

2016 Season Hurdles Report

Hurdle Touchdown Times

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

UPDATED
2021.02.10



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Todd Henson

2016 Season Hurdles Report

Men's 110m Hurdles

Top 10 Times	5
AG Memorial van Damme (Brussels, BEL) (TV Analysis) — Final	6
Athletissima (Lausanne, SUI) (TV Analysis) — Final	7
Olympic Games (Rio de Janeiro, BRA) (TV Analysis) — Final	8
London Anniversary Games (London, GBR) (TV Analysis) — Final	<i>NEW</i> 9
Spanish National Championships (Gijón, ESP) — Final	<i>NEW</i> 9
Herculis Meeting International d'Athletisme (Monaco, MON) (TV Analysis) — Final	<i>NEW</i> 10
USA Olympic Trials (Eugene, OR) (TV Analysis) — Final	11
Jamaican National Championships (Kingston, JAM) (TV Analysis) — Final	12
Racers Grand Prix (Kingston, JAM) (TV Analysis) — Final	12
Golden Gala Pietro Mennea (Rome, ITA) (TV Analysis) — Final	13
Prefontaine Classic (Eugene, OR) (TV Analysis) — Final	<i>NEW</i> 14
Meeting International Mohammed VI D'Athletisme (Rabat, MAR) (TV Analysis) — Final	15
Shanghai Golden Grand Prix (Shanghai, CHN) (TV Analysis) — Final	<i>NEW</i> 16
Doha Diamond League (Doha, QAT) (TV Analysis) — Final	17

Women's 100m Hurdles

Top 10 Times	19
AG Memorial van Damme (Brussels, BEL) (TV Analysis) — Final	<i>NEW</i> 20
Weltklasse (Zürich, SUI) (TV Analysis) — Final	21
Meeting Paris (Saint-Denis, FRA) (TV Analysis) — Final	22
Athletissima (Lausanne, SUI) (TV Analysis) — Final	23
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USA Olympic Trials (Eugene, OR) (TV Analysis) — Final	27
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Bauhaus Athletics (Stockholm, SWE) (TV Analysis) — Final	29
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Birmingham Diamond League (Birmingham, GBR) (TV Analysis) — Final	31
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2016 Season Hurdles Report

Men's 400m Hurdles

Top 10 Times	34
Weltklasse (Zürich, SUI) (TV Analysis) — Final	35
Meeting Paris (Saint-Denis, FRA) (TV Analysis) — Final	36
Athletissima (Lausanne, SUI) (TV Analysis) — Final	37
London Anniversary Games (London, GBR) (TV Analysis) — Final	38
USA Olympic Trials (Eugene, OR) (TV Analysis) — Final	39
European Championships (Amsterdam, NED) (TV Analysis) — Final	40
Bauhaus Athletics (Stockholm, SWE) (TV Analysis) — Final	41
Racers Grand Prix (Kingston, JAM) (TV Analysis) — Final	41
Bislett Games (Oslo, NOR) (TV Analysis) — Final	<i>NEW</i> 42
Prefontaine Classic (Eugene, OR) (TV Analysis) — Final	43
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Women's 400m Hurdles

Top 10 Times	46
AG Memorial van Damme (Brussels, BEL) (TV Analysis) — Final	<i>NEW</i> 47
Weltklasse (Zürich, SUI) (TV Analysis) — Final	<i>NEW</i> 48
Athletissima (Lausanne, SUI) (TV Analysis) — Final	49
Olympic Games (Rio de Janeiro, BRA) (TV Analysis) — Final	<i>NEW</i> 50
London Anniversary Games (London, GBR) (TV Analysis) — Final	<i>NEW</i> 51
Herculis Meeting International d'Athletisme (Monaco, MON) (TV Analysis) — Final	52
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Birmingham Diamond League (Birmingham, GBR) (TV Analysis) — Final	54
Golden Gala Pietro Mennea (Rome, ITA) (TV Analysis) — Final	55
Meeting International Mohammed VI D'Athletisme (Rabat, MAR) (TV Analysis) — Final	56
Doha Diamond League (Doha, QAT) (TV Analysis) — Final	<i>NEW</i> 57

Notes:

