47.26	6/1	47.26	6/1	11.00	12.02	13.32	
	reaction time	0.210	interval	3.54	3.68	3.78	3.88	4.00	4.14	4.30	4.48	4.54	5.14				9.55	8.74	7.88	
	H1 lead leg	L	velocity	7.79	9.89	9.51	9.26	9.02	8.75	8.45	8.14	7.81	7.71	7.78	8.46					
			strides	13	13	13	13	13	13	14	14	14	14	14	17.2	138.2				
<b>McMaster, Kyrion (IVB) (1997)</b>	<b>FINAL - 2023 Weltklasse (Zürich, SUI)</b>	31-Aug	5.56	9.05	12.66	16.39	20.25	24.26	28.39	32.72	37.25	41.90	47.27	6/1	47.27	6/1	10.83	12.00	13.51	
	reaction time	0.149	interval	3.49	3.61	3.73	3.86	4.01	4.13	4.33	4.53	4.65	5.37				9.70	8.75	7.77	
	H1 lead leg	L	velocity	8.09	10.03	9.70	9.38	9.07	8.73	8.47	8.08	7.73	7.53	7.45	8.46					
			strides	21	13	13	13	13	13	13	14	14	14	17.2	158.2					
<b>Warholm, Karsten (NOR) (1996)</b>	<b>FINAL - 2023 Weltklasse (Zürich, SUI)</b>	31-Aug	5.63	9.23	12.94	16.69	20.55	24.50	28.55	32.78	37.30	41.91	47.30	7/2	47.30	7/2	11.06	11.86	13.36	
	reaction time	0.169	interval	3.60	3.71	3.75	3.86	3.95	4.05	4.23	4.52	4.61	5.39				9.49	8.85	7.86	
	H1 lead leg	L	velocity	7.99	9.72	9.43	9.33	9.07	8.86	8.64	8.27	7.74	7.59	7.42	8.46					
			strides	20	13	13	13	13	13	13	13	15	15	18	159					
<b>McMaster, Kyrion (IVB) (1997)</b>	<b>FINAL - 2023 Prefontaine Classic (Eugene, OR)</b>	16-Sep	5.58	9.11	12.71	16.42	20.29	24.26	28.35	32.59	37.11	41.75	47.31	6/3	47.31	6/3	10.84	11.93	13.40	
	reaction time	0.133	interval	3.53	3.60	3.71	3.87	3.97	4.09	4.24	4.52	4.64	5.56				9.69	8.80	7.84	
	H1 lead leg	L	velocity	8.06	9.92	9.72	9.43	9.04	8.82	8.56	8.25	7.74	7.54	7.19	8.45					
			strides	21	13	13	12	13	13	13	13	14	14	17	156					
<b>Clarke, Roshawn (JAM) (2004)</b>	<b>Semi-Final 2 - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)</b>	21-Aug	5.77	9.48	13.08	16.61	20.42	24.49	28.66	33.01	37.54	42.14	47.34	7/2	47.34	7/2	10.84	12.05	13.48	
	reaction time	0.198	interval	3.71	3.60	3.53	3.81	4.07	4.17	4.35	4.53	4.60	5.20				9.69	8.71	7.79	
	H1 lead leg	R	velocity	7.80	9.43	9.72	9.92	9.19	8.60	8.39	8.05	7.73	7.61	7.69	8.45					
			strides	21	13	13	13	13	14	14	15	15	15	18.5	164.5					
<b>McMaster, Kyrion (IVB) (1997)</b>	<b>FINAL - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)</b>	23-Aug	5.67	9.33	12.80	16.45	20.26	24.28	28.39	32.78	37.33	41.98	47.34	8/2	47.34	8/2	10.78	11.94	13.59	
	reaction time	0.151	interval	3.66	3.47	3.65	3.81	4.02	4.11	4.39	4.55	4.65	5.36				9.74	8.79	7.73	
	H1 lead leg	L	velocity	7.94	9.56	10.09	9.59	9.19	8.71	8.52	7.97	7.69	7.53	7.46	8.45					
			strides	21	13	13	13	13	13	13	14	14	14	17.7	158.7					



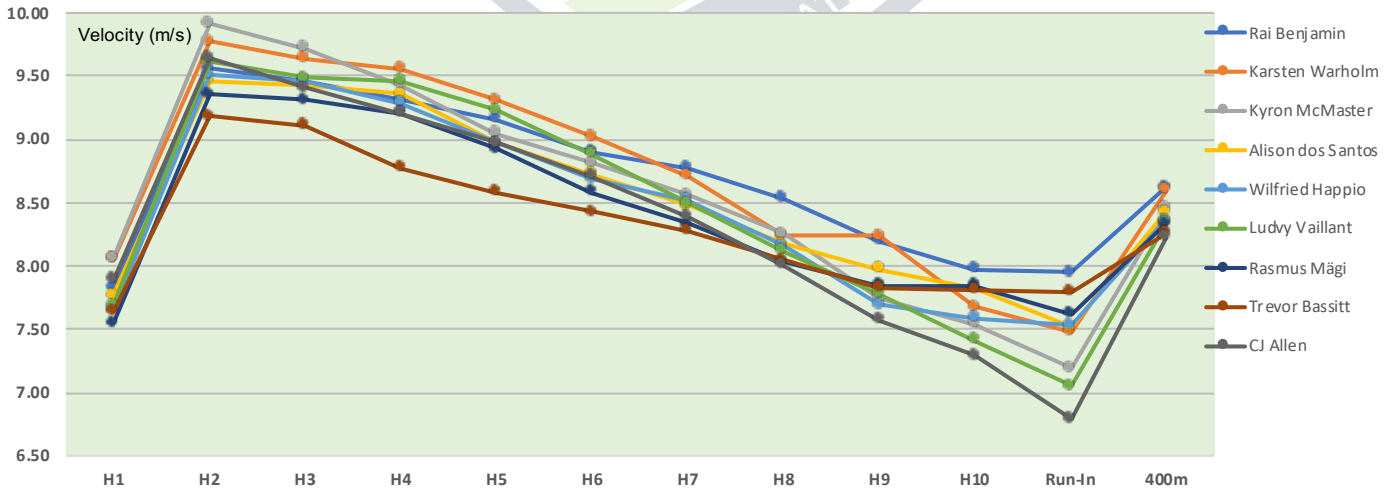
2023 Prefontaine Classic (Eugene, OR)

Men's 400m Hurdles

Date 2023.09.16

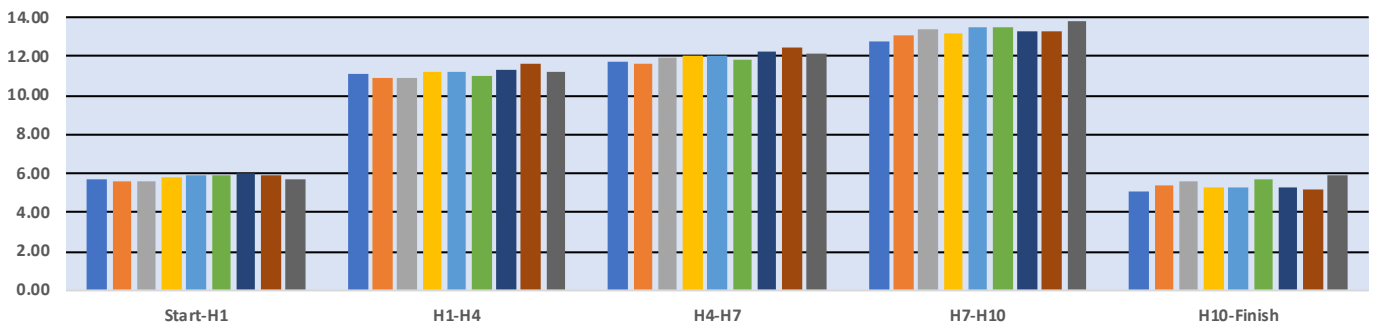
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Benjamin, Rai (USA) (1997)</b>	time	5.74	9.40	13.10	16.86	20.68	24.61	28.60	32.70	36.97	41.36		46.39	5 / 1			
	reaction time	0.154															
	interval		3.66	3.70	3.76	3.82	3.93	3.99	4.10	4.27	4.39	5.03			11.12	11.74	12.76
	velocity	7.84	9.56	9.46	9.31	9.16	8.91	8.77	8.54	8.20	7.97	7.95	8.62		9.44	8.94	8.23
H1 lead leg	R	20	13	13	12	12	13	13	13	13	13	17	152				
<b>Warholm, Karsten (NOR) (1996)</b>	time	5.59	9.17	12.80	16.46	20.22	24.10	28.12	32.37	36.62	41.18		46.53	7 / 2			
	reaction time	0.135															
	interval		3.58	3.63	3.66	3.76	3.88	4.02	4.25	4.25	4.56	5.35			10.87	11.66	13.06
	velocity	8.05	9.78	9.64	9.56	9.31	9.02	8.71	8.24	8.24	7.68	7.48	8.60		9.66	9.01	8.04
H1 lead leg	L	20	13	13	13	13	13	13	13	13	15	18	157				
<b>McMaster, Kyron (IVB) (1997)</b>	time	5.58	9.11	12.71	16.42	20.29	24.26	28.35	32.59	37.11	41.75		47.31	6 / 3			
	reaction time	0.133															
	interval		3.53	3.60	3.71	3.87	3.97	4.09	4.24	4.52	4.64	5.56			10.84	11.93	13.40
	velocity	8.06	9.92	9.72	9.43	9.04	8.82	8.56	8.25	7.74	7.54	7.19	8.45		9.69	8.80	7.84
H1 lead leg	L	21	13	13	12	13	13	13	13	14	14	17	156				
<b>dos Santos, Alison (BRA) (2000)</b>	time	5.79	9.49	13.20	16.94	20.84	24.85	28.98	33.26	37.65	42.12		47.44	4 / 4			
	reaction time	0.172															
	interval		3.70	3.71	3.74	3.90	4.01	4.13	4.28	4.39	4.47	5.32			11.15	12.04	13.14
	velocity	7.77	9.46	9.43	9.36	8.97	8.73	8.47	8.18	7.97	7.83	7.52	8.43		9.42	8.72	7.99
H1 lead leg	L	20			12	12	12	13	13	13	16	124					
<b>Happio, Wilfried (FRA) (1998)</b>	time	5.88	9.56	13.26	17.03	20.93	24.96	29.07	33.36	37.91	42.52		47.83	3 / 5			
	reaction time	0.173															
	interval		3.68	3.70	3.77	3.90	4.03	4.11	4.29	4.55	4.61	5.31			11.15	12.04	13.45
	velocity	7.65	9.51	9.46	9.28	8.97	8.68	8.52	8.16	7.69	7.59	7.53	8.36		9.42	8.72	7.81
H1 lead leg	L	20			13	13	13	13	13	15	15	18	133				
<b>Vaillant, Ludvy (FRA) (1995)</b>	time	5.85	9.49	13.18	16.88	20.67	24.61	28.73	33.04	37.54	42.26		47.93	1 / 6			
	reaction time	0.138															
	interval		3.64	3.69	3.70	3.79	3.94	4.12	4.31	4.50	4.72	5.67			11.03	11.85	13.53
	velocity	7.69	9.62	9.49	9.46	9.23	8.88	8.50	8.12	7.78	7.42	7.05	8.35		9.52	8.86	7.76
H1 lead leg	R	21			13	13	13	14	14	14	14	18	134				
<b>Mägi, Rasmus (EST) (1992)</b>	time	5.96	9.70	13.46	17.26	21.18	25.26	29.46	33.82	38.28	42.74		47.99	9 / 7			
	reaction time	0.155															
	interval		3.74	3.76	3.80	3.92	4.08	4.20	4.36	4.46	4.46	5.25			11.30	12.20	13.28
	velocity	7.55	9.36	9.31	9.21	8.93	8.58	8.33	8.03	7.85	7.85	7.62	8.34		9.29	8.61	7.91
H1 lead leg	R	21			13	13	13	13	14		87						
<b>Bassitt, Trevor (USA) (1998)</b>	time	5.89	9.70	13.54	17.53	21.61	25.76	29.99	34.34	38.81	43.29		48.42	8 / 8			
	reaction time	0.154															
	interval		3.81	3.84	3.99	4.08	4.15	4.23	4.35	4.47	4.48	5.13			11.64	12.46	13.30
	velocity	7.64	9.19	9.11	8.77	8.58	8.43	8.27	8.05	7.83	7.81	7.80	8.26		9.02	8.43	7.89
H1 lead leg	R	20	13	13	13	13	13	13			111						
<b>Allen, CJ (USA) (1995)</b>	time	5.70	9.33	13.05	16.85	20.75	24.77	28.94	33.31	37.93	42.73		48.62	2 / 9			
	reaction time	0.137															
	interval		3.63	3.72	3.80	3.90	4.02	4.17	4.37	4.62	4.80	5.89			11.15	12.09	13.79
	velocity	7.89	9.64	9.41	9.21	8.97	8.71	8.39	8.01	7.58	7.29	6.79	8.23		9.42	8.68	7.61
H1 lead leg	L	20			13	13	13	14	14	14		115					



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 31 Aug 2023 20:15) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030D0102070101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=4S5SKwasIRs>

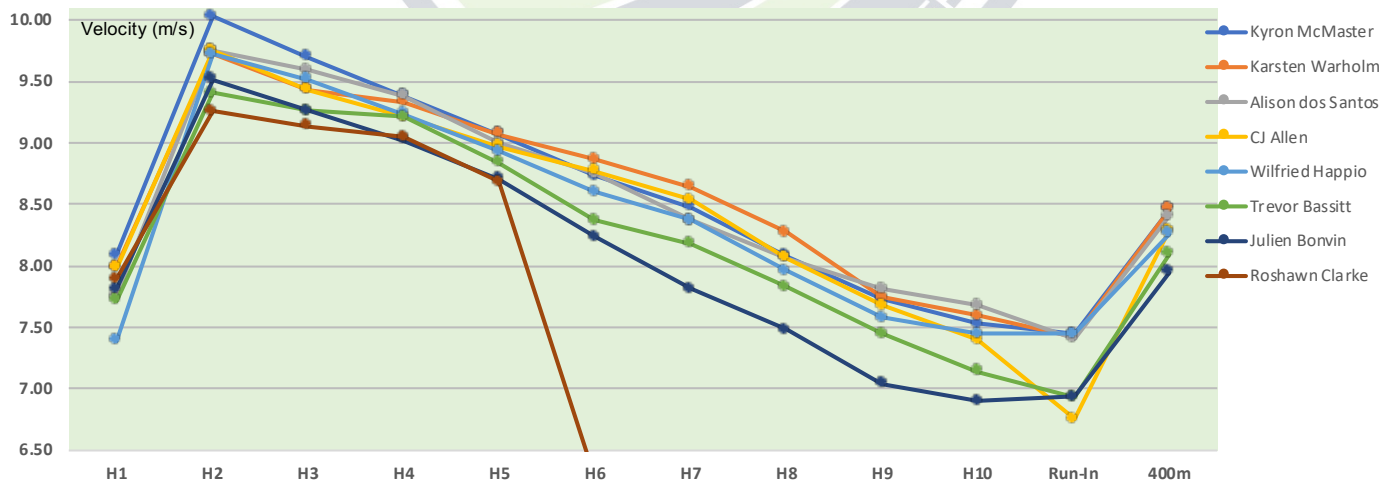
2023 Weltklasse (Zürich, SU1)

Men's 400m Hurdles

Date 2023.08.31

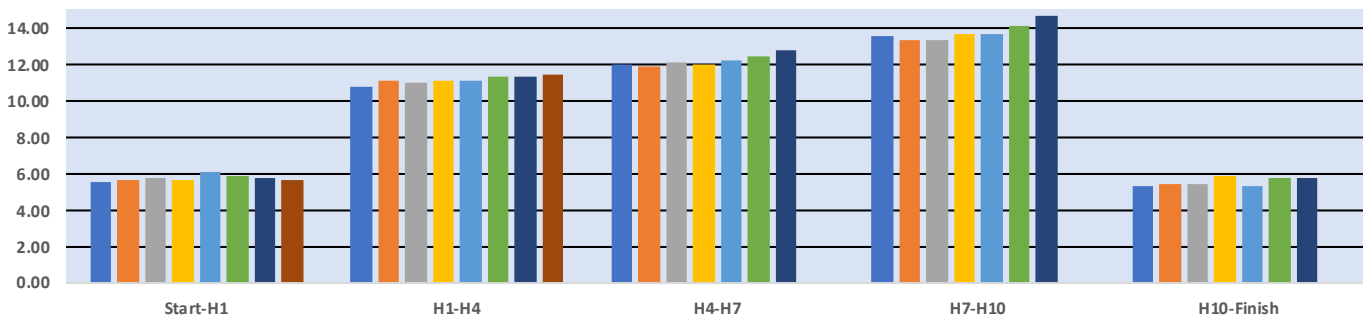
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>McMaster, Kyron (IVB) (1997)</b>	time	5.56	9.05	12.66	16.39	20.25	24.26	28.39	32.72	37.25	41.90		47.27	6 / 1			
	reaction time	0.149															
	interval		3.49	3.61	3.73	3.86	4.01	4.13	4.33	4.53	4.65	5.37			10.83	12.00	13.51
	velocity	8.09	10.03	9.70	9.38	9.07	8.73	8.47	8.08	7.73	7.53	7.45	8.46		9.70	8.75	7.77
H1 lead leg	L	21	13	13	13	13	13	13	14	14	14	17.2	158.2				
<b>Warholm, Karsten (NOR) (1996)</b>	time	5.63	9.23	12.94	16.69	20.55	24.50	28.55	32.78	37.30	41.91		47.30	7 / 2			
	reaction time	0.169															
	interval		3.60	3.71	3.75	3.86	3.95	4.05	4.23	4.52	4.61	5.39			11.06	11.86	13.36
	velocity	7.99	9.72	9.43	9.33	9.07	8.86	8.64	8.27	7.74	7.59	7.42	8.46		9.49	8.85	7.86
H1 lead leg	L	20	13	13	13	13	13	13	13	15	15	18	159				
<b>dos Santos, Alison (BRA) (2000)</b>	time	5.80	9.39	13.04	16.77	20.66	24.66	28.84	33.18	37.66	42.22		47.62	5 / 3			
	reaction time	0.162															
	interval		3.59	3.65	3.73	3.89	4.00	4.18	4.34	4.48	4.56	5.40			10.97	12.07	13.38
	velocity	7.76	9.75	9.59	9.38	9.00	8.75	8.37	8.06	7.81	7.68	7.41	8.40		9.57	8.70	7.85
H1 lead leg	L	20	13			12	12	13			13	16.2	99.2				
<b>Allen, CJ (USA) (1995)</b>	time	5.64	9.23	12.94	16.74	20.64	24.63	28.73	33.07	37.63	42.36		48.28	3 / 4			
	reaction time	0.141															
	interval		3.59	3.71	3.80	3.90	3.99	4.10	4.34	4.56	4.73	5.92			11.10	11.99	13.63
	velocity	7.98	9.75	9.43	9.21	8.97	8.77	8.54	8.06	7.68	7.40	6.76	8.29		9.46	8.76	7.70
H1 lead leg	L	20	13			13	13	13			14	18	104				
<b>Happio, Wilfried (FRA) (1998)</b>	time	6.09	9.69	13.37	17.16	21.08	25.15	29.33	33.73	38.35	43.05		48.42	2 / 5			
	reaction time	0.469															
	interval		3.60	3.68	3.79	3.92	4.07	4.18	4.40	4.62	4.70	5.37			11.07	12.17	13.72
	velocity	7.39	9.72	9.51	9.23	8.93	8.60	8.37	7.95	7.58	7.45	7.45	8.26		9.49	8.63	7.65
H1 lead leg	L	20	13			13	13	13			15	17.2	104.2				
<b>Bassitt, Trevor (USA) (1998)</b>	time	5.83	9.55	13.33	17.13	21.09	25.27	29.55	34.02	38.72	43.62		49.39	8 / 6			
	reaction time	0.171															
	interval		3.72	3.78	3.80	3.96	4.18	4.28	4.47	4.70	4.90	5.77			11.30	12.42	14.07
	velocity	7.72	9.41	9.26	9.21	8.84	8.37	8.18	7.83	7.45	7.14	6.93	8.10		9.29	8.45	7.46
H1 lead leg	R	20	13	13	13	13	13	13	13			111					
<b>Bonvin, Julien (SUI) (1999)</b>	time	5.76	9.44	13.22	17.10	21.12	25.37	29.85	34.53	39.50	44.57		50.34	1 / 7			
	reaction time	0.149															
	interval		3.68	3.78	3.88	4.02	4.25	4.48	4.68	4.97	5.07	5.77			11.34	12.75	14.72
	velocity	7.81	9.51	9.26	9.02	8.71	8.24	7.81	7.48	7.04	6.90	6.93	7.95		9.26	8.24	7.13
H1 lead leg	L	21	13			13	14	14				75					
<b>Clarke, Roshawn (JAM) (2004)</b>	time	5.70	9.48	13.31	17.18	21.21	26.79						dnf	4 / --			
	reaction time	0.175															
	interval		3.78	3.83	3.87	4.03	5.58										
	velocity	7.89	9.26	9.14	9.04	8.68	6.27								11.48		
H1 lead leg	L	22	14			14						50		9.15			



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 31 Aug 2023 20:15) - diamond league race analysis  
<https://www.omegaitiming.com/File/0002030D0102070101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=4S5SKwasIRs>

Biomechanical Analysis

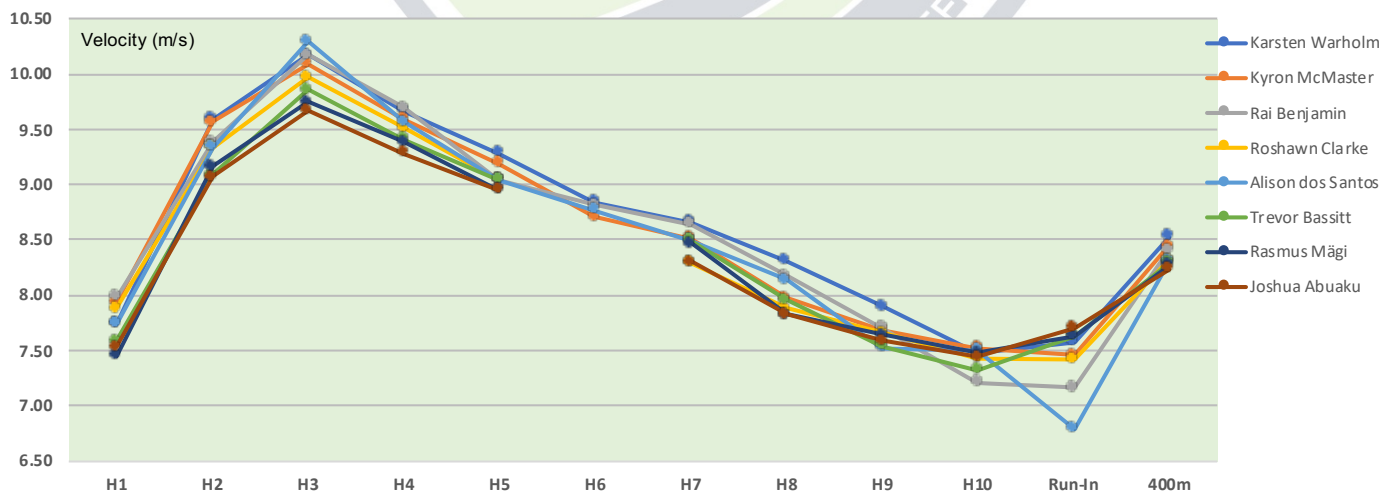
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.23

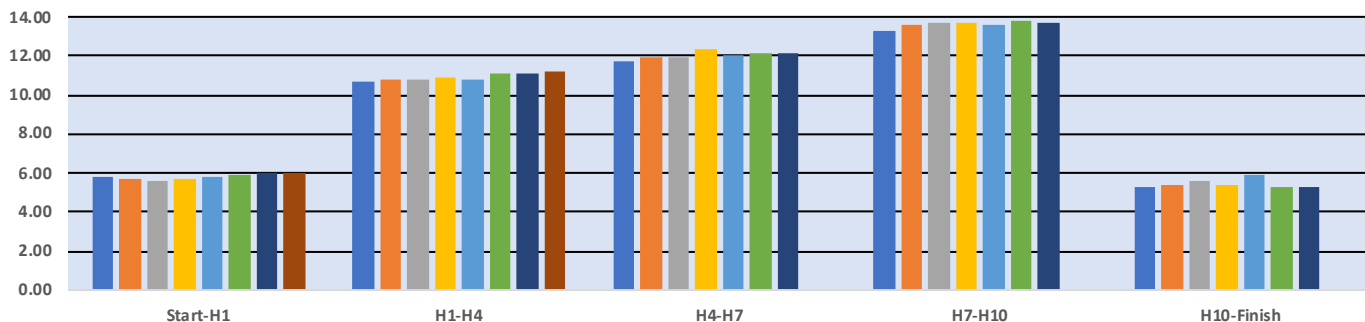
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Warholm, Karsten (NOR) (1996)</b>	time	5.81	9.46	12.90	16.52	20.29	24.25	28.29	32.50	36.93	41.61		46.89	7 / 1			
	reaction time	0.171															
	interval		3.65	3.44	3.62	3.77	3.96	4.04	4.21	4.43	4.68	5.28			10.71	11.77	13.32
	velocity	7.75	9.59	10.17	9.67	9.28	8.84	8.66	8.31	7.90	7.48	7.58	8.53		9.80	8.92	7.88
H1 lead leg	L		20	13	13	13	13	13	13	13	15	18	157				
<b>McMaster, Kyron (IVB) (1997)</b>	time	5.67	9.33	12.80	16.45	20.26	24.28	28.39	32.78	37.33	41.98		47.34	8 / 2			
	reaction time	0.151															
	interval		3.66	3.47	3.65	3.81	4.02	4.11	4.39	4.55	4.65	5.36			10.78	11.94	13.59
	velocity	7.94	9.56	10.09	9.59	9.19	8.71	8.52	7.97	7.69	7.53	7.46	8.45		9.74	8.79	7.73
H1 lead leg	L		21	13	13	13	13	13	14	14	14	17.7	158.7				
<b>Benjamin, Rai (USA) (1997)</b>	time	5.64	9.37	12.81	16.42	20.29	24.26	28.31	32.59	37.13	41.98		47.56	6 / 3			
	reaction time	0.168															
	interval		3.73	3.44	3.61	3.87	3.97	4.05	4.28	4.54	4.85	5.58			10.78	11.89	13.67
	velocity	7.98	9.38	10.17	9.70	9.04	8.82	8.64	8.18	7.71	7.22	7.17	8.41		9.74	8.83	7.68
H1 lead leg	R		20	13	12	12	12	13	13	13	14	17	152				
<b>Clarke, Roshawn (JAM) (2004)</b>	time	5.71	9.46	12.97	16.65	20.52		28.96	33.40	37.97	42.68		48.07	5 / 4			
	reaction time	0.164															
	interval		3.75	3.51	3.68	3.87		8.44	4.44	4.57	4.71	5.39			10.94	12.31	13.72
	velocity	7.88	9.33	9.97	9.51	9.04		8.29	7.88	7.66	7.43	7.42	8.32		9.60	8.53	7.65
H1 lead leg	R		21	13	13	13	14	15	15	15	18.2	150.2					
<b>dos Santos, Alison (BRA) (2000)</b>	time	5.81	9.56	12.96	16.62	20.49	24.48	28.60	32.90	37.55	42.21		48.10	9 / 5			
	reaction time	0.164															
	interval		3.75	3.40	3.66	3.87	3.99	4.12	4.30	4.65	4.66	5.89			10.81	11.98	13.61
	velocity	7.75	9.33	10.29	9.56	9.04	8.77	8.50	8.14	7.53	7.51	6.79	8.32		9.71	8.76	7.71
H1 lead leg	L		20	13	12	12	12	13	13	14	14	17.2	152.2				
<b>Bassitt, Trevor (USA) (1998)</b>	time	5.93	9.78	13.33	17.05	20.92		29.16	33.56	38.20	42.98		48.22	3 / 6			
	reaction time	0.164															
	interval		3.85	3.55	3.72	3.87		8.24	4.40	4.64	4.78	5.24			11.12	12.11	13.82
	velocity	7.59	9.09	9.86	9.41	9.04		8.50	7.95	7.54	7.32	7.63	8.30		9.44	8.67	7.60
H1 lead leg	R		20	13	13	13			13	13	14	17	129				
<b>Mägi, Rasmus (EST) (1992)</b>	time	6.04	9.86	13.45	17.18	21.09		29.36	33.83	38.41	43.09		48.33	4 / 7			
	reaction time	0.161															
	interval		3.82	3.59	3.73	3.91		8.27	4.47	4.58	4.68	5.24			11.14	12.18	13.73
	velocity	7.45	9.16	9.75	9.38	8.95		8.46	7.83	7.64	7.48	7.63	8.28		9.43	8.62	7.65
H1 lead leg	R		21	13	13	13			14	14	14	17.2	132.2				
<b>Abuaku, Joshua (GER) (1996)</b>	time	5.97	9.83	13.45	17.22	21.13		29.56	34.03	38.64	43.34		48.53	2 / 8			
	reaction time	0.156															
	interval		3.86	3.62	3.77	3.91		8.43	4.47	4.61	4.70	5.19			11.25	12.34	13.78
	velocity	7.54	9.07	9.67	9.28	8.95		8.30	7.83	7.59	7.45	7.71	8.24		9.33	8.51	7.62
H1 lead leg	L		20	13		13			14	14	14	18	119				



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=kW3kfam5DrM>

Biomechanical Analysis

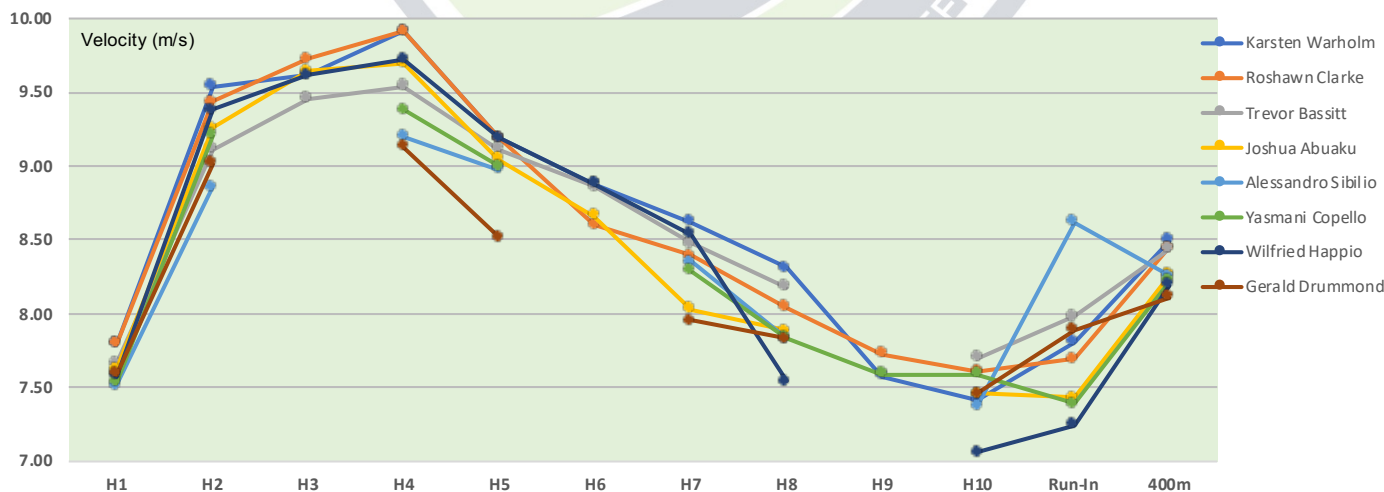
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.21

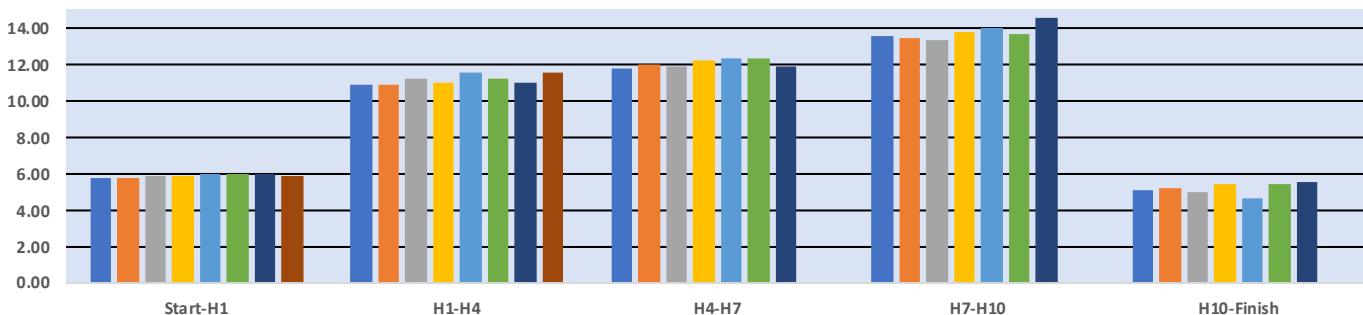
Semi-Final 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10	
<b>Warholm, Karsten (NOR) (1996)</b>	time	5.77	9.44	13.08	16.61	20.42	24.36	28.42	32.63	37.25	41.97		47.09	5 / 1				
	reaction time	0.162																
	interval		3.67	3.64	3.53	3.81	3.94	4.06	4.21	4.62	4.72	5.12			10.84	11.81	13.55	
	velocity	7.80	9.54	9.62	9.92	9.19	8.88	8.62	8.31	7.58	7.42	7.81	8.49		9.69	8.89	7.75	
H1 lead leg	L																	
<b>Clarke, Roshawn (JAM) (2004)</b>	time	5.77	9.48	13.08	16.61	20.42	24.49	28.66	33.01	37.54	42.14		47.34	7 / 2				
	reaction time	0.198																
	interval		3.71	3.60	3.53	3.81	4.07	4.17	4.35	4.53	4.60	5.20	<b>WJR</b>		10.84	12.05	13.48	
	velocity	7.80	9.43	9.72	9.92	9.19	8.60	8.39	8.05	7.73	7.61	7.69	8.45		9.69	8.71	7.79	
H1 lead leg	R																	
<b>Bassitt, Trevor (USA) (1998)</b>	time	5.87	9.71	13.41	17.08	20.92	24.87	29.00	33.28			42.37		47.38	9 / 3			
	reaction time	0.187																
	interval		3.84	3.70	3.67	3.84	3.95	4.13	4.28		9.09	5.01	<b>PB</b>		11.21	11.92	13.37	
	velocity	7.67	9.11	9.46	9.54	9.11	8.86	8.47	8.18		7.70	7.98	8.44		9.37	8.81	7.85	
H1 lead leg	R																	
<b>Abuaku, Joshua (GER) (1996)</b>	time	5.90	9.68	13.31	16.92	20.79	24.83	29.19	33.63			43.01		48.39	8 / 4			
	reaction time	0.179																
	interval		3.78	3.63	3.61	3.87	4.04	4.36	4.44		9.38	5.38			11.02	12.27	13.82	
	velocity	7.63	9.26	9.64	9.70	9.04	8.66	8.03	7.88		7.46	7.43	8.27		9.53	8.56	7.60	
H1 lead leg	L																	
<b>Sibilio, Alessandro (ITA) (1999)</b>	time	5.99	9.94		17.55	21.45		29.83	34.30			43.79		48.43	2 / 5			
	reaction time	0.152																
	interval		3.95		7.61	3.90		8.38	4.47		9.49	4.64			11.56	12.28	13.96	
	velocity	7.51	8.86		9.20	8.97		8.35	7.83		7.38	8.62	8.26		9.08	8.55	7.52	
H1 lead leg	R																	
<b>Copello, Yasmani (TUR) (1987)</b>	time	5.97	9.77		17.23	21.12		29.57	34.03	38.64		43.25		48.66	3 / 6			
	reaction time	0.220																
	interval		3.80		7.46	3.89		8.45	4.46	4.61	4.61	5.41			11.26	12.34	13.68	
	velocity	7.54	9.21		9.38	9.00		8.29	7.84	7.59	7.59	7.39	8.22		9.33	8.51	7.67	
H1 lead leg	R																	
<b>Happio, Wilfried (FRA) (1998)</b>	time	5.94	9.67	13.31	16.91	20.72	24.66	28.76	33.40			43.31		48.83	6 / 7			
	reaction time	0.176																
	interval		3.73	3.64	3.60	3.81	3.94	4.10	4.64		9.91	5.52			10.97	11.85	14.55	
	velocity	7.58	9.38	9.62	9.72	9.19	8.88	8.54	7.54		7.06	7.25	8.19		9.57	8.86	7.22	
H1 lead leg	L																	
<b>Drummond, Gerald (CRC) (1994)</b>	time	5.93	9.81		17.48	21.59		30.39	34.86			44.24		49.31	4 / 8			
	reaction time	0.169																
	interval		3.88		7.67	4.11		8.80	4.47		9.38	5.07			11.55	12.91	13.85	
	velocity	7.59	9.02		9.13	8.52		7.95	7.83		7.46	7.89	8.11		9.09	8.13	7.58	
H1 lead leg	L																	



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=fP1CbXQ3e44>

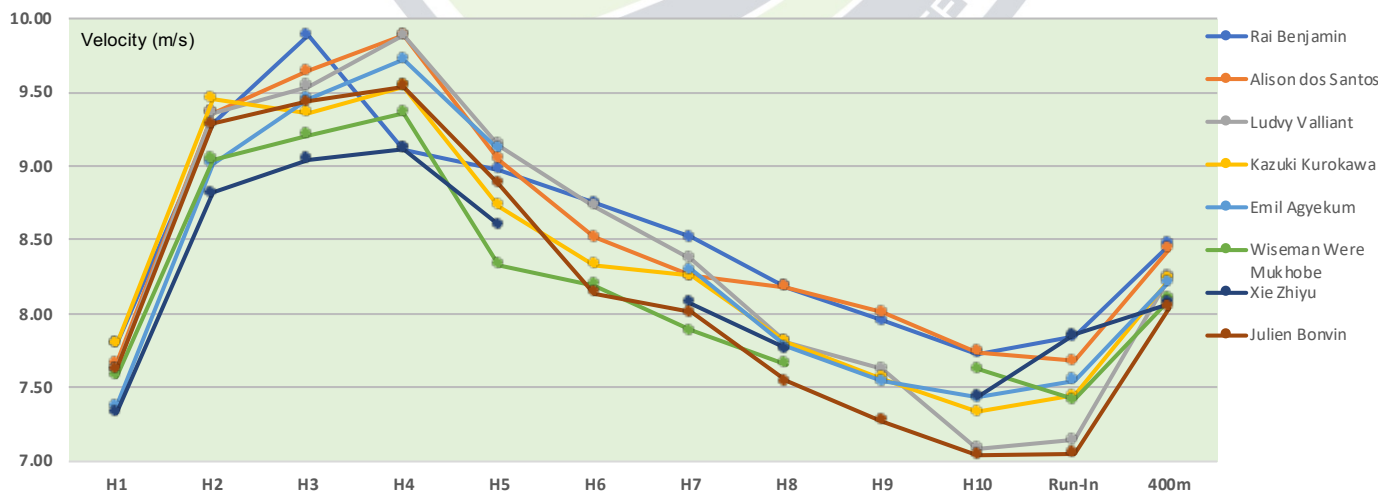
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.21

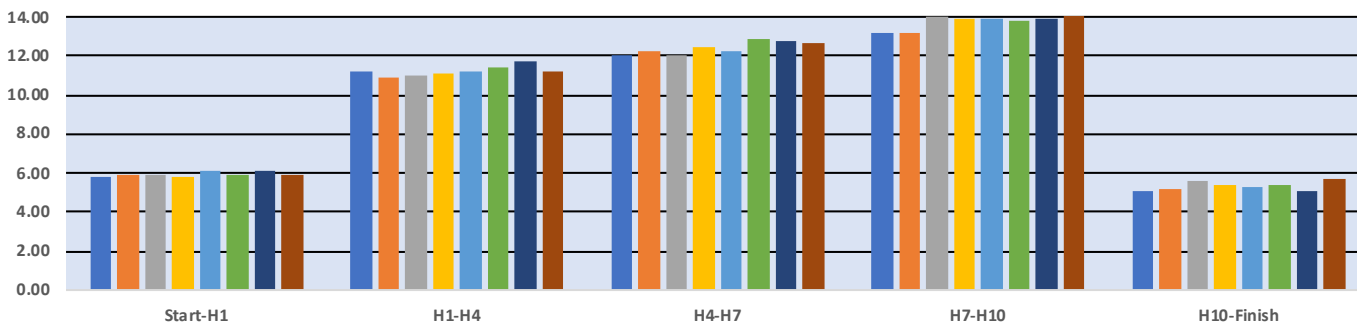
Semi-Final 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Benjamin, Rai (USA) (1997)</b>	time	5.77	9.54	13.08	16.92	20.82	24.82	28.93	33.21	37.61	42.14	47.24	47.24	7 / 1			
	reaction time	0.169													11.15	12.01	13.21
	interval velocity	7.80	9.28	9.89	9.11	8.97	8.75	8.52	8.18	7.95	7.73	7.84	8.47		9.42	8.74	7.95
	H1 lead leg	R	20	13	13	13	13	13	13	13	13	13	16.5	153.5			
<b>dos Santos, Alison (BRA) (2000)</b>	time	5.87	9.61	13.24	16.78	20.65	24.76	29.00	33.28	37.65	42.17	47.38	47.38	8 / 2			
	reaction time	0.182													10.91	12.22	13.17
	interval velocity	7.67	9.36	9.64	9.89	9.04	8.52	8.25	8.18	8.01	7.74	7.68	8.44		9.62	8.59	7.97
	H1 lead leg	L	20	13	12	12	12	13	13	13	13	13	16.2	150.2			
<b>Valliant, Ludvy (FRA) (1995)</b>	time	5.90	9.64	13.31	16.85	20.68	24.69	28.87	33.35	37.94	42.88	48.48	48.48	6 / 3			
	reaction time	0.194													10.95	12.02	14.01
	interval velocity	7.63	9.36	9.54	9.89	9.14	8.73	8.37	7.81	7.63	7.09	7.14	8.25		9.59	8.74	7.49
	H1 lead leg	R	21	13	13	13	13	13	14	14	14	15	18	161			
<b>Kurokawa, Kazuki (JPN) (2001)</b>	time	5.77	9.47	13.21	16.88	20.89	25.09	29.33	33.81	38.44	43.21	48.58	48.58	5 / 4			
	reaction time	0.144													11.11	12.45	13.88
	interval velocity	7.80	9.46	9.36	9.54	8.73	8.33	8.25	7.81	7.56	7.34	7.45	8.23		9.45	8.43	7.56
	H1 lead leg	L	21	13	13	13	13	14	14	15	15	15	19	165			
<b>Agyekum, Emil (GER) (1999)</b>	time	6.10	9.98	13.68	17.28	21.12	25.56	30.06	34.06	38.70	43.41	48.71	48.71	3 / 5			
	reaction time	0.196													11.18	12.28	13.85
	interval velocity	7.38	9.02	9.46	9.72	9.11	8.29	7.78	7.54	7.43	7.55	8.21			9.39	8.55	7.58
	H1 lead leg	L	21	13	13	13	13		14	15	15	18	135				
<b>Mukhobe, Wiseman Were (KEN) (1999)</b>	time	5.94	9.81	13.61	17.35	21.55	25.82	30.26	34.83	39.18	44.01	49.40	49.40	9 / 6			
	reaction time	0.196													11.41	12.91	13.75
	interval velocity	7.58	9.04	9.21	9.36	8.33	8.20	7.88	7.66	7.63	7.42	8.10			9.20	8.13	7.64
	H1 lead leg	R	22	14	14	13	14	14	15			19	125				
<b>Xie Zhiyu (CHN) (2000)</b>	time	6.14	10.11	13.98	17.82	21.89	26.56	30.57	35.07	39.11	44.48	49.57	49.57	2 / 7			
	reaction time	0.189													11.68	12.74	13.92
	interval velocity	7.33	8.82	9.04	9.11	8.60	8.07	7.76	7.44	7.44	7.86	8.07			8.99	8.24	7.54
	H1 lead leg	L	21	8.82	9.04	9.11	8.60		14		17	91					
<b>Bonvin, Julien (SUI) (1999)</b>	time	5.90	9.67	13.38	17.05	20.99	25.29	29.66	34.30	39.11	44.08	49.75	49.75	4 / 8			
	reaction time	0.175													11.15	12.61	14.42
	interval velocity	7.63	9.28	9.43	9.54	8.88	8.14	8.01	7.54	7.28	7.04	7.05	8.04		9.42	8.33	7.28
	H1 lead leg	L	20	13	13	13	13	14	14	15	15	18	148				



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=0vCaWWJaR08>

Biomechanical Analysis

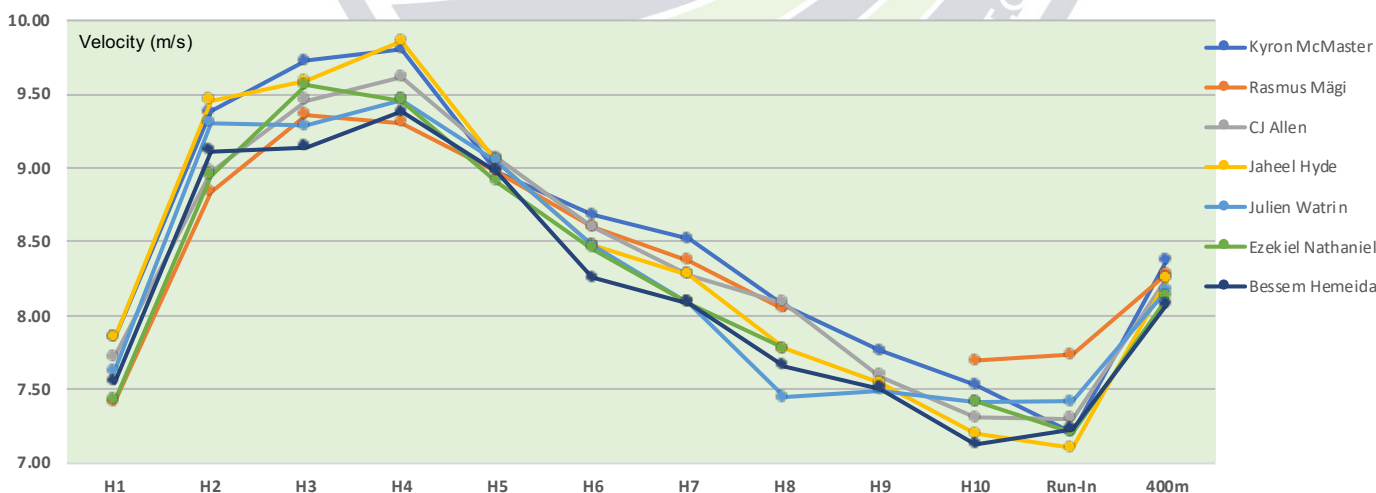
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.21

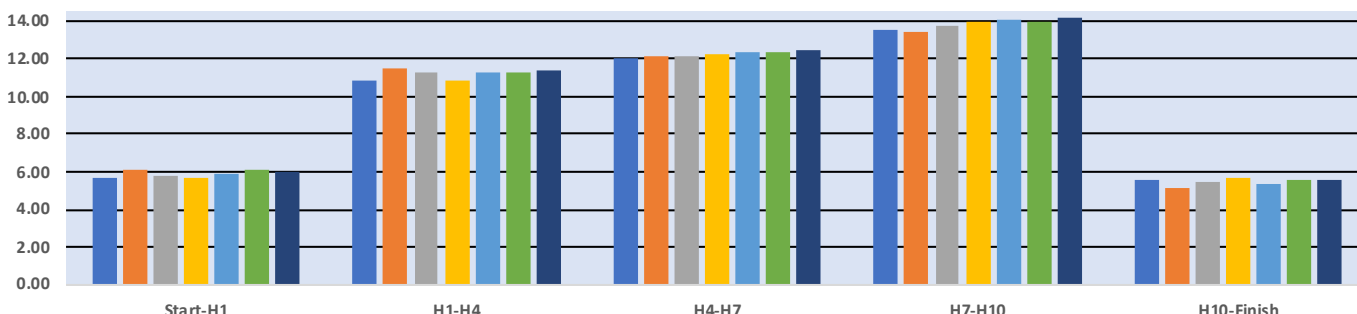
Semi-Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>McMaster, Kyron (IVB) (1997)</b>	time	5.73	9.46	13.06	16.63	20.53	24.56	28.67	33.01	37.52	42.17	47.72	47.72	8 / 1			
	reaction time	0.168															
	interval		3.73	3.60	3.57	3.90	4.03	4.11	4.34	4.51	4.65	5.55			10.90	12.04	13.50
	velocity	7.85	9.38	9.72	9.80	8.97	8.68	8.52	8.06	7.76	7.53	7.21	8.38		9.63	8.72	7.78
H1 lead leg	L																
	strides	21	13	13	13	13	13	13	13	14	14	17	157				
<b>Mägi, Rasmus (EST) (1992)</b>	time	6.07	10.03	13.77	17.53	21.43	25.50	29.68	34.03		43.13		48.30	7 / 2			
	reaction time	0.180															
	interval		3.96	3.74	3.76	3.90	4.07	4.18	4.35		9.10	5.17			11.46	12.15	13.45
	velocity	7.41	8.84	9.36	9.31	8.97	8.60	8.37	8.05		7.69	7.74	8.28		9.16	8.64	7.81
H1 lead leg	R																
	strides	21	13	13	13	13	13	13	14			17.5	130.5				
<b>Allen, CJ (USA) (1995)</b>	time	5.83	9.73	13.43	17.07	20.93	25.00	29.23	33.56	38.17	42.96		48.44	6 / 3			
	reaction time	0.152															
	interval		3.90	3.70	3.64	3.86	4.07	4.23	4.33	4.61	4.79	5.48			11.24	12.16	13.73
	velocity	7.72	8.97	9.46	9.62	9.07	8.60	8.27	8.08	7.59	7.31	7.30	8.26		9.34	8.63	7.65
H1 lead leg	L																
	strides	20	13	13	13	13	13	14	14	14	14	17.2	158.2				
<b>Hyde, Jaheel (JAM) (1997)</b>	time	5.73	9.43	13.08	16.63	20.50	24.63	28.86	33.36	38.00	42.86		48.49	5 / 4			
	reaction time	0.150															
	interval		3.70	3.65	3.55	3.87	4.13	4.23	4.50	4.64	4.86	5.63			10.90	12.23	14.00
	velocity	7.85	9.46	9.59	9.86	9.04	8.47	8.27	7.78	7.54	7.20	7.10	8.25		9.63	8.59	7.50
H1 lead leg	L																
	strides	22	13	13	13	13	14	14	14	15	18.7	163.7					
<b>Watrin, Julien (BEL) (1992)</b>	time	5.90	9.66	13.43	17.13	21.00	25.13	29.46	34.16	38.83	43.55		48.94	3 / 5			
	reaction time	0.205															
	interval		3.76	3.77	3.70	3.87	4.14	4.33	4.70	4.67	4.72	5.39			11.23	12.33	14.09
	velocity	7.63	9.31	9.28	9.46	9.04	8.47	8.08	7.45	7.49	7.42	7.42	8.17		9.35	8.52	7.45
H1 lead leg	R																
	strides	20	13	13	13	13	13	14	15	15	18	147					
<b>Nathaniel, Ezekiel (NGR) (2003)</b>	time	6.06	9.97	13.63	17.33	21.26	25.40	29.73	34.23		43.67		49.22	9 / 6			
	reaction time	0.209															
	interval		3.91	3.66	3.70	3.93	4.14	4.33	4.50		9.44	5.55			11.27	12.40	13.94
	velocity	7.43	8.95	9.56	9.46	8.91	8.45	8.08	7.78		7.42	7.21	8.13		9.32	8.47	7.53
H1 lead leg	R																
	strides	21	13	13	13	13	13	14	14			17	131				
<b>Hemeida, Bassem (QAT) (2000)</b>	time	5.96	9.80	13.63	17.36	21.26	25.50	29.83	34.40	39.06	43.97		49.50	4 / 7			
	reaction time	0.172															
	interval		3.84	3.83	3.73	3.90	4.24	4.33	4.57	4.66	4.91	5.53			11.40	12.47	14.14
	velocity	7.55	9.11	9.14	9.38	8.97	8.25	8.08	7.66	7.51	7.13	7.23	8.08		9.21	8.42	7.43
H1 lead leg	R																
	strides	21	13	14	13	13	14		14	14	15	17.7	148.7				



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=JAqkZzqOPZA>

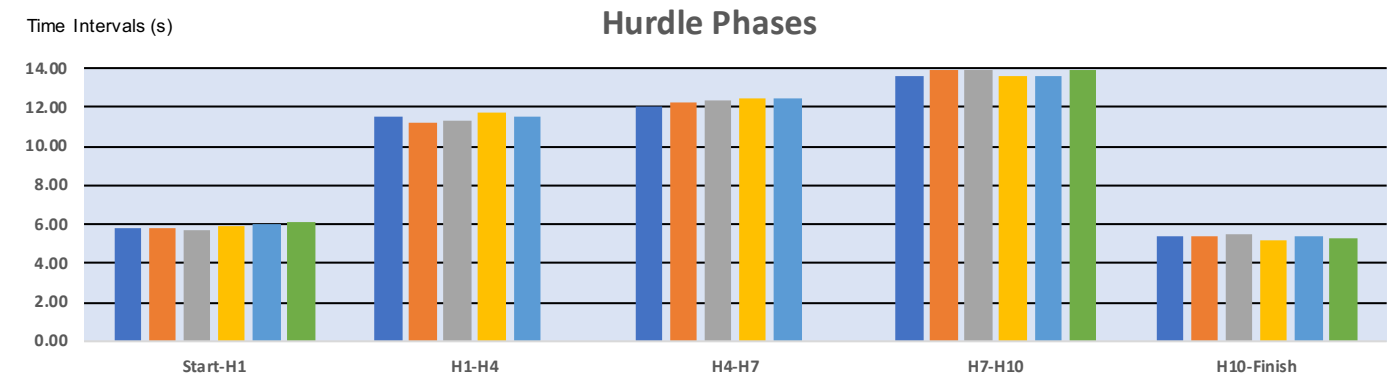
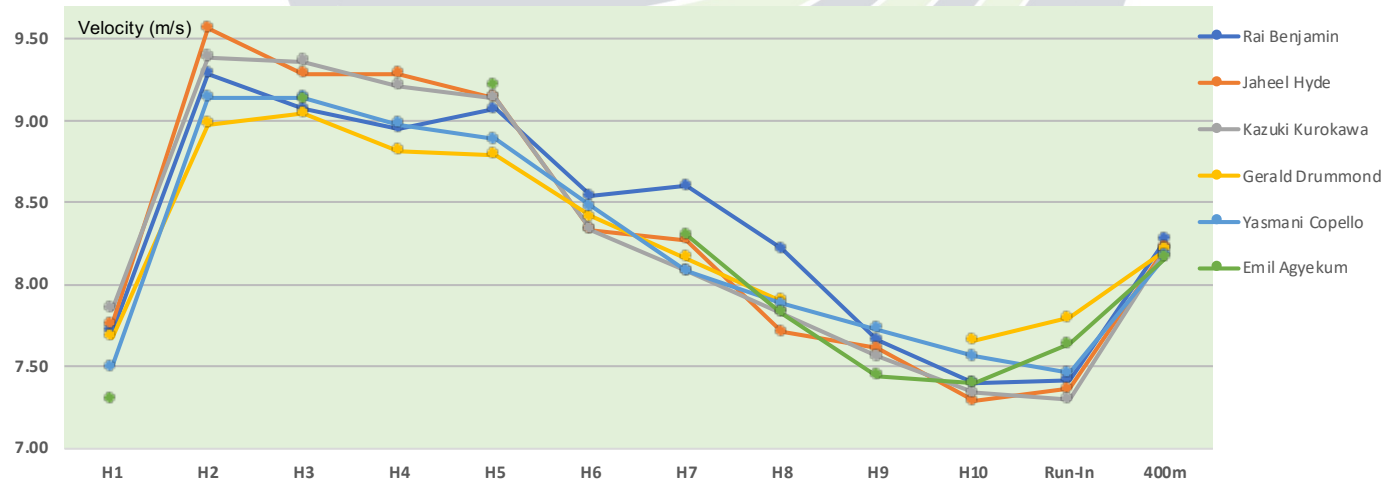
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.20

Heat 5

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Benjamin, Rai (USA) (1997)</b>	time	5.83	9.60	13.46	17.37	21.23	25.33	29.40	33.66	38.23	42.96		48.35	5 / 1			
	reaction time	0.176															
	interval		3.77	3.86	3.91	3.86	4.10	4.07	4.26	4.57	4.73	5.39			11.54	12.03	13.56
	velocity	7.72	9.28	9.07	8.95	9.07	8.54	8.60	8.22	7.66	7.40	7.42	8.27		9.10	8.73	7.74
H1 lead leg	R		20	13	13	13	13	13	13	13	13	16.7	153.7				
<b>Hyde, Jaheel (JAM) (1997)</b>	time	5.80	9.46	13.23	17.00	20.83	25.03	29.26	33.80	38.40	43.20		48.63	9 / 2			
	reaction time	0.182															
	interval		3.66	3.77	3.77	3.83	4.20	4.23	4.54	4.60	4.80	5.43			11.20	12.26	13.94
	velocity	7.76	9.56	9.28	9.28	9.14	8.33	8.27	7.71	7.61	7.29	7.37	8.23		9.38	8.56	7.53
H1 lead leg	L		22	13	13	13	14	14	14	14	15	18	163				
<b>Kurokawa, Kazuki (JPN) (2001)</b>	time	5.73	9.46	13.20	17.00	20.83	25.03	29.36	33.83	38.46	43.23		48.71	3 / 3			
	reaction time	0.158															
	interval		3.73	3.74	3.80	3.83	4.20	4.33	4.47	4.63	4.77	5.48			11.27	12.36	13.87
	velocity	7.85	9.38	9.36	9.21	9.14	8.33	8.08	7.83	7.56	7.34	7.30	8.21		9.32	8.50	7.57
H1 lead leg	L		21	13	13	13	14	14	15	15	15	18.7	164.7				
<b>Drummond, Gerald (CRC) (1994)</b>	time	5.86	9.76	13.63	17.60	21.58	25.74	30.03	34.46		43.60		48.73	8 / 4			
	reaction time	0.220															
	interval		3.90	3.87	3.97	3.98	4.16	4.29	4.43		9.14	5.13			11.74	12.43	13.57
	velocity	7.68	8.97	9.04	8.82	8.79	8.41	8.16	7.90		7.66	7.80	8.21		8.94	8.45	7.74
H1 lead leg	L		21	14	14	14	14	14	15		18	138					
<b>Copello, Yasmani (TUR) (1987)</b>	time	6.00	9.83	13.66	17.56	21.50	25.63	29.96	34.40	38.93	43.56		48.92	6 / 5			
	reaction time	0.244															
	interval		3.83	3.83	3.90	3.94	4.13	4.33	4.44	4.53	4.63	5.36			11.56	12.40	13.60
	velocity	7.50	9.14	9.14	8.97	8.88	8.47	8.08	7.88	7.73	7.56	7.46	8.18		9.08	8.47	7.72
H1 lead leg	R		20	13	13	13	13	14	14	14	14	17.5	158.5				
<b>Agyekum, Emil (GER) (1999)</b>	time	6.16		13.83		21.43		29.86	34.33	39.03	43.76		49.00	1 / 6			
	reaction time	0.232				7.67		8.43	4.47	4.70	4.73	5.24					
	interval																
	velocity	7.31		9.13		9.21		8.30	7.83	7.45	7.40	7.63	8.16				
H1 lead leg	R							13		14	15	15	18	95			13.90
																	7.55



Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: First Movement  
 Source: <https://www.youtube.com/watch?v=W4r-vyIQ5wI&t=72s>

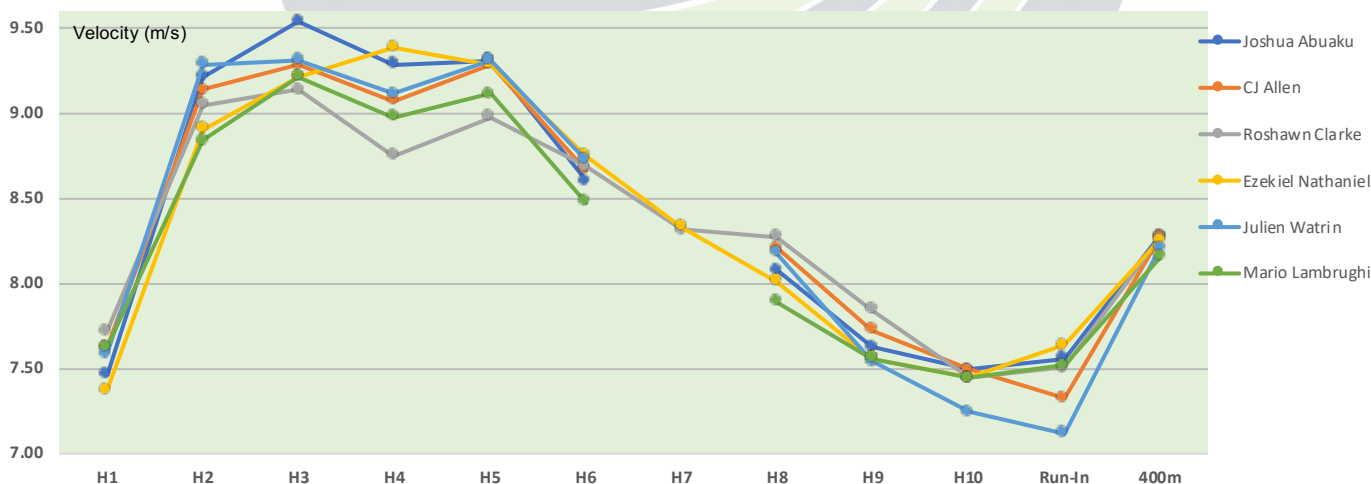
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.20

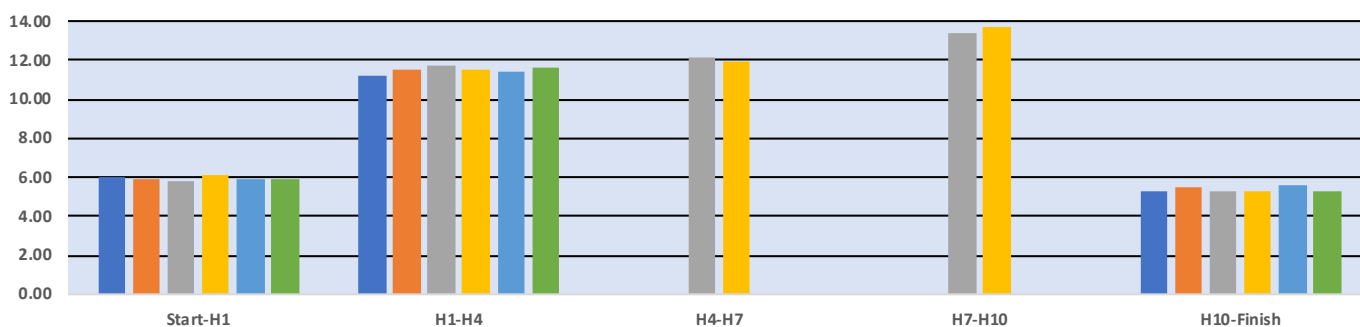
Heat 4

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Abuaku, Joshua (GER) (1996)</b>	time	6.03	9.83	13.50	17.27	21.03	25.10		33.77	38.36	43.03		48.32	5 / 1			
	reaction time	0.207															
	interval		3.80	3.67	3.77	3.76	4.07		8.67	4.59	4.67	5.29			11.24		
	velocity		7.46	9.21	9.54	9.28	9.31	8.60		8.07	7.63	7.49	7.56	8.28		9.34	
H1 lead leg	L		20	13	13	13	13			14	14	18	131				
<b>Allen, CJ (USA) (1995)</b>	time	5.90	9.73	13.50	17.36	21.13	25.17		33.70	38.23	42.90		48.36	9 / 2			
	reaction time	0.167															
	interval		3.83	3.77	3.86	3.77	4.04		8.53	4.53	4.67	5.46			11.46		
	velocity		7.63	9.14	9.28	9.07	9.28	8.66		8.21	7.73	7.49	7.33	8.27		9.16	
H1 lead leg	L		20	13	13	13	13			14	14	17	130				
<b>Clarke, Roshawn (JAM) (2004)</b>	time	5.83	9.70	13.53	17.53	21.43	25.46	29.67	33.90	38.36	43.06		48.39	3 / 3			
	reaction time	0.183															
	interval		3.87	3.83	4.00	3.90	4.03	4.21	4.23	4.46	4.70	5.33			11.70	12.14	13.39
	velocity		7.72	9.04	9.14	8.75	8.97	8.68	8.31	8.27	7.85	7.45	7.50	8.27		8.97	8.65
H1 lead leg	L		22	14	14	13	14	14	14	15	15	18.2	167.2				
<b>Nathaniel, Ezekiel (NGR) (2003)</b>	time	6.10	10.03	13.83	17.56	21.33	25.33	29.53	33.90	38.53	43.23		48.47	8 / 4			
	reaction time	0.210															
	interval		3.93	3.80	3.73	3.77	4.00	4.20	4.37	4.63	4.70	5.24			11.46	11.97	13.70
	velocity		7.38	8.91	9.21	9.38	9.28	8.75	8.33	8.01	7.56	7.45	7.63	8.25		9.16	8.77
H1 lead leg	R		21	13	13	13	13	13	14	14	17	158					
<b>Watrin, Julien (BEL) (1992)</b>	time	5.93	9.70	13.46	17.30	21.06	25.07		33.63	38.27	43.10		48.72	6 / 5			
	reaction time	0.230															
	interval		3.77	3.76	3.84	3.76	4.01		8.56	4.64	4.83	5.62			11.37		
	velocity		7.59	9.28	9.31	9.11	9.31	8.73		8.18	7.54	7.25	7.12	8.21		9.23	
H1 lead leg	R		20	13	13	13	13			14	14	19	132				
<b>Lambrugh, Mario (ITA) (1992)</b>	time	5.90	9.86	13.66	17.56	21.40	25.53		34.40	39.03	43.73		49.05	1 / 6			
	reaction time	0.129															
	interval		3.96	3.80	3.90	3.84	4.13		8.87	4.63	4.70	5.32			11.66		
	velocity		7.63	8.84	9.21	8.97	9.11	8.47		7.89	7.56	7.45	7.52	8.15		9.01	
H1 lead leg	R		22	14	14	14	14			15	15	18.5	140.5				



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=W4r-vyIQ5wI&t=72s>



2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.20

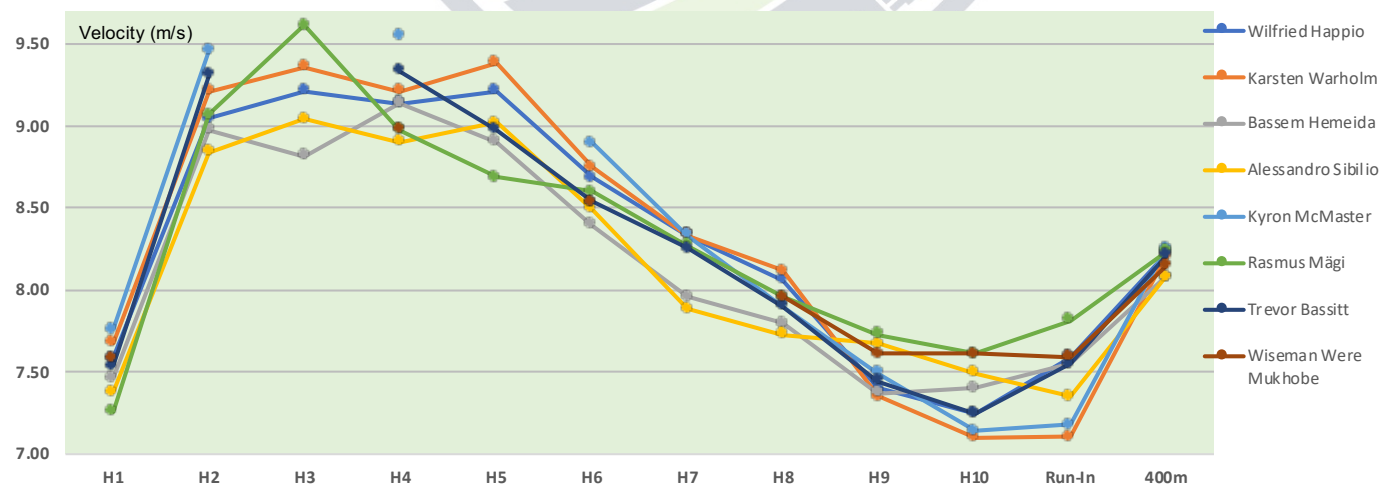
Heat 3

Table of performance metrics for Heat 3, including athlete names, reaction times, interval times, velocity, and stride counts across hurdles H1-H10.

Date 2023.08.20

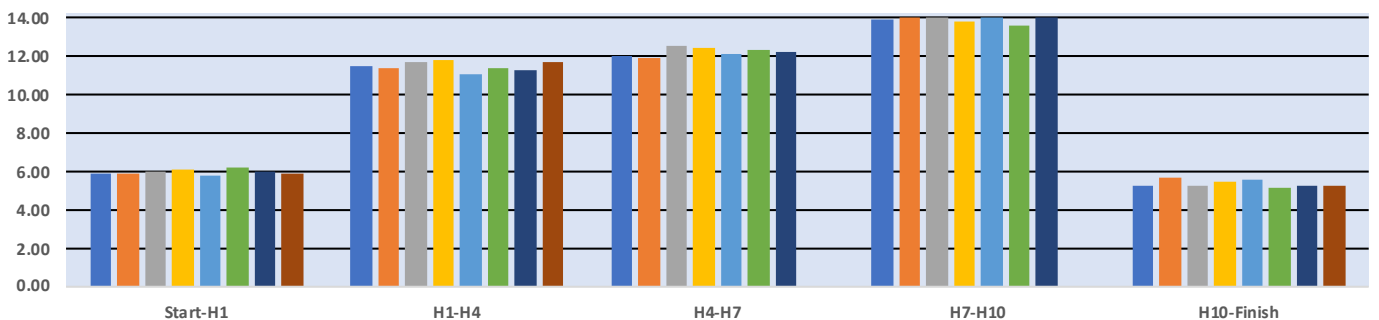
Heat 2

Table of performance metrics for Heat 2, including athlete names, reaction times, interval times, velocity, and stride counts across hurdles H1-H10.