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

Men's 110m Hurdles

2016 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
McLeod, Omar (JAM) (1994)																	
FINAL - 2016 Shanghai Golden Grand Prix (Shanghai, CHN) (TV Analysis)																	
date	14-May	time	2.42	3.48	4.48	5.48	6.50	7.52	8.54	9.56	10.56	11.58		Henson (2021) - Athlete First: 2016 year end hurdle report			
reaction time	0.133	interval		1.06	1.00	1.00	1.02	1.02	1.02	1.02	1.00	1.02	1.40		3.06	3.06	3.04
wind	1.2 m/s	velocity	5.67	8.62	9.14	9.14	8.96	8.96	8.96	8.96	9.14	8.96	10.01	8.47	8.96	8.96	9.02
McLeod, Omar (JAM) (1994)																	
FINAL - 2016 Jamaican National Championships (Kingston, JAM) (TV Analysis)																	
date	2-Jul	time	2.43	3.50	4.51	5.51	6.49	7.47	8.49	9.51	10.51	11.53		Henson (2020) - Athlete First: 2016 year end hurdle report			
reaction time		interval		1.07	1.01	1.00	0.98	0.98	1.02	1.02	1.00	1.02	1.48		3.08	2.98	3.04
wind	0.4 m/s	velocity	5.65	8.54	9.05	9.14	9.33	9.33	8.96	8.96	9.14	8.96	9.47	8.46	8.90	9.20	9.02
Allen, Devon (USA) (1994)																	
FINAL - 2016 USA Olympic Trials (Eugene, OR) (TV Analysis)																	
date	9-Jul	time	2.53	3.55	4.57	5.55	6.54	7.54	8.52	9.54	10.56	11.57		Henson (2020) - Athlete First: 2016 year end hurdle report			
reaction time		interval		1.02	1.02	0.98	0.99	1.00	0.98	1.02	1.02	1.01	1.46	PB	3.02	2.97	3.05
wind	1.0 m/s	velocity	5.42	8.96	8.96	9.33	9.23	9.14	9.33	8.96	8.96	9.05	9.60	8.44	9.08	9.23	8.99
Ortega, Orlando (ESP) (1991)																	
FINAL - 2016 Herculis Meeting International d'Athletisme (Monaco, MON)																	
date	15-Jul	time	2.48	3.52	4.54	5.54	6.54	7.54	8.56	9.56	10.56	11.60		Henson (2021) - Athlete First: 2016 year end hurdle report			
reaction time	0.136	interval	7 steps	1.04	1.02	1.00	1.00	1.00	1.02	1.00	1.00	1.04	1.44	NR	3.06	3.02	3.04
wind	0.0 m/s	velocity	5.53	8.79	8.96	9.14	9.14	9.14	8.96	9.14	9.14	8.79	9.74	8.44	8.96	9.08	9.02
Allen, Devon (USA) (1994)																	
FINAL - 2016 USA Olympic Trials (Eugene, OR) (TV Analysis)																	
date	9-Jul	time	2.53	3.55	4.57	5.55	6.54	7.54	8.52	9.54	10.56	11.57		Henson (2020) - Athlete First: 2016 year end hurdle report			
reaction time		interval		1.02	1.02	0.98	0.99	1.00	0.98	1.02	1.02	1.01	1.46	PB	3.02	2.97	3.05
wind	1.0 m/s	velocity	5.42	8.96	8.96	9.33	9.23	9.14	9.33	8.96	8.96	9.05	9.60	8.44	9.08	9.23	8.99
McLeod, Omar (JAM) (1994)																	
FINAL - 2016 Doha Diamond League (Doha, QAT) (TV Analysis)																	
date	6-May	time	2.50	3.54	4.54	5.54	6.52	7.50	8.50	9.54	10.56	11.62		Henson (2020) - Athlete First: 2016 year end hurdle report			
reaction time	0.131	interval		1.04	1.00	1.00	0.98	0.98	1.00	1.04	1.02	1.06	1.43		3.04	2.96	3.12
wind	1.4 m/s	velocity	5.49	8.79	9.14	9.14	9.33	9.33	9.14	8.79	8.96	8.62	9.80	8.43	9.02	9.26	8.79
McLeod, Omar (JAM) (1994)																	
FINAL - 2016 Olympic Games (Rio de Janeiro, BRA) (TV Analysis)																	
date	16-Aug	time	2.44	3.50	4.52	5.54	6.54	7.54	8.56	9.60	10.60	11.62		Henson (2020) - Athlete First: 2016 year end hurdle report			
reaction time	0.142	interval		1.06	1.02	1.02	1.00	1.00	1.02	1.04	1.00	1.02	1.43		3.10	3.02	3.06
wind	0.2 m/s	velocity	5.62	8.62	8.96	8.96	9.14	9.14	8.96	8.79	9.14	8.96	9.80	8.43	8.85	9.08	8.96
McLeod, Omar (JAM) (1994)																	
FINAL - 2016 Prefontaine Classic (Eugene, OR) (TV Analysis)																	
date	28-May	time	2.44	3.50	4.52	5.54	6.56	7.56	8.56	9.58	10.60	11.62		Henson (2021) - Athlete First: 2016 year end hurdle report			
reaction time		interval		1.06	1.02	1.02	1.02	1.00	1.00	1.02	1.02	1.02	1.44		3.10	3.02	3.06
wind	0.7 m/s	velocity	5.62	8.62	8.96	8.96	8.96	9.14	9.14	8.96	8.96	8.96	9.74	8.42	8.85	9.08	8.96
McLeod, Omar (JAM) (1994)																	
FINAL - 2016 Drake Relays (Des Moines, IA)																	
date	30-Apr	time															
reaction time		interval															
wind	- 0.1 m/s	velocity															
Ortega, Orlando (ESP) (1991)																	
FINAL - 2016 Memorial van Damme (Brussels, BEL) (TV Analysis)																	
date	9-Sep	time	2.50	3.54	4.57	5.57	6.57	7.57	8.57	9.59	10.61	11.64		Henson (2020) - Athlete First: 2016 year end hurdle report			
reaction time	0.145	interval	7 steps	1.04	1.03	1.00	1.00	1.00	1.00	1.02	1.02	1.03	1.44		3.07	3.00	3.07
wind	0.2 m/s	velocity	5.49	8.79	8.87	9.14	9.14	9.14	8.96	8.96	8.87	9.74	8.41		8.93	9.14	8.93
Oliver, David (USA) (1982)																	
FINAL - 2016 Racers Grand Prix (Kingston, JAM) (TV Analysis)																	
date	11-Jun	time	2.43	3.46	4.46	5.46	6.46	7.43	8.46	9.50	10.50	11.56		Henson (2020) - Athlete First: 2016 year end hurdle report			
reaction time		interval	7 steps	1.03	1.00	1.00	1.00	0.97	1.03	1.04	1.00	1.06	1.53		3.03	3.00	3.10
wind	0.2 m/s	velocity	5.65	8.87	9.14	9.14	9.14	9.42	8.87	8.79	9.14	8.62	9.16	8.40	9.05	9.14	8.85
Ortega, Orlando (ESP) (1991)																	
FINAL - 2016 Spanish National Championships (Gijón, ESP) (TV Analysis)																	
date	24-Jul	time	2.50	3.56	4.57	5.56	6.54	7.56	8.56	9.56	10.56	11.60		Henson (2021) - Athlete First: 2016 year end hurdle report			
reaction time		interval	7 steps	1.06	1.01	0.99	0.98	1.02	1.00	1.00	1.00	1.04	1.49		3.06	3.00	3.04
wind	1.0 m/s	velocity	5.49	8.62	9.05	9.23	9.33	8.96	9.14	9.14	9.14	8.79	9.41	8.40	8.96	9.14	9.02