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Heat 3 - Gun Flash

Heat 2 - First Movement

Source: https://www.youtube.com/watch?v=W4r-vvIQ5wI&t=72s

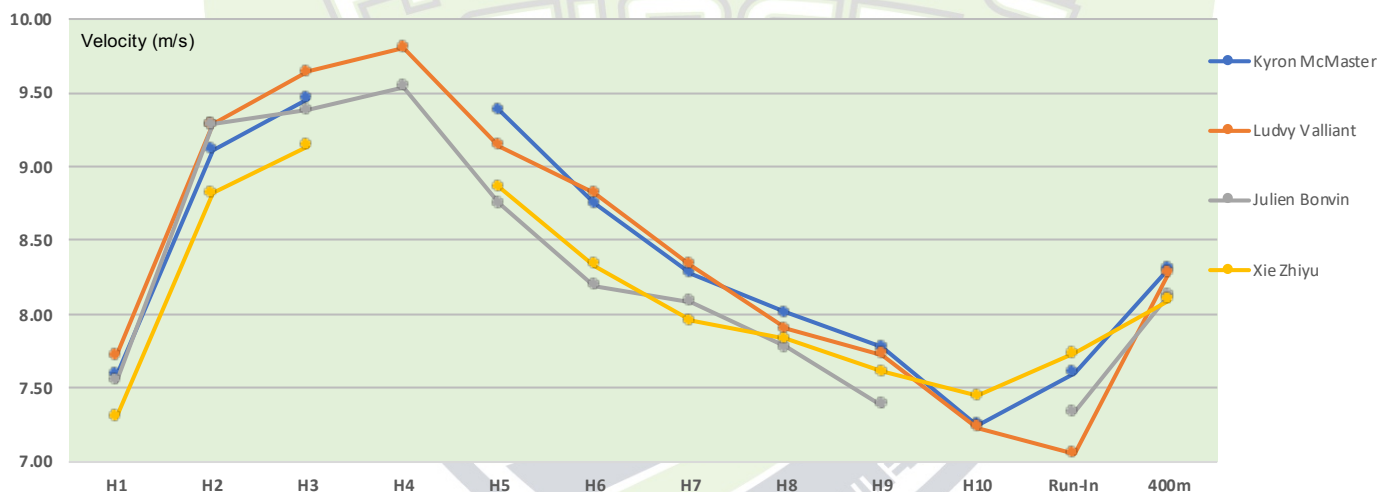
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.20

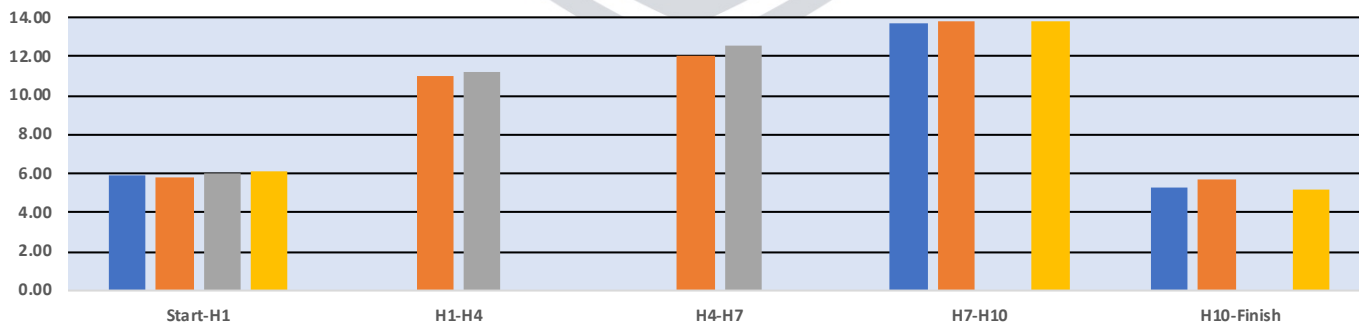
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>dos Santos, Alison (BRA) (2000)</b>	time	5.93	9.77	13.47		20.93	24.93	29.16	33.53	38.03	42.86		48.12	2 / 1			
	reaction time	0.167															13.70
	interval		3.84	3.70		7.46	4.00	4.23	4.37	4.50	4.83	5.26					7.66
	velocity	7.59	9.11	9.46		9.38	8.75	8.27	8.01	7.78	7.25	7.60	8.31				
H1 lead leg	L	strides	20	13	12		12		13	13	14	16.2	113.2				
<b>Valliant, Ludvy (FRA) (1995)</b>	time	5.83	9.60	13.23	16.80	20.63	24.60	28.80	33.23	37.76	42.60		48.27	3 / 2			
	reaction time	0.182													10.97	12.00	13.80
	interval		3.77	3.63	3.57	3.83	3.97	4.20	4.43	4.53	4.84	5.67			9.57	8.75	7.61
	velocity	7.72	9.28	9.64	9.80	9.14	8.82	8.33	7.90	7.73	7.23	7.05	8.29				
H1 lead leg	R	strides	21	13	13	13	13	14	14	14	14	17.7	159.7				
<b>Bonvin, Julien (SUJ) (1999)</b>	time	5.96	9.73	13.46	17.13	21.13	25.40	29.73	34.23	38.97			49.19	5 / 3			
	reaction time	0.188													11.17	12.60	
	interval		3.77	3.73	3.67	4.00	4.27	4.33	4.50	4.74		10.22			9.40	8.33	
	velocity	7.55	9.28	9.38	9.54	8.75	8.20	8.08	7.78	7.38		7.34	8.13				
H1 lead leg	L	strides	21	13	13	13	13	14	14	15	15	131					
<b>Xie Zhiyu (CHN) (2000)</b>	time	6.16	10.13	13.96		21.86	26.06	30.46	34.93	39.53	44.23		49.40	8 / 4			
	reaction time	0.207															13.77
	interval		3.97	3.83		7.90	4.20	4.40	4.47	4.60	4.70	5.17					7.63
	velocity	7.31	8.82	9.14		8.86	8.33	7.95	7.83	7.61	7.45	7.74	8.10				
H1 lead leg	L	strides	21	13	13		13	14	14	14	17	119					



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=W4r-yvIQ5wI&t=72s>

2023 Herculis Meeting International d'Athlétisme (Monaco, MON)

Men's 400m Hurdles

Date 2023.07.21

FINAL

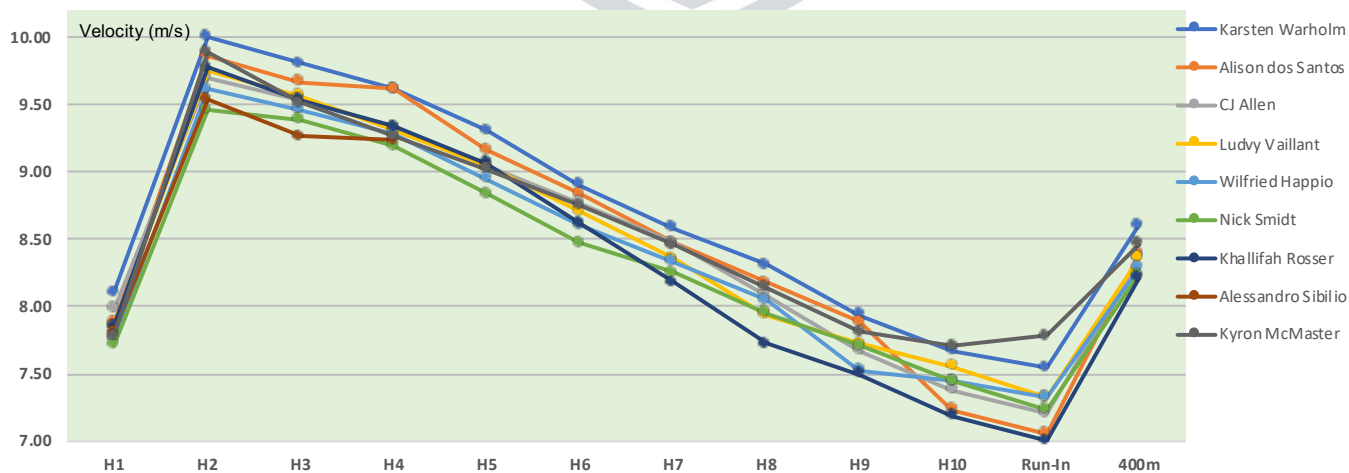
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-in	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Warholm, Karsten (NOR) (1996)	time	5.55	9.05	12.62	16.26	20.02	23.95	28.03	32.24	36.65	41.21		46.51	7 / 1			
	reaction time	0.146										5.30			10.71	11.77	13.18
	interval velocity	8.11	10.00	9.80	9.62	9.31	8.91	8.58	8.31	7.94	7.68	7.55	8.60		9.80	8.92	7.97
	H1 lead leg	L	20	13	13	13	13	13	13	13	13	15	17.7	156.7			
dos Santos, Alison (BRA) (2000)	time	5.71	9.26	12.88	16.52	20.34	24.30	28.43	32.71	37.15	41.99		47.66	6 / 2			
	reaction time	0.169										5.67			10.81	11.91	13.56
	interval velocity	7.88	9.86	9.67	9.62	9.16	8.84	8.47	8.18	7.88	7.23	7.05	8.39		9.71	8.82	7.74
	H1 lead leg	L	20	13	12	12	12	13	13	13	13	14	17	151			
Allen, CJ (USA) (1995)	time	5.64	9.25	12.92	16.67	20.54	24.53	28.66	32.99	37.55	42.29		47.84	5 / 3			
	reaction time	0.148										5.55			11.03	11.99	13.63
	interval velocity	7.98	9.70	9.54	9.33	9.04	8.77	8.47	8.08	7.68	7.38	7.21	8.36		9.52	8.76	7.70
	H1 lead leg	L	20	13	13	13			13	14	14	15		115			
Vaillant, Ludvy (FRA) (1995)	time	5.73	9.32	12.98	16.74	20.61	24.63	28.82	33.23	37.76	42.39		47.85	2 / 4			
	reaction time	0.158										5.46			11.01	12.08	13.57
	interval velocity	7.85	9.75	9.56	9.31	9.04	8.71	8.35	7.94	7.73	7.56	7.33	8.36		9.54	8.69	7.74
	H1 lead leg	R	21	13	13	13			14	14	14	14	18	134			
Happio, Wilfried (FRA) (1998)	time	5.80	9.44	13.14	16.91	20.82	24.89	29.09	33.44	38.09	42.79		48.25	4 / 5			
	reaction time	0.149										5.46			11.11	12.18	13.70
	interval velocity	7.76	9.62	9.46	9.28	8.95	8.60	8.33	8.05	7.53	7.45	7.33	8.29		9.45	8.62	7.66
	H1 lead leg	L	20	13	13	13			13	13	15	15		115			
Smidt, Nick (NED) (1997)	time	5.83	9.53	13.26	17.07	21.03	25.16	29.40	33.80	38.34	43.04		48.57	8 / 6			
	reaction time	0.167										5.53			11.24	12.33	13.64
	interval velocity	7.72	9.46	9.38	9.19	8.84	8.47	8.25	7.95	7.71	7.45	7.23	8.24		9.34	8.52	7.70
	H1 lead leg	L	21	13	13	13	13	14	14	14	14	14		143			
Rosser, Khallifah (USA) (1995)	time	5.73	9.31	12.98	16.73	20.59	24.65	28.93	33.46	38.13	43.00		48.71	1 / 7			
	reaction time	0.172										5.71			11.00	12.20	14.07
	interval velocity	7.85	9.78	9.54	9.33	9.07	8.62	8.18	7.73	7.49	7.19	7.01	8.21		9.55	8.61	7.46
	H1 lead leg	R	21	13	13	13			14	14	14	14		116			
Sibilio, Alessandro (ITA) (1999)	time	5.76	9.43	13.21	17.00								dnf	3 / --			
	reaction time	0.126													11.24		
	interval velocity	7.81	9.54	9.26	9.23										9.34		
	H1 lead leg	R	21	13	13	13								60			

2023 P-T-S Meeting (Banská Bystrica, SVK) (TV Analysis)

Date 2023.07.20

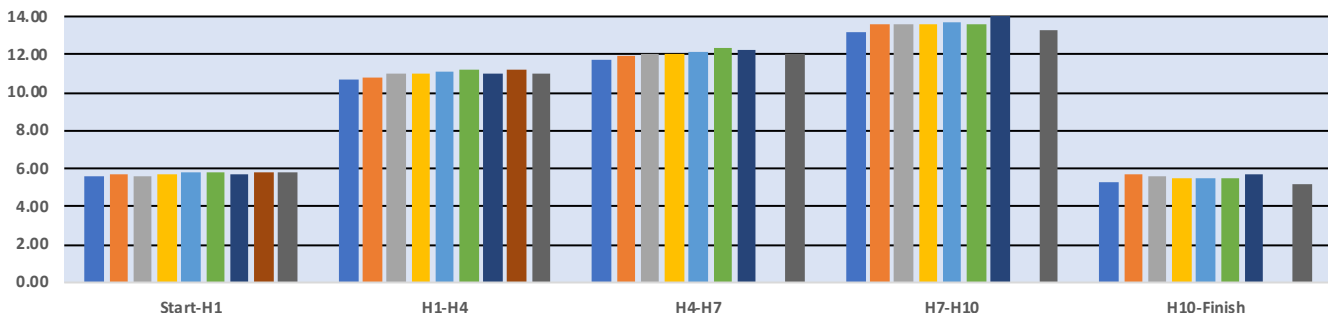
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-in	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McMaster, Kyron (IVB) (1997)	time	5.78	9.32	13.00	16.78	20.66	24.66	28.80	33.10	37.58	42.12		47.26	6 / 1			
	reaction time	0.210										5.14			11.00	12.02	13.32
	interval velocity	7.79	9.89	9.51	9.26	9.02	8.75	8.45	8.14	7.81	7.71	7.78	8.46		9.55	8.74	7.88
	H1 lead leg	L		13	13	13	13	13	14	14	14	14	17.2	138.2			



Time Intervals (s)

Hurdle Phases



Herculis Meeting International d'Athlétisme  
 Source: Omega Timing (Fri 21 Jul 2023 20:09) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030B0102040101FFFFFFFF4D.pdf>  
 Video: <https://www.youtube.com/watch?v=ICT3lqsBSLQ>

P-T-S Meeting  
 Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: Gun Flash  
 Source: <https://www.youtube.com/watch?v=mV7VwTdbu7s>

Biomechanical Analysis

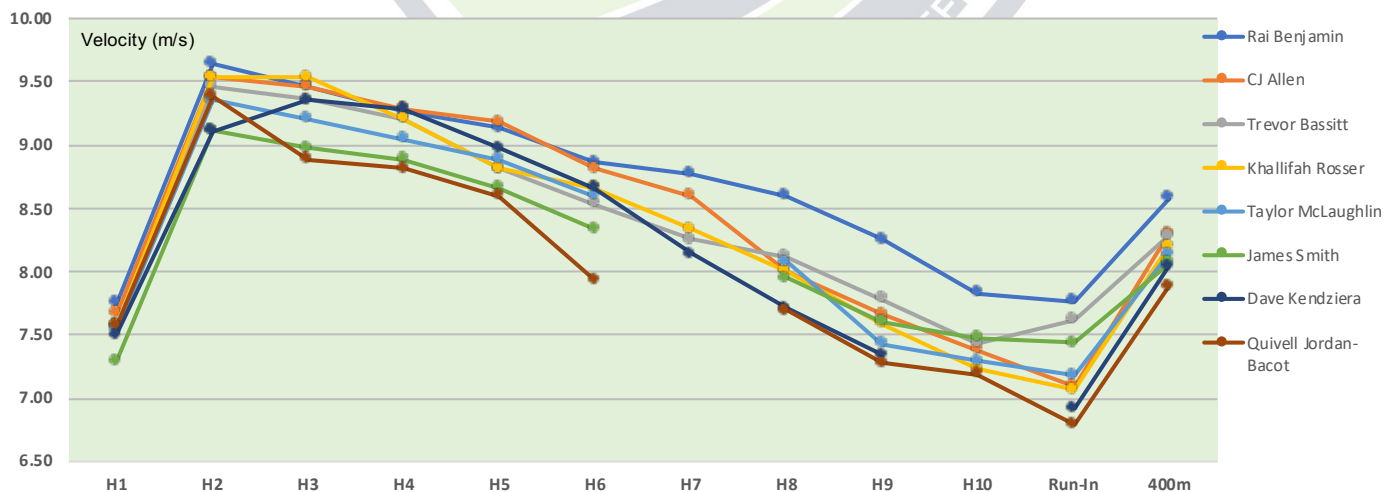
2023 USATF National Championships (Eugene, OR) (TV Analysis)

Men's 400m Hurdles

Date 2023.07.09

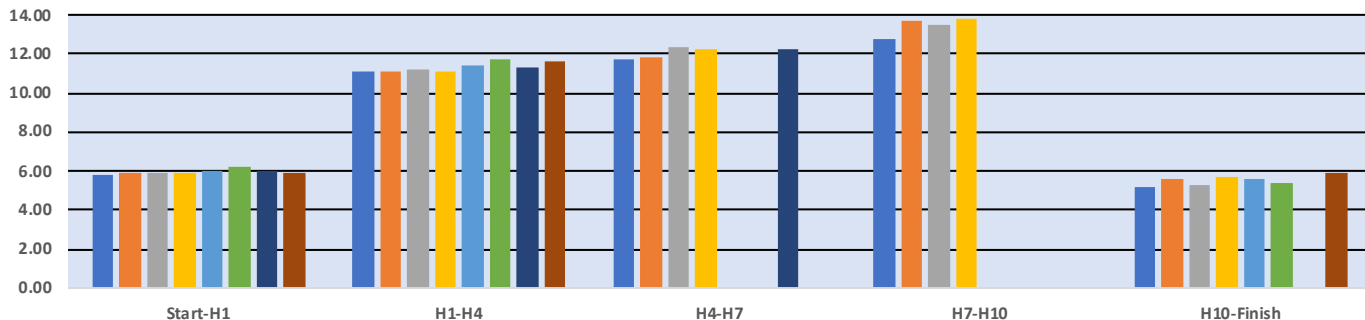
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Benjamin, Rai (USA) (1997)</b>	time	5.81	9.44	13.14	16.92	20.75	24.70	28.69	32.76	37.00	41.47		46.62	5 / 1			
	reaction time											5.15			11.11	11.77	12.78
	interval velocity	7.75	9.64	9.46	9.26	9.14	8.86	8.77	8.60	8.25	7.83	7.77	8.58		9.45	8.92	8.22
	H1 lead leg R	20	13	13	13	13	13	13	13	13	13	13	17	154			
<b>Allen, CJ (USA) (1995)</b>	time	5.87	9.54	13.24	17.01	20.82	24.79	28.86	33.23	37.80	42.54		48.18	4 / 2			
	reaction time											5.64			11.14	11.85	13.68
	interval velocity	7.67	9.54	9.46	9.28	9.19	8.82	8.60	8.01	7.66	7.38	7.09	8.30		9.43	8.86	7.68
	H1 lead leg L	20	13	13	13	13	13	13	13	14	14	17.7	156.7				
<b>Bassitt, Trevor (USA) (1998)</b>	time	5.94	9.64	13.38	17.18	21.15	25.25	29.49	33.80	38.30	43.01		48.26	6 / 3			
	reaction time											5.25			11.24	12.31	13.52
	interval velocity	7.58	9.46	9.36	9.21	8.82	8.54	8.25	8.12	7.78	7.43	7.62	8.29		9.34	8.53	7.77
	H1 lead leg R	20	13	13	12	12	13	13	13	14	14	17	154				
<b>Rosser, Khallifah (USA) (1995)</b>	time	5.94	9.61	13.28	17.08	21.05	25.09	29.29	33.66	38.27	43.11		48.77	7 / 4			
	reaction time											5.66			11.14	12.21	13.82
	interval velocity	7.58	9.54	9.54	9.21	8.82	8.66	8.33	8.01	7.59	7.23	7.07	8.20		9.43	8.60	7.60
	H1 lead leg R	21	13	13	13	13	13	13	14	14	15	18	160				
<b>McLaughlin, Taylor (USA) (1997)</b>	time	5.97	9.71	13.51	17.38	21.32	25.39		34.06	38.77	43.57		49.14	1 / 5			
	reaction time								8.67	4.71	4.80	5.57			11.41		
	interval velocity	7.54	9.36	9.21	9.04	8.88	8.60		8.07	7.43	7.29	7.18	8.14		9.20		
	H1 lead leg R	21	13	13	13	13	13		15	15	18	134					
<b>Smith, James (USA) (2000)</b>	time	6.17	10.01	13.91	17.85	21.89	26.09		34.90	39.50	44.18		49.56	3 / 6			
	reaction time								8.81	4.60	4.68	5.38			11.68		
	interval velocity	7.29	9.11	8.97	8.88	8.66	8.33		7.95	7.61	7.48	7.43	8.07		8.99		
	H1 lead leg L	21	13	13	13	13			15	15	103						
<b>Kenziera, Dave (USA) (1994)</b>	time	6.00	9.84	13.58	17.35	21.25	25.29	29.59	34.13	38.90			49.74	8 / 7			
	reaction time											10.84			11.35	12.24	
	interval velocity	7.50	9.11	9.36	9.28	8.97	8.66	8.14	7.71	7.34		6.92	8.04		9.25	8.58	
	H1 lead leg L	21	14	13	13	13		14	14	15		117					
<b>Jordan-Bacot, Quivell (USA) (1999)</b>	time	5.94	9.67	13.61	17.58	21.65	26.06		35.16	39.97	44.84		50.73	2 / 8			
	reaction time								9.10	4.81	4.87	5.89			11.64		
	interval velocity	7.58	9.38	8.88	8.82	8.60	7.94		7.69	7.28	7.19	6.79	7.88		9.02		
	H1 lead leg L	21	13	13	13	13			15	15	103						



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=kPW-B3T5nAA>

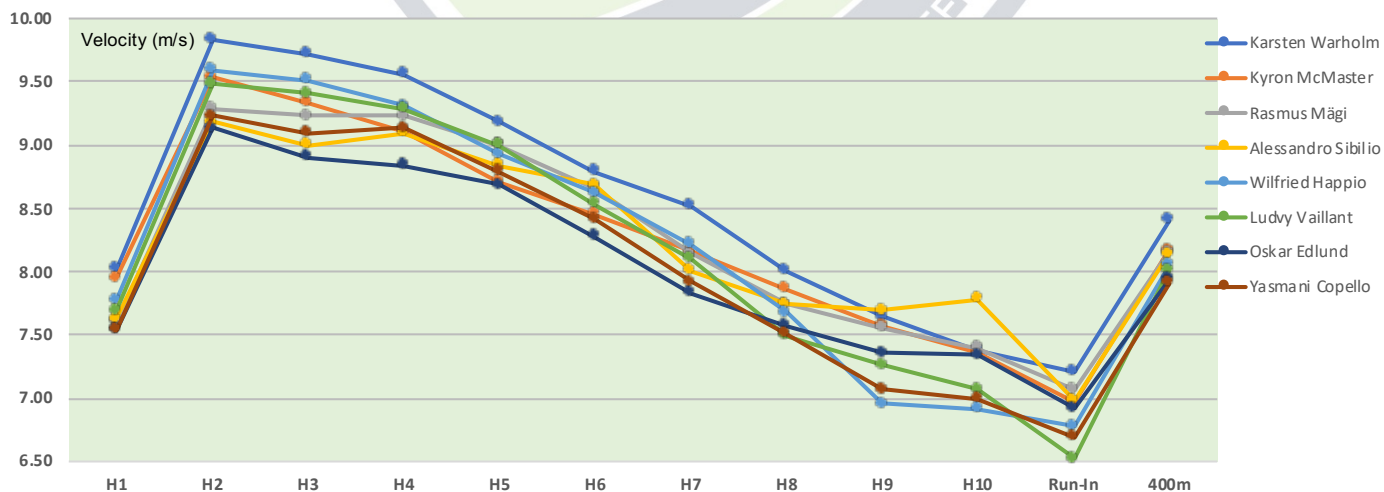
## 2023 Bauhaus Galan (Stockholm, SWE)

## Men's 400m Hurdles

Date 2023.07.02

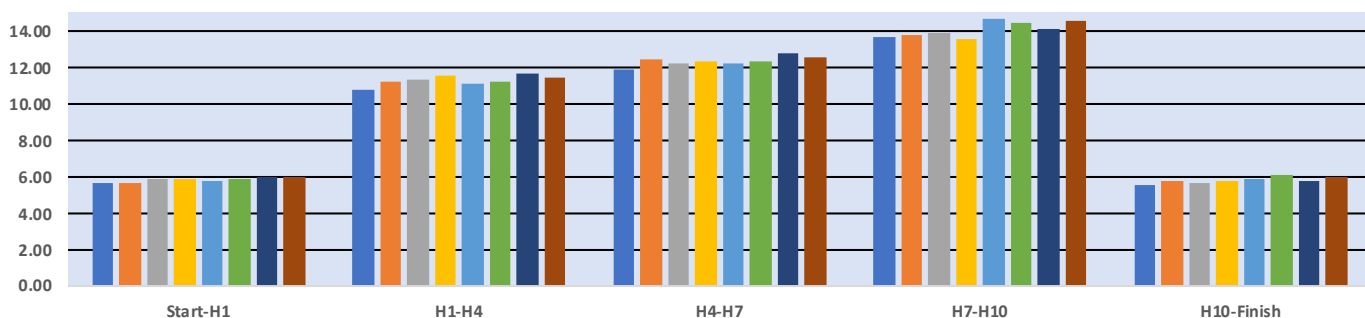
FINAL

		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	5.61	9.17	12.77	16.43	20.24	24.22	28.33	32.70	37.28	42.02		47.57	8 / 1			
	reaction time	0.156															
	interval		3.56	3.60	3.66	3.81	3.98	4.11	4.37	4.58	4.74	5.55			10.82	11.90	13.69
	velocity	8.02	9.83	9.72	9.56	9.19	8.79	8.52	8.01	7.38	7.38	7.21	8.41		9.70	8.82	7.67
H1 lead leg	L																
McMaster, Kyron (IVB) (1997)	time	5.66	9.33	13.08	16.92	20.94	25.08	29.37	33.82	38.44	43.20		48.94	7 / 2			
	reaction time	0.147															
	interval		3.67	3.75	3.84	4.02	4.14	4.29	4.45	4.62	4.76	5.74			11.26	12.45	13.83
	velocity	7.95	9.54	9.33	9.11	8.71	8.45	8.16	7.87	7.58	7.35	6.97	8.17		9.33	8.43	7.59
H1 lead leg	L																
Mägi, Rasmus (EST) (1992)	time	5.92	9.69	13.48	17.27	21.16	25.20	29.50	34.02	38.65	43.38		49.04	3 / 3			
	reaction time	0.165															
	interval		3.77	3.79	3.79	3.89	4.04	4.30	4.52	4.63	4.73	5.66			11.35	12.23	13.88
	velocity	7.60	9.28	9.23	9.23	9.00	8.66	8.14	7.74	7.56	7.40	7.07	8.16		9.25	8.59	7.56
H1 lead leg	R																
Sibilio, Alessandro (ITA) (1999)	time	5.90	9.71	13.60	17.45	21.41	25.44	29.81	34.33	38.88	43.38		49.11	5 / 4			
	reaction time	0.150															
	interval		3.81	3.89	3.85	3.96	4.03	4.37	4.52	4.55	4.50	5.73			11.55	12.36	13.57
	velocity	7.63	9.19	9.00	9.09	8.84	8.68	8.01	7.74	7.69	7.78	6.98	8.14		9.09	8.50	7.74
H1 lead leg	R																
Happio, Wilfried (FRA) (1998)	time	5.79	9.44	13.12	16.88	20.80	24.86	29.12	33.68	38.71	43.77		49.67	6 / 5			
	reaction time	0.151															
	interval		3.65	3.68	3.76	3.92	4.06	4.26	4.56	5.03	5.06	5.90			11.09	12.24	14.65
	velocity	7.77	9.59	9.51	9.31	8.93	8.62	8.22	7.68	6.96	6.92	6.78	8.05		9.47	8.58	7.17
H1 lead leg	L																
Vaillant, Ludvy (FRA) (1995)	time	5.85	9.54	13.26	17.03	20.92	25.02	29.34	34.01	38.83	43.78		49.91	4 / 6			
	reaction time	0.199															
	interval		3.69	3.72	3.77	3.89	4.10	4.32	4.67	4.82	4.95	6.13			11.18	12.31	14.44
	velocity	7.69	9.49	9.41	9.28	9.00	8.54	8.10	7.49	7.26	7.07	6.53	8.01		9.39	8.53	7.27
H1 lead leg	R																
Edlund, Oskar (SWE) (2002)	time	5.97	9.80	13.73	17.69	21.72	25.95	30.42	35.04	39.80	44.57		50.35	1 / 7			
	reaction time	0.177															
	interval		3.83	3.93	3.96	4.03	4.23	4.47	4.62	4.76	4.77	5.78			11.72	12.73	14.15
	velocity	7.54	9.14	8.91	8.84	8.68	8.27	7.83	7.58	7.35	7.34	6.92	7.94		8.96	8.25	7.42
H1 lead leg	L																
Copello, Yasmani (TUR) (1987)	time	5.97	9.76	13.61	17.44	21.42	25.58	30.00	34.66	39.61	44.61		50.59	2 / 8			
	reaction time	0.186															
	interval		3.79	3.85	3.83	3.98	4.16	4.42	4.66	4.95	5.00	5.98			11.47	12.56	14.61
	velocity	7.54	9.23	9.09	9.14	8.79	8.41	7.92	7.51	7.07	7.00	6.69	7.91		9.15	8.36	7.19
H1 lead leg	R																



Time Intervals (s)

## Hurdle Phases



Source: Omega Timing (Sun 2 Jul 2023 19:36) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030901020B0101FFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=SBKIT2SBLzY>

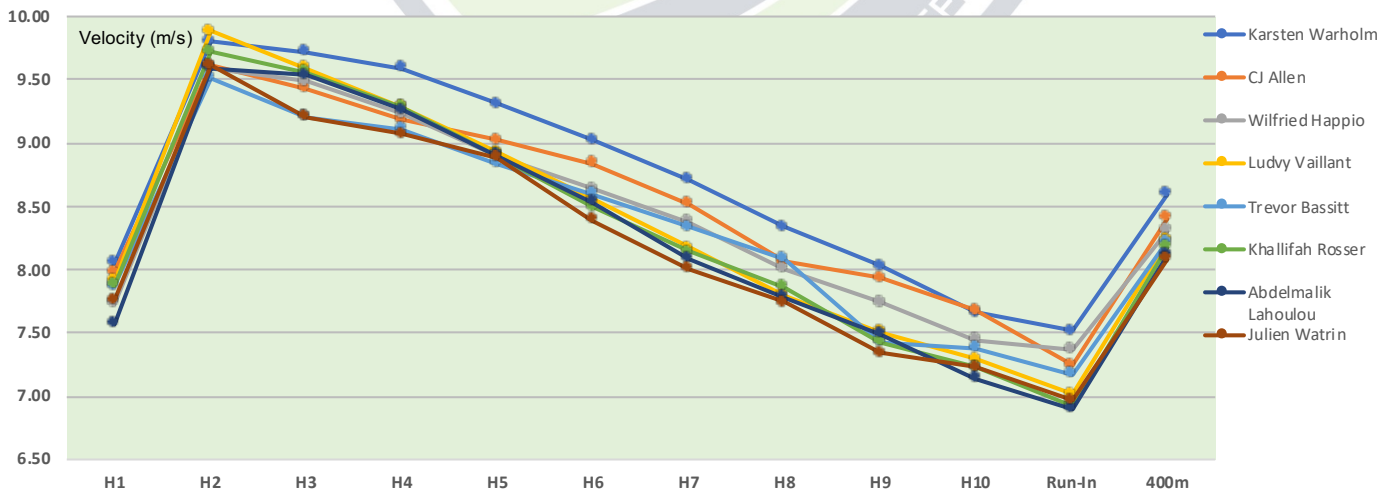
2023 Bislett Games (Oslo, NOR)

Men's 400m Hurdles

Date 2023.06.15

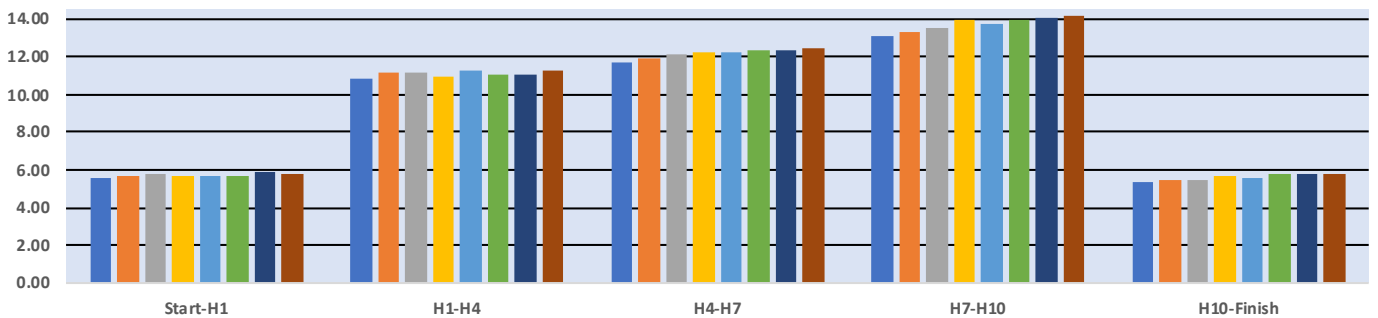
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Warholm, Karsten (NOR) (1996)</b>	time	5.59	9.16	12.76	16.41	20.17	24.05	28.07	32.27	36.63	41.20		46.52	7 / 1			
	reaction time	0.162	interval	3.57	3.60	3.65	3.76	3.88	4.02	4.20	4.36	4.57	5.32		10.82	11.66	13.13
	H1 lead leg	L	velocity	8.05	9.80	9.72	9.59	9.31	9.02	8.71	8.33	8.03	7.66	7.52	8.60	9.70	9.01
			strides	20	13	13	13	13	13	13	13	15	17.7	156.7			
<b>Allen, CJ (USA) (1995)</b>	time	5.64	9.28	12.99	16.80	20.68	24.64	28.75	33.09	37.50	42.06		47.58	6 / 2			
	reaction time	0.170	interval	3.64	3.71	3.81	3.88	3.96	4.11	4.34	4.41	4.56	5.52	<b>PB</b>	11.16	11.95	13.31
	H1 lead leg	L	velocity	7.98	9.62	9.43	9.19	9.02	8.84	8.52	8.06	7.94	7.68	7.25	8.41	9.41	8.79
			strides	22	13	13	13	13	14	14	14	14	17	160			
<b>Happio, Wilfried (FRA) (1998)</b>	time	5.82	9.47	13.16	16.95	20.88	24.93	29.11	33.48	38.00	42.70		48.13	5 / 3			
	reaction time	0.159	interval	3.65	3.69	3.79	3.93	4.05	4.18	4.37	4.52	4.70	5.43		11.13	12.16	13.59
	H1 lead leg	L	velocity	7.73	9.59	9.49	9.23	8.91	8.64	8.37	8.01	7.74	7.45	7.37	8.31	9.43	8.63
			strides	20			13	13	13			13	15	104			
<b>Vaillant, Ludvy (FRA) (1995)</b>	time	5.69	9.23	12.88	16.65	20.57	24.66	28.94	33.43	38.09	42.89		48.59	2 / 4			
	reaction time	0.155	interval	3.54	3.65	3.77	3.92	4.09	4.28	4.49	4.66	4.80	5.70		10.96	12.29	13.95
	H1 lead leg	R	velocity	7.91	9.89	9.59	9.28	8.93	8.56	8.18	7.80	7.51	7.29	7.02	8.23	9.58	8.54
			strides	21			13	13	13			14	14	105.7			
<b>Bassitt, Trevor (USA) (1998)</b>	time	5.72	9.40	13.20	17.04	21.00	25.07	29.27	33.60	38.31	43.05		48.63	4 / 5			
	reaction time	0.185	interval	3.68	3.80	3.84	3.96	4.07	4.20	4.33	4.71	4.74	5.58		11.32	12.23	13.78
	H1 lead leg	R	velocity	7.87	9.51	9.21	9.11	8.84	8.60	8.33	8.08	7.43	7.38	7.17	8.23	9.28	8.59
			strides	20			13	13	13			14	13	86			
<b>Rosser, Khallifah (USA) (1995)</b>	time	5.71	9.31	12.97	16.74	20.67	24.79	29.09	33.54	38.25	43.09		48.87	3 / 6			
	reaction time	0.172	interval	3.60	3.66	3.77	3.93	4.12	4.30	4.45	4.71	4.84	5.78		11.03	12.35	14.00
	H1 lead leg	R	velocity	7.88	9.72	9.56	9.28	8.91	8.50	8.14	7.87	7.43	7.23	6.92	8.18	9.52	8.50
			strides	21			13	13	13			15	15	90			
<b>Lahoulou, Abdelmalik (ALG) (1992)</b>	time	5.94	9.59	13.26	17.04	20.97	25.07	29.40	33.90	38.57	43.47		49.27	8 / 7			
	reaction time	0.178	interval	3.65	3.67	3.78	3.93	4.10	4.33	4.50	4.67	4.90	5.80		11.10	12.36	14.07
	H1 lead leg	L	velocity	7.58	9.59	9.54	9.26	8.91	8.54	8.08	7.78	7.49	7.14	6.90	8.12	9.46	8.50
			strides	22	13	13	13	13	14			15	103				
<b>Watrinn, Julien (BEL) (1992)</b>	time	5.80	9.44	13.24	17.10	21.04	25.21	29.58	34.10	38.87	43.71		49.45	1 / 8			
	reaction time	0.209	interval	3.64	3.80	3.86	3.94	4.17	4.37	4.52	4.77	4.84	5.74		11.30	12.48	14.13
	H1 lead leg	R	velocity	7.76	9.62	9.21	9.07	8.88	8.39	8.01	7.74	7.34	7.23	6.97	8.09	9.29	8.41
			strides	20			13	13	15			14	15	90			



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 15 Jun 2023 21:44) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030701010D0101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=q8ZUH-drYes>

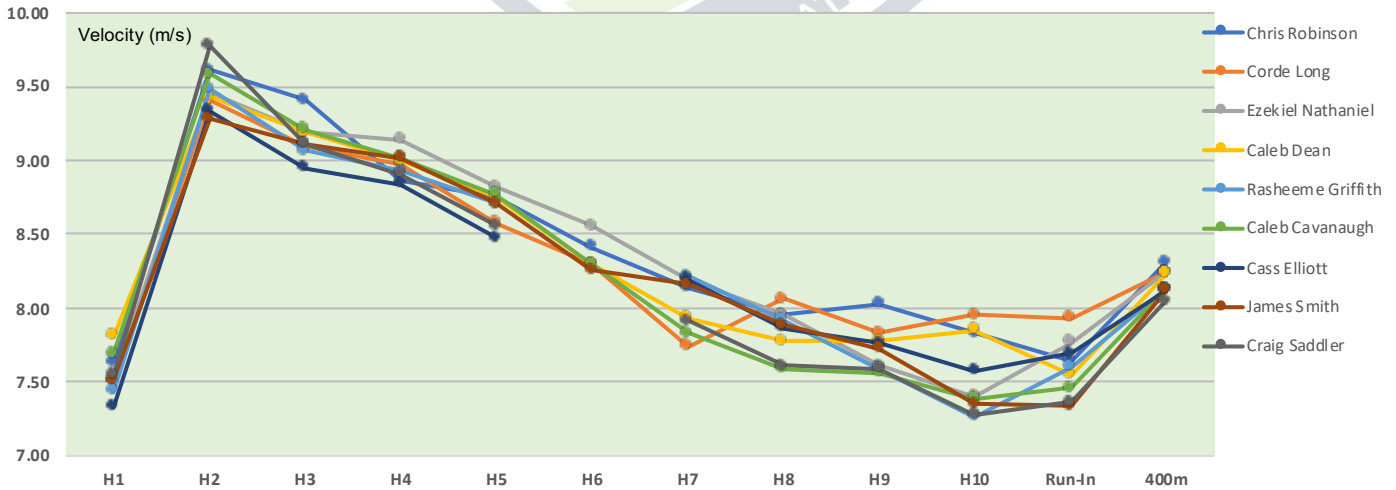
2023 NCAA Championships (Austin, TX) (TV Analysis)

Men's 400m Hurdles

Date 2023.06.09

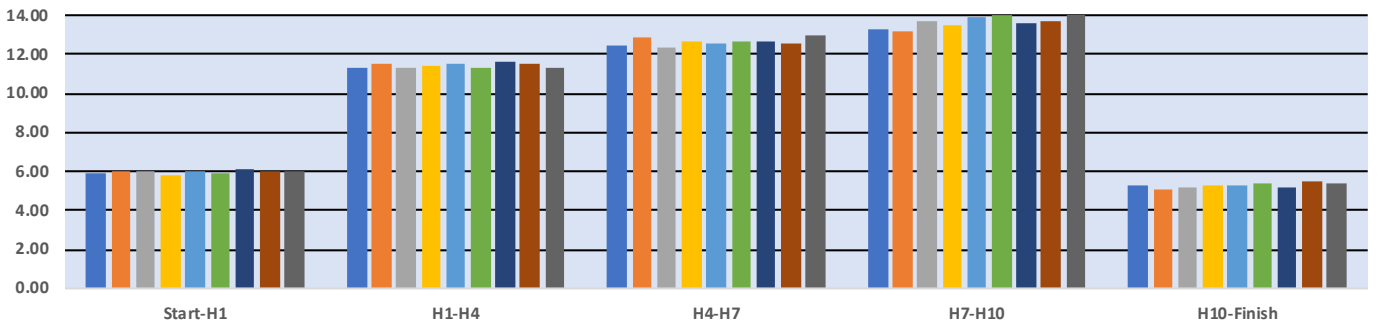
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Robinson, Chris (USA) (2001)</b>	time	5.89	9.53	13.25	17.20	21.20	25.36	29.66	34.06	38.42	42.89		48.12	6 / 1			
	reaction time											5.23	<b>PB</b>		11.31	12.46	13.23
	interval velocity	7.64	9.62	9.41	8.86	8.75	8.41	8.14	7.95	8.03	7.83	7.83	7.65	8.31	9.28	8.43	7.94
	H1 lead leg R strides	21	13	13	14	14	14	14	15	15	15	15	18.2	166.2			
<b>Long, Corde (USA) (2002)</b>	time	5.99	9.71	13.56	17.46	21.54	25.76	30.28	34.62	39.09	43.49		48.53	5 / 2			
	reaction time											5.04	<b>PB</b>		11.47	12.82	13.21
	interval velocity	7.51	9.41	9.09	8.97	8.58	8.29	7.74	8.06	7.83	7.95	7.94	8.24	8.24	9.15	8.19	7.95
	H1 lead leg L strides	21	13	13	13	13	13	14	14	14	13	16.7	157.7				
<b>Nathaniel, Ezekiel (NGR) (2003)</b>	time	5.99	9.69	13.50	17.33	21.30	25.39	29.66	34.06	38.66	43.39		48.54	8 / 3			
	reaction time											5.15			11.34	12.33	13.73
	interval velocity	7.51	9.46	9.19	9.14	8.82	8.56	8.20	7.95	7.61	7.40	7.77	8.24	8.24	9.26	8.52	7.65
	H1 lead leg R strides	21	13	13	13	13	13	13	13	13	14	14	17.7	157.7			
<b>Dean, Caleb (USA) (2001)</b>	time	5.76	9.47	13.28	17.17	21.17	25.39	29.80	34.30	38.80	43.26		48.56	7 / 4			
	reaction time											5.30			11.41	12.63	13.46
	interval velocity	7.81	9.43	9.19	9.00	8.75	8.29	7.94	7.78	7.78	7.85	7.55	8.24	8.24	9.20	8.31	7.80
	H1 lead leg R strides	21	13	13	13	13	13	14	14	15	14	18.2	161.2				
<b>Griffith, Rasheeme (BAR) (2000)</b>	time	6.05	9.74	13.60	17.52	21.54		30.06	34.48	39.09	43.91		49.17	3 / 5			
	reaction time											5.26			11.47	12.54	13.85
	interval velocity	7.44	9.49	9.07	8.93	8.71		8.22	7.92	7.59	7.26	7.60	8.14	8.14	9.15	8.37	7.58
	H1 lead leg L strides	21	13	13	13	13	13	14	14	15	15	18	147				
<b>Cavanaugh, Caleb (USA) (2001)</b>	time	5.85	9.50	13.30	17.18	21.17	25.39	29.86	34.47	39.10	43.84		49.20	9 / 6			
	reaction time											5.36			11.33	12.68	13.98
	interval velocity	7.69	9.59	9.21	9.02	8.77	8.29	7.83	7.59	7.56	7.38	7.46	8.13	8.13	9.27	8.28	7.51
	H1 lead leg R strides	20	13	13	13	13	13	15	15	15	15	17.7	162.7				
<b>Elliott, Cass (USA) (2000)</b>	time	6.14	9.89	13.80	17.76	21.89		30.43	34.88	39.39	44.01		49.21	2 / 7			
	reaction time											5.20			11.62	12.67	13.58
	interval velocity	7.33	9.33	8.95	8.84	8.47		8.20	7.87	7.76	7.58	7.69	8.13	8.13	9.04	8.29	7.73
	H1 lead leg L strides	21	14	14	14	14			15	15	16	18.5	141.5				
<b>Smith, James (USA) (2000)</b>	time	5.99	9.76	13.60	17.48	21.50	25.74	30.03	34.47	39.00	43.76		49.21	4 / 8			
	reaction time											5.45	<b>PB</b>		11.49	12.55	13.73
	interval velocity	7.51	9.28	9.11	9.02	8.71	8.25	8.16	7.88	7.73	7.35	7.34	8.13	8.13	9.14	8.37	7.65
	H1 lead leg L strides	21	13	13	13	13	14	14	15	15	15	18.2	164.2				
<b>Saddler, Craig (USA)</b>	time	5.96	9.54	13.38	17.31	21.40		30.25	34.85	39.46	44.27		49.70	1 / 9			
	reaction time											5.43			11.35	12.94	14.02
	interval velocity	7.55	9.78	9.11	8.91	8.56		7.91	7.61	7.59	7.28	7.37	8.05	8.05	9.25	8.11	7.49
	H1 lead leg R strides	21	13	13	13	13			15	15	15	17	135				



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=0E8BFbQS0ao>

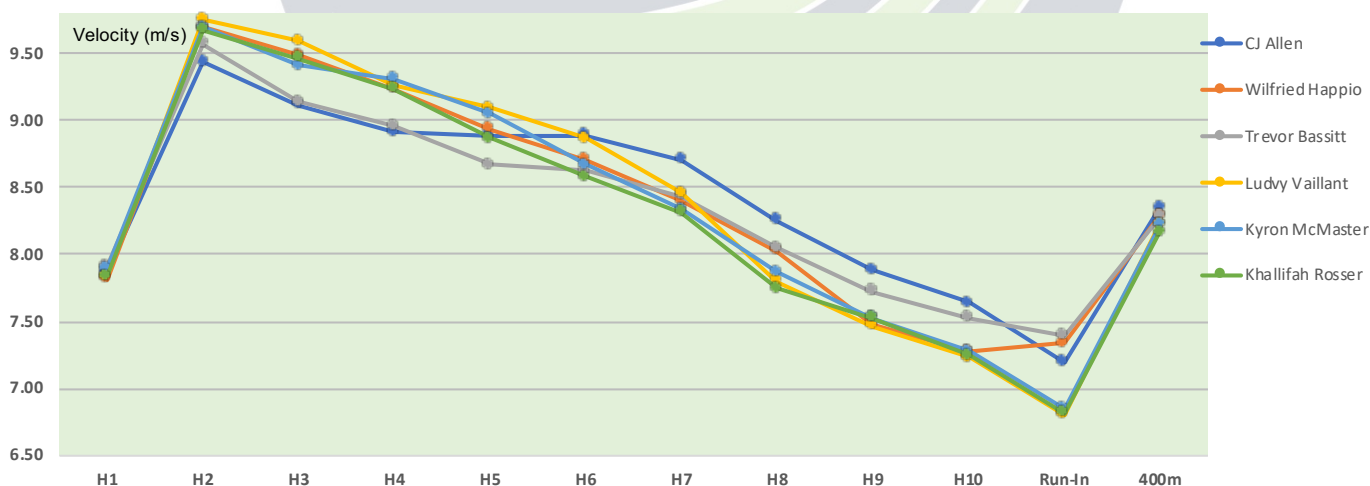
2023 Meeting de Paris (Paris, FRA)

400m Hurdles

Date: 2023.06.09

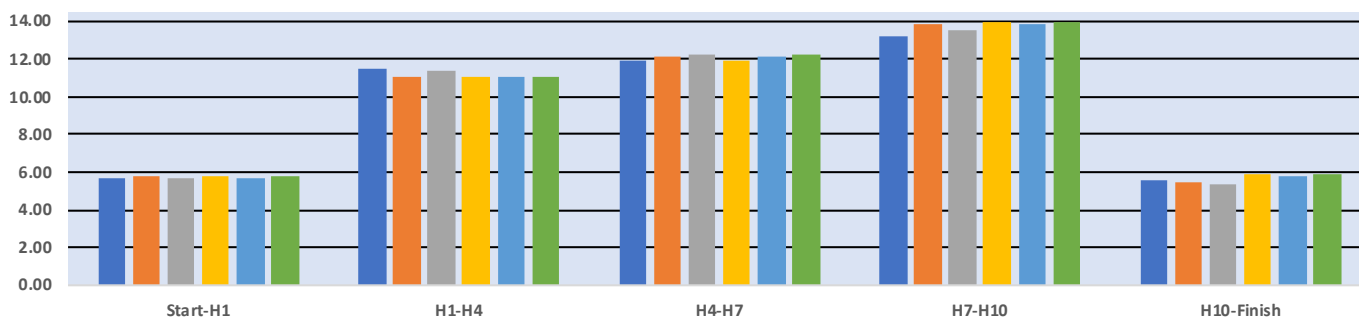
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Allen, CJ (USA) (1995)</b>	time	5.72	9.43	13.27	17.20	21.14	25.08	29.10	33.34	37.78	42.36		47.92	7 / 1			
	reaction time	0.138															
	interval		3.71	3.84	3.93	3.94	3.94	4.02	4.24	4.44	4.58	5.56			11.48	11.90	13.26
	velocity	7.87	9.43	9.14	8.91	8.88	8.88	8.71	8.25	7.88	7.64	7.19	8.35		9.15	8.82	7.92
H1 lead leg	L	20	13	13	13	13	13	13	14	14	14	17	157				
<b>Happio, Wilfried (FRA) (1998)</b>	time	5.76	9.37	13.06	16.85	20.77	24.79	28.96	33.32	38.00	42.81		48.26	6 / 2			
	reaction time	0.156															
	interval		3.61	3.69	3.79	3.92	4.02	4.17	4.36	4.68	4.81	5.45			11.09	12.11	13.85
	velocity	7.81	9.70	9.49	9.23	8.93	8.71	8.39	8.03	7.48	7.28	7.34	8.29		9.47	8.67	7.58
H1 lead leg	L	20	13	13	13	13	13	13	13	15	15	18	159				
<b>Bassitt, Trevor (USA) (1998)</b>	time	5.69	9.35	13.18	17.09	21.13	25.19	29.34	33.69	38.22	42.87		48.28	4 / 3			
	reaction time	0.164															
	interval		3.66	3.83	3.91	4.04	4.06	4.15	4.35	4.53	4.65	5.41			11.40	12.25	13.53
	velocity	7.91	9.56	9.14	8.95	8.66	8.62	8.43	8.05	7.73	7.53	7.39	8.29		9.21	8.57	7.76
H1 lead leg	R	20	13	13	13	13	13	13	13	13	14	17	155				
<b>Vaillant, Ludvy (FRA) (1995)</b>	time	5.74	9.33	12.98	16.76	20.61	24.56	28.70	33.19	37.88	42.72		48.60	2 / 4			
	reaction time	0.153															
	interval		3.59	3.65	3.78	3.85	3.95	4.14	4.49	4.69	4.84	5.88			11.02	11.94	14.02
	velocity	7.84	9.75	9.59	9.26	9.09	8.86	8.45	7.80	7.46	7.23	6.80	8.23		9.53	8.79	7.49
H1 lead leg	R	21	13	13	13	13	13	14	14	14	14	18	160				
<b>McMaster, Kyron (IVB) (1997)</b>	time	5.70	9.31	13.03	16.79	20.66	24.70	28.90	33.35	38.00	42.81		48.65	8 / 5			
	reaction time	0.157															
	interval		3.61	3.72	3.76	3.87	4.04	4.20	4.45	4.65	4.81	5.84			11.09	12.11	13.91
	velocity	7.89	9.70	9.41	9.31	9.04	8.66	8.33	7.87	7.53	7.28	6.85	8.22		9.47	8.67	7.55
H1 lead leg	L	21	13	13	13	13	13	13	14	15	15	17.5	160.5				
<b>Rosser, Khalfifah (USA) (1995)</b>	time	5.74	9.36	13.06	16.85	20.80	24.88	29.09	33.61	38.26	43.09		48.96	3 / 6			
	reaction time	0.143															
	interval		3.62	3.70	3.79	3.95	4.08	4.21	4.52	4.65	4.83	5.87			11.11	12.24	14.00
	velocity	7.84	9.67	9.46	9.23	8.86	8.58	8.31	7.74	7.53	7.25	6.81	8.17		9.45	8.58	7.50
H1 lead leg	R	21	13	13	13	13	13	13	14	14	15	18	160				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 09 Jun 2023 21:07) - diamond league race analysis  
<https://www.omegatiming.com/File/000203060101080101FFFFFFFFFFFF4D.pdf>

Video: [https://www.youtube.com/watch?v=teHrleAkm\\_8](https://www.youtube.com/watch?v=teHrleAkm_8)



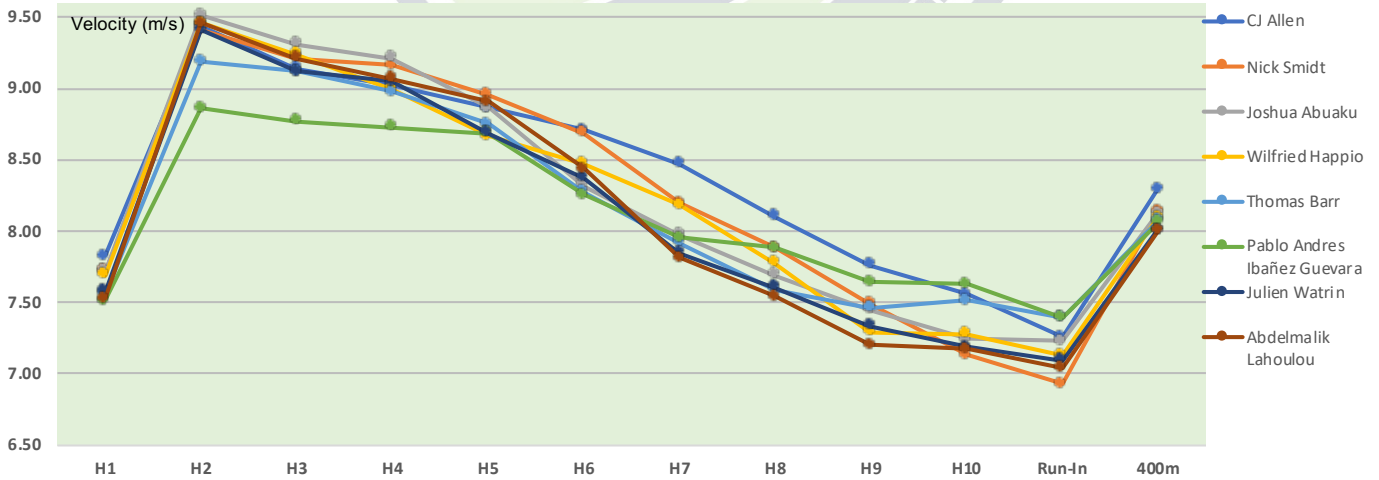
2023 FBK Games (Hengelo, NED)

Men's 400m Hurdles

Date 2023.06.04

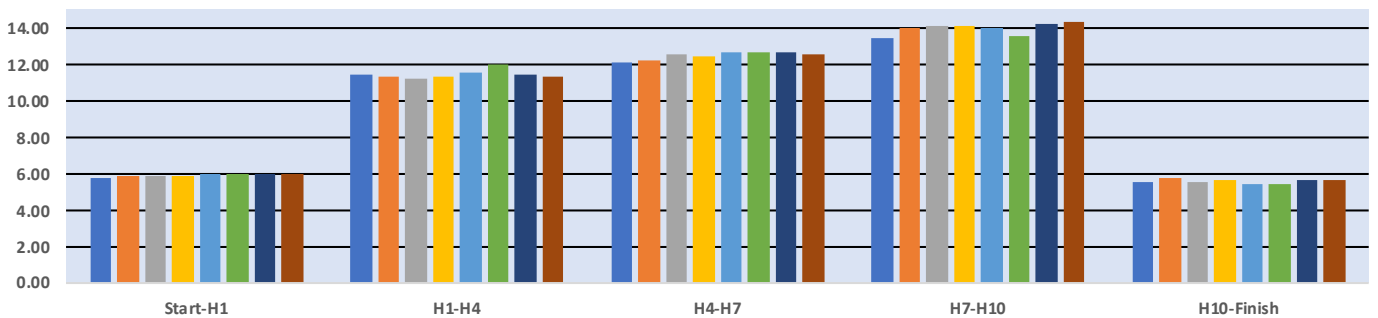
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Allen, CJ (USA) (1995)</b>	time	5.75	9.46	13.29	17.17	21.12	25.14	29.27	33.59	38.10	42.73		48.24	6 / 1			
	reaction time	0.166															
	interval		3.71	3.83	3.88	3.95	4.02	4.13	4.32	4.51	4.63	5.51			11.42	12.10	13.46
	velocity	7.83	9.43	9.14	9.02	8.86	8.71	8.47	8.10	7.76	7.56	7.26	8.29		9.19	8.68	7.80
H1 lead leg	L	21	13	13	13	13	13	13	14	14	14	17	158				
<b>Smidt, Nick (NED) (1997)</b>	time	5.83	9.55	13.35	17.17	21.08	25.11	29.38	33.82	38.49	43.40		49.17	5 / 2			
	reaction time	0.186															
	interval		3.72	3.80	3.82	3.91	4.03	4.27	4.44	4.67	4.91	5.77			11.34	12.21	14.02
	velocity	7.72	9.41	9.21	9.16	8.95	8.68	8.20	7.88	7.49	7.13	6.93	8.14		9.26	8.60	7.49
H1 lead leg	L	21	13				13	14	14	14	15	18	122				
<b>Abuaku, Joshua (GER) (1996)</b>	time	5.83	9.51	13.27	17.07	21.02	25.23	29.62	34.17	38.87	43.70		49.23	8 / 3			
	reaction time	0.207															
	interval		3.68	3.76	3.80	3.95	4.21	4.39	4.55	4.70	4.83	5.53			11.24	12.55	14.08
	velocity	7.72	9.51	9.31	9.21	8.86	8.31	7.97	7.69	7.45	7.25	7.23	8.13		9.34	8.37	7.46
H1 lead leg	L	20	13	13	13	13	13	14	14	15	15	18	161				
<b>Happio, Wilfried (FRA) (1998)</b>	time	5.85	9.55	13.34	17.23	21.27	25.40	29.68	34.18	38.98	43.79		49.40	7 / 4			
	reaction time	0.158															
	interval		3.70	3.79	3.89	4.04	4.13	4.28	4.50	4.80	4.81	5.61			11.38	12.45	14.11
	velocity	7.69	9.46	9.23	9.00	8.66	8.47	8.18	7.78	7.29	7.28	7.13	8.10		9.23	8.43	7.44
H1 lead leg	L	20	13	13	13	13	13	13	15	15	15	17.5	158.5				
<b>Barr, Thomas (IRL) (1992)</b>	time	5.95	9.76	13.60	17.50	21.50	25.73	30.15	34.76	39.45	44.11		49.52	2 / 5			
	reaction time	0.167															
	interval		3.81	3.84	3.90	4.00	4.23	4.42	4.61	4.69	4.66	5.41			11.55	12.65	13.96
	velocity	7.56	9.19	9.11	8.97	8.75	8.27	7.92	7.59	7.46	7.51	7.39	8.08		9.09	8.30	7.52
H1 lead leg	L	20	13							14	14	17.7	78.7				
<b>Ibañez Guevara, Pablo Andres (ESA)</b>	time	5.99	9.94	13.93	17.94	21.97	26.21	30.61	35.05	39.63	44.22		49.63	3 / 6			
	reaction time	0.156															
	interval		3.95	3.99	4.01	4.03	4.24	4.40	4.44	4.58	4.59	5.41			11.95	12.67	13.61
	velocity	7.51	8.86	8.77	8.73	8.68	8.25	7.95	7.88	7.64	7.63	7.39	8.06		8.79	8.29	7.71
H1 lead leg	L	21	14							15	15	18.2	83.2				
<b>Watrin, Julien (BEL) (1992)</b>	time	5.94	9.66	13.50	17.37	21.40	25.58	30.04	34.64	39.41	44.28		49.92	4 / 7			
	reaction time	0.242															
	interval		3.72	3.84	3.87	4.03	4.18	4.46	4.60	4.77	4.87	5.64			11.43	12.67	14.24
	velocity	7.58	9.41	9.11	9.04	8.68	8.37	7.85	7.61	7.34	7.19	7.09	8.01		9.19	8.29	7.37
H1 lead leg	R	20	13							14	15	18	80				
<b>Lahoulou, Abdelmalik (ALG) (1992)</b>	time	5.98	9.68	13.48	17.34	21.27	25.42	29.90	34.54	39.40	44.28		49.96	1 / 8			
	reaction time	0.173															
	interval		3.70	3.80	3.86	3.93	4.15	4.48	4.64	4.86	4.88	5.68			11.36	12.56	14.38
	velocity	7.53	9.46	9.21	9.07	8.91	8.43	7.81	7.54	7.20	7.17	7.04	8.01		9.24	8.36	7.30
H1 lead leg	L	22	13							15	15	18	83				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 4 Jun 2023 19:46) - continental tour race analysis  
<https://www.omegaitiming.com/File/000203010102090101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=s1vdEfrtL10>

Biomechanical Analysis

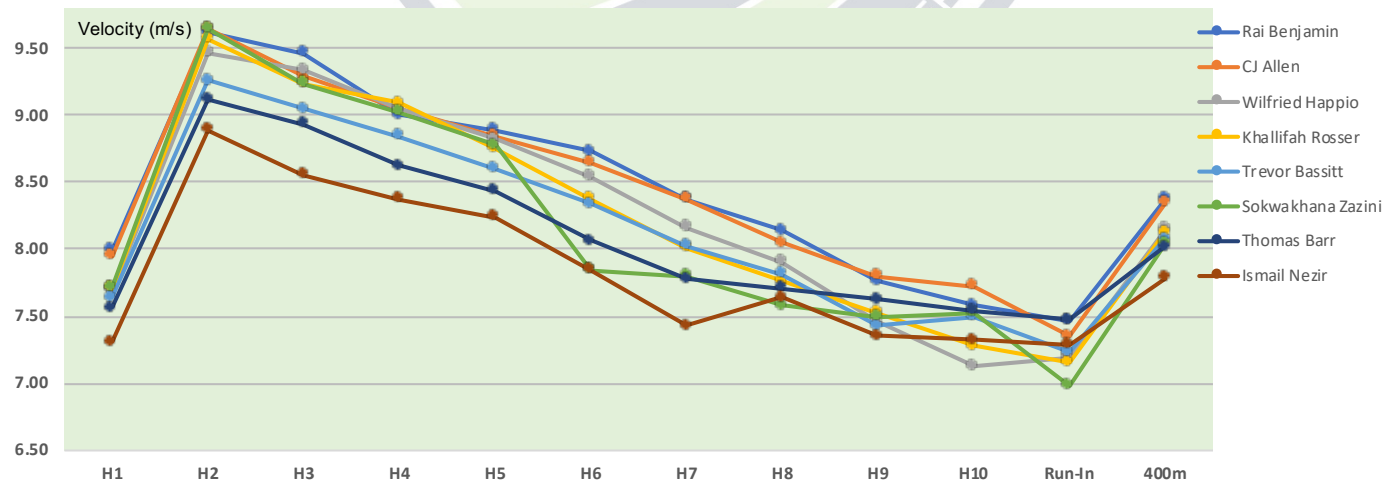
2023 Doha Diamond League (Doha, QAT)

Men's 400m Hurdles

Date 2023.05.05

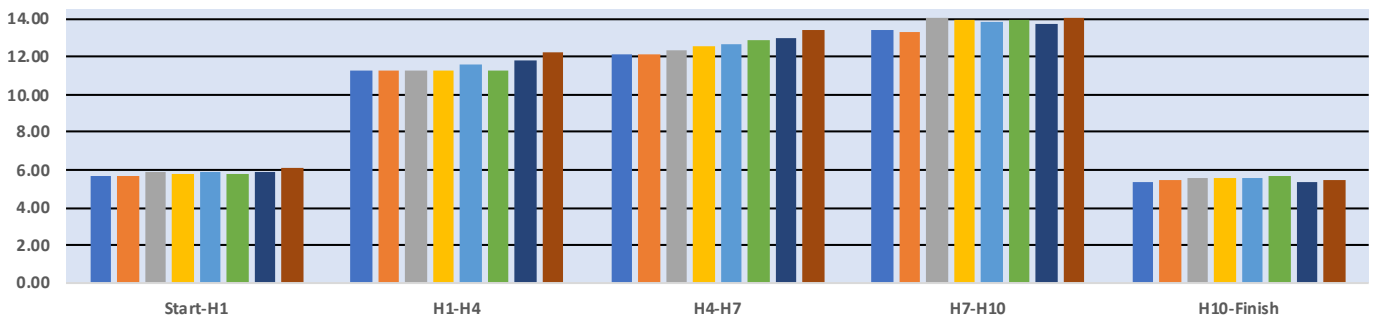
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Benjamin, Rai (USA) (1997)</b>	time	5.63	9.27	12.97	16.86	20.80	24.81	28.99	33.29	37.80	42.42	47.78		6 / 1			
	reaction time	0.169	interval	3.64	3.70	3.89	3.94	4.01	4.18	4.30	4.51	5.36			11.23	12.13	13.43
	velocity	7.99	9.62	9.46	9.00	8.88	8.73	8.37	8.14	7.76	7.58	7.46	8.37		9.35	8.66	7.82
H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	17	154				
<b>Allen, CJ (USA) (1995)</b>	time	5.66	9.29	13.06	16.93	20.89	24.94	29.12	33.47	37.96	42.49	47.93		3 / 2			
	reaction time	0.144	interval	3.63	3.77	3.87	3.96	4.05	4.18	4.35	4.49	5.44	PB		11.27	12.19	13.37
	velocity	7.95	9.64	9.28	9.04	8.84	8.64	8.37	8.05	7.80	7.73	7.35	8.35		9.32	8.61	7.85
H1 lead leg	L	strides	20	13	13	13	13	13	14	14	14	17	157				
<b>Happio, Wilfried (FRA) (1998)</b>	time	5.85	9.55	13.30	17.17	21.14	25.24	29.53	33.96	38.65	43.56	49.12		5 / 3			
	reaction time	0.156	interval	3.70	3.75	3.87	3.97	4.10	4.29	4.43	4.69	5.56			11.32	12.36	14.03
	velocity	7.69	9.46	9.33	9.04	8.82	8.54	8.16	7.90	7.46	7.13	7.19	8.14		9.28	8.50	7.48
H1 lead leg	L	strides	20	13	13	13	13	13	13	15	15	18	159				
<b>Rosser, Khallifah (USA) (1995)</b>	time	5.84	9.50	13.29	17.14	21.14	25.32	29.69	34.20	38.85	43.66	49.25		4 / 4			
	reaction time	0.161	interval	3.66	3.79	3.85	4.00	4.18	4.37	4.51	4.65	5.59			11.30	12.55	13.97
	velocity	7.71	9.56	9.23	9.09	8.75	8.37	8.01	7.76	7.53	7.28	7.16	8.12		9.29	8.37	7.52
H1 lead leg	R	strides	21	13	13	13	13	14	14	14	14	17.5	159.5				
<b>Bassitt, Trevor (USA) (1998)</b>	time	5.89	9.67	13.54	17.50	21.57	25.77	30.13	34.61	39.32	43.99	49.52		7 / 5			
	reaction time	0.158	interval	3.78	3.87	3.96	4.07	4.20	4.36	4.48	4.71	5.53			11.61	12.63	13.86
	velocity	7.64	9.26	9.04	8.84	8.60	8.33	8.03	7.81	7.43	7.49	7.23	8.08		9.04	8.31	7.58
H1 lead leg	R	strides	20	13	13	13	13	13	13	13	14	20	158				
<b>Zazini, Sokwakhana (RSA) (2000)</b>	time	5.83	9.46	13.25	17.13	21.12	25.58	30.07	34.69	39.36	44.01	49.74		1 / 6			
	reaction time	0.170	interval	3.63	3.79	3.88	3.99	4.46	4.49	4.62	4.67	5.73			11.30	12.94	13.94
	velocity	7.72	9.64	9.23	9.02	8.77	7.85	7.80	7.58	7.49	7.53	6.98	8.04		9.29	8.11	7.53
H1 lead leg	L	strides	23	14	14	14	14	15		16	16	126					
<b>Barr, Thomas (IRL) (1992)</b>	time	5.95	9.79	13.71	17.77	21.92	26.26	30.76	35.30	39.89	44.53	49.88		8 / 7			
	reaction time	0.159	interval	3.84	3.92	4.06	4.15	4.34	4.50	4.54	4.59	5.35			11.82	12.99	13.77
	velocity	7.56	9.11	8.93	8.62	8.43	8.06	7.78	7.71	7.63	7.54	7.48	8.02		8.88	8.08	7.63
H1 lead leg	L	strides	20	13	13	13	13	13	14	14	14	127					
<b>Nezir, Ismail (TUR) (2003)</b>	time	6.16	10.10	14.19	18.37	22.62	27.08	31.79	36.37	41.13	45.91	51.40		2 / 8			
	reaction time	0.195	interval	3.94	4.09	4.18	4.25	4.46	4.71	4.58	4.76	5.49			12.21	13.42	14.12
	velocity	7.31	8.88	8.56	8.37	8.24	7.85	7.43	7.64	7.35	7.32	7.29	7.78		8.60	7.82	7.44
H1 lead leg	L	strides	20	13	13	13	13	13	14	14	14	127					



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 05 May 2023 19:39) - diamond league race analysis

[https://doha.diamondleague.com/live/libraries/universal/components/modules/pdfviewer/viewer.html?file=https://livecache.sportresult.com/node/binarvData/ATH\\_PROD/DOHA2023/PDF\\_ATHM400MHURDDI/AMOND---FNL-000100--C78.PDF?h=kCSwSlqdtQezKCaQ4vpcRIQWY=](https://doha.diamondleague.com/live/libraries/universal/components/modules/pdfviewer/viewer.html?file=https://livecache.sportresult.com/node/binarvData/ATH_PROD/DOHA2023/PDF_ATHM400MHURDDI/AMOND---FNL-000100--C78.PDF?h=kCSwSlqdtQezKCaQ4vpcRIQWY=)

Video: <https://www.youtube.com/watch?v=AQhysxO05mLU>

# Women's 400m Hurdles

## Biomechanical Analysis

## 2023 Top 10 Times - Women's 400m Hurdles

Boi, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 London Athletics Meet (London, GBR)																	
Omega Timing - diamond league race analysis																	
date	23-Jul	time	6.25	10.26	14.30	18.43	22.65	27.05	31.58	36.26	41.09	45.88	51.45	6 / 1			
reaction time	0.187	interval		4.01	4.04	4.13	4.22	4.40	4.53	4.68	4.83	4.79	5.57	AR PB	12.18	13.15	14.30
		velocity	7.20	8.73	8.66	8.47	8.29	7.95	7.73	7.48	7.25	7.31	7.18	7.77	8.62	7.98	7.34
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	19	170			
Boi, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
Henson (2023) - Athlete First: 2023 year end hurdle report																	
date	24-Aug	time	6.37	10.44	14.41	18.41	22.66	27.03	31.53	36.24	41.07	46.01	51.70	6 / 1			
reaction time	0.202	interval		4.07	3.97	4.00	4.25	4.37	4.50	4.71	4.83	4.94	5.69		12.04	13.12	14.48
		velocity	7.06	8.60	8.82	8.75	8.24	8.01	7.78	7.43	7.25	7.09	7.03	7.74	8.72	8.00	7.25
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	18.5	169.5			
Boi, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Prefontaine Classic (Eugene, OR)																	
Omega Timing - diamond league race analysis																	
date	17-Sep	time	6.25	10.32	14.46	18.63	22.96	27.45	32.03	36.74	41.54	46.44	51.98	6 / 1			
reaction time	0.158	interval		4.07	4.14	4.17	4.33	4.49	4.58	4.71	4.80	4.90	5.54		12.38	13.40	14.41
		velocity	7.20	8.60	8.45	8.39	8.08	7.80	7.64	7.43	7.29	7.14	7.22	7.70	8.48	7.84	7.29
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	18.2	169.2			
Boi, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Memorial van Damme (Brussels, BEL)																	
Omega Timing - diamond league race analysis																	
date	8-Sep	time	6.27	10.23	14.33	18.52	22.83	27.32	32.00	36.77	41.61	46.55	52.11	5 / 1			
reaction time	0.203	interval		3.96	4.10	4.19	4.31	4.49	4.68	4.77	4.84	4.94	5.56		12.25	13.48	14.55
		velocity	7.18	8.84	8.54	8.35	8.12	7.80	7.48	7.34	7.23	7.09	7.19	7.68	8.57	7.79	7.22
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	18.2	147.2			
Boi, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Bislett Games (Oslo, NOR)																	
Omega Timing - diamond league race analysis																	
date	15-Jun	time	6.29	10.36	14.52	18.74	23.05	27.48	32.11	36.92	41.78	46.69	52.30	5 / 1			
reaction time	0.172	interval		4.07	4.16	4.22	4.31	4.43	4.63	4.81	4.86	4.91	5.61		12.45	13.37	14.58
		velocity	7.15	8.60	8.41	8.29	8.12	7.90	7.56	7.28	7.20	7.13	7.13	7.65	8.43	7.85	7.20
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	18.5	169.5			
Boi, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Golden Gala Pietro Mennea (Firenze, ITA)																	
Omega Timing - diamond league race analysis																	
date	2-Jun	time	6.27	10.35	14.48	18.63	22.90	27.28	31.96	36.76	41.63	46.64	52.43	6 / 1			
reaction time	0.170	interval		4.08	4.13	4.15	4.27	4.38	4.68	4.80	4.87	5.01	5.79		12.36	13.33	14.68
		velocity	7.18	8.58	8.47	8.43	8.20	7.99	7.68	7.48	7.29	7.19	6.99	6.91	8.50	7.88	7.15
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	19	170			
Boi, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Athletissima (Lausanne, SU)																	
Omega Timing - diamond league race analysis																	
date	30-Jun	time	6.14	10.09	14.11	18.16	22.38	26.76	31.43	36.35	41.36	46.61	52.76	5 / 1			
reaction time	0.169	interval		3.95	4.02	4.05	4.22	4.38	4.67	4.92	5.01	5.25	6.15		12.02	13.27	15.18
		velocity	7.33	8.86	8.71	8.64	8.29	7.99	7.49	7.11	6.99	6.67	6.50	7.58	8.74	7.91	6.92
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	19.7	170.7			
Boi, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Galà Dei Castelli (Bellinzona, ITA) (TV Analysis)																	
Henson (2023) - Athlete First: 2023 year end hurdle report																	
date	4-Sep	time	6.36	10.52	14.68	18.92	23.28	27.80	32.48	37.32	42.28	47.28	52.79	4 / 1			
reaction time		interval		4.16	4.16	4.24	4.36	4.52	4.68	4.84	4.96	5.00	5.51		12.56	13.56	14.80
		velocity	7.08	8.41	8.41	8.25	8.03	7.74	7.48	7.23	7.06	7.00	7.26	7.58	8.36	7.74	7.09
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	18.2	169.2			
Little, Shamier (USA) (1995)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
Henson (2023) - Athlete First: 2023 year end hurdle report																	
date	24-Aug	time	6.24	10.41	14.58	18.68	23.02	27.46	31.96	36.64	41.54	46.81	52.80	5 / 2			
reaction time	0.181	interval		4.17	4.17	4.10	4.34	4.44	4.50	4.68	4.90	5.27	5.99		12.44	13.28	14.85
		velocity	7.21	8.39	8.39	8.54	8.06	7.88	7.78	7.48	7.14	6.64	6.68	7.58	8.44	7.91	7.07
H1 lead leg	R	strides	23	15	15	15	15	15	15	15	15	16	20	164			
Little, Shamier (USA) (1995)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
Semi-Final 3 - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
Henson (2023) - Athlete First: 2023 year end hurdle report																	
date	22-Aug	time	6.17	10.14	14.28	18.52	22.92	27.42	32.03	36.80	41.86	46.95	52.81	8 / 1			
reaction time	0.212	interval		3.97	4.14	4.24	4.40	4.50	4.61	4.77	5.06	5.09	5.86		12.35	13.51	14.92
		velocity	7.29	8.82	8.45	8.25	7.95	7.78	7.59	7.34	6.92	6.88	6.83	7.57	8.50	7.77	7.04
H1 lead leg	R	strides	23	15	15	15	15	15	15	15	16	16	19.2	179.2			
Clayton, Rushell (JAM) (1992)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
Henson (2023) - Athlete First: 2023 year end hurdle report																	
date	24-Aug	time	6.31	10.39	14.42	18.36	22.59	27.06	31.63	36.43	41.47	46.68	52.81	8 / 3			
reaction time	0.147	interval		4.08	4.03	3.94	4.23	4.47	4.57	4.80	5.04	5.21	6.13	PB	12.05	13.27	15.05
		velocity	7.13	8.58	8.68	8.88	8.27	7.83	7.66	7.29	6.94	6.72	6.53	7.57	8.71	7.91	6.98
H1 lead leg	L	strides	22	14	14	14	14	15	15	15	16	16	20	175			
Boi, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
Semi-Final 2 - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
Henson (2023) - Athlete First: 2023 year end hurdle report																	
date	22-Aug	time	6.31	10.44	14.45	18.45	22.75	27.20	31.79	36.57	41.60	46.71	52.95	8 / 1			
reaction time	0.199	interval		4.13	4.01	4.00	4.30	4.45	4.59	4.78	5.03	5.11	6.24		12.14	13.34	14.92
		velocity	7.13	8.47	8.73	8.75	8.14	7.87	7.63	7.32	6.96	6.85	6.41	7.55	8.65	7.87	7.04
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	18.5	169.5			
Adekoya, Kemi (BRN) (1993)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
Henson (2023) - Athlete First: 2023 year end hurdle report																	
date	24-Aug	time	6.34	10.41	14.48	18.55	22.82	27.23	31.73	36.64	41.74	47.18	53.09	7 / 4			
reaction time	0.207	interval		4.07	4.07	4.07	4.27	4.41	4.50	4.91	5.10	5.44	5.91	AR	12.21	13.18	15.45
		velocity	7.10	8.60	8.60	8.60	8.20	7.94	7.78	7.13	6.86	6.43	6.77	7.53	8.60	7.97	6.80
H1 lead leg	R	strides	23	15	15	15	15	15	15	16	16	17	20	182			
Boi, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 IFAM Oordegem (Oordegem, BEL) (TV Analysis)																	
Henson (2023) - Athlete First: 2023 year end hurdle report																	
date	27-May	time	6.40	10.53	14.73	19.03	23.40	27.96	32.67	37.43		47.63	53.12	6 / 1			
reaction time		interval		4.13	4.20	4.30	4.37	4.56	4.71	4.76		10.20	5.49		12.63	13.64	14.96
		velocity	7.03	8.47													

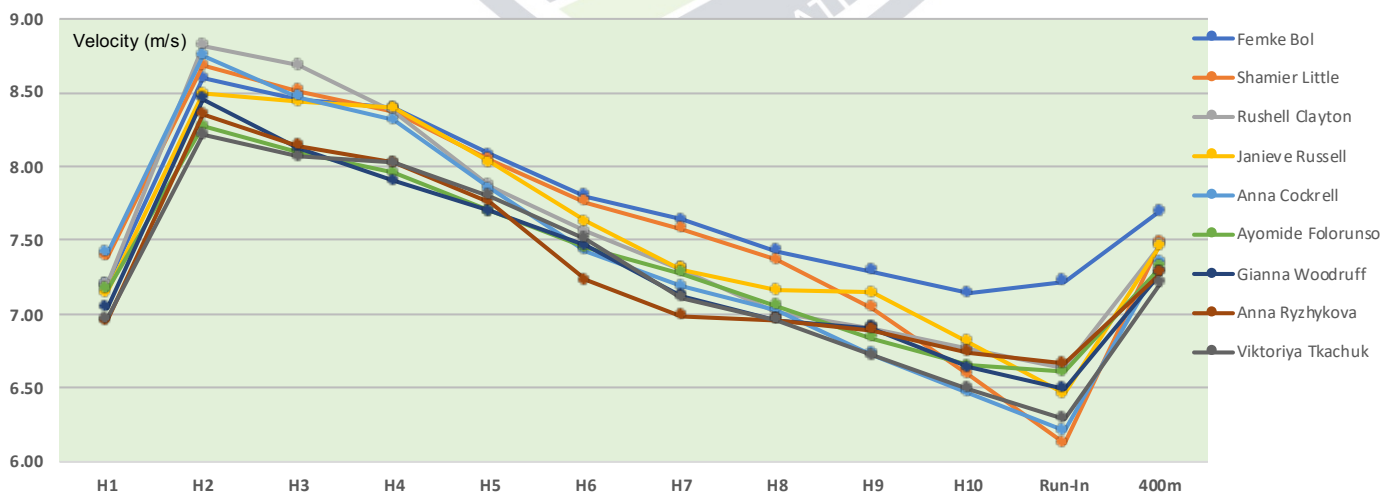
2023 Prefontaine Classic (Eugene, OR)