2016 Memorial van Damme (Brussels, BEL) (TV Analysis)

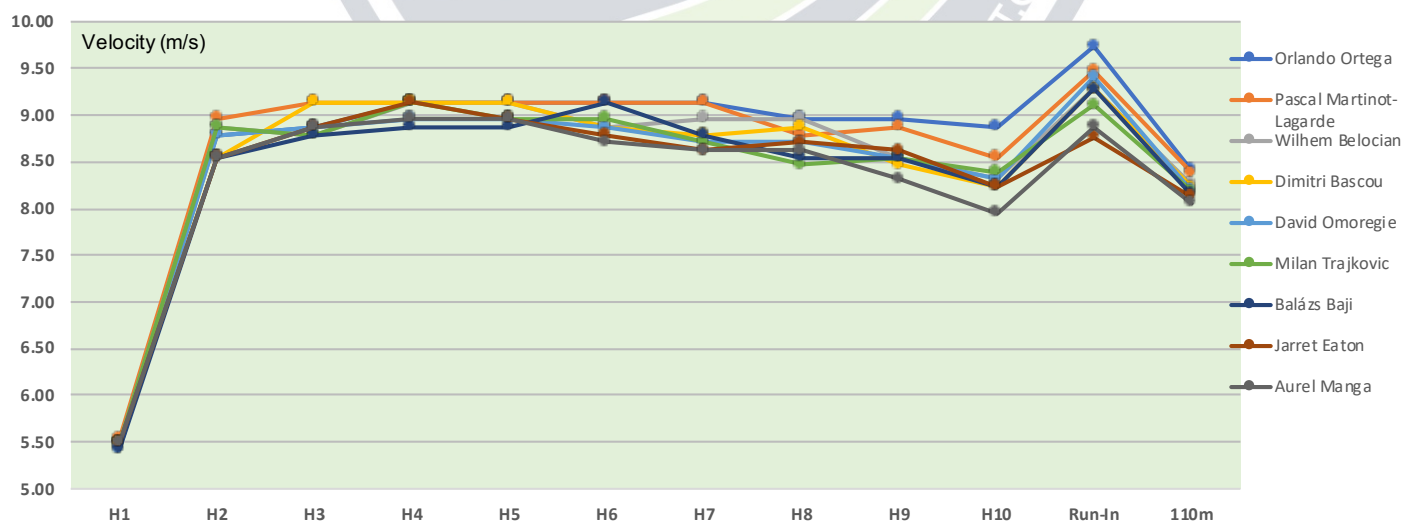
110m Hurdles

Date: 2016.09.09

Wind: 0.2 m/s

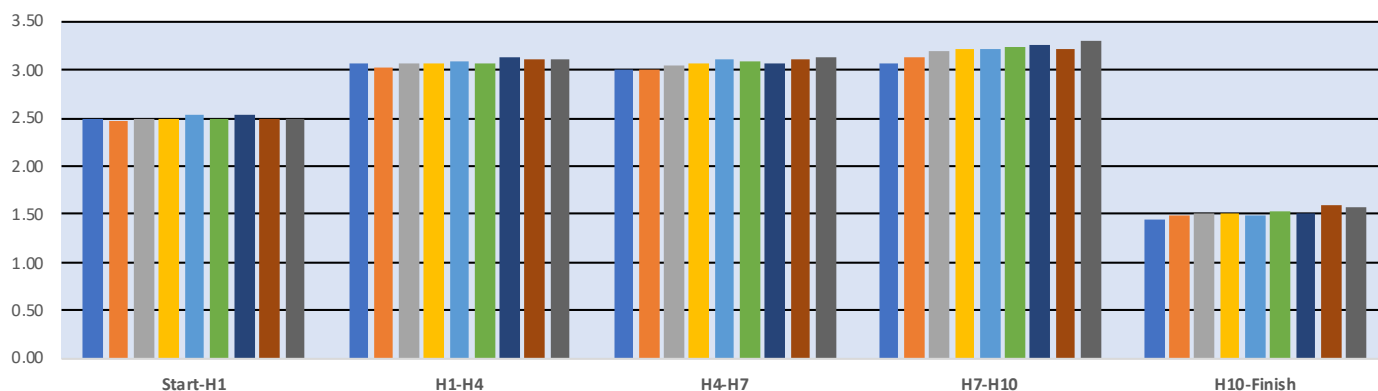
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Ortega, Orlando (ESP) (1991)	time		2.50	3.54	4.57	5.57	6.57	7.57	8.57	9.59	10.61	11.64		13.08	5 / 1			
	reaction time	0.145											1.44			3.07	3.00	3.07
	interval velocity		7 steps	1.04	1.03	1.00	1.00	1.00	1.00	1.02	1.02	1.03	9.74	8.41		8.93	9.14	8.93
Martino-Lagarde, Pascal (FRA) (1991)	time		2.48	3.50	4.50	5.50	6.50	7.50	8.50	9.54	10.57	11.64		13.12	6 / 2			
	reaction time	0.160											1.48			3.02	3.00	3.14
	interval velocity		7 steps	1.02	1.00	1.00	1.00	1.00	1.00	1.04	1.03	1.07	9.47	8.38		9.08	9.14	8.73
Belocian, Wilhem (FRA) (1995)	time		2.50	3.53	4.57	5.57	6.57	7.60	8.62	9.64	10.71	11.81		13.32	8 / 3			
	reaction time	0.153											1.51			3.07	3.05	3.19
	interval velocity		7 steps	1.03	1.04	1.00	1.00	1.03	1.02	1.02	1.07	1.10	9.28	8.26		8.93	8.99	8.60
Bascou, Dimitri (FRA) (1987)	time		2.50	3.57	4.57	5.57	6.57	7.60	8.64	9.67	10.75	11.86		13.37	4 / 4			
	reaction time	0.160											1.51			3.07	3.07	3.22
	interval velocity		7 steps	1.07	1.00	1.00	1.00	1.03	1.04	1.03	1.08	1.11	9.28	8.23		8.93	8.93	8.52
Omereg, David (GBR) (1995)	time		2.53	3.57	4.60	5.62	6.64	7.67	8.72	9.77	10.84	11.94		13.43	3 / 5			
	reaction time	0.153											1.49			3.09	3.10	3.22
	interval velocity		7 steps	1.04	1.03	1.02	1.02	1.03	1.05	1.05	1.07	1.10	9.41	8.19		8.87	8.85	8.52
Trajkovic, Milan (CYP) (1992)	time		2.50	3.53	4.57	5.57	6.59	7.61	8.66	9.74	10.81	11.90		13.44	7 / 6			
	reaction time	0.143											1.54			3.07	3.09	3.24
	interval velocity		7 steps	1.03	1.04	1.00	1.02	1.02	1.05	1.08	1.07	1.09	9.10	8.18		8.93	8.87	8.46
Baji, Balázs (HUN) (1989)	time		2.53	3.60	4.64	5.67	6.70	7.70	8.74	9.81	10.88	11.99		13.50	2 / 7			
	reaction time	0.183											1.51			3.14	3.07	3.25
	interval velocity		7 steps	1.07	1.04	1.03	1.03	1.00	1.04	1.07	1.07	1.11	9.28	8.15		8.73	8.93	8.44
Eaton, Jarret (USA) (1989)	time		2.50	3.57	4.60	5.60	6.62	7.66	8.72	9.77	10.83	11.94		13.54	9 / 8			
	reaction time	0.181											1.60			3.10	3.12	3.22
	interval velocity		7 steps	1.07	1.03	1.00	1.02	1.04	1.06	1.05	1.06	1.11	8.76	8.12		8.85	8.79	8.52
Manga, Aurel (FRA) (1992)	time		2.50	3.57	4.60	5.62	6.64	7.69	8.75	9.81	10.91	12.06		13.64	1 / 9			
	reaction time	0.173											1.58			3.12	3.13	3.31
	interval velocity		7 steps	1.07	1.03	1.02	1.02	1.05	1.06	1.06	1.10	1.15	8.87	8.06		8.79	8.76	8.28