Women's 400m Hurdles

Date 2023.09.17

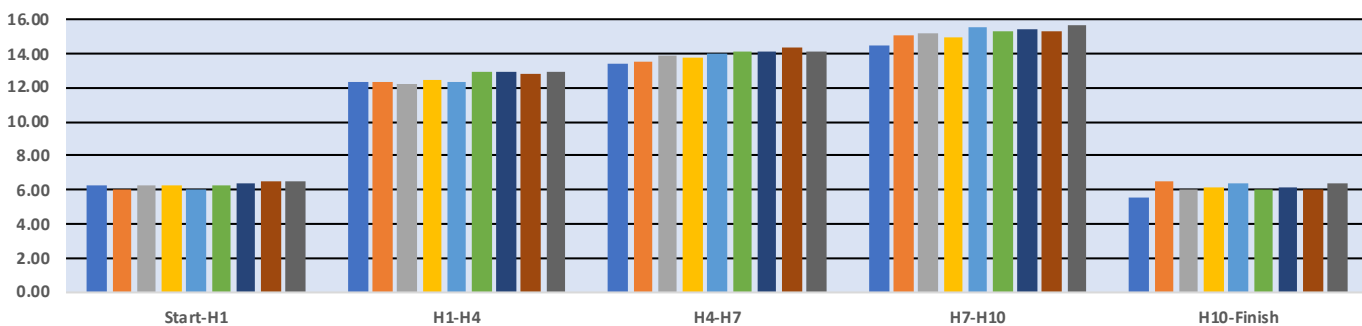
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Bol, Femke (NED) (2000)</b>	time	6.25	10.32	14.46	18.63	22.96	27.45	32.03	36.74	41.54	46.44	51.98	51.98	6 / 1			
	reaction time	0.158															
	interval velocity	7.20	8.60	8.45	8.37	8.05	7.76	7.58	7.37	7.04	6.59	6.13	7.48		12.38	13.40	14.41
H1 lead leg	L	22	14	14	14	14	14	14	15	15	15	18.2	169.2		8.48	7.84	7.29
<b>Little, Shamier (USA) (1995)</b>	time	6.09	10.12	14.23	18.41	22.76	27.27	31.89	36.64	41.61	46.92	53.45	53.45	5 / 2			
	reaction time	0.169															
	interval velocity	7.39	8.68	8.52	8.37	8.05	7.76	7.58	7.37	7.04	6.59	6.13	7.48		12.32	13.48	15.03
H1 lead leg	R	23	15	15	14	14	15	15	15	16	16	20	178		8.52	7.79	6.99
<b>Clayton, Rushell (JAM) (1992)</b>	time	6.25	10.22	14.25	18.43	22.88	27.51	32.30	37.29	42.36	47.53	53.56	53.56	7 / 3			
	reaction time	0.138															
	interval velocity	7.20	8.82	8.68	8.37	7.87	7.56	7.31	7.01	6.90	6.77	6.63	7.47		12.18	13.87	15.23
H1 lead leg	L	22	14	14	14	14	15	16	16	16	16	19	176		8.62	7.57	6.89
<b>Russell, Janieve (JAM) (1993)</b>	time	6.30	10.42	14.57	18.74	23.10	27.69	32.48	37.37	42.27	47.41	53.60	53.60	3 / 4			
	reaction time	0.140															
	interval velocity	7.14	8.50	8.43	8.39	8.03	7.63	7.31	7.16	7.14	6.81	6.46	7.46		12.44	13.74	14.93
H1 lead leg	R	23	15	15	15	15	15	16	16	16	16	20	152		8.44	7.64	7.03
<b>Cockrell, Anna (USA) (1997)</b>	time	6.07	10.07	14.20	18.41	22.87	27.58	32.45	37.43	42.63	48.04	54.48	54.48	4 / 5			
	reaction time	0.139															
	interval velocity	7.41	8.75	8.47	8.31	7.85	7.43	7.19	7.03	6.73	6.47	6.21	7.34		12.34	14.04	15.59
H1 lead leg	R	22	14	14	14	15	15	15	15	15	16	126		8.51	7.48	6.74	
<b>Folorunso, Ayomide (ITA) (1996)</b>	time	6.28	10.51	14.83	19.23	23.78	28.48	33.29	38.25	43.37	48.63	54.68	54.68	8 / 6			
	reaction time	0.182															
	interval velocity	7.17	8.27	8.10	7.95	7.69	7.45	7.28	7.06	6.84	6.65	6.61	7.32		12.95	14.06	15.34
H1 lead leg	L	23	15	15	15	16	16	16	16	16	16	132		8.11	7.47	6.84	
<b>Woodruff, Gianna (PAN) (1993)</b>	time	6.39	10.53	14.84	19.27	23.82	28.51	33.42	38.45	43.52	48.79	54.95	54.95	2 / 7			
	reaction time	0.192															
	interval velocity	7.04	8.45	8.12	7.90	7.69	7.46	7.13	6.96	6.90	6.64	6.49	7.28		12.88	14.15	15.37
H1 lead leg	L	22	14	14	14	15	15	15	15	15	17	98		8.15	7.42	6.83	
<b>Ryzhykova, Anna (UKR) (1989)</b>	time	6.47	10.66	14.96	19.32	23.83	28.67	33.68	38.71	43.79	48.98	54.98	54.98	1 / 8			
	reaction time	0.166															
	interval velocity	6.96	8.35	8.14	8.03	7.76	7.23	6.99	6.96	6.89	6.74	6.67	7.28		12.85	14.36	15.30
H1 lead leg	R	22	14	14	14	14	15	15	15	15	15	95		8.17	7.31	6.86	
<b>Tkachuk, Viktoriya (UKR) (1994)</b>	time	6.46	10.72	15.06	19.42	23.91	28.57	33.49	38.52	43.73	49.12	55.48	55.48	9 / 9			
	reaction time	0.218															
	interval velocity	6.97	8.22	8.06	8.03	7.80	7.51	7.11	6.96	6.72	6.49	6.29	7.21		12.96	14.07	15.63
H1 lead leg	L	22	15	15	15	15	15	16	16	16	16	129		8.10	7.46	6.72	



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 17 Sep 2023 13:09) - diamond league race analysis  
<https://www.omegatiming.com/File/0002031001010C0101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=IE2uq3jMAaU>

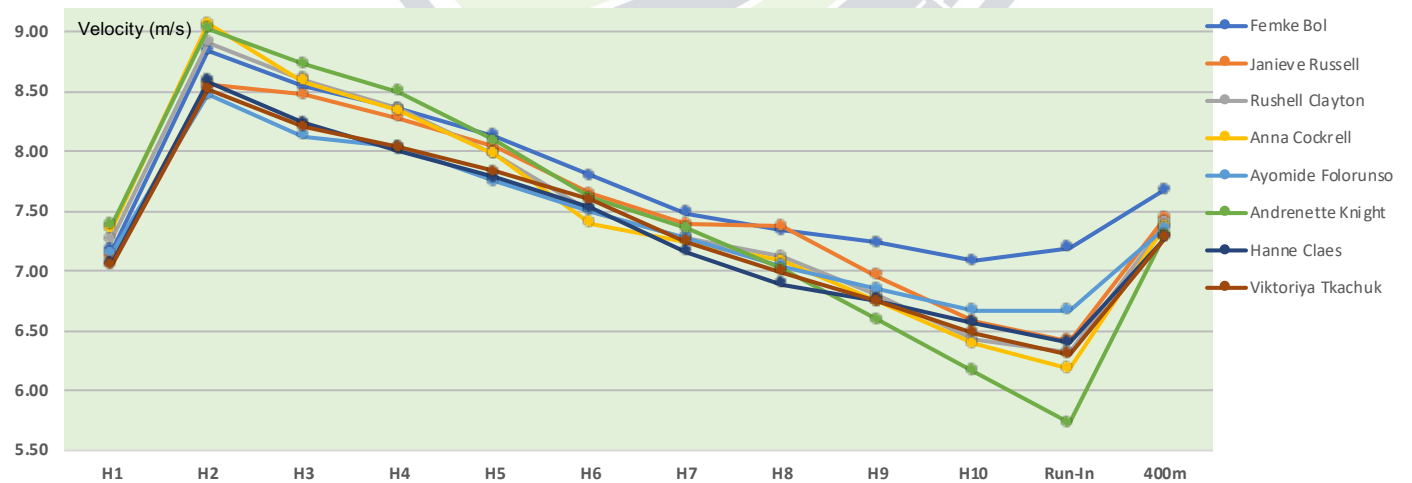
2023 Memorial van Damme (Brussels, BEL)

Women's 400m Hurdles

Date 2023.09.08

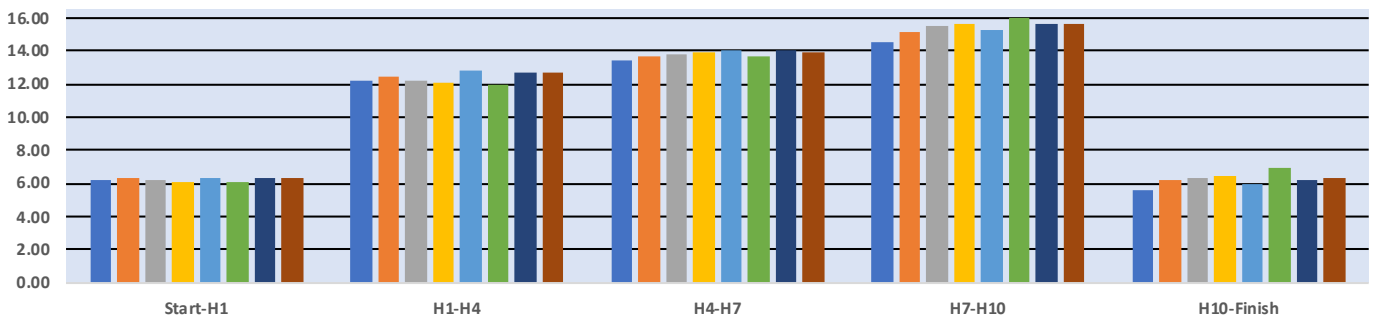
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Bol, Femke (NED) (2000)</b>	time	6.27	10.23	14.33	18.52	22.83	27.32	32.00	36.77	41.61	46.55	52.11	52.11	5 / 1			
	reaction time	0.203															
	interval		3.96	4.10	4.19	4.31	4.49	4.68	4.77	4.84	4.94	5.56			12.25	13.48	14.55
	velocity	7.18	8.84	8.54	8.35	8.12	7.80	7.48	7.34	7.23	7.09	7.19	7.68		8.57	7.79	7.22
H1 lead leg	L												18.2	169.2			
<b>Russell, Janieve (JAM) (1993)</b>	time	6.33	10.42	14.55	18.78	23.14	27.72	32.46	37.21	42.24	47.56		53.80	7 / 2			
	reaction time	0.153															
	interval		4.09	4.13	4.23	4.36	4.58	4.74	4.75	5.03	5.32	6.24			12.45	13.68	15.10
	velocity	7.11	8.56	8.47	8.27	8.03	7.64	7.38	7.37	6.96	6.58	6.41	7.43		8.43	7.68	6.95
H1 lead leg	R												154				
<b>Clayton, Rushell (JAM) (1992)</b>	time	6.19	10.12	14.19	18.38	22.77	27.44	32.25	37.17	42.32	47.77		54.10	6 / 3			
	reaction time	0.141															
	interval		3.93	4.07	4.19	4.39	4.67	4.81	4.92	5.15	5.45	6.33			12.19	13.87	15.52
	velocity	7.27	8.91	8.60	8.35	7.97	7.49	7.28	7.11	6.80	6.42	6.32	7.39		8.61	7.57	6.77
H1 lead leg	L												175.5				
<b>Cockrell, Anna (USA) (1997)</b>	time	6.12	9.98	14.06	18.26	22.65	27.38	32.21	37.15	42.34	47.82		54.29	2 / 4			
	reaction time	0.218															
	interval		3.86	4.08	4.20	4.39	4.73	4.83	4.94	5.19	5.48	6.47			12.14	13.95	15.61
	velocity	7.35	9.07	8.58	8.33	7.97	7.40	7.25	7.09	6.74	6.39	6.18	7.37		8.65	7.53	6.73
H1 lead leg	R												145.7				
<b>Folorunso, Ayomide (ITA) (1996)</b>	time	6.29	10.42	14.73	19.09	23.61	28.28	33.09	38.06	43.17	48.42		54.42	8 / 5			
	reaction time	0.213															
	interval		4.13	4.31	4.16	4.33	4.67	4.81	4.97	5.11	5.25	6.00			12.80	14.00	15.33
	velocity	7.15	8.47	8.12	8.03	7.74	7.49	7.28	7.04	6.85	6.67	6.67	7.35		8.20	7.50	6.85
H1 lead leg	L												155				
<b>Knight, Andrenette (JAM) (1996)</b>	time	6.09	9.97	13.98	18.10	22.43	27.03	31.79	36.78	42.09	47.77		54.75	3 / 6			
	reaction time	0.153															
	interval		3.88	4.01	4.12	4.33	4.60	4.76	4.99	5.31	5.68	6.98			12.01	13.69	15.98
	velocity	7.39	9.02	8.73	8.50	8.08	7.61	7.35	7.01	6.59	6.16	5.73	7.31		8.74	7.67	6.57
H1 lead leg	R												156.2				
<b>Claes, Hanne (BEL) (1991)</b>	time	6.37	10.45	14.70	19.07	23.57	28.22	33.11	38.19	43.37	48.70		54.95	4 / 7			
	reaction time	0.205															
	interval		4.08	4.25	4.37	4.50	4.65	4.89	5.08	5.18	5.33	6.25			12.70	14.04	15.59
	velocity	7.06	8.58	8.24	8.01	7.78	7.53	7.16	6.89	6.76	6.57	6.40	7.28		8.27	7.48	6.74
H1 lead leg	R												185				
<b>Tkachuk, Viktoriya (UKR) (1994)</b>	time	6.38	10.49	14.76	19.12	23.59	28.20	33.03	38.04	43.23	48.63		54.98	1 / 8			
	reaction time	0.217															
	interval		4.11	4.27	4.36	4.47	4.61	4.83	5.01	5.19	5.40	6.35			12.74	13.91	15.60
	velocity	7.05	8.52	8.20	8.03	7.83	7.59	7.25	6.99	6.74	6.48	6.30	7.28		8.24	7.55	6.73
H1 lead leg	L												152.5				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 8 Sep 2023 20:53) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030E0101100101FFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=2rc5vOA4LhI>

2023 Galà Dei Castelli (Bellinzona, ITA) (TV Analysis)

Women's 400m Hurdles

Date 2023.09.04

FINAL

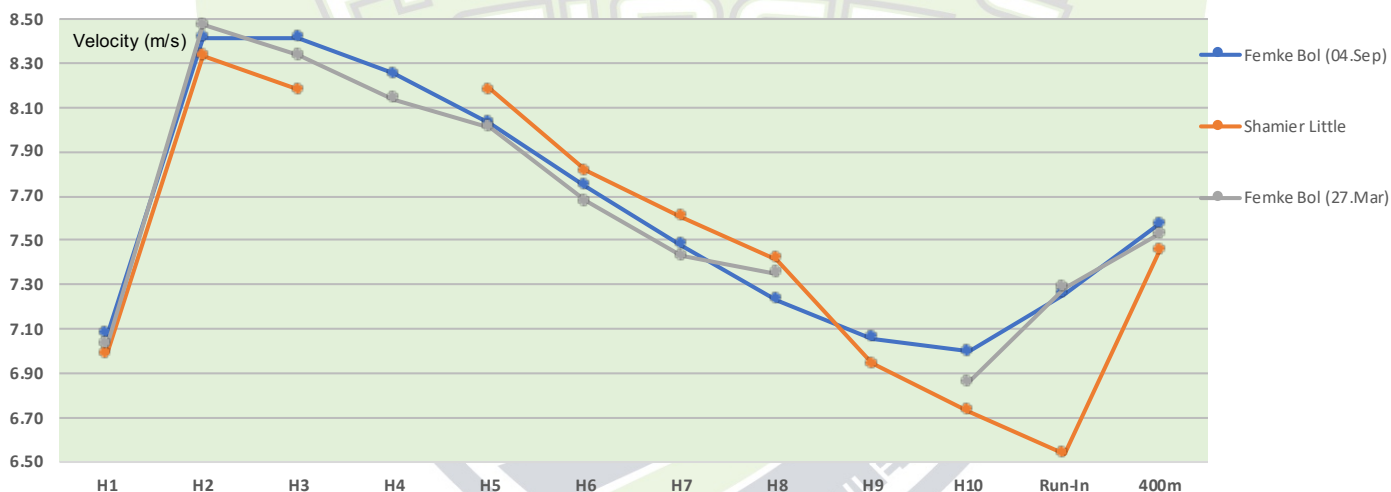
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Bol, Femke (NED) (2000)</b>	time	6.36	10.52	14.68	18.92	23.28	27.80	32.48	37.32	42.28	47.28		52.79	4 / 1			
	reaction time														12.56	13.56	14.80
	interval		4.16	4.16	4.24	4.36	4.52	4.68	4.84	4.96	5.00	5.51			8.36	7.74	7.09
	velocity	7.08	8.41	8.41	8.25	8.03	7.74	7.48	7.23	7.06	7.00	7.26	7.58				
H1 lead leg	L	strides	22	14	14	14	14	14	15	15	15	18.2	169.2				
<b>Little, Shamier (USA) (1995)</b>	time	6.44	10.64	14.92		23.48	27.96	32.56	37.28	42.32	47.52		53.64	5 / 2			
	reaction time																14.96
	interval		4.20	4.28		8.56	4.48	4.60	4.72	5.04	5.20	6.12					7.02
	velocity	6.99	8.33	8.18		8.18	7.81	7.61	7.42	6.94	6.73	6.54	7.46				
H1 lead leg	R	strides	23	15	15		15	15	15	16	16	20	150				

2023 IFAM Oordegem (Oordegem, BEL) (TV Analysis)

Date 2023.05.27

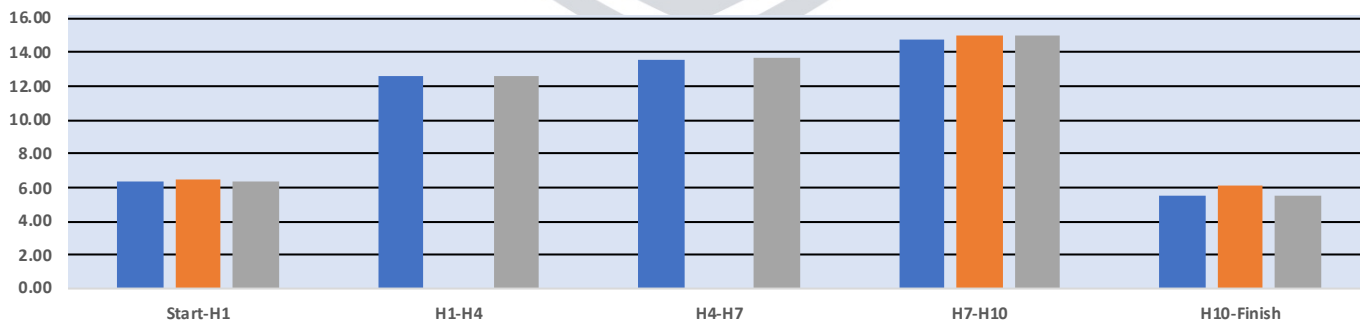
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Bol, Femke (NED) (2000)</b>	time	6.40	10.53	14.73	19.03	23.40	27.96	32.67	37.43		47.63		53.12	6 / 1			
	reaction time														12.63	13.64	14.96
	interval		4.13	4.20	4.30	4.37	4.56	4.71	4.76		10.20	5.49			8.31	7.70	7.02
	velocity	7.03	8.47	8.33	8.14	8.01	7.68	7.43	7.35		6.86	7.29	7.53				
H1 lead leg	L	strides	22	14	14	14	14	14	15		16	19	156				



Time Intervals (s)

Hurdle Phases



Galà Dei Castelli

Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1280 x 720 @ 30fps  
 Timing From: First Movement  
 Source: [https://www.youtube.com/watch?v=HJ\\_Inh7Sq2B8](https://www.youtube.com/watch?v=HJ_Inh7Sq2B8)

IFAM Oordegem

Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1280 x 720 @ 30fps  
 Timing From: First Movement  
 Source: <https://www.youtube.com/watch?v=TIVzHU0zaCs>

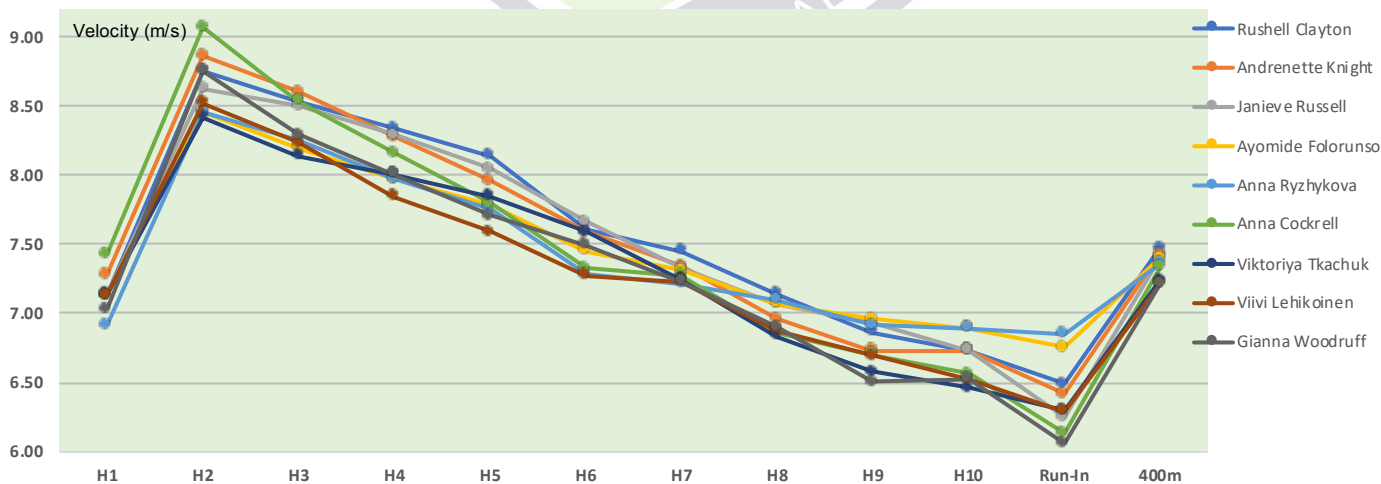
2023 Xiamen Diamond League (Xiamen, CHN)

Women's 400m Hurdles

Date 2023.09.02

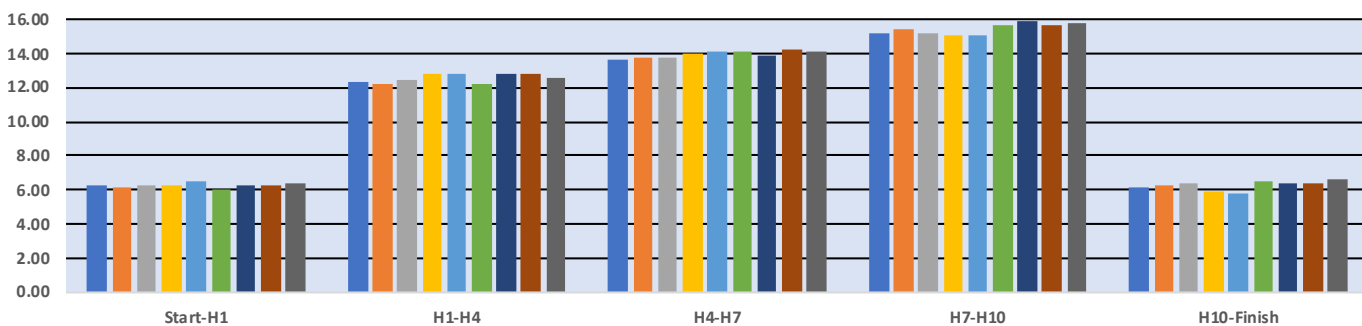
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Clayton, Rushell (JAM) (1992)</b>	time	6.30	10.30	14.40	18.60	22.90	27.50	32.20	37.10	42.20	47.40		53.56	5 / 1			
	reaction time	0.138															
	interval		4.00	4.10	4.20	4.30	4.60	4.70	4.90	5.10	5.20	6.16			12.30	13.60	15.20
	velocity	7.14	8.75	8.54	8.33	8.14	7.61	7.45	7.14	6.86	6.73	6.49	7.47		8.54	7.72	6.91
H1 lead leg	R											19.2	179.2				
<b>Knight, Andrenette (JAM) (1996)</b>	time	6.18	10.13	14.20	18.43	22.83	27.44	32.21	37.24	42.44	47.64		53.87	7 / 2			
	reaction time	0.162															
	interval		3.95	4.07	4.23	4.40	4.61	4.77	5.03	5.20	5.20	6.23			12.25	13.78	15.43
	velocity	7.28	8.86	8.60	8.27	7.95	7.59	7.34	6.96	6.73	6.73	6.42	7.43		8.57	7.62	6.80
H1 lead leg	R											186					
<b>Russell, Janieve (JAM) (1993)</b>	time	6.31	10.37	14.49	18.71	23.06	27.63	32.41	37.36	42.41	47.61		54.01	6 / 3			
	reaction time	0.173															
	interval		4.06	4.12	4.22	4.35	4.57	4.78	4.95	5.05	5.20	6.40			12.40	13.70	15.20
	velocity	7.13	8.62	8.50	8.29	8.05	7.66	7.32	7.07	6.93	6.73	6.25	7.41		8.47	7.66	6.91
H1 lead leg	R											184					
<b>Folorunso, Ayomide (ITA) (1996)</b>	time	6.31	10.45	14.72	19.11	23.61	28.31	33.10	38.05	43.08	48.16		54.08	3 / 4			
	reaction time	0.185															
	interval		4.14	4.27	4.39	4.50	4.70	4.79	4.95	5.03	5.08	5.92			12.80	13.99	15.06
	velocity	7.13	8.45	8.20	7.97	7.78	7.45	7.31	7.07	6.96	6.89	6.76	7.40		8.20	7.51	6.97
H1 lead leg	L											185					
<b>Ryzhykova, Anna (UKR) (1989)</b>	time	6.51	10.65	14.89	19.28	23.79	28.59	33.44	38.37	43.43	48.51		54.35	1 / 5			
	reaction time	0.157															
	interval		4.14	4.24	4.39	4.51	4.80	4.85	4.93	5.06	5.08	5.84			12.77	14.16	15.07
	velocity	6.91	8.45	8.25	7.97	7.76	7.29	7.22	7.10	6.92	6.89	6.85	7.36		8.22	7.42	6.97
H1 lead leg	R											172					
<b>Cockrell, Anna (USA) (1997)</b>	time	6.06	9.92	14.02	18.31	22.80	27.58	32.39	37.49	42.71	48.04		54.56	4 / 6			
	reaction time	0.182															
	interval		3.86	4.10	4.29	4.49	4.78	4.81	5.10	5.22	5.33	6.52			12.25	14.08	15.65
	velocity	7.43	9.07	8.54	8.16	7.80	7.32	7.28	6.86	6.70	6.57	6.13	7.33		8.57	7.46	6.71
H1 lead leg	R											174.7					
<b>Tkachuk, Viktoriya (UKR) (1994)</b>	time	6.31	10.47	14.77	19.14	23.60	28.21	33.04	38.16	43.48	48.90		55.25	8 / 7			
	reaction time	0.201															
	interval		4.16	4.30	4.37	4.46	4.61	4.83	5.12	5.32	5.42	6.35			12.83	13.90	15.86
	velocity	7.13	8.41	8.14	8.01	7.85	7.59	7.25	6.84	6.58	6.46	6.30	7.24		8.18	7.55	6.62
H1 lead leg	L											146					
<b>Lehikoinen, Viivi (FIN) (1999)</b>	time	6.31	10.42	14.67	19.13	23.74	28.55	33.39	38.48	43.71	49.08		55.44	2 / 8			
	reaction time	0.215															
	interval		4.11	4.25	4.46	4.61	4.81	4.84	5.09	5.23	5.37	6.36			12.82	14.26	15.69
	velocity	7.13	8.52	8.24	7.85	7.59	7.28	6.88	6.69	6.52	6.29	7.22			8.19	7.36	6.69
H1 lead leg	R											167					
<b>Woodruff, Gianna (PAN) (1993)</b>	time	6.40	10.40	14.62	18.99	23.53	28.20	33.04	38.11	43.49	48.85		55.45	9 / 9			
	reaction time	0.219															
	interval		4.00	4.22	4.37	4.54	4.67	4.84	5.07	5.38	5.36	6.60			12.59	14.05	15.81
	velocity	7.03	8.75	8.29	8.01	7.71	7.49	7.23	6.90	6.51	6.53	6.06	7.21		8.34	7.47	6.64
H1 lead leg	L											145					



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sat 2 Sep 2023 20:32) - diamond league race analysis

<https://www.omegatiming.com/File/0002031101010C0101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=UvCey9WuIztc>



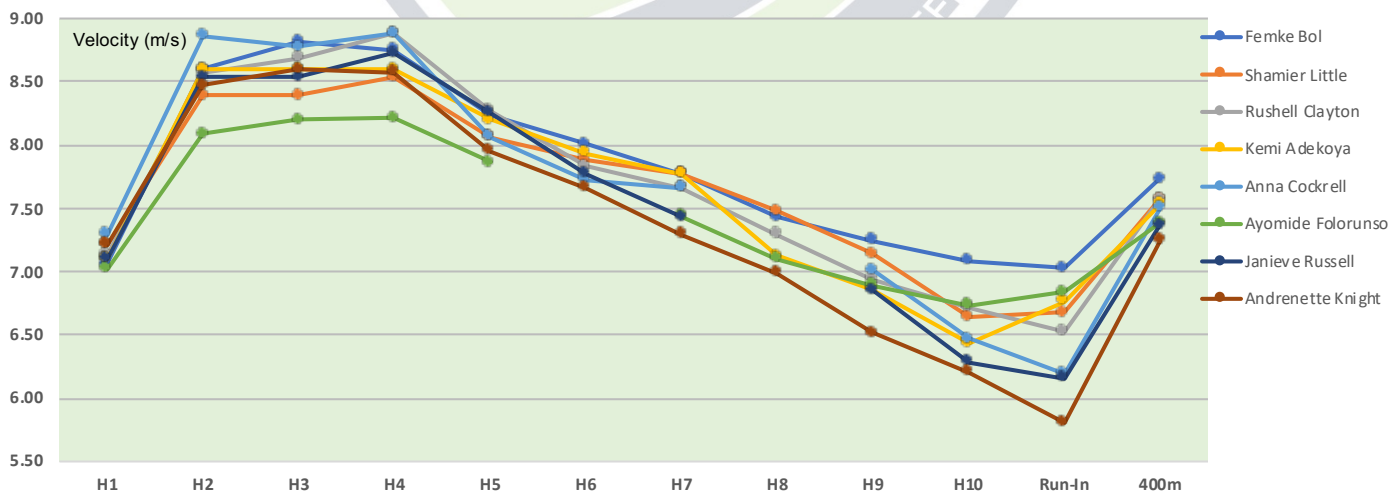
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.24

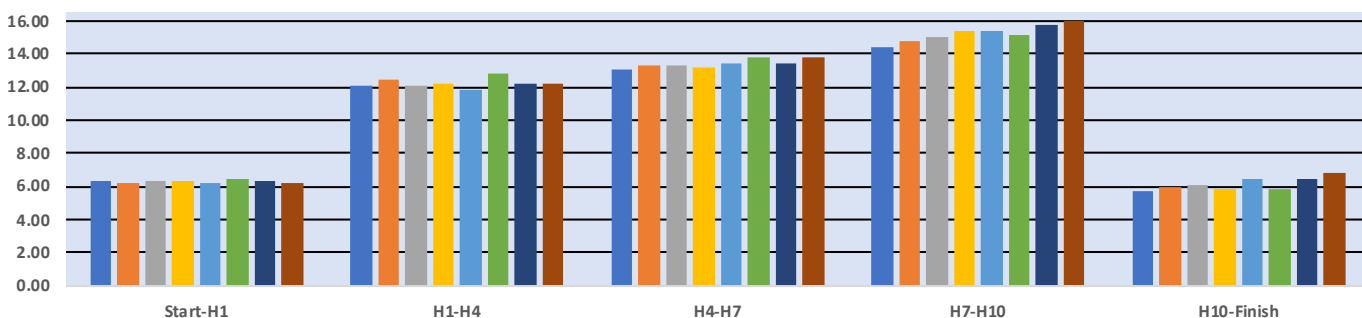
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Bol, Femke (NED) (2000)</b>	time	6.37	10.44	14.41	18.41	22.66	27.03	31.53	36.24	41.07	46.01	51.70	52.80	6 / 1			
	reaction time	0.202													12.04	13.12	14.48
	H1 lead leg	L	7.06	8.07	8.39	8.54	8.24	8.01	7.78	7.43	7.25	7.09	7.74	7.74	8.72	8.00	7.25
<b>Little, Shamier (USA) (1995)</b>	time	6.24	10.41	14.58	18.68	23.02	27.46	31.96	36.64	41.54	46.81	52.80	52.80	5 / 2			
	reaction time	0.181													12.44	13.28	14.85
	H1 lead leg	R	7.21	8.39	8.39	8.54	8.06	7.88	7.78	7.48	7.14	6.64	6.68	7.58	8.44	7.91	7.07
<b>Clayton, Rushell (JAM) (1992)</b>	time	6.31	10.39	14.42	18.36	22.59	27.06	31.63	36.43	41.47	46.68	52.81	52.81	8 / 3			
	reaction time	0.147													12.05	13.27	15.05
	H1 lead leg	L	7.13	8.58	8.68	8.88	8.27	7.83	7.66	7.29	6.94	6.72	6.53	7.57	8.71	7.91	6.98
<b>Adekoya, Kemi (BRN) (1993)</b>	time	6.34	10.41	14.48	18.55	22.82	27.23	31.73	36.64	41.74	47.18	53.09	53.09	7 / 4			
	reaction time	0.207													12.21	13.18	15.45
	H1 lead leg	R	7.10	8.60	8.60	8.60	8.20	7.94	7.78	7.13	6.86	6.43	6.77	7.53	8.60	7.97	6.80
<b>Cockrell, Anna (USA) (1997)</b>	time	6.17	10.12	14.11	18.05	22.39	26.92	31.49	36.64	41.47	46.88	53.34	53.34	9 / 5			
	reaction time	0.189													11.88	13.44	15.39
	H1 lead leg	R	7.29	8.86	8.77	8.88	8.06	7.73	7.66	7.01	6.47	6.19	7.50	8.84	7.81	6.82	
<b>Folorunso, Ayomide (ITA) (1996)</b>	time	6.41	10.74	15.01	19.27	23.72	28.91	33.13	38.06	43.14	48.34	54.19	54.19	2 / 6			
	reaction time	0.192													12.86	13.86	15.21
	H1 lead leg	L	7.02	8.08	8.20	8.22	7.87	7.44	7.10	6.89	6.73	6.84	7.38	8.16	7.58	6.90	
<b>Russell, Janieve (JAM) (1993)</b>	time	6.34	10.44	14.54	18.55	22.79	27.29	32.00	36.64	42.21	47.78	54.28	54.28	3 / 7			
	reaction time	0.152													12.21	13.45	15.78
	H1 lead leg	R	7.10	8.54	8.54	8.73	8.25	7.78	7.43	6.86	6.28	6.15	7.37	8.60	7.81	6.65	
<b>Knight, Andrenette (JAM) (1996)</b>	time	6.24	10.37	14.44	18.52	22.92	27.49	32.29	37.30	42.67	48.31	55.20	55.20	4 / 8			
	reaction time	0.158													12.28	13.77	16.02
	H1 lead leg	R	7.21	8.47	8.60	8.58	7.95	7.66	7.29	6.99	6.52	6.21	5.81	7.25	8.55	7.63	6.55



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=0DLYOvNtIU&t=26s>

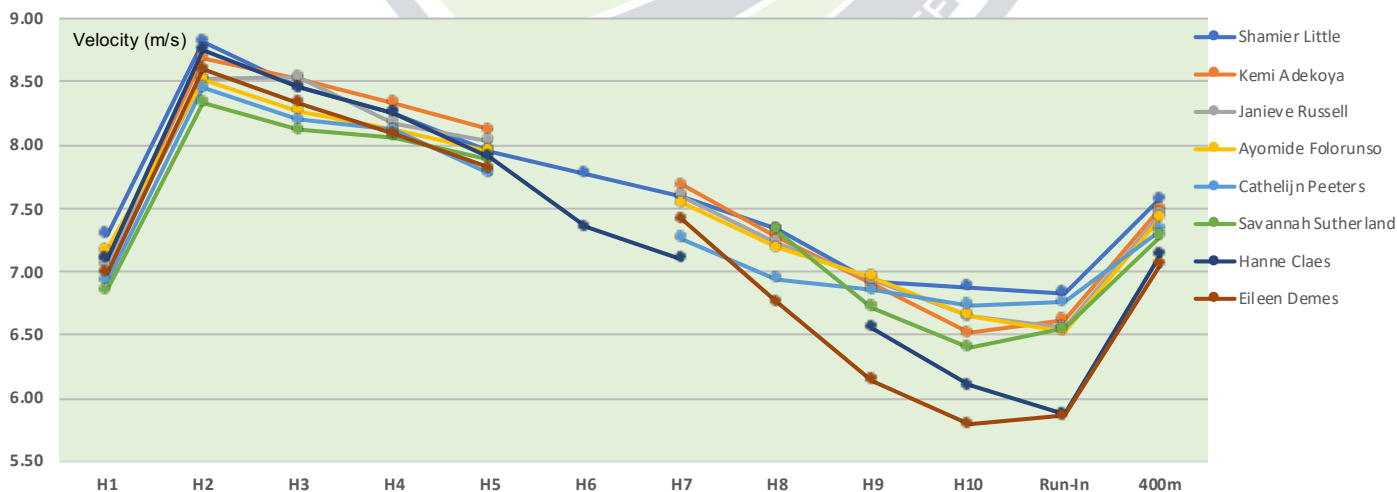
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.22