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=w10uaj-QUw>

2016 Athletissima (Lausanne, SUI) (TV Analysis)

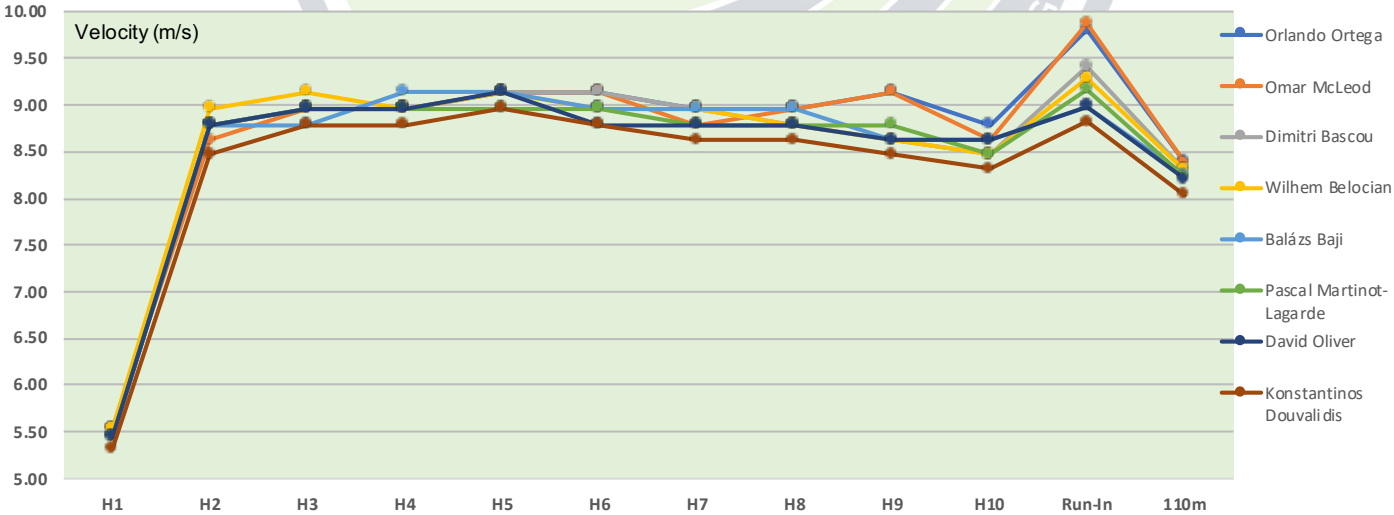
110m Hurdles

Date: 2016.08.25

Wind: 0.5 m/s

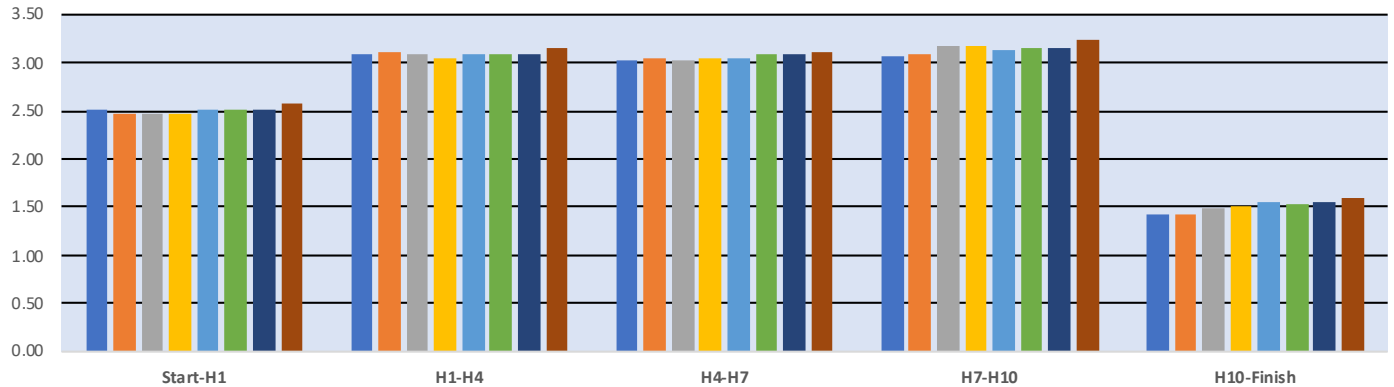
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Ortega, Orlando (ESP) (1991)	time		2.52	3.56	4.58	5.60	6.60	7.60	8.62	9.64	10.64	11.68		13.11	5 / 1	3.08	3.02	3.06
	reaction time	0.133											1.43					
	interval		7 steps	1.04	1.02	1.02	1.00	1.00	1.02	1.02	1.00	1.04	1.43	8.39				
	velocity		5.44	8.79	8.96	8.96	9.14	9.14	8.96	8.96	9.14	8.79	9.80	8.39		8.90	9.08	8.96
McLeod, Omar (JAM) (1994)	time		2.48	3.54	4.56	5.58	6.58	7.58	8.62	9.64	10.64	11.70		13.12	4 / 2	3.10	3.04	3.08
	reaction time	0.144											1.42					
	interval		5.53	8.62	8.96	8.96	9.14	9.14	8.79	8.96	9.14	8.62	9.87	8.38				
	velocity		5.53	8.62	8.96	8.96	9.14	9.14	8.79	8.96	9.14	8.62	9.87	8.38		8.85	9.02	8.90
Bascou, Dimitri (FRA) (1987)	time		2.48	3.52	4.54	5.56	6.56	7.56	8.58	9.62	10.68	11.76		13.25	6 / 3	3.08	3.02	3.18
	reaction time	0.139											1.49					
	interval		5.53	8.79	8.96	8.96	9.14	9.14	8.96	8.79	8.62	8.46	9.41	8.30				
	velocity		5.53	8.79	8.96	8.96	9.14	9.14	8.96	8.79	8.62	8.46	9.41	8.30		8.90	9.08	8.62
Belocian, Wilhem (FRA) (1995)	time		2.48	3.50	4.50	5.52	6.52	7.54	8.56	9.60	10.66	11.74		13.25	7 / 4	3.04	3.04	3.18
	reaction time	0.126											1.51					
	interval		5.53	8.96	9.14	8.96	9.14	8.96	8.96	8.79	8.62	8.46	9.28	8.30				