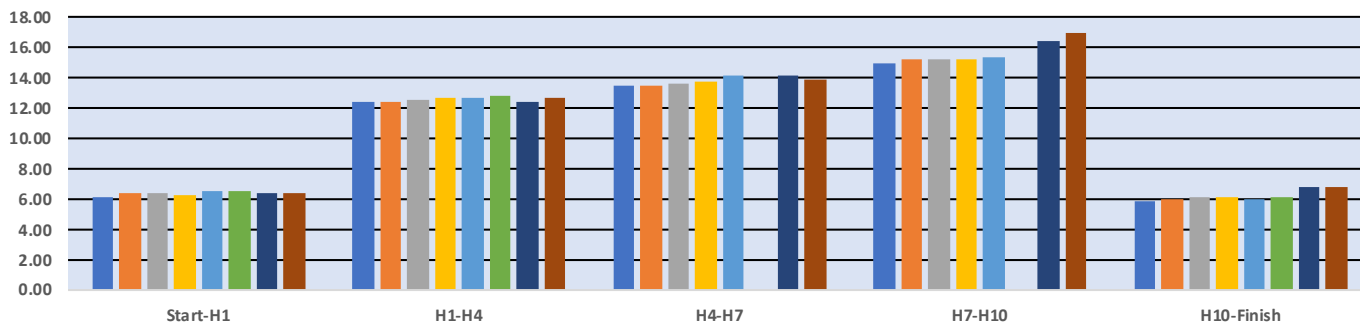
Semi-Final 3

		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	6.17	10.14	14.28	18.52	22.92	27.42	32.03	36.80	41.86	46.95	52.81	52.81	8 / 1			
	reaction time	0.212	interval	3.97	4.14	4.24	4.40	4.50	4.61	4.77	5.06	5.09	5.86		12.35	13.51	14.92
	velocity	7.29	8.82	8.45	8.25	7.95	7.78	7.59	7.34	6.92	6.88	6.83	7.57		8.50	7.77	7.04
	H1 lead leg	R	strides	23	15	15	15	15	15	15	16	16	19.2	179.2			
Adekoya, Kemi (BRN) (1993)	time	6.34	10.37	14.48	18.68	22.99		32.10	36.91	41.98	47.35		53.39	6 / 2			
	reaction time	0.195	interval	4.03	4.11	4.20	4.31	4.50	4.81	5.07	5.37	6.04	NR		12.34	13.42	15.25
	velocity	7.10	8.68	8.52	8.33	8.12		7.68	7.28	6.90	6.52	6.62	7.49		8.51	7.82	6.89
	H1 lead leg	R	strides	23	15	15	15	15	15	16	17	19.7	150.7				
Russell, Janieve (JAM) (1993)	time	6.37	10.48	14.58	18.86	23.22		32.43	37.27	42.32	47.59		53.69	7 / 3			
	reaction time	0.180	interval	4.11	4.10	4.28	4.36	4.50	4.84	5.05	5.27	6.10			12.49	13.57	15.16
	velocity	7.06	8.52	8.54	8.18	8.03		7.60	7.23	6.93	6.64	6.56	7.45		8.41	7.74	6.93
	H1 lead leg	R	strides	23	15	15	15	15	16	17	17	20	153				
Folorunso, Ayomide (ITA) (1996)	time	6.27	10.38	14.61	18.92	23.32		32.60	37.47	42.50	47.76		53.89	5 / 4			
	reaction time	0.190	interval	4.11	4.23	4.31	4.40	4.50	4.87	5.03	5.26	6.13	NR		12.65	13.68	15.16
	velocity	7.18	8.52	8.27	8.12	7.95		7.54	7.19	6.96	6.65	6.53	7.42		8.30	7.68	6.93
	H1 lead leg	L	strides	23	15	15	15	16	16	16	17	20.5	153.5				
Peeters, Cathelijn (NED) (1996)	time	6.50	10.64	14.91	19.22	23.72		33.36	38.40	43.51	48.71		54.63	4 / 5			
	reaction time	0.248	interval	4.14	4.27	4.31	4.50	4.64	5.04	5.11	5.20	5.92			12.72	14.14	15.35
	velocity	6.92	8.45	8.20	8.12	7.78		7.26	6.94	6.85	6.73	6.76	7.32		8.25	7.43	6.84
	H1 lead leg	R	strides	22	15	15	15	15	16	16	16	19.2	165.2				
Sutherland, Savannah (CAN) (2003)	time	6.57	10.77	15.08	19.42	23.86		34.34	39.48	44.62	49.76		54.99	2 / 6			
	reaction time	0.214	interval	4.20	4.31	4.34	4.44	4.50	4.84	5.01	5.17	6.11			12.85		
	velocity	6.85	8.33	8.12	8.06	7.88		7.32	6.94	6.72	6.40	6.55	7.27		8.17		
	H1 lead leg	R	strides	23	15	15	15	15	16	16	17	20	136				
Claes, Hanne (BEL) (1991)	time	6.34	10.34	14.48	18.72	23.15	27.91	32.84		37.99	43.14	48.29	53.44	9 / 7			
	reaction time	0.208	interval	4.00	4.14	4.24	4.43	4.76	4.93	5.11	5.29	6.81			12.38	14.12	16.41
	velocity	7.10	8.75	8.45	8.25	7.90	7.35	7.10		6.56	6.10	5.87	7.14		8.48	7.44	6.40
	H1 lead leg	R	strides	23	15	15	15	15	16	16	16	18	21	170			
Demes, Eileen (GER) (1997)	time	6.44	10.51	14.71	19.04	23.52		32.96	38.14	43.84	49.88		56.71	3 / 8			
	reaction time	0.166	interval	4.07	4.20	4.33	4.48	4.64	5.18	5.70	6.04	6.83			12.60	13.92	16.92
	velocity	6.99	8.60	8.33	8.08	7.81		7.42	6.76	6.14	5.79	5.86	7.05		8.33	7.54	6.21
	H1 lead leg	R	strides	22	14	14	14	14	16	17	17	20	148				



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=rqF4xRAdpoA>

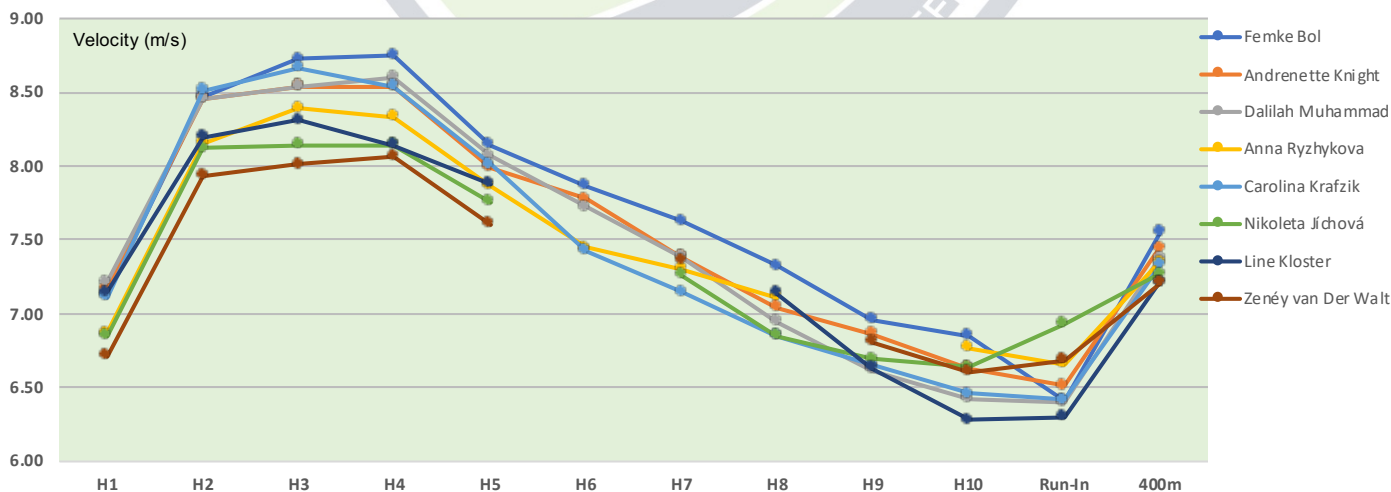
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.22

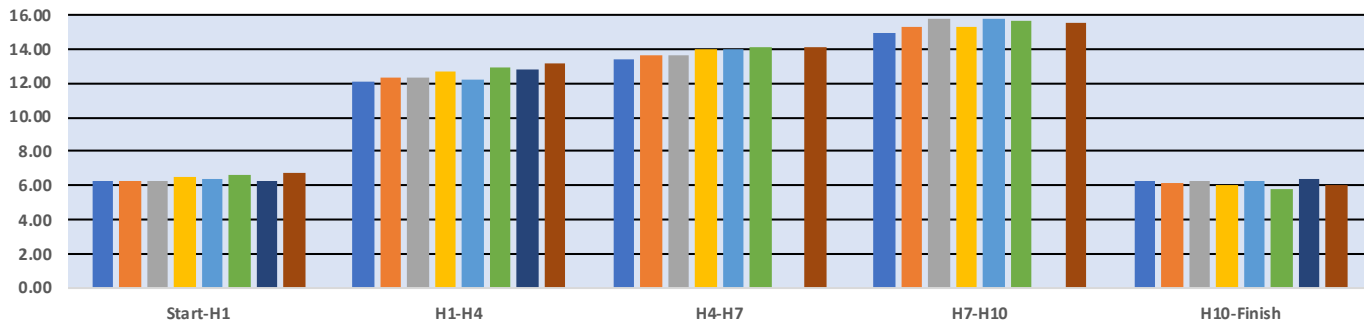
Semi-Final 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Bol, Femke (NED) (2000)</b>	time	6.31	10.44	14.45	18.45	22.75	27.20	31.79	36.57	41.60	46.71	52.95		8 / 1			
	reaction time	0.199	interval	4.13	4.01	4.00	4.30	4.45	4.59	4.78	5.03	5.11	6.24		12.14	13.34	14.92
	H1 lead leg	L	velocity	7.13	8.47	8.73	8.75	8.14	7.87	7.63	6.96	6.85	6.41	7.55		8.65	7.87
			strides	22	14	14	14	14	14	15	15	15	18.5	169.5			
<b>Knight, Andrenette (JAM) (1996)</b>	time	6.27	10.41	14.51	18.61	22.99	27.49	32.23	37.20	42.30	47.58	53.72		7 / 2			
	reaction time	0.163	interval	4.14	4.10	4.10	4.38	4.50	4.74	4.97	5.10	5.28	6.14		12.34	13.62	15.35
	H1 lead leg	R	velocity	7.18	8.45	8.54	8.54	7.99	7.78	7.38	7.04	6.86	6.63	6.51	7.45	8.51	7.71
			strides	23	15	15	15	15	15	16	16	17	20	182			
<b>Muhammad, Dalilah (USA) (1990)</b>	time	6.24	10.38	14.48	18.55	22.89	27.42	32.16	37.20	42.49	47.94	54.19		6 / 3			
	reaction time	0.169	interval	4.14	4.10	4.07	4.34	4.53	4.74	5.04	5.29	5.45	6.25		12.31	13.61	15.78
	H1 lead leg	R	velocity	7.21	8.45	8.54	8.60	8.06	7.73	7.38	6.94	6.62	6.42	6.40	7.38	8.53	7.71
			strides	22	14	14	15	15	15	15	16	16	16	19.7	176.7		
<b>Ryzhykova, Anna (UKR) (1989)</b>	time	6.55	10.84	15.01	19.21	23.66	28.36	33.15	38.07	42.93	48.41	54.42		9 / 4			
	reaction time	0.186	interval	4.29	4.17	4.20	4.45	4.70	4.79	4.92	5.10	5.34	6.01		12.66	13.94	15.26
	H1 lead leg	R	velocity	6.87	8.16	8.39	8.33	7.87	7.45	7.31	7.11	6.77	6.66	7.35	8.29	7.53	6.88
			strides	22	14	14	14	15	15	15	15	15	19.2	157.2			
<b>Krafzik, Carolina (GER) (1995)</b>	time	6.33	10.44	14.48	18.58	22.95	27.66	32.56	37.67	42.93	48.35	54.58		5 / 5			
	reaction time	0.192	interval	4.11	4.04	4.10	4.37	4.71	4.90	5.11	5.26	5.42	6.23		12.25	13.98	15.79
	H1 lead leg	L	velocity	7.11	8.52	8.66	8.54	8.01	7.43	7.14	6.85	6.65	6.46	6.42	7.33	8.57	7.51
			strides	23	15	15	15	15	17	17	17	17	21.7	189.7			
<b>Jichová, Nikoleta (CZE) (2000)</b>	time	6.57	10.88	15.18	19.48	23.99	28.99	33.63	38.74	43.97	49.24	55.01		4 / 6			
	reaction time	0.229	interval	4.31	4.30	4.30	4.51	4.64	5.11	5.23	5.27	5.77	6.40		12.91	14.15	15.61
	H1 lead leg	R	velocity	6.85	8.12	8.14	8.14	7.76	7.26	6.85	6.69	6.64	6.93	7.27	8.13	7.42	6.73
			strides	22	15	15	15	15	16	16	16	20.7	150.7				
<b>Kloster, Line (NOR) (1990)</b>	time	6.30	10.57	14.78	19.08	23.52	28.52	33.93	38.23	43.51	49.08	55.43		2 / 7			
	reaction time	0.152	interval	4.27	4.21	4.30	4.44	4.71	4.92	5.11	5.26	6.35	6.40		12.78		
	H1 lead leg	R	velocity	7.14	8.20	8.31	8.14	7.88	7.14	6.63	6.28	6.30	7.22	8.22			
			strides	22	14	14	15	15	16	16	17	20	149				
<b>van Der Walt, Zenéy (RSA) (2000)</b>	time	6.70	11.11	15.48	19.82	24.42	29.42	33.93	38.23	43.51	49.51	55.49		3 / 8			
	reaction time	0.212	interval	4.41	4.37	4.34	4.60	4.91	5.11	5.26	5.30	5.98	6.40		13.12	14.11	15.58
	H1 lead leg	L	velocity	6.72	7.94	8.01	8.06	7.61	7.36	6.81	6.60	6.69	7.21	8.00	7.44	6.74	
			strides	23	15	15	15	15	16	16	16	19.5	134.5				



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=XuWVBzvZ5ZA>

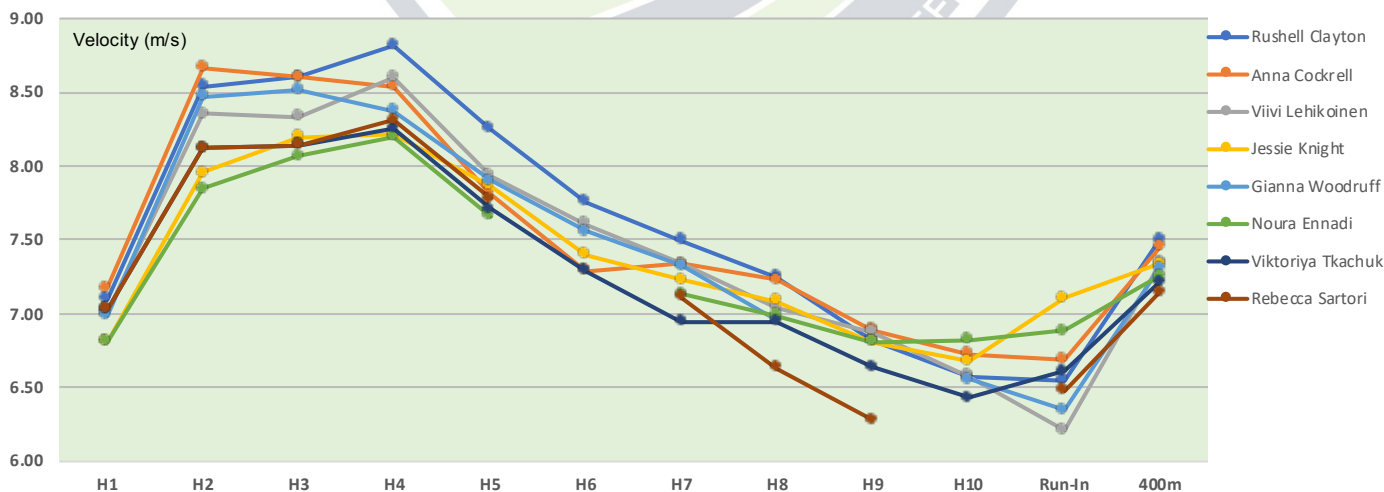
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.22

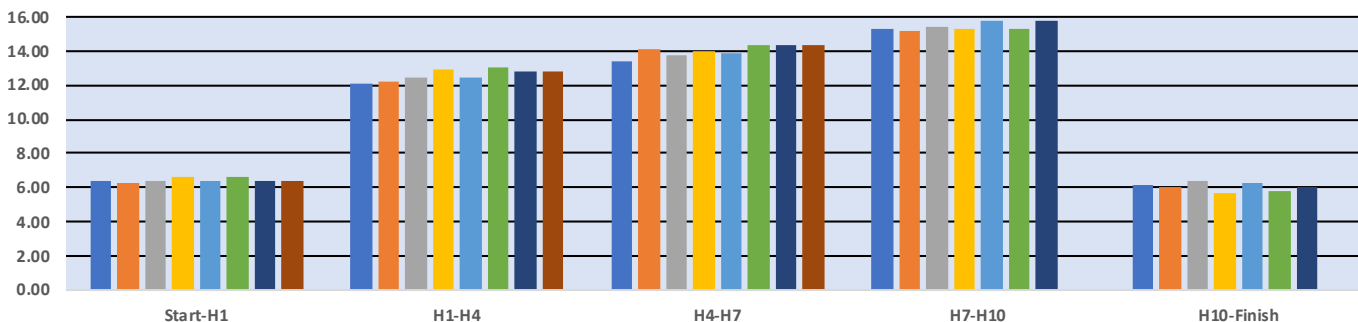
Semi-Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Clayton, Rushell (JAM) (1992)</b>	time	6.34	10.44	14.51	18.48	22.72	27.23	31.90	36.73	41.86	47.19		53.30	5 / 1			
	reaction time	0.190															
	interval		4.10	4.07	3.97	4.24	4.51	4.67	4.83	5.13	5.33	6.11					
	velocity	7.10	8.54	8.60	8.82	8.25	7.76	7.49	7.25	6.82	6.57	6.55	7.50		12.14	13.42	15.29
H1 lead leg	L												174		8.65	7.82	6.87
<b>Cockrell, Anna (USA) (1997)</b>	time	6.27	10.31	14.38	18.48	22.96	27.76	32.53	37.37	42.45	47.65		53.63	7 / 2			
	reaction time	0.199															
	interval		4.04	4.07	4.10	4.48	4.80	4.77	4.84	5.08	5.20	5.98					
	velocity	7.18	8.66	8.60	8.54	7.81	7.29	7.34	7.23	6.89	6.73	6.69	7.46		12.21	14.05	15.12
H1 lead leg	R												173		8.60	7.47	6.94
<b>Lehikoinen, Viivi (FIN) (1999)</b>	time	6.42	10.61	14.81	18.88	23.29	27.89	32.66	37.63	42.72	48.04		54.48	4 / 3			
	reaction time	0.200															
	interval		4.19	4.20	4.07	4.41	4.60	4.77	4.97	5.09	5.32	6.44					
	velocity	7.01	8.35	8.33	8.60	7.94	7.61	7.34	7.04	6.88	6.58	6.21	7.34		12.46	13.78	15.38
H1 lead leg	R												187		8.43	7.62	6.83
<b>Knight, Jessie (GBR) (1994)</b>	time	6.61	11.01	15.28	19.54	23.99	28.72	33.56	38.50	43.64	48.88		54.51	8 / 4			
	reaction time	0.187															
	interval		4.40	4.27	4.26	4.45	4.73	4.84	4.94	5.14	5.24	5.63					
	velocity	6.81	7.95	8.20	8.22	7.87	7.40	7.23	7.09	6.81	6.68	7.10	7.34		12.93	14.02	15.32
H1 lead leg	R												139		8.12	7.49	6.85
<b>Woodruff, Gianna (PAN) (1993)</b>	time	6.44	10.57	14.68	18.86	23.29	27.92	32.70	37.73		48.41		54.71	9 / 5			
	reaction time	0.208															
	interval		4.13	4.11	4.18	4.43	4.63	4.78	5.03		10.68	6.30					
	velocity	6.99	8.47	8.52	8.37	7.90	7.56	7.32	6.96		6.55	6.35	7.31		12.42	13.84	15.71
H1 lead leg	L												128		8.45	7.59	6.68
<b>Ennadi, Noura (MAR) (1999)</b>	time	6.61	11.07	15.41	19.68	24.25		34.06	39.07	44.21	49.34		55.15	2 / 6			
	reaction time	0.184															
	interval		4.46	4.34	4.27	4.57		9.81	5.01	5.14	5.13	5.81					
	velocity	6.81	7.85	8.06	8.20	7.66		7.14	6.99	6.81	6.82	6.88	7.25		13.07	14.38	15.28
H1 lead leg	L												105		8.03	7.30	6.87
<b>Tkachuk, Viktoriya (UKR) (1994)</b>	time	6.40	10.71	15.01	19.25	23.79	28.59	33.63	38.67	43.94	49.38		55.43	6 / 7			
	reaction time	0.209															
	interval		4.31	4.30	4.24	4.54	4.80	5.04	5.04	5.27	5.44	6.05					
	velocity	7.03	8.12	8.14	8.25	7.71	7.29	6.94	6.94	6.64	6.43	6.61	7.22		12.85	14.38	15.75
H1 lead leg	L												163		8.17	7.30	6.67
<b>Sartori, Rebecca (ITA) (1997)</b>	time	6.40	10.71	15.01	19.22	23.72		33.56	38.84	44.41			55.98	3 / 8			
	reaction time	0.213															
	interval		4.31	4.30	4.21	4.50		9.84	5.28	5.57		11.57					
	velocity	7.03	8.12	8.14	8.31	7.78		7.11	6.63	6.28		6.48	7.15		12.82	14.34	
H1 lead leg	L												133		8.19	7.32	



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=Y6Gs0m1edYI>

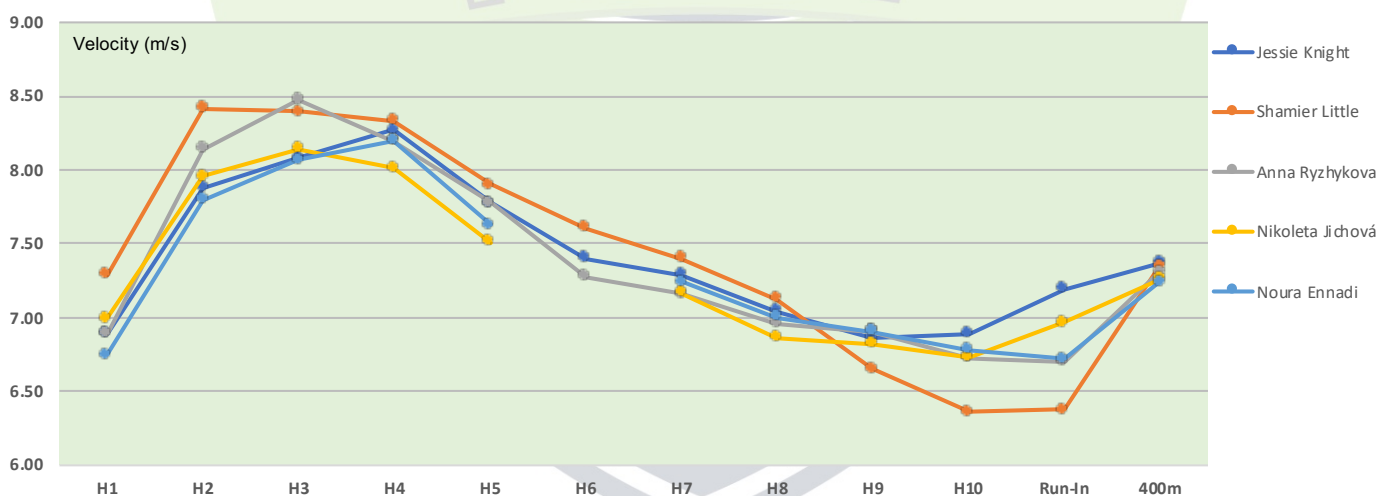
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.21

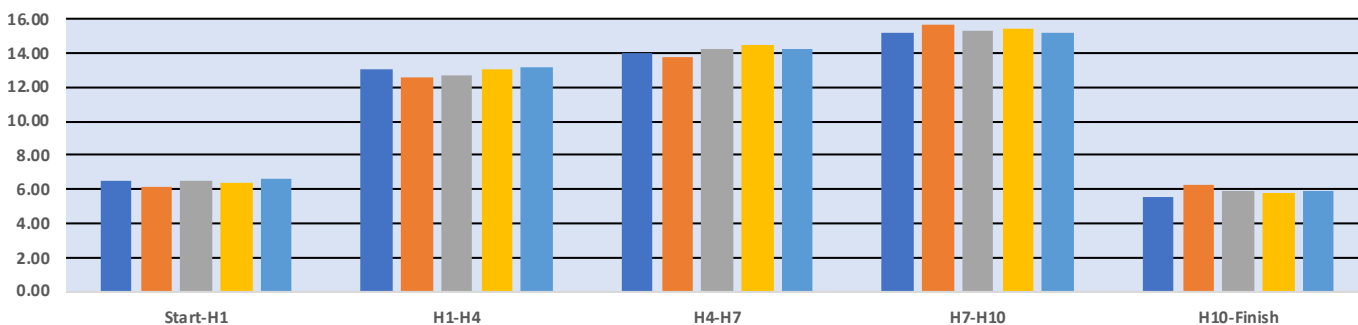
Heat 5

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Knight, Jessie (GBR) (1994)</b>	time	6.53	10.97	15.30	19.53	24.03	28.76	33.56	38.53	43.63	48.71	54.27	54.27	8 / 1			
	reaction time	0.161													13.00	14.03	15.15
	interval	6.89	7.88	8.08	8.27	7.78	7.40	7.29	7.04	6.86	6.89	7.19	7.37		8.08	7.48	6.93
	H1 lead leg	R															
	strides	22	14	14	14	14	15	15	15	15	15	18.5	171.5				
<b>Little, Shamier (USA) (1995)</b>	time	6.17	10.33	14.50	18.70	23.13	27.73	32.46	37.37	42.63	48.13	54.40	54.40	4 / 2			
	reaction time	0.215													12.53	13.76	15.67
	interval	7.29	8.41	8.39	8.33	7.90	7.61	7.40	7.13	6.65	6.36	6.38	7.35		8.38	7.63	6.70
	H1 lead leg	R															
	strides	23	15	15	15	15	15	15	15	16	17	19.2	180.2				
<b>Ryzhykova, Anna (UKR) (1989)</b>	time	6.53	10.83	14.96	19.23	23.73	28.54	33.43	38.46	43.53	48.73	54.70	54.70	7 / 3			
	reaction time	0.186													12.70	14.20	15.30
	interval	6.89	8.14	8.47	8.20	7.78	7.28	7.16	6.96	6.90	6.73	6.70	7.31		8.27	7.39	6.86
	H1 lead leg	R															
	strides	22	14	14	14	14	15	15	15	15	15	19	172				
<b>Jíchová, Nikoleta (CZE) (2000)</b>	time	6.43	10.83	15.13	19.50	24.16		33.93	39.03	44.16	49.36	55.10	55.10	3 / 4			
	reaction time	0.206													13.07	14.43	15.43
	interval	7.00	7.95	8.14	8.01	7.51		9.77	5.10	5.13	5.20	5.74	7.26		8.03	7.28	6.80
	H1 lead leg	R															
	strides	22	15	15	15	15		16	17	17	21	153					
<b>Ennadi, Noura (MAR) (1999)</b>	time	6.67	11.16	15.50	19.77	24.36		34.03	39.03	44.10	49.26	55.21	55.21	2 / 5			
	reaction time	0.178													13.10	14.26	15.23
	interval	6.75	7.80	8.06	8.20	7.63		9.67	5.00	5.07	5.16	5.95	7.25		8.02	7.36	6.89
	H1 lead leg	L															
	strides	24		15	15	15		17	17	17	20	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=JAgk2zqOPzA>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.21

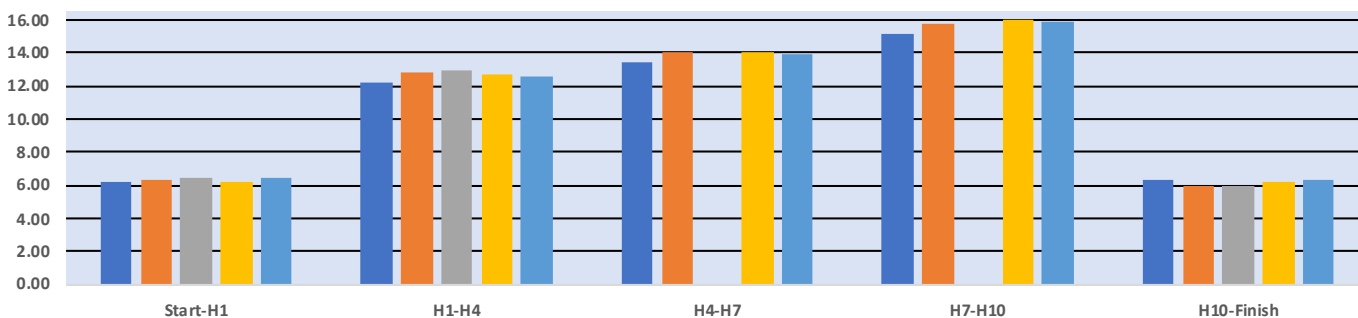
Heat 4

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Bol, Femke (NED) (2000)</b>	time	6.27	10.43	14.50	18.43	22.70	27.23	31.90	36.76	41.80	47.00		53.39	4 / 1			
	reaction time	0.206															
	interval		4.16	4.07	3.93	4.27	4.53	4.67	4.86	5.04	5.20	6.39			12.16	13.47	15.10
	velocity	7.18	8.41	8.60	8.91	8.20	7.73	7.49	7.20	6.94	6.73	6.26	7.49		8.63	7.80	6.95
H1 lead leg	L												171.5				
<b>Tkachuk, Viktoriya (UKR) (1994)</b>	time	6.37	10.66	15.00	19.23	23.76	28.40	33.26	38.36	43.56	49.03		55.05	6 / 2			
	reaction time	0.201															
	interval		4.29	4.34	4.23	4.53	4.64	4.86	5.10	5.20	5.47	6.02			12.86	14.03	15.77
	velocity	7.06	8.16	8.06	8.27	7.73	7.54	7.20	6.86	6.73	6.40	6.64	7.27		8.16	7.48	6.66
H1 lead leg	L												182				
<b>Claes, Hanne (BEL) (1991)</b>	time	6.43	10.76	15.16	19.43	23.96			38.64	43.86	49.16		55.13	1 / 3			
	reaction time	0.193															
	interval		4.33	4.40	4.27	4.53			14.68	5.22	5.30	5.97			13.00		
	velocity	7.00	8.08	7.95	8.20	7.73			7.15	6.70	6.60	6.70	7.26		8.08		
H1 lead leg	R												137.5				
<b>Kloster, Line (NOR) (1990)</b>	time	6.26	10.53	14.70	18.93	23.46	28.16	32.96	38.03	43.46	48.96		55.23	9 / 4			
	reaction time	0.170															
	interval		4.27	4.17	4.23	4.53	4.70	4.80	5.07	5.43	5.50	6.27			12.67	14.03	16.00
	velocity	7.19	8.20	8.39	8.27	7.73	7.45	7.29	6.90	6.45	6.36	6.38	7.24		8.29	7.48	6.56
H1 lead leg	R												176.5				
<b>Demes, Eileen (GER) (1997)</b>	time	6.50	10.73	14.90	19.06	23.56	28.20	33.00	38.06	43.30	48.94		55.29	5 / 5			
	reaction time	0.169															
	interval		4.23	4.17	4.16	4.50	4.64	4.80	5.06	5.24	5.64	6.35	<b>PB</b>		12.56	13.94	15.94
	velocity	6.92	8.27	8.39	8.41	7.78	7.54	7.29	6.92	6.68	6.21	6.30	7.23		8.36	7.53	6.59
H1 lead leg	R												178				



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=JAgk2zqOPzA>

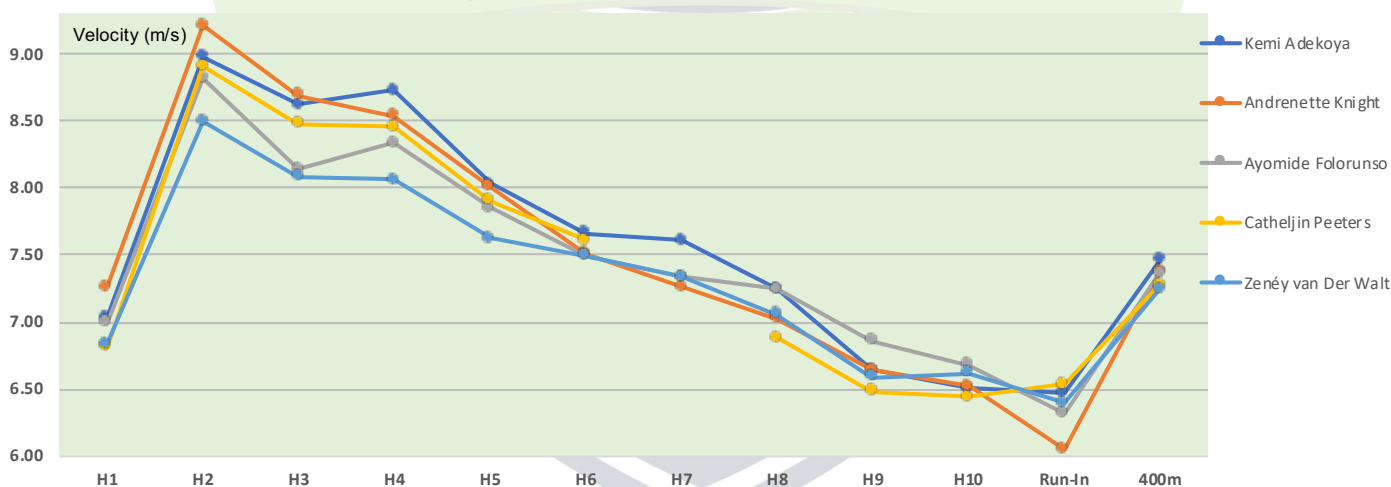
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.21

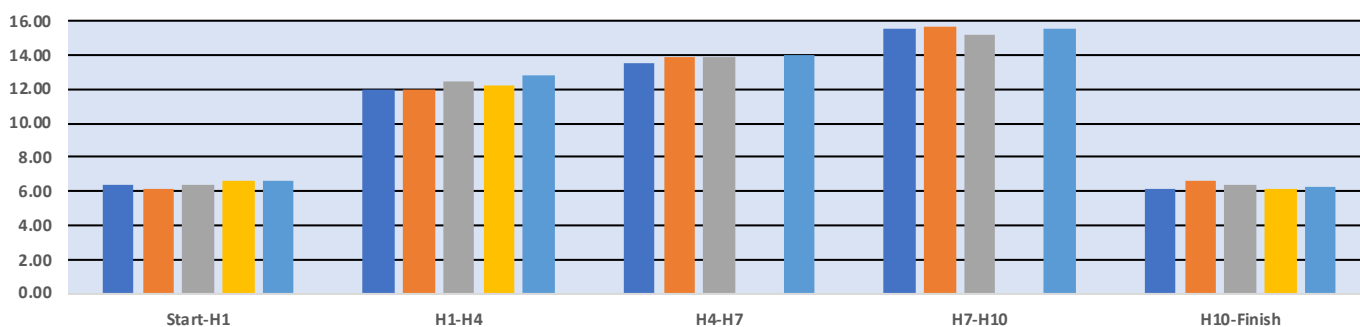
Heat 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Adekoya, Kemi (BRN) (1993)</b>	time	6.40	10.30	14.36	18.37	22.73	27.30	31.90	36.73	42.00	47.38		53.56	8 / 1			
	reaction time	0.191															
	interval		3.90	4.06	4.01	4.36	4.57	4.60	4.83	5.27	5.38	6.18	AR		11.97	13.53	15.48
	velocity		7.03	8.97	8.62	8.73	8.03	7.66	7.61	7.25	6.64	6.51	6.47	7.47	8.77	7.76	6.78
H1 lead leg	R																
<b>Knight, Andrenette (JAM) (1996)</b>	time	6.20	10.00	14.03	18.13	22.50	27.16	31.98	36.96	42.23	47.60		54.21	5 / 2			
	reaction time	0.165															
	interval		3.80	4.03	4.10	4.37	4.66	4.82	4.98	5.27	5.37	6.61			11.93	13.85	15.62
	velocity		7.26	9.21	8.68	8.54	8.01	7.51	7.26	7.03	6.64	6.52	6.05	7.38	8.80	7.58	6.72
H1 lead leg	R																
<b>Folorunso, Ayomide (ITA) (1996)</b>	time	6.43	10.40	14.70	18.90	23.36	28.03	32.80	37.63	42.73	47.97		54.30	9 / 3			
	reaction time	0.189															
	interval		3.97	4.30	4.20	4.46	4.67	4.77	4.83	5.10	5.24	6.33			12.47	13.90	15.17
	velocity		7.00	8.82	8.14	8.33	7.85	7.49	7.34	7.25	6.86	6.68	6.32	7.37	8.42	7.55	6.92
H1 lead leg	L																
<b>Peeters, Cathelijn (NED) (1996)</b>	time	6.60	10.53	14.66	18.80	23.23	27.83		38.00	43.40	48.83		54.95	2 / 4			
	reaction time	0.247															
	interval		3.93	4.13	4.14	4.43	4.60		10.17	5.40	5.43	6.12			12.20		
	velocity		6.82	8.91	8.47	8.45	7.90	7.61		6.88	6.48	6.45	6.54	7.28	8.61		
H1 lead leg	R																
<b>van Der Walt, Zenéy (RSA) (2000)</b>	time	6.58	10.70	15.03	19.37	23.96	28.63	33.40	38.36	43.67	48.96		55.21	7 / 5			
	reaction time	0.203															
	interval		4.12	4.33	4.34	4.59	4.67	4.77	4.96	5.31	5.29	6.25			12.79	14.03	15.56
	velocity		6.84	8.50	8.08	8.06	7.63	7.49	7.34	7.06	6.59	6.62	6.40	7.25	8.21	7.48	6.75
H1 lead leg	L																