	velocity		5.53	8.96	9.14	8.96	9.14	8.96	8.96	8.79	8.62	8.46	9.28	8.30		9.02	9.02	8.62
Baji, Balázs (HUN) (1989)	time		2.52	3.56	4.60	5.60	6.60	7.62	8.64	9.66	10.72	11.78		13.34	1 / 5	3.08	3.04	3.14
	reaction time	0.141											1.56					
	interval		5.44	8.79	8.79	9.14	9.14	8.96	8.96	8.96	8.62	8.62	8.99	8.25				
	velocity		5.44	8.79	8.79	9.14	9.14	8.96	8.96	8.96	8.62	8.62	8.99	8.25		8.90	9.02	8.73
Martino-Lagarde, Pascal (FRA) (1991)	time		2.52	3.56	4.58	5.60	6.62	7.64	8.68	9.72	10.76	11.84		13.37	2 / 6	3.08	3.08	3.16
	reaction time	0.146											1.53					
	interval		5.44	8.79	8.96	8.96	8.96	8.96	8.79	8.79	8.79	8.46	9.16	8.23				
	velocity		5.44	8.79	8.96	8.96	8.96	8.96	8.79	8.79	8.79	8.46	9.16	8.23		8.90	8.90	8.68
Oliver, David (USA) (1982)	time		2.52	3.56	4.58	5.60	6.60	7.64	8.68	9.72	10.78	11.84		13.40	3 / 7	3.08	3.08	3.16
	reaction time	0.146											1.56					
	interval		5.44	8.79	8.96	8.96	9.14	8.79	8.79	8.79	8.62	8.62	8.99	8.21				
	velocity		5.44	8.79	8.96	8.96	9.14	8.79	8.79	8.79	8.62	8.62	8.99	8.21		8.90	8.90	8.68
Douvalidis, Konstadinos (GRE) (1987)	time		2.58	3.66	4.70	5.74	6.76	7.80	8.86	9.92	11.00	12.10		13.69	8 / 8	3.16	3.12	3.24
	reaction time	0.136											1.59					
	interval		5.32	8.46	8.79	8.79	8.96	8.79	8.62	8.62	8.46	8.31	8.82	8.04				
	velocity		5.32	8.46	8.79	8.79	8.96	8.79	8.62	8.62	8.46	8.31	8.82	8.04		8.68	8.79	8.46



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
Quality & Frame Rate: 1280 x 720 @ 25fps
Timing From: First Movement
Source: <https://www.youtube.com/watch?v=97am-Mfj3jM>

2016 Olympic Games (Rio de Janeiro, BRA) (TV Analysis)

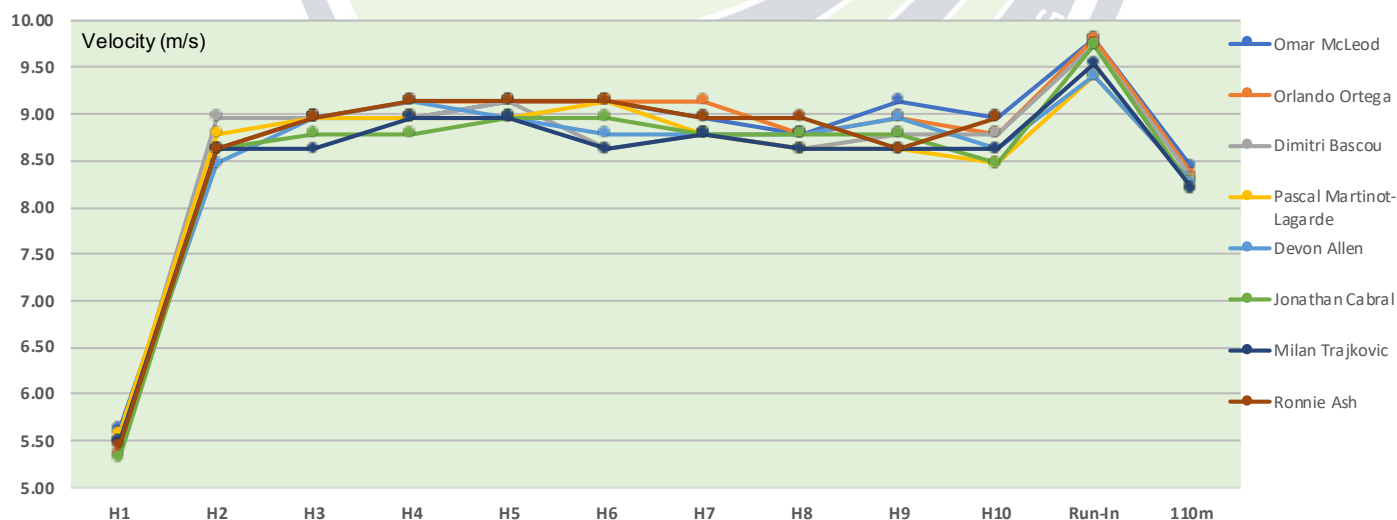
110m Hurdles

Date: 2016.08.16

Wind: 0.2 m/s

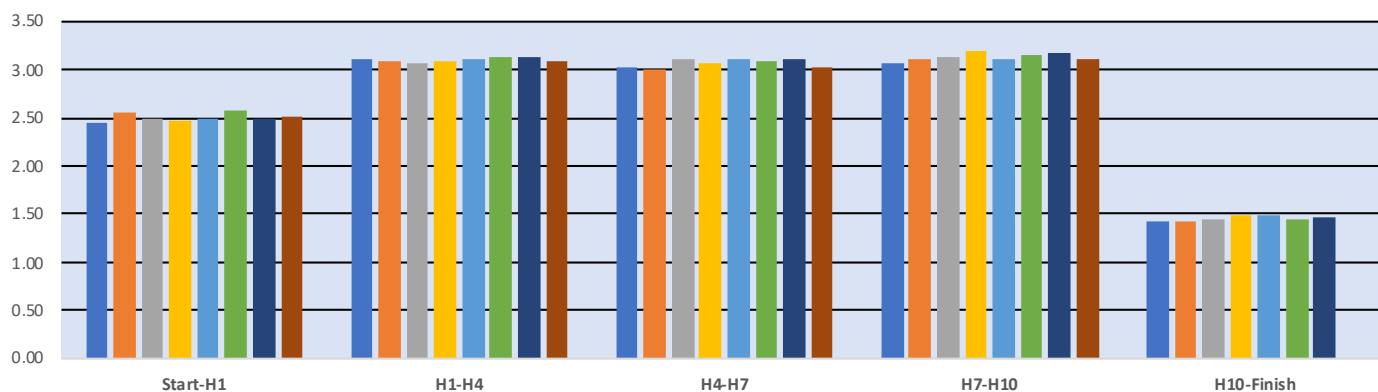
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
McLeod, Omar (JAM) (1994)	time		2.44	3.50	4.52	5.54	6.54	7.54	8.56	9.60	10.60	11.62		13.05	5 / 1			
	reaction time	0.142											1.43			3.10	3.02	3.06
	interval			1.06	1.02	1.02	1.00	1.00	1.02	1.04	1.00	1.02	1.43			8.85	9.08	8.96
Ortega, Orlando (ESP) (1991)	time		2.56	3.62	4.64	5.64	6.64	7.64	8.64	9.68	10.70	11.74		13.17	7 / 2			
	reaction time	0.127											1.43			3.08	3.00	3.10
	interval		7 steps	1.06	1.02	1.00	1.00	1.00	1.00	1.04	1.02	1.04	1.43			8.90	9.14	8.85
Bascou, Dimitri (FRA) (1987)	time		2.50	3.52	4.54	5.56	6.56	7.62	8.66	9.72	10.76	11.80		13.24	6 / 3			
	reaction time	0.131											1.44			3.06	3.10	3.14
	interval		7 steps	1.02	1.02	1.02	1.00	1.06	1.04	1.06	1.04	1.04	1.44			8.96	8.85	8.73
Martino-Lagarde, Pascal (FRA) (1991)	time		2.46	3.50	4.52	5.54	6.56	7.56	8.60	9.66	10.72	11.80		13.29	4 / 4			
	reaction time	0.142											1.49			3.08	3.06	3.20
	interval		7 steps	1.04	1.02	1.02	1.02	1.00	1.04	1.06	1.06	1.08	1.49			8.90	8.96	8.57
Allen, Devon (USA) (1994)	time		2.50	3.58	4.60	5.60	6.62	7.66	8.70	9.74	10.76	11.82		13.31	3 / 5			
	reaction time	0.135											1.49			3.10	3.10	3.12
	interval			1.08	1.02	1.00	1.02	1.04	1.04	1.04	1.02	1.06	1.49			8.85	8.85	8.79
Cabral, Jonathan (CAN) (1992)	time		2.58	3.64	4.68	5.72	6.74	7.76	8.80	9.84	10.88	11.96		13.40	2 / 6			
	reaction time	0.146											1.44			3.14	3.08	3.16
	interval		7 steps	1.06	1.04	1.04	1.02	1.02	1.04	1.04	1.04	1.08	1.44			8.73	8.90	8.68
Trajkovic, Milan (CYP) (1992)	time		2.50	3.56	4.62	5.64	6.66	7.72	8.76	9.82	10.88	11.94		13.41	8 / 7			
	reaction time	0.136											1.47			3.14	3.12	3.18
	interval		7 steps	1.06	1.06	1.02	1.02	1.06	1.04	1.06	1.06	1.06	1.47			8.73	8.79	8.62
Ash, Ronnie (USA) (1988)	time		2.52	3.58	4.60	5.60	6.60	7.60	8.62	9.64	10.70	11.72			9 / --			
	reaction time	0.160														3.08	3.02	3.10
	interval		7 steps	1.06	1.02	1.00	1.00	1.00	1.02	1.02	1.06	1.02				8.90	9.08	8.85
	velocity		5.44	8.62	8.96	9.14	9.14	9.14	8.96	8.96	8.62	8.96						