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

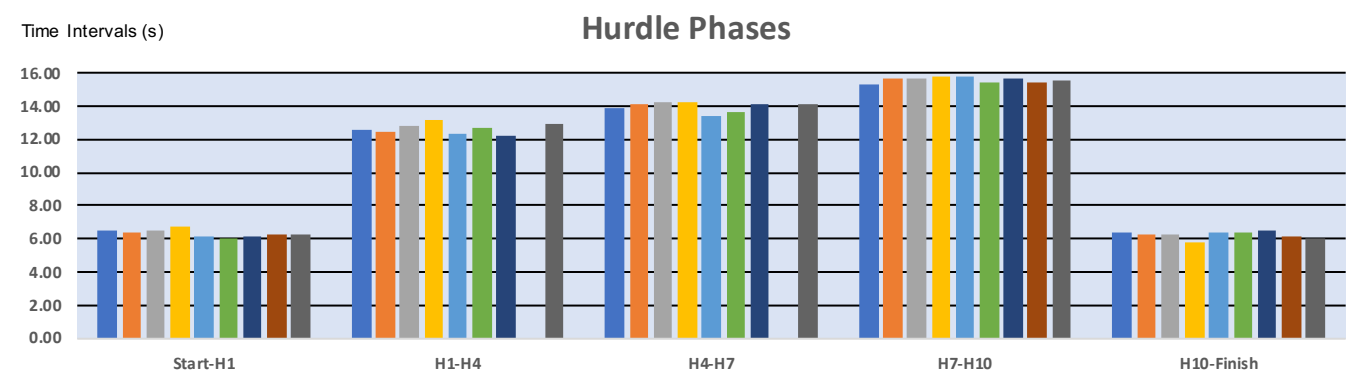
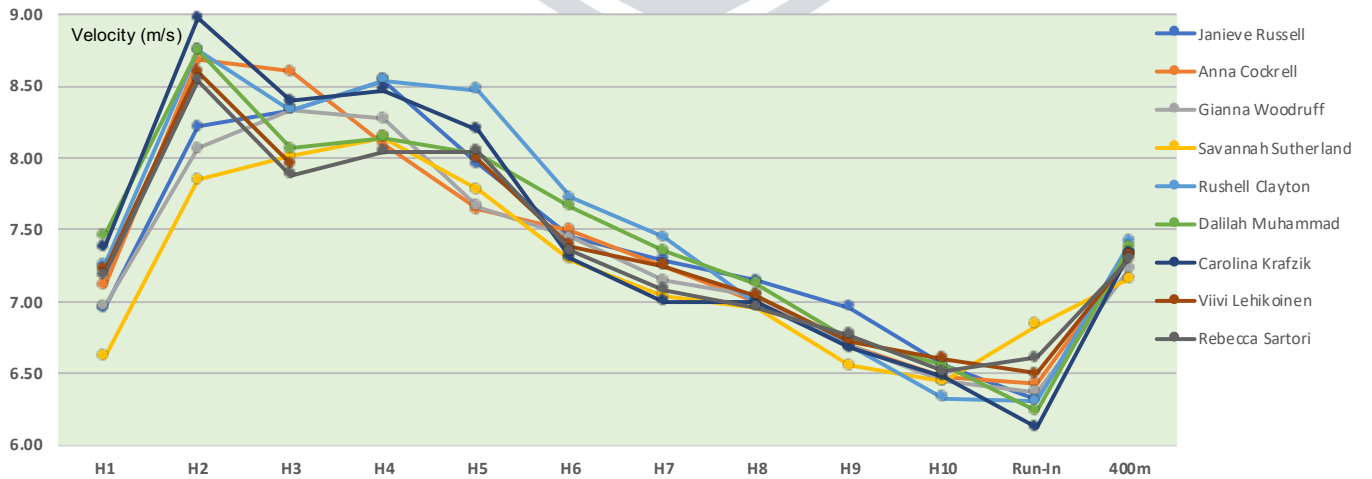
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2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

		Date 2023.08.21													Heat 2						
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10				
Russell, Janieve (JAM) (1993)	time	6.47	10.73	14.93	19.03	23.43	28.13	32.93	37.83	42.86	48.20		54.53	4 / 1	12.56	13.90	15.27				
	reaction time	0.164	interval	4.26	4.20	4.10	4.40	4.70	4.80	4.90	5.03	5.34	6.33								
	velocity	6.96	8.22	8.33	8.33	8.54	7.95	7.45	7.29	7.14	6.96	6.55	6.32					7.34		8.36	7.55
	H1 lead leg	R	23	15	15	15	15	16	16	16	16	17	20								
Cockrell, Anna (USA) (1997)	time	6.33	10.36	14.43	18.75	23.33	28.00	32.83	37.83	43.06	48.46		54.68	9 / 2	12.42	14.08	15.63				
	reaction time	0.211	interval	4.03	4.07	4.32	4.58	4.67	4.83	5.00	5.23	5.40	6.22								
	velocity	7.11	8.68	8.60	8.10	7.64	7.49	7.25	7.00	6.69	6.48	6.43	7.32					7.32		8.45	7.46
	H1 lead leg	R	22	14	14	15	15	15	15	15	16	16	19.2	176.2							
Woodruff, Gianna (PAN) (1993)	time	6.46	10.80	15.00	19.23	23.80	28.50	33.40	38.37	43.60	49.03		55.31	2 / 3	12.77	14.17	15.63				
	reaction time	0.171	interval	4.34	4.20	4.23	4.57	4.70	4.90	4.97	5.23	5.43	6.28								
	velocity	6.97	8.06	8.33	8.27	7.66	7.45	7.14	7.04	6.69	6.45	6.37	7.23					7.23		8.22	7.41
	H1 lead leg	L	22	15	15	15	15	15	16	16	17	17	19.7	182.7							
Sutherland, Savannah (CAN) (2003)	time	6.80	11.26	15.63	19.93	24.43	29.23	34.20	39.23	44.57	50.00		55.85	5 / 4	13.13	14.27	15.80				
	reaction time	0.227	interval	4.46	4.37	4.30	4.50	4.80	4.97	5.03	5.34	5.85									
	velocity	6.62	7.85	8.01	8.14	7.78	7.29	7.04	6.96	6.55	6.45	6.84	7.16					7.16		8.00	7.36
	H1 lead leg	R	23	15	15	15	15	16	16	16	17	17	20	185							

		Date 2023.08.21													Heat 1					
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10			
Clayton, Rushell (JAM) (1992)	time	6.20	10.20	14.40	18.50	22.63	27.16	31.86	36.87	42.10	47.63		53.97	3 / 1	12.30	13.36	15.77			
	reaction time	0.156	interval	4.00	4.20	4.10	4.13	4.53	4.70	5.01	5.23	5.53	6.34							
	velocity	7.26	8.75	8.33	8.54	8.47	7.73	7.45	6.99	6.69	6.33	6.31	7.41					7.41		8.54
	H1 lead leg	L	22	14	14	14	14	15	15	16	16	17	19.7	176.7						
Muhammad, Dalilah (USA) (1990)	time	6.03	10.03	14.37	18.67	23.03	27.60	32.36	37.27	42.46	47.80		54.21	5 / 2	12.64	13.69	15.44			
	reaction time	0.156	interval	4.00	4.34	4.30	4.36	4.57	4.76	4.91	5.19	5.34	6.41							
	velocity	7.46	8.75	8.06	8.14	8.03	7.66	7.35	7.13	6.74	6.55	6.24	7.38					7.38		8.31
	H1 lead leg	R	22	15	15	15	15	15	15	16	16	19	178							
Krafzik, Carolina (GER) (1995)	time	6.10	10.00	14.17	18.30	22.57	27.36	32.36	37.36	42.60	48.00		54.53	8 / 3	12.20	14.06	15.64			
	reaction time	0.190	interval	3.90	4.17	4.13	4.27	4.79	5.00	5.00	5.24	5.40	6.53							
	velocity	7.38	8.97	8.39	8.47	8.20	7.31	7.00	7.00	6.68	6.48	6.13	7.34					7.34		8.61
	H1 lead leg	L	23	15	15	15	15	17	17	17	17	21.7	172.7							
Lehikoinen, Viivi (FIN) (1999)	time	6.23	10.30	14.70		23.46	28.20	33.03	38.00	43.20	48.50		54.65	2 / 4			15.47			
	reaction time	0.181	interval	4.07	4.40		8.76	4.74	4.83	4.97	5.20	5.30	6.15							
	velocity	7.22	8.60	7.95		7.99	7.38	7.25	7.04	6.73	6.60	6.50	7.32					7.32		
	H1 lead leg	R	23	15	15	15		16	16	17	17	20	154							
Sartori, Rebecca (ITA) (1997)	time	6.26	10.36	14.80	19.15	23.50	28.26	33.20	38.23	43.40	48.77		54.82	4 / 5	12.89	14.05	15.57			
	reaction time	0.203	interval	4.10	4.44	4.35	4.35	4.76	4.94	5.03	5.17	5.37	PB							
	velocity	7.19	8.54	7.88	8.05	8.05	7.35	7.09	6.96	6.77	6.52	6.61	7.30					7.30		8.15
	H1 lead leg	L	22	15	15	15	15	16	16	16	17	19.7	182.7							



Evaluated with: ObjectusVideo  
 Quality & Frame Rate: 1920 x 1080 @ 30fps  
 Timing From: Gun Flash  
 Source: <https://www.youtube.com/watch?v=JAqk2zgQPZA>



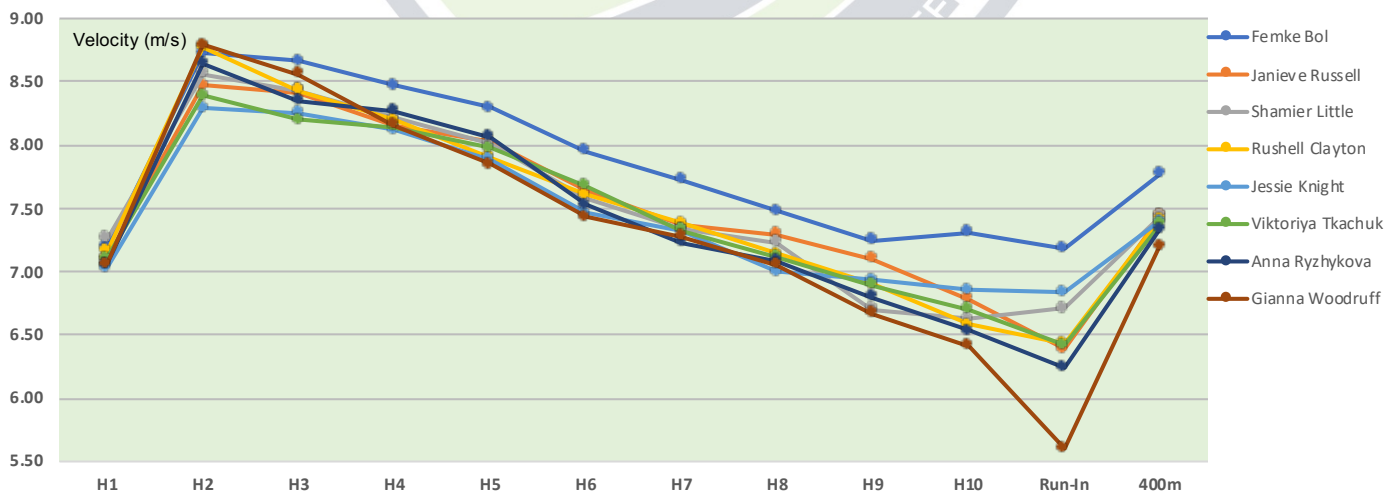
2023 London Athletics Meet (London, GBR)

Women's 400m Hurdles

Date 2023.07.23

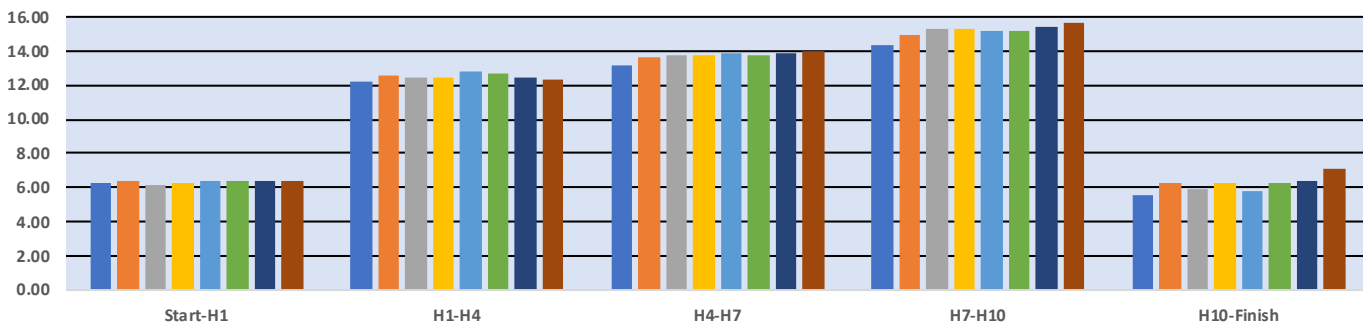
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Boi, Femke (NED) (2000)</b>	time	6.25	10.26	14.30	18.43	22.65	27.05	31.58	36.26	41.09	45.88		51.45	6 / 1			
	reaction time	0.187	interval	4.01	4.04	4.13	4.22	4.40	4.53	4.68	4.83	4.79	5.57	<b>AR PB</b>	12.18	13.15	14.30
	H1 lead leg	L	velocity	7.20	8.73	8.66	8.47	8.29	7.95	7.73	7.48	7.25	7.31	7.18	7.77	8.62	7.98
			strides	22	14	14	14	14	14	15	15	15	19	170			
<b>Russell, Janieve (JAM) (1993)</b>	time	6.33	10.46	14.62	18.91	23.27	27.85	32.60	37.40	42.33	47.49		53.75	5 / 2			
	reaction time	0.148	interval	4.13	4.16	4.29	4.36	4.58	4.75	4.80	4.93	5.16	6.26		12.58	13.69	14.89
	H1 lead leg	R	velocity	7.11	8.47	8.41	8.16	8.03	7.64	7.37	7.29	7.10	6.78	6.39	7.44	8.35	7.67
			strides	23	15	15	15	15	16	16	16	17	20	184			
<b>Little, Shamier (USA) (1995)</b>	time	6.20	10.29	14.44	18.70	23.07	27.69	32.46	37.30	42.52	47.80		53.76	4 / 3			
	reaction time	0.174	interval	4.09	4.15	4.26	4.37	4.62	4.77	4.84	5.22	5.28	5.96		12.50	13.76	15.34
	H1 lead leg	R	velocity	7.26	8.56	8.43	8.22	8.01	7.58	7.34	7.23	6.70	6.63	6.71	7.44	8.40	7.63
			strides	23	15	15	15	15	15	15	16	16	20	180			
<b>Clayton, Rushell (JAM) (1992)</b>	time	6.28	10.27	14.42	18.69	23.12	27.72	32.46	37.36	42.43	47.75		53.97	3 / 4			
	reaction time	0.131	interval	3.99	4.15	4.27	4.43	4.60	4.74	4.90	5.07	5.32	6.22		12.41	13.77	15.29
	H1 lead leg	L	velocity	7.17	8.77	8.43	8.20	7.90	7.61	7.38	7.14	6.90	6.58	6.43	7.41	8.46	7.63
			strides	22	15	15	15	15	15	15	16	16	19	178			
<b>Knight, Jessie (GBR) (1994)</b>	time	6.40	10.62	14.86	19.17	23.61	28.30	33.08	38.08	43.13	48.24		54.09	7 / 5			
	reaction time	0.182	interval	4.22	4.24	4.31	4.44	4.69	4.78	5.00	5.05	5.11	5.85	<b>=PB</b>	12.77	13.91	15.16
	H1 lead leg	R	velocity	7.03	8.29	8.25	8.12	7.88	7.46	7.32	7.00	6.93	6.85	6.84	7.40	8.22	7.55
			strides	22	14	14	14	14	15	15	15	15	19	157			
<b>Tkachuk, Viktoriya (UKR) (1994)</b>	time	6.33	10.50	14.77	19.07	23.46	28.02	32.80	37.72	42.80	48.02		54.25	2 / 6			
	reaction time	0.152	interval	4.17	4.27	4.30	4.39	4.56	4.78	4.92	5.08	5.22	6.23		12.74	13.73	15.22
	H1 lead leg	L	velocity	7.11	8.39	8.20	8.14	7.97	7.68	7.32	7.11	6.89	6.70	6.42	7.37	8.24	7.65
			strides	22	15	15	15	15		16	16	16	20.2	150.2			
<b>Ryzhykova, Anna (UKR) (1989)</b>	time	6.37	10.42	14.61	18.84	23.18	27.83	32.67	37.61	42.76	48.12		54.53	1 / 7			
	reaction time	0.166	interval	4.05	4.19	4.23	4.34	4.65	4.84	4.94	5.15	5.36	6.41		12.47	13.83	15.45
	H1 lead leg	R	velocity	7.06	8.64	8.35	8.27	8.06	7.53	7.23	7.09	6.80	6.53	6.24	7.34	8.42	7.59
			strides	22	14	14	14	14		15	15	16	20	144			
<b>Woodruff, Gianna (PAN) (1993)</b>	time	6.37	10.35	14.44	18.73	23.19	27.90	32.71	37.67	42.92	48.38		55.52	8 / 8			
	reaction time	0.201	interval	3.98	4.09	4.29	4.46	4.71	4.81	4.96	5.25	5.46	7.14		12.36	13.98	15.67
	H1 lead leg	L	velocity	7.06	8.79	8.56	8.16	7.85	7.43	7.28	7.06	6.67	6.41	5.60	7.20	8.50	7.51
			strides	23	15	15	15	15	15	15	16	17	21	167			



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 23 Jul 2023 14:08) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030C0101070101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=LkXU5aPIF5A>

Biomechanical Analysis

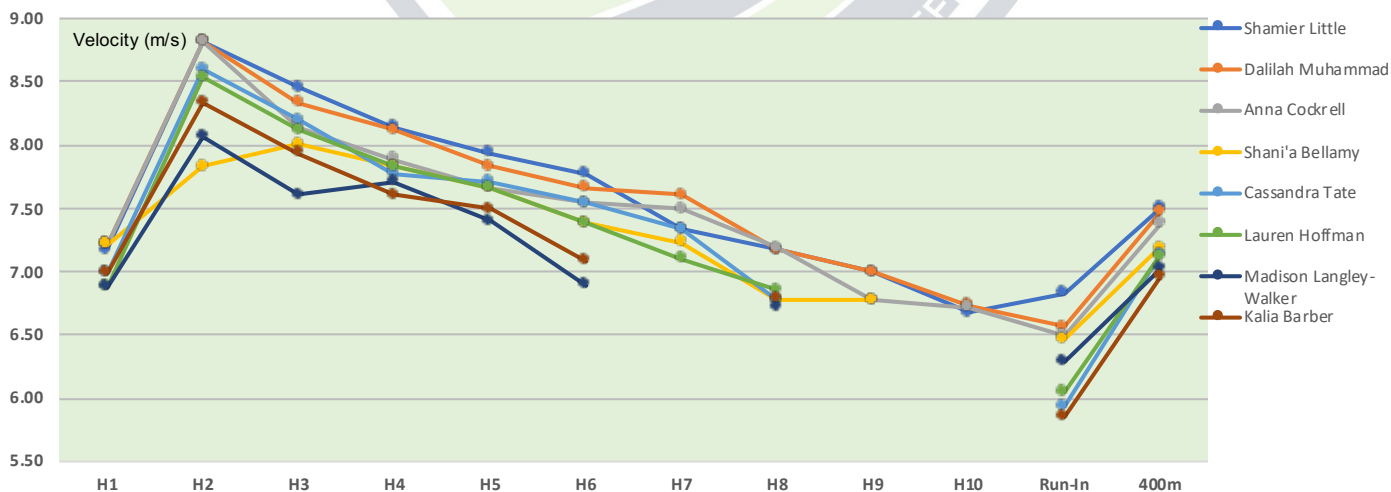
2023 USATF National Championships (Eugene, OR) (TV Analysis)

Women's 400m Hurdles

Date 2023.07.09

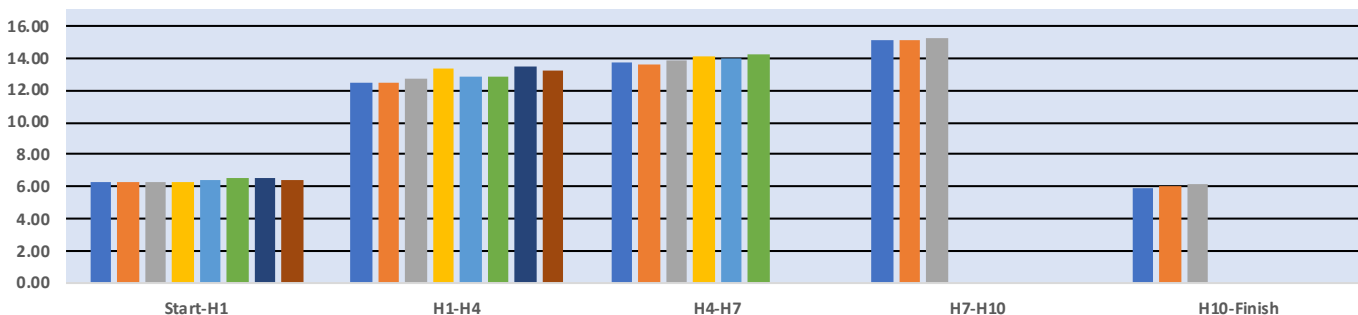
FINAL

		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	6.27	10.24	14.38	18.68	23.09	27.59	32.36	37.24	42.24	47.48		53.34	5 / 1			
	reaction time																
	interval velocity	7.18	8.82	8.45	8.14	7.94	7.78	7.34	7.17	7.00	6.68	6.83	7.50		12.41	13.68	15.12
	H1 lead leg R strides	23	15	15	15	15	15	16	16	16	16	20.2	182.2		8.46	7.68	6.94
Muhammad, Dalilah (USA) (1990)	time	6.24	10.21	14.41	18.72	23.19	27.76	32.36	37.24	42.24	47.44		53.53	4 / 2			
	reaction time																
	interval velocity	7.21	8.82	8.33	8.12	7.83	7.66	7.61	7.17	7.00	6.73	6.57	7.47		12.48	13.64	15.08
	H1 lead leg R strides	22	15	15	15	15	15	15	15	16	16	19.5	178.5		8.41	7.70	6.96
Cockrell, Anna (USA) (1997)	time	6.24	10.21	14.51	18.95	23.52	28.16	32.83	37.70	42.87	48.08		54.24	6 / 3			
	reaction time																
	interval velocity	7.21	8.82	8.14	7.88	7.66	7.54	7.49	7.19	6.77	6.72	6.49	7.37		12.71	13.88	15.25
	H1 lead leg R strides	22	14	14	14	14	15	15	15	16	16	20	175		8.26	7.56	6.89
Bellamy, Shani'a (USA) (2002)	time	6.24	10.71	15.08	19.55	24.12	28.86	33.70	38.87	44.04			55.64	3 / 4			
	reaction time											11.60					
	interval velocity	7.21	7.83	8.01	7.83	7.66	7.38	7.23	6.77	6.77		6.47	7.19		13.31	14.15	
	H1 lead leg L strides	23	15	15	15	15	15	15	16	16		114			7.89	7.42	
Tate, Cassandra (USA) (1990)	time	6.44	10.51	14.78	19.28	23.82	28.46	33.23	38.40				56.09	7 / 5			
	reaction time											17.69					
	interval velocity	6.99	8.60	8.20	7.78	7.71	7.54	7.34	6.77			5.94	7.13		12.84	13.95	
	H1 lead leg R strides	22	14	14	15	15	15	15	15			125			8.18	7.53	
Hoffman, Lauren (USA) (1999)	time	6.54	10.64	14.95	19.42	23.99	28.73	33.66	38.77				56.13	8 / 6			
	reaction time											17.36					
	interval velocity	6.88	8.54	8.12	7.83	7.66	7.38	7.10	6.85			6.05	7.13		12.88	14.24	
	H1 lead leg L strides	23	15	15	16	16	16	18	18			137			8.15	7.37	
Langley-Walker, Madison (USA) (1993)	time	6.54	10.88	15.48	20.02	24.75	29.83		40.24				56.94	2 / 7			
	reaction time											16.70					
	interval velocity	6.88	8.06	7.61	7.71	7.40	6.89		6.72			6.29	7.02		13.48		
	H1 lead leg R strides	24	16	17	16	16						89			7.79		
Barber, Kaila (USA) (1993)	time	6.44	10.64	15.05	19.65	24.32	29.26		39.57				57.51	1 / 8			
	reaction time											17.94					
	interval velocity	6.99	8.33	7.94	7.61	7.49	7.09		6.79			5.85	6.96		13.21		
	H1 lead leg R strides	23	15	15	15	15						17	100		7.95		



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=QdxnFlek1vE>

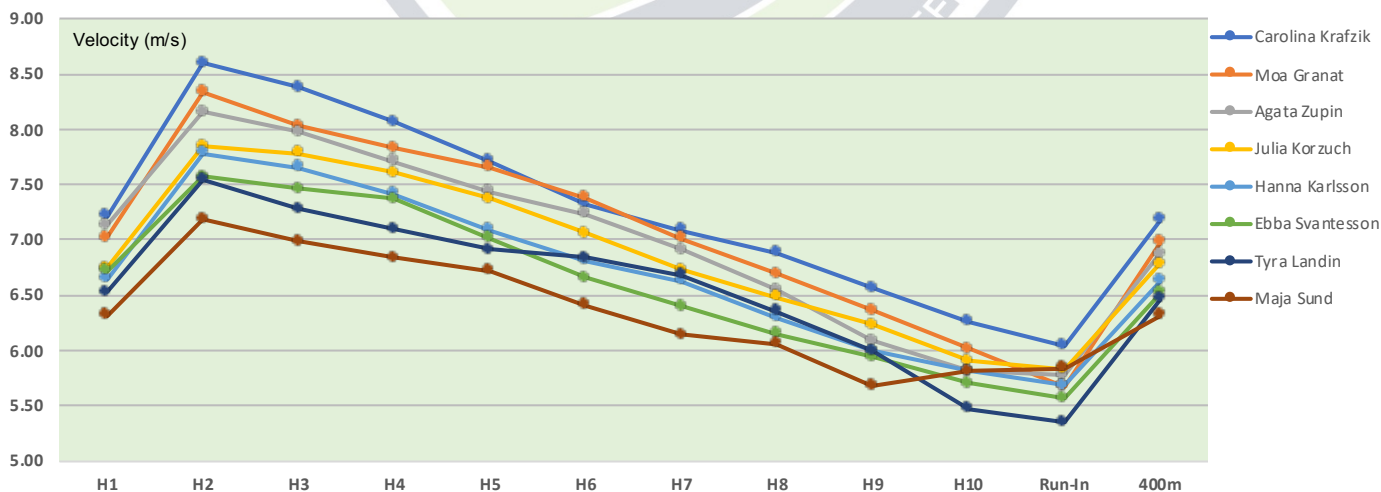
2023 Bauhaus Galan (Stockholm, SWE)

Women's 400m Hurdles

Date 2023.07.02

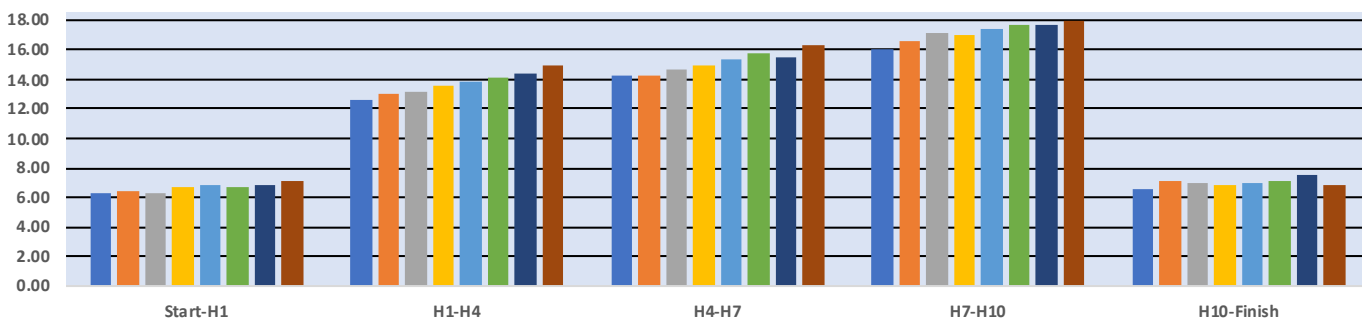
National FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10		
<b>Krafzik, Carolina (GER) (1995)</b>	time	6.24	10.31	14.49	18.83	23.37	28.15	33.09	38.17	43.50	49.09		55.71	5 / 1					
	reaction time	0.178													12.59	14.26	16.00		
	H1 lead leg		interval	7.21	8.60	8.37	8.06	7.71	7.32	7.09	6.89	6.57	6.26	6.04	6.62	7.18	0	8.34	7.36
<b>Granat, Moa (SWE) (2004)</b>	time	6.41	10.61	14.97	19.44	24.01	28.75	33.74	38.97	44.47	50.29		57.34	4 / 2					
	reaction time	0.144													13.03	14.30	16.55		
	H1 lead leg		interval	7.02	8.33	8.03	7.83	7.66	7.38	7.01	6.69	6.36	6.01	5.67	7.05	6.98	0	8.06	7.34
<b>Zupin, Agata (SLO) (1998)</b>	time	6.31	10.60	14.99	19.53	24.24	29.08	34.14	39.49	45.24	51.26		58.18	7 / 3					
	reaction time	0.164													13.22	14.61	17.12		
	H1 lead leg		interval	7.13	8.16	7.97	7.71	7.43	7.23	6.92	6.54	6.09	5.81	5.78	6.88	0	7.94	7.19	6.13
<b>Korzuch, Julia (POL) (1995)</b>	time	6.67	11.13	15.63	20.23	24.98	29.94	35.14	40.54	46.15	52.08		58.94	3 / 4					
	reaction time	0.138													13.56	14.91	16.94		
	H1 lead leg		interval	6.75	7.85	7.78	7.61	7.37	7.06	6.73	6.48	6.24	5.90	5.83	6.79	0	7.74	7.04	6.20
<b>Karlsson, Hanna (SWE) (2003)</b>	time	6.77	11.27	15.84	20.56	25.50	30.64	35.92	41.48	47.32	53.34		60.37	6 / 5					
	reaction time	0.163													13.79	15.36	17.42		
	H1 lead leg		interval	6.65	7.78	7.66	7.42	7.09	6.81	6.63	6.29	5.99	5.81	5.69	6.63	0	7.61	6.84	6.03
<b>Svantesson, Ebba (SWE) (1997)</b>	time	6.70	11.32	16.01	20.76	25.75	31.01	36.48	42.17	48.06	54.20		61.38	2 / 6					
	reaction time	0.176													14.06	15.72	17.72		
	H1 lead leg		interval	6.72	7.58	7.46	7.37	7.01	6.65	6.40	6.15	5.94	5.70	5.57	6.52	0	7.47	6.68	5.93
<b>Landin, Tyra (SWE) (2002)</b>	time	6.89	11.53	16.34	21.27	26.33	31.45	36.69	42.20	48.04	54.43		61.90	8 / 7					
	reaction time	0.174													14.38	15.42	17.74		
	H1 lead leg		interval	6.53	7.54	7.28	7.10	6.92	6.84	6.68	6.35	5.99	5.48	5.35	6.46	0	7.30	6.81	5.92
<b>Sund, Maja (SWE) (2001)</b>	time	7.12	11.99	17.00	22.12	27.33	32.79	38.49	44.26	50.42	56.44		63.29	1 / 8					
	reaction time	0.171													15.00	16.37	17.95		
	H1 lead leg		interval	6.32	7.19	6.99	6.84	6.72	6.41	6.14	6.07	5.68	5.81	5.84	6.32	0	7.00	6.41	5.85



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 2 Jul 2023 17:07) - diamond league race analysis  
<https://www.omegatiming.com/File/000203090101040101FFFFFFFF4D.pdf>

Video: No Video Found

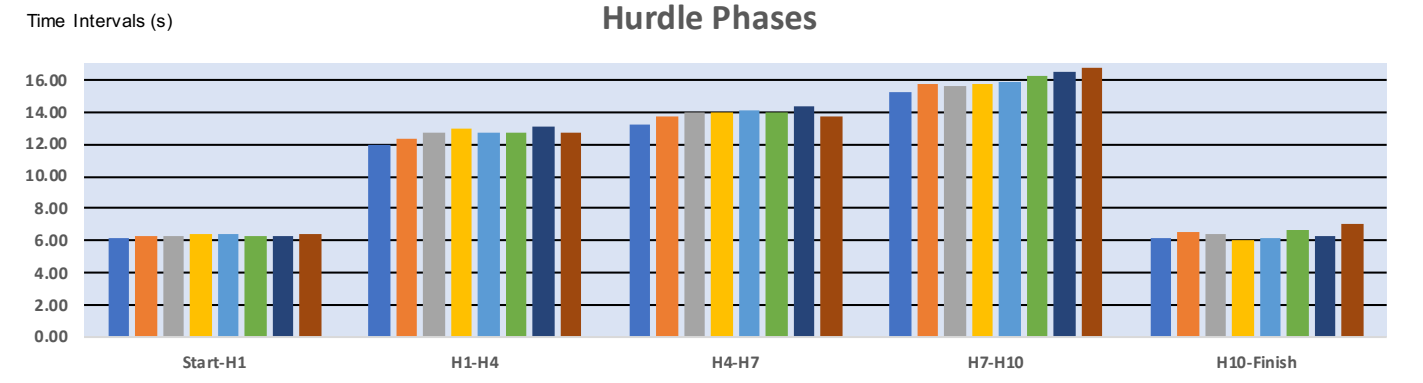
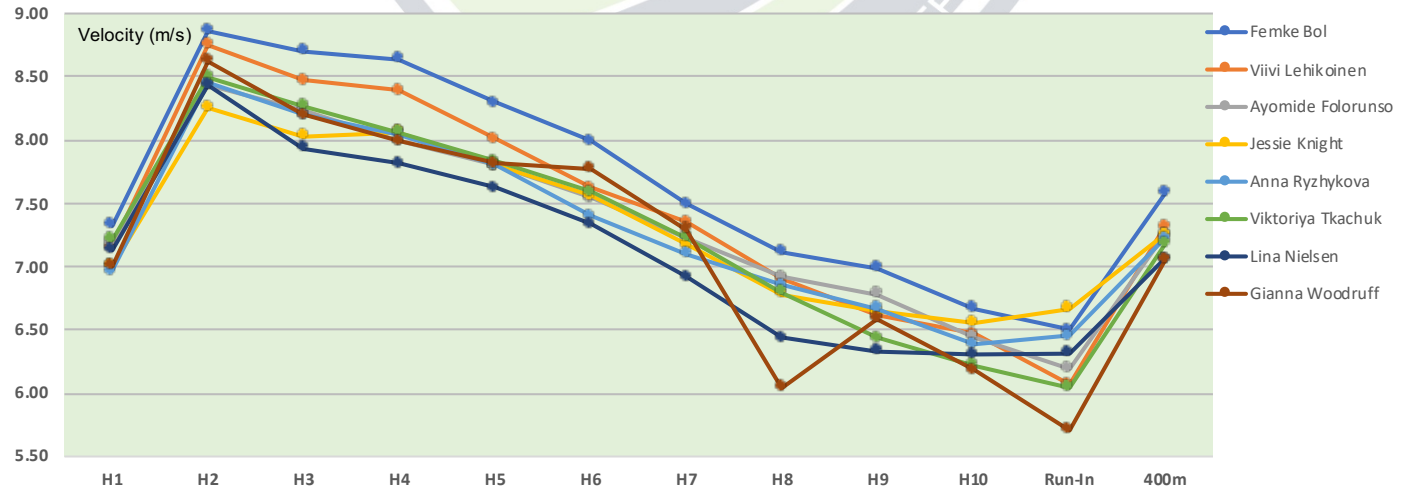
2023 Athletissima (Lausanne, SUI)