Time Intervals (s)

Hurdle Phases



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

2016 London Anniversary Games (London, GBR) (TV Analysis)

110m Hurdles

Date: 2016.07.23

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
Bascou, Dimitri (FRA) (1987)	time			2.50	3.53	4.56	5.56	6.58	7.60	8.62	9.64	10.68	11.74		13.20	5 / 1	3.06	3.06	3.12
	reaction time	0.103		7 steps	1.03	1.03	1.00	1.02	1.02	1.02	1.04	1.06	1.46						
	interval velocity		5.49	8.87	8.87	9.14	8.96	8.96	8.96	8.96	8.79	8.62	9.60	8.33	8.96				
Traber, Gregor (GER) (1992)	time			2.53	3.58	4.60	5.63	6.65	7.68	8.72	9.80	10.86	11.95		13.45	3 / 2	3.10	3.09	3.23
	reaction time	0.150		7 steps	1.05	1.02	1.03	1.02	1.03	1.04	1.08	1.06	1.09	1.50					
	interval velocity		5.42	8.70	8.96	8.87	8.96	8.87	8.79	8.46	8.62	8.39	9.35	8.18	8.85				
Douvalidis, Konstadinos (GRE) (1987)	time			2.60	3.63	4.66	5.73	6.76	7.80	8.85	9.90	10.98	12.06		13.54	7 / 3	3.13	3.12	3.21
	reaction time	0.146			1.03	1.03	1.07	1.03	1.04	1.05	1.05	1.08	1.48						
	interval velocity		5.28	8.87	8.87	8.54	8.87	8.79	8.70	8.70	8.46	8.46	9.47	8.12	8.76				
Manga, Aurel (FRA) (1992)	time			2.46	3.52	4.58	5.62	6.63	7.74	8.82	9.88	11.02	12.08		13.59	9 / 4	3.16	3.20	3.26
	reaction time	0.155		7 steps	1.06	1.06	1.04	1.01	1.11	1.08	1.06	1.14	1.06	1.51					
	interval velocity		5.58	8.62	8.62	8.79	9.05	8.23	8.46	8.62	8.02	8.62	9.28	8.09	8.68				
Omoregie, David (GBR) (1995)	time			2.50	3.60	4.63	5.70	6.78	7.83	8.90	10.02	11.08	12.16		13.64	4 / 5	3.20	3.20	3.26
	reaction time	0.153			1.10	1.03	1.07	1.08	1.05	1.07	1.12	1.06	1.08	1.48					
	interval velocity		5.49	8.31	8.87	8.54	8.46	8.70	8.54	8.16	8.62	8.46	9.47	8.06	8.57				