Women's 400m Hurdles

Date 2023.06.30

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Bol, Femke (NED) (2000)</b>	time	6.14	10.09	14.11	18.16	22.38	26.76	31.43	36.35	41.36	46.61	52.76	52.76	5 / 1			
	reaction time	0.169															
	interval velocity	7.33	8.95	8.02	8.05	8.22	4.38	4.67	4.92	5.01	5.25	6.15	6.15		12.02	13.27	15.18
H1 lead leg	L	22	14	14	14	14	14	14	15	15	15	19.7	170.7		8.74	7.91	6.92
<b>Lehikoinen, Viivi (FIN) (1999)</b>	time	6.29	10.29	14.42	18.59	22.96	27.55	32.31	37.38	42.67	48.08	54.67	54.67	4 / 2			
	reaction time	0.208															
	interval velocity	7.15	8.75	8.47	8.39	8.01	7.63	7.35	6.90	6.62	6.47	6.07	7.32		12.30	13.72	15.77
H1 lead leg	R	23	15				16	16	16	17	17	21	141		8.54	7.65	6.66
<b>Folorunso, Ayomide (ITA) (1996)</b>	time	6.26	10.41	14.66	19.04	23.53	28.17	33.01	38.07	43.23	48.66	55.12	55.12	8 / 3			
	reaction time	0.222															
	interval velocity	7.19	8.43	8.24	7.99	7.80	7.54	7.23	6.92	6.78	6.45	6.19	7.26		12.78	13.97	15.65
H1 lead leg	L	23	15			15	15	16	16	17	17	21	155		8.22	7.52	6.71
<b>Knight, Jessie (GBR) (1994)</b>	time	6.42	10.66	15.02	19.36	23.85	28.48	33.36	38.52	43.79	49.13	55.13	55.13	3 / 4			
	reaction time	0.178															
	interval velocity	7.01	8.25	8.03	8.06	7.80	7.56	7.17	6.78	6.64	6.55	6.67	7.26		12.94	14.00	15.77
H1 lead leg	R	22	14			14	15	15	16	16	16	19	131		8.11	7.50	6.66
<b>Ryzhykova, Anna (UKR) (1989)</b>	time	6.46	10.60	14.87	19.22	23.71	28.44	33.37	38.48	43.73	49.21	55.41	55.41	2 / 5			
	reaction time	0.175															
	interval velocity	6.97	8.45	8.20	8.05	7.80	7.40	7.10	6.85	6.67	6.39	6.45	7.22		12.76	14.15	15.84
H1 lead leg	R	22	14			14	15	15	15	15	16	19.5	130.5		8.23	7.42	6.63
<b>Tkachuk, Viktoriya (UKR) (1994)</b>	time	6.24	10.36	14.59	18.93	23.40	28.01	32.85	38.00	43.44	49.07	55.69	55.69	7 / 6			
	reaction time	0.196															
	interval velocity	7.21	8.50	8.27	8.06	7.83	7.59	7.23	6.80	6.43	6.22	6.04	7.18		12.69	13.92	16.22
H1 lead leg	L	22	15		15	15	15	15	16	18	17	21	169		8.27	7.54	6.47
<b>Nielsen, Lina (GBR) (1996)</b>	time	6.31	10.46	14.87	19.35	23.94	28.71	33.77	39.21	44.74	50.29	56.62	56.62	1 / 7			
	reaction time	0.141															
	interval velocity	7.13	8.43	7.94	7.81	7.63	7.34	6.92	6.43	6.33	6.31	6.32	7.06		13.04	14.42	16.52
H1 lead leg	L	22	15			15	15	15	16	16	16	114		8.05	7.28	6.36	
<b>Woodruff, Gianna (PAN) (1993)</b>	time	6.42	10.48	14.75	19.13	23.61	28.11	32.91	38.70	44.01	49.67	56.68	56.68	6 / 8			
	reaction time	0.227															
	interval velocity	7.01	8.62	8.20	7.99	7.81	7.78	7.29	6.04	6.59	6.18	5.71	7.06		12.71	13.78	16.76
H1 lead leg	L	22	15	15			15	15	17	17	17	133		8.26	7.62	6.26	



Source: Omega Timing (Fri 30 Jun 2023 21:36) - diamond league race analysis  
<https://www.omegatiming.com/File/0002030801010D0101FFFFFFFFFFFF4D.pdf>  
 Video: <https://www.youtube.com/watch?v=PIDYWraVBoQ>

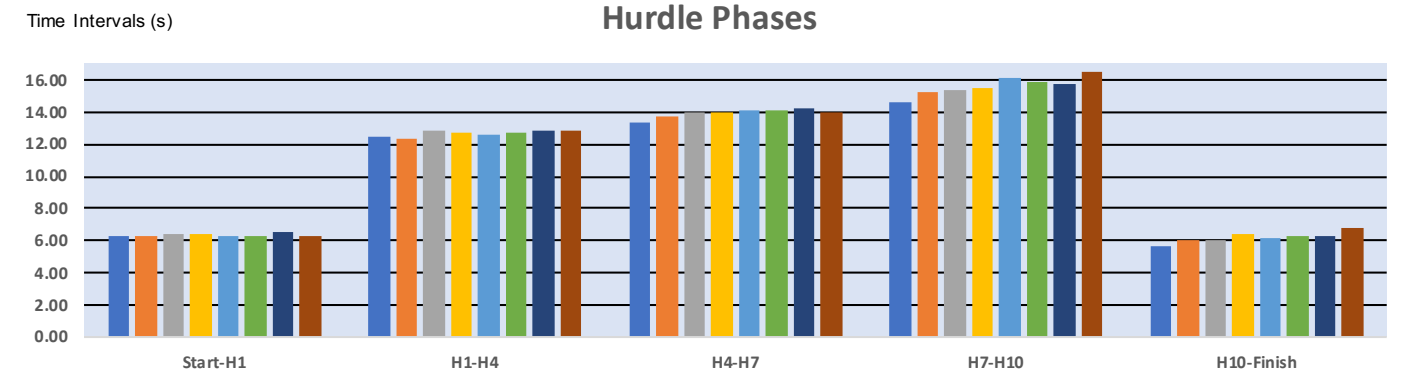
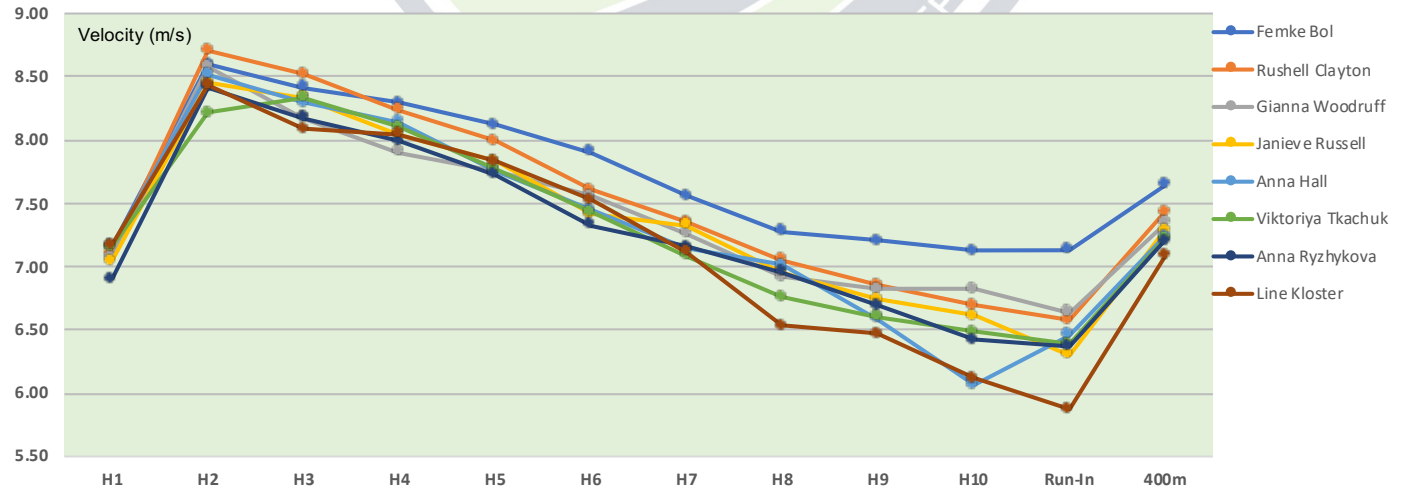
2023 Bislett Games (Oslo, NOR)

Women's 400m Hurdles

Date 2023.06.15

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10	
<b>Bol, Femke (NED) (2000)</b>	time	6.29	10.36	14.52	18.74	23.05	27.48	32.11	36.92	41.78	46.69	52.30	53.84	5 / 1				
	reaction time	0.172	interval	4.07	4.16	4.22	4.31	4.43	4.63	4.81	4.86	4.91	5.61		12.45	13.37	14.58	
	H1 lead leg	L	velocity	7.15	8.60	8.41	8.29	8.12	7.90	7.56	7.28	7.20	7.13	7.65		8.43	7.85	7.20
			strides	22	14	14	14	14	14	15	15	15	18.5	169.5				
<b>Clayton, Rushell (JAM) (1992)</b>	time	6.34	10.36	14.47	18.72	23.10	27.70	32.46	37.42	42.53	47.76	53.84	53.84	6 / 2				
	reaction time	0.141	interval	4.02	4.11	4.25	4.38	4.60	4.76	4.96	5.11	5.23	6.08		12.38	13.74	15.30	
	H1 lead leg	L	velocity	7.10	8.71	8.52	8.24	7.99	7.61	7.35	7.06	6.85	6.69	6.58		8.48	7.64	6.86
			strides	22	15	14	14	15	15	16	16	16	20	178				
<b>Woodruff, Gianna (PAN) (1993)</b>	time	6.36	10.44	14.72	19.15	23.66	28.29	33.11	38.17	43.30	48.43	54.46	54.46	4 / 3				
	reaction time	0.198	interval	4.08	4.28	4.43	4.51	4.63	4.82	5.06	5.13	6.03		12.79	13.96	15.32		
	H1 lead leg	L	velocity	7.08	8.58	8.18	7.90	7.76	7.56	7.26	6.92	6.82	6.63	7.34		8.21	7.52	6.85
			strides	22	15	15	15	15	15	16	16	17	180					
<b>Russell, Janieve (JAM) (1993)</b>	time	6.39	10.53	14.73	19.08	23.55	28.27	33.05	38.08	43.27	48.56	54.91	54.91	3 / 4				
	reaction time	0.135	interval	4.14	4.20	4.35	4.47	4.72	4.78	5.03	5.19	5.29	6.35		12.69	13.97	15.51	
	H1 lead leg	L	velocity	7.04	8.45	8.33	8.05	7.83	7.42	7.32	6.96	6.74	6.62	6.30	7.28		8.27	7.52
			strides	23	15	15	15	15	16	16	17	17	20	185				
<b>Hall, Anna (USA) (2001)</b>	time	6.28	10.39	14.61	18.91	23.42	28.12	33.02	38.01	43.32	49.09	55.28	55.28	8 / 5				
	reaction time	0.212	interval	4.11	4.22	4.30	4.51	4.70	4.90	4.99	5.31	5.77	6.19		12.63	14.11	16.07	
	H1 lead leg	L	velocity	7.17	8.52	8.29	8.14	7.76	7.45	7.14	7.01	6.59	6.07	6.46	7.24		8.31	7.44
			strides	21	14	14	14	14	15	15	15	17	139					
<b>Tkachuk, Viktoriya (UKR) (1994)</b>	time	6.29	10.55	14.75	19.07	23.57	28.28	33.22	38.40	43.70	49.10	55.36	55.36	7 / 6				
	reaction time	0.171	interval	4.26	4.20	4.32	4.50	4.71	4.94	5.18	5.30	5.40	6.26		12.78	14.15	15.88	
	H1 lead leg	L	velocity	7.15	8.22	8.33	8.10	7.78	7.43	7.09	6.76	6.60	6.48	6.39	7.23		8.22	7.42
			strides	24	15	15	15	15	15	16	16	17	148					
<b>Ryzhykova, Anna (UKR) (1989)</b>	time	6.52	10.68	14.96	19.34	23.87	28.65	33.54	38.57	43.80	49.25	55.53	55.53	1 / 7				
	reaction time	0.202	interval	4.16	4.28	4.38	4.53	4.78	4.89	5.03	5.23	5.45	6.28		12.82	14.20	15.71	
	H1 lead leg	R	velocity	6.90	8.41	8.18	7.99	7.73	7.32	7.16	6.96	6.69	6.42	6.37	7.20		8.19	7.39
			strides	22	14	14	14	14	15	15	15	16	154					
<b>Kloster, Line (NOR) (1990)</b>	time	6.27	10.42	14.75	19.10	23.57	28.22	33.14	38.50	43.91	49.63	56.44	56.44	2 / 8				
	reaction time	0.150	interval	4.15	4.33	4.35	4.47	4.65	4.92	5.36	5.41	5.72	6.81		12.83	14.04	16.49	
	H1 lead leg	R	velocity	7.18	8.43	8.08	8.05	7.83	7.53	7.11	6.53	6.47	6.12	5.87	7.09		8.18	7.48
			strides	22	15	15	15	15	15	16	16	17	17	163				



Source: Omega Timing (Thu 15 Jun 2023 20:09) - diamond league race analysis  
<https://www.omegatiming.com/File/000203070102090101FFFFFFFF4D.pdf>  
 Video: <https://www.youtube.com/watch?v=i1ZeTEHyPs>

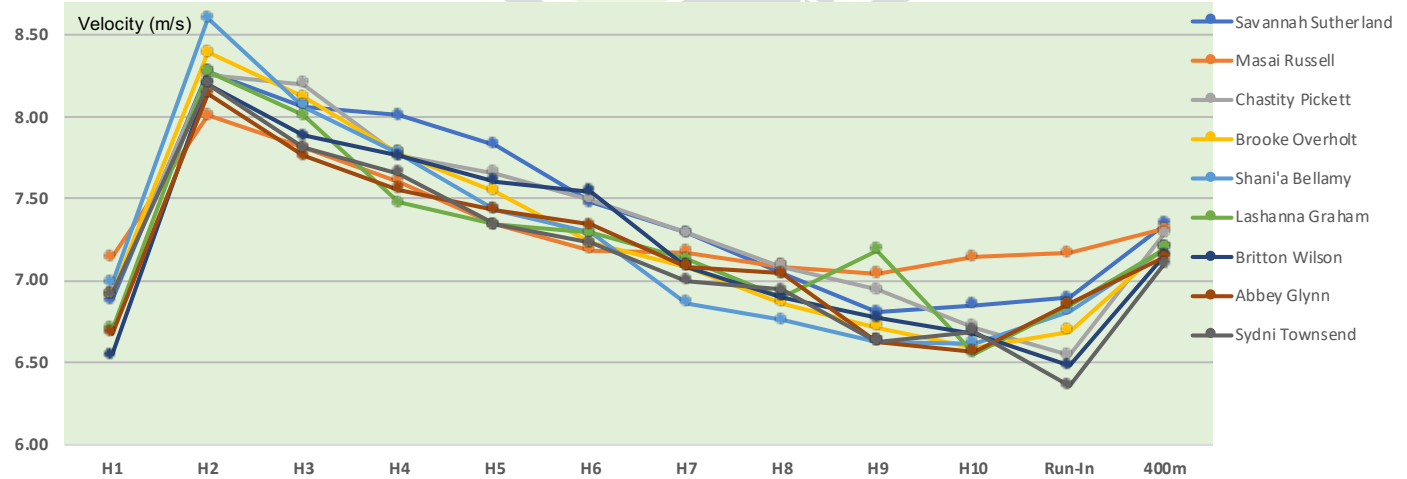
2023 NCAA Championships (Austin, TX) (TV Analysis)

Women's 400m Hurdles

Date 2023.06.10

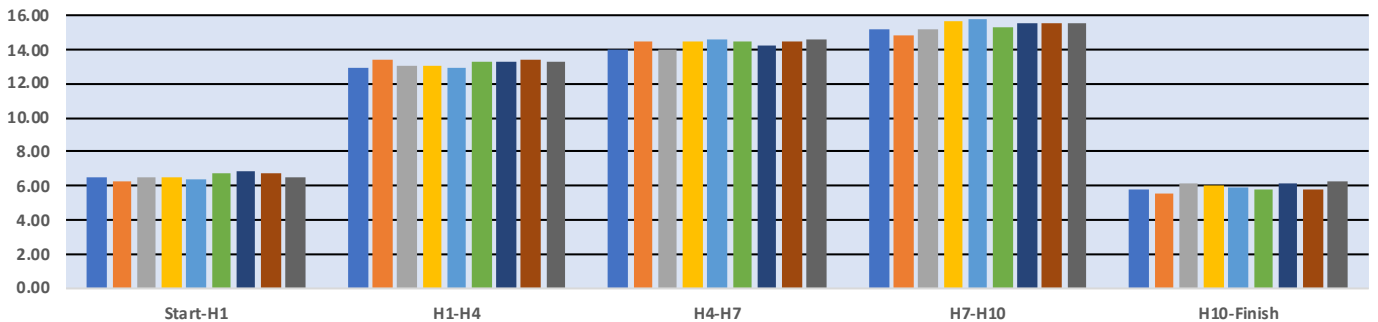
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10	
Sutherland, Savannah (CAN) (2003)	time	6.54	10.77	15.11	19.48	23.95	28.63	33.43	38.40	43.54	48.65		54.45	7 / 1				
	reaction time		interval	4.23	4.34	4.37	4.47	4.68	4.80	5.14	5.11	5.80	PB		12.94	13.95	15.22	
	velocity	6.88	8.27	8.06	8.01	7.83	7.83	7.29	7.04	6.81	6.85	6.90	7.35		8.11	7.53	6.90	
H1 lead leg	R	strides	23	15	15	15	15	16	16	16	16	20	182					
Russell, Masai (USA) (2000)	time	6.30	10.67	15.15	19.75	24.52	29.39	34.27	39.21	44.18	49.08		54.66	5 / 2				
	reaction time		interval	4.37	4.48	4.60	4.77	4.87	4.88	4.94	4.90	5.58	PB		13.45	14.52	14.81	
	velocity	7.14	8.01	7.81	7.61	7.34	7.19	7.17	7.09	7.04	7.14	7.17	7.32		7.81	7.23	7.09	
H1 lead leg	R	strides	24	16	16	16	16	16	17	17	17	21	192					
Pickett, Chastity (USA) (2001)	time	6.50	10.74	15.01	19.52	24.09	28.76	33.56	38.50	43.54	48.75		54.86	8 / 3				
	reaction time		interval	4.24	4.27	4.51	4.57	4.67	4.80	4.94	5.04	6.11	PB		13.02	14.04	15.19	
	velocity	6.92	8.25	8.20	7.76	7.66	7.49	7.29	7.09	6.94	6.72	6.55	7.29		8.06	7.48	6.91	
H1 lead leg	L	strides	22	14	14	14	14	15	15	15	15	18.2	171.2					
Overholt, Brooke (CAN) (2000)	time	6.50	10.67	14.98	19.48	24.12	28.96	33.90	39.00	44.21	49.52		55.50	4 / 4				
	reaction time		interval	4.17	4.31	4.50	4.64	4.84	4.94	5.10	5.21	5.31	5.98	PB		12.98	14.42	15.62
	velocity	6.92	8.39	8.12	7.78	7.54	7.23	7.09	6.86	6.72	6.59	6.69	7.21		8.09	7.28	6.72	
H1 lead leg	L	strides	24	15	15	15	15	16	16	17	17	20	187					
Bellamy, Shani'a (USA) (2002)	time	6.44	10.51	14.85	19.35	24.06	28.86	33.96	39.14	44.42	49.71		55.58	1 / 5				
	reaction time		interval	4.07	4.34	4.50	4.71	4.80	5.10	5.18	5.28	5.29	5.87	PB		12.91	14.61	15.75
	velocity	6.99	8.60	8.06	7.78	7.43	7.29	6.86	6.76	6.63	6.62	6.81	7.20		8.13	7.19	6.67	
H1 lead leg	R	strides	22	14	15	15	15	15	16	16	16	18.5	178.5					
Graham, Lashanna (JAM) (2000)	time	6.71	10.94	15.31	19.99	24.76	29.56	34.47	39.54	44.41	49.75		55.59	9 / 6				
	reaction time		interval	4.23	4.37	4.68	4.77	4.80	4.91	5.07	5.34	5.84	PB		13.28	14.48	15.28	
	velocity	6.71	8.27	8.01	7.48	7.34	7.29	7.13	6.90	7.19	6.55	6.85	7.20		7.91	7.25	6.87	
H1 lead leg	L	strides	22.14	15	15	15	15	15	15	16	15	16	159.14					
Wilson, Britton (USA) (2000)	time	6.87	11.14	15.58	20.09	24.69	29.33	34.27	39.34	44.51	49.75		55.92	6 / 7				
	reaction time		interval	4.27	4.44	4.51	4.60	4.64	4.94	5.07	5.17	5.24	6.17		13.22	14.18	15.48	
	velocity	6.55	8.20	7.88	7.76	7.61	7.54	7.09	6.90	6.77	6.68	6.48	7.15		7.94	7.40	6.78	
H1 lead leg	R	strides	23	15	15	15	15	15	16	16	16	16	162					
Glynn, Abbey (USA) (2001)	time	6.74	11.04	15.55	20.18	24.89	29.66	34.60	39.57	44.85	50.18		56.01	3 / 8				
	reaction time		interval	4.30	4.51	4.63	4.71	4.77	4.94	5.28	5.33	5.83			13.44	14.42	15.58	
	velocity	6.68	8.14	7.76	7.56	7.43	7.34	7.09	7.04	6.63	6.57	6.86	7.14		7.81	7.28	6.74	
H1 lead leg	L	strides	22	15	15	15	15	15	15	17	17	161						
Townsend, Sydney (USA) (2000)	time	6.50	10.77	15.25	19.82	24.59	29.43	34.43	39.47	44.75	49.98		56.27	2 / 9				
	reaction time		interval	4.27	4.48	4.57	4.77	4.84	5.00	5.04	5.28	6.29			13.32	14.61	15.55	
	velocity	6.92	8.20	7.81	7.66	7.34	7.23	7.00	6.94	6.63	6.69	6.36	7.11		7.88	7.19	6.75	
H1 lead leg	L	strides	23	16	16	16	16	17	18	18	18	175						



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=0E8BFbQS0ao>

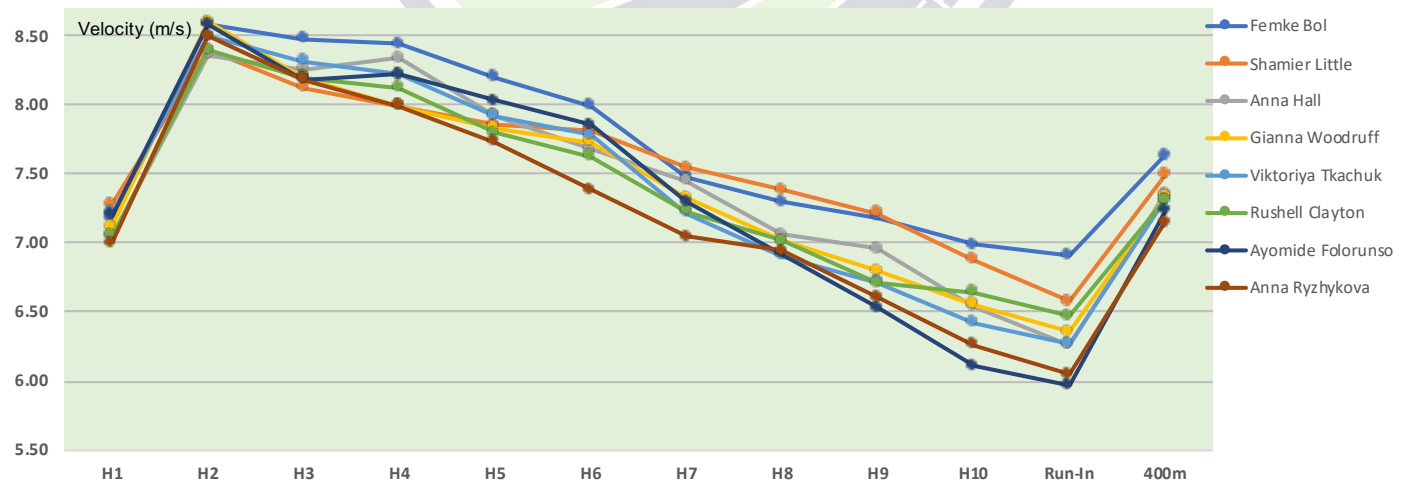
2023 Golden Gala Pietro Mennea (Firenze, ITA)

Women's 400m Hurdles

Date 2023.06.02

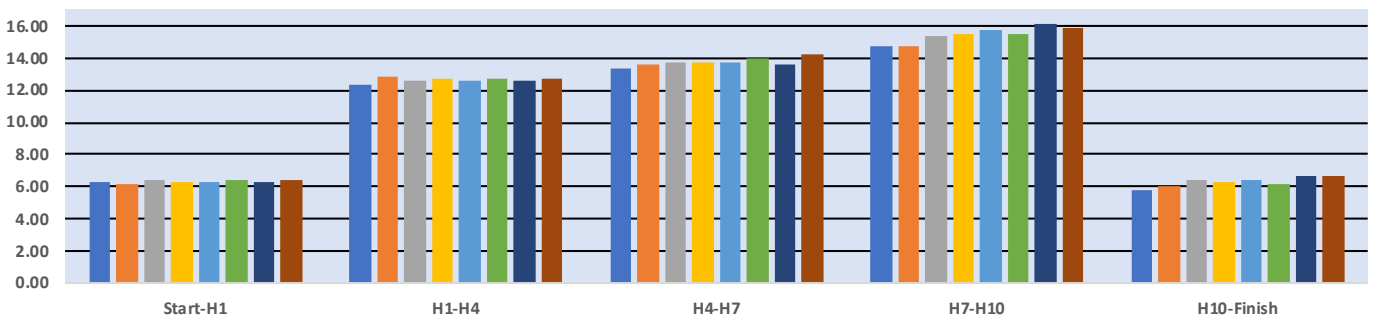
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
<b>Bol, Femke (NED) (2000)</b>	time	6.27	10.35	14.48	18.63	22.90	27.28	31.96	36.76	41.63	46.64	52.43		6 / 1			
	reaction time	0.170	interval	4.08	4.13	4.15	4.27	4.38	4.68	4.80	4.87	5.01	5.79		12.36	13.33	14.68
	velocity	7.18	8.58	8.47	8.43	8.20	7.99	7.98	7.48	7.29	7.19	6.99	6.91	7.63	8.50	7.88	7.15
	H1 lead leg	L	strides	22	14	14	14	14	14	15	15	15	19	170			
<b>Little, Shamier (USA) (1995)</b>	time	6.18	10.35	14.66	19.04	23.50	27.98	32.62	37.36	42.21	47.30	53.38		4 / 2			
	reaction time	0.153	interval	4.17	4.31	4.38	4.46	4.48	4.64	4.74	4.85	5.09	6.08		12.86	13.58	14.68
	velocity	7.28	8.39	8.12	7.99	7.85	7.81	7.54	7.38	7.22	6.88	6.58	7.49		8.16	7.73	7.15
	H1 lead leg	R	strides	23	15	15	15	15	15	15	16	19.2	178.2				
<b>Hall, Anna (USA) (2001)</b>	time	6.38	10.57	14.81	19.01	23.43	27.99	32.69	37.65	42.68	48.03	54.42		8 / 3			
	reaction time	0.182	interval	4.19	4.24	4.20	4.42	4.56	4.70	4.96	5.03	5.35	6.39	PB	12.63	13.68	15.34
	velocity	7.05	8.35	8.25	8.33	7.92	7.68	7.45	7.06	6.96	6.54	6.26	7.35		8.31	7.68	6.84
	H1 lead leg	L	strides	21	14	14	14	15	15	15	17	19.5	173.5				
<b>Woodruff, Gianna (PAN) (1993)</b>	time	6.32	10.39	14.66	19.04	23.51	28.04	32.82	37.81	42.96	48.30	54.59		3 / 4			
	reaction time	0.184	interval	4.07	4.27	4.38	4.47	4.53	4.78	4.99	5.15	5.34	6.29		12.72	13.78	15.48
	velocity	7.12	8.60	8.20	7.99	7.83	7.73	7.32	7.01	6.80	6.55	6.36	7.33		8.25	7.62	6.78
	H1 lead leg	L	strides	22	15	15	15	15	16	16	17	19.5	180.5				
<b>Tkachuk, Viktoriya (UKR) (1994)</b>	time	6.24	10.36	14.57	18.83	23.25	27.75	32.60	37.67	42.88	48.33	54.71		7 / 5			
	reaction time	0.167	interval	4.12	4.21	4.26	4.42	4.50	4.85	5.07	5.21	5.45	6.38		12.59	13.77	15.73
	velocity	7.21	8.50	8.31	8.22	7.92	7.78	7.22	6.90	6.72	6.42	6.27	7.31		8.34	7.63	6.68
	H1 lead leg	L	strides	22	15	15	15	15	16	16	17	20.2	328.2				
<b>Clayton, Rushell (JAM) (1992)</b>	time	6.38	10.55	14.82	19.13	23.62	28.21	33.05	38.04	43.26	48.53	54.71		5 / 6			
	reaction time	0.133	interval	4.17	4.27	4.31	4.49	4.59	4.84	4.99	5.22	5.27	6.18		12.75	13.92	15.48
	velocity	7.05	8.39	8.20	8.12	7.80	7.63	7.23	7.01	6.70	6.64	6.47	7.31		8.24	7.54	6.78
	H1 lead leg	L	strides	23	15	14	14	15	15	16	16	19	178				
<b>Folorunso, Ayomide (ITA) (1996)</b>	time	6.25	10.33	14.61	18.87	23.23	27.69	32.49	37.55	42.91	48.64	55.34		2 / 7			
	reaction time	0.190	interval	4.08	4.28	4.26	4.36	4.46	4.80	5.06	5.36	6.70		12.62	13.62	16.15	
	velocity	7.20	8.58	8.18	8.22	8.03	7.85	7.29	6.92	6.53	6.11	5.97	7.23		8.32	7.71	6.50
	H1 lead leg	L	strides	23	15	15	15	15	16	16	16	21.2	184.2				
<b>Ryzhykova, Anna (UKR) (1989)</b>	time	6.43	10.55	14.83	19.21	23.74	28.48	33.45	38.49	43.79	49.38	55.99		1 / 8			
	reaction time	0.155	interval	4.12	4.28	4.38	4.53	4.74	4.97	5.04	5.30	6.61		12.78	14.24	15.93	
	velocity	7.00	8.50	8.18	7.99	7.73	7.38	7.04	6.94	6.60	6.26	6.05	7.14		8.22	7.37	6.59
	H1 lead leg	R	strides	22	14	14	14	14	15	15	16	20	130				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 2 Jun 2023 20:10) - diamond league race analysis  
<https://www.omegatiming.com/File/000203050101050101FFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=Cw6iko0XnE>

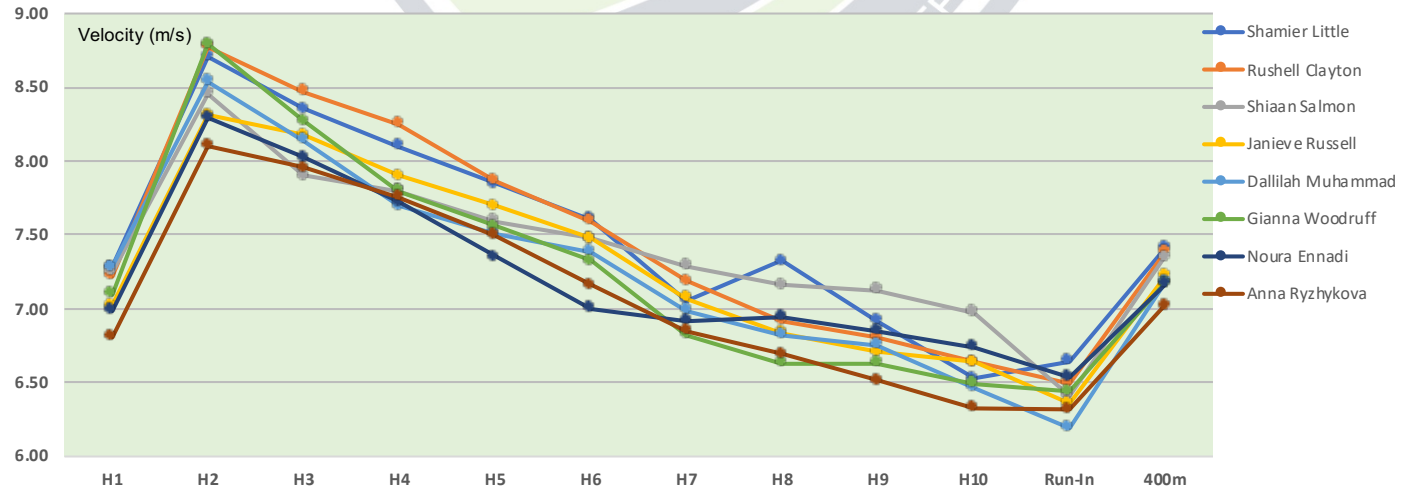
2023 Meeting International Mohammed VI d'Athlétisme (Rabat, MAR)

Women's 400m Hurdles

Date 2023.05.28

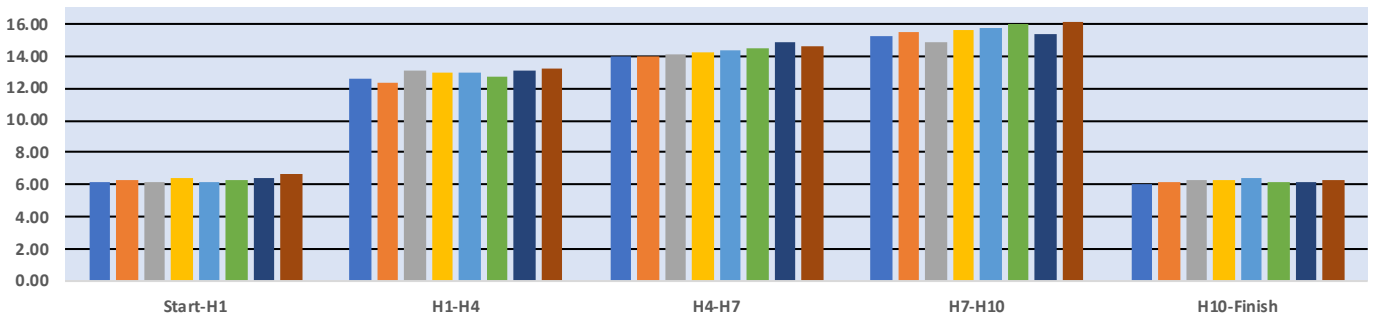
FINAL

		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	6.18	10.20	14.39	18.71	23.17	27.77	32.73	37.51	42.57	47.93		53.95	4 / 1			
	reaction time	0.183	interval	4.02	4.19	4.32	4.46	4.60	4.78	5.06	5.36	6.02			12.53	14.02	15.20
	H1 lead leg	R	velocity	7.28	8.71	8.35	8.10	7.85	7.61	7.32	6.92	6.53	6.64	7.41		8.38	7.49
			strides	23	15	15	15	15	15	15	16	19.5	178.5				
Clayton, Rushell (JAM) (1992)	time	6.23	10.22	14.35	18.59	23.04	27.65	32.52	37.58	42.72	47.99		54.15	5 / 2			
	reaction time	0.142	interval	3.99	4.13	4.24	4.45	4.61	4.87	5.06	5.14	5.27	6.16		12.36	13.93	15.47
	H1 lead leg	L	velocity	7.22	8.77	8.47	8.25	7.87	7.59	7.19	6.92	6.81	6.64	6.49	7.39	8.50	7.54
			strides	23	15	15	15	15	16	16	16	16	19.2	181.2			
Salmon, Shiaan (JAM) (1999)	time	6.21	10.35	14.78	19.27	23.88	28.56	33.36	38.25	43.16	48.18		54.42	3 / 3			
	reaction time	0.178	interval	4.14	4.43	4.49	4.61	4.68	4.80	4.89	4.91	5.02	6.24		13.06	14.09	14.82
	H1 lead leg	R	velocity	7.25	8.45	7.90	7.80	7.59	7.48	7.29	7.16	7.13	6.97	6.41	7.35	8.04	7.45
			strides	21	15	15	14	15	15	16	16	16	19.7	178.7			
Russell, Janieve (JAM) (1993)	time	6.41	10.62	14.90	19.33	23.88	28.56	33.51	38.63	43.85	49.12		55.41	7 / 4			
	reaction time	0.160	interval	4.21	4.28	4.43	4.55	4.68	4.95	5.12	5.22	5.27	6.29		12.92	14.18	15.61
	H1 lead leg	L	velocity	7.02	8.31	8.18	7.90	7.69	7.48	7.07	6.84	6.70	6.64	6.36	7.22	8.13	7.40
			strides	23	15	15	15	15	16	16	17	20	152				
Muhammad, Dalilah (USA) (1990)	time	6.18	10.28	14.58	19.13	23.79	28.53	33.54	38.67	43.85	49.26		55.72	6 / 5			
	reaction time	0.17	interval	4.10	4.30	4.45	4.66	4.74	5.01	5.13	5.18	5.41	6.46		12.95	14.41	15.72
	H1 lead leg	R	velocity	7.28	8.54	8.14	7.69	7.51	7.38	6.99	6.82	6.76	6.47	6.19	7.18	8.11	7.29
			strides	22	14	14	15	15	15	15	16	20	146				
Woodruff, Gianna (PAN) (1993)	time	6.34	10.32	14.55	19.04	23.67	28.45	33.58	38.86	44.14	49.53		55.74	2 / 6			
	reaction time	0.201	interval	3.98	4.23	4.49	4.63	4.78	5.13	5.28	5.28	5.39	6.21		12.70	14.54	15.95
	H1 lead leg	R	velocity	7.10	8.79	8.27	7.80	7.56	7.32	6.82	6.63	6.63	6.49	6.44	7.18	8.27	7.22
			strides	22	14	15	15	15	16	16	16	19	132				
Ennadi, Noura (MAR) (1999)	time	6.44	10.66	15.02	19.55	24.31	29.31	34.37	39.41	44.52	49.71		55.83	1 / 7			
	reaction time	0.183	interval	4.22	4.36	4.53	4.76	5.00	5.06	5.04	5.11	5.19	6.12	<b>PB</b>	13.11	14.82	15.34
	H1 lead leg	R	velocity	6.99	8.29	8.03	7.73	7.35	7.00	6.92	6.94	6.85	6.74	6.54	7.16	8.01	7.09
			strides	23	15	15	15	15	17	17	17	20	139				
Ryzhykova, Anna (UKR) (1989)	time	6.61	10.93	15.33	19.84	24.51	29.40	34.51	39.74	45.11	50.64		56.97	8 / 8			
	reaction time	0.268	interval	4.32	4.40	4.51	4.67	4.89	5.11	5.23	5.37	5.53	6.33		13.23	14.67	16.13
	H1 lead leg	R	velocity	6.81	8.10	7.95	7.76	7.49	7.16	6.85	6.69	6.52	6.33	6.32	7.02	7.94	7.16
			strides	22	14	14	14	14	15	15	16	16	19	159			



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 28 May 2023 19:08) - diamond league race analysis

<https://www.omegatiming.com/File/000203040101050101FFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=WczG-g8i6bQ>