2016 Spanish National Championships (Gijón, ESP) (TV Analysis)

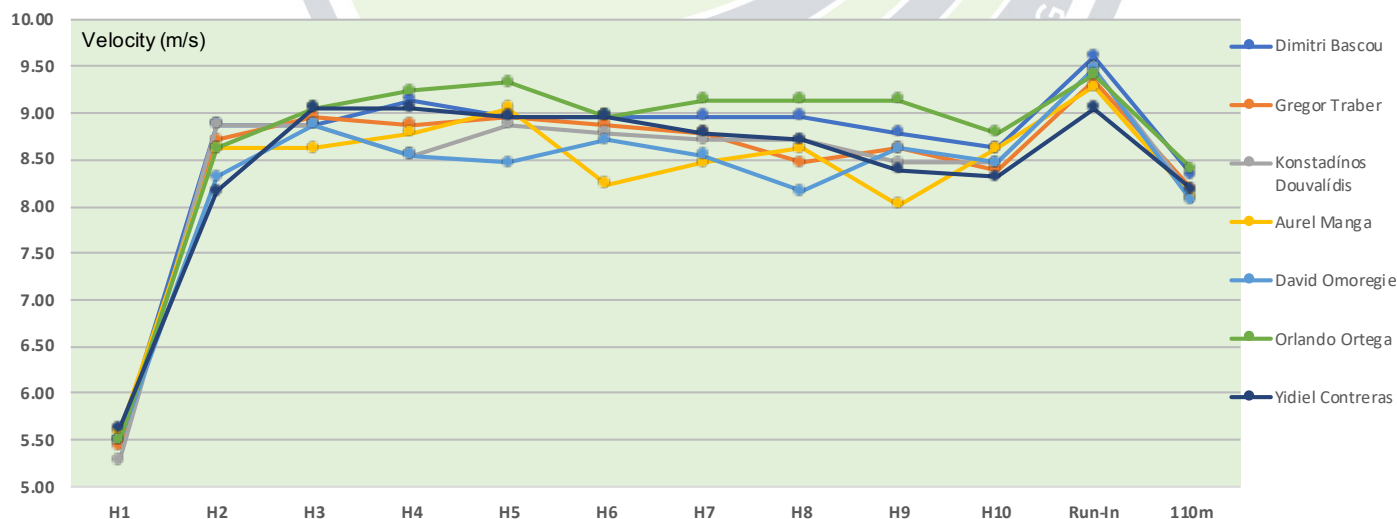
110m Hurdles

Date: 2016.07.24

Wind: 1.0 m/s

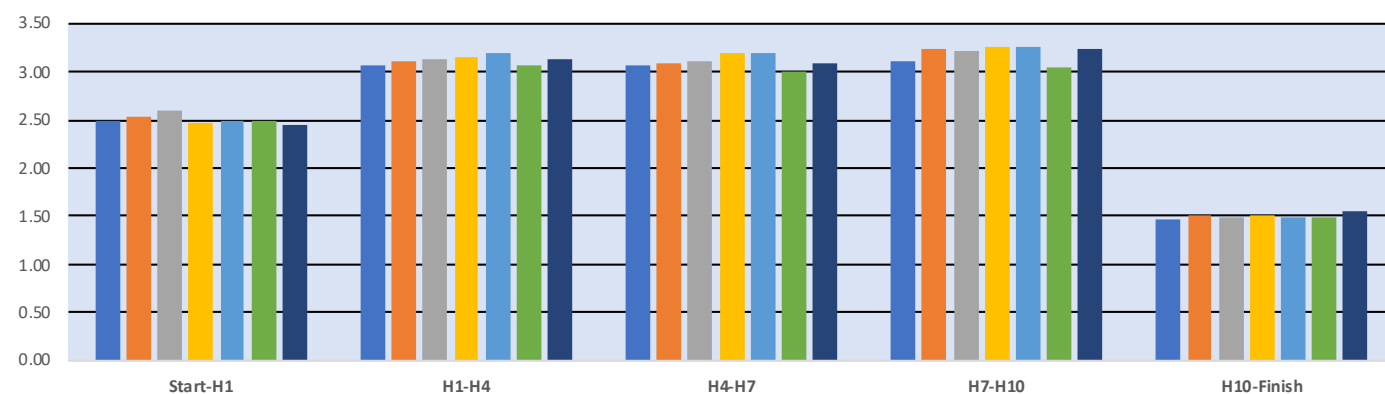
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Ortega, Orlando (ESP) (1991)	time		2.50	3.56	4.57	5.56	6.54	7.56	8.56	9.56	10.56	11.60		13.09	4 / 1	3.06	3.00	3.04
	reaction time	0.161																
	interval		7 steps	1.06	1.01	0.99	0.98	1.02	1.00	1.00	1.04	1.49						
	velocity		5.49	8.62	9.05	9.23	9.33	8.96	9.14	9.14	9.14	8.79	9.41	8.40		8.96	9.14	9.02
Contreras, Yidiel (ESP) (1992)	time		2.44	3.56	4.57	5.58	6.60	7.62	8.66	9.71	10.80	11.90		13.45	5 / 2	3.14	3.08	3.24
	reaction time																	
	interval		7 steps	1.12	1.01	1.01	1.02	1.02	1.04	1.05	1.09	1.10	1.55					
	velocity		5.62	8.16	9.05	9.05	8.96	8.96	8.79	8.70	8.39	8.31	9.05	8.18		8.73	8.90	8.46



Time Intervals (s)

Hurdle Phases



London Anniversary Games

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=gSY8FinPk8>

Spanish National Championships

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 30fps

Timing From: First Movement

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

2016 Herculis Meeting International d'Athlétisme (Monaco, MON) (TV Analysis)

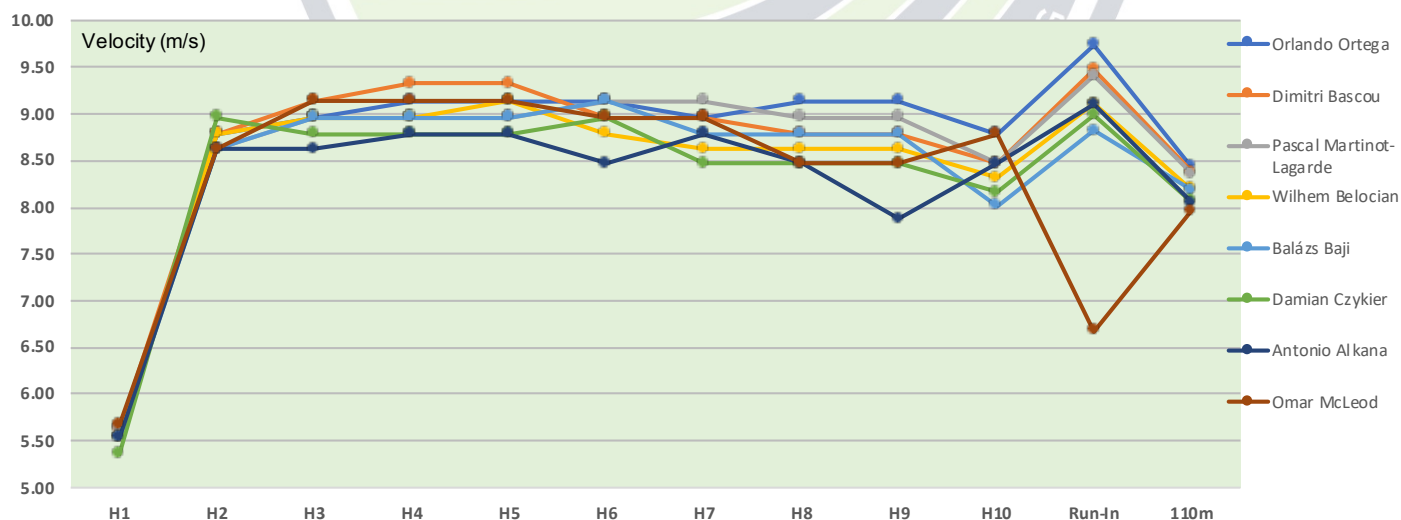
110m Hurdles

Date: 2016.07.15

Wind: 0.0 m/s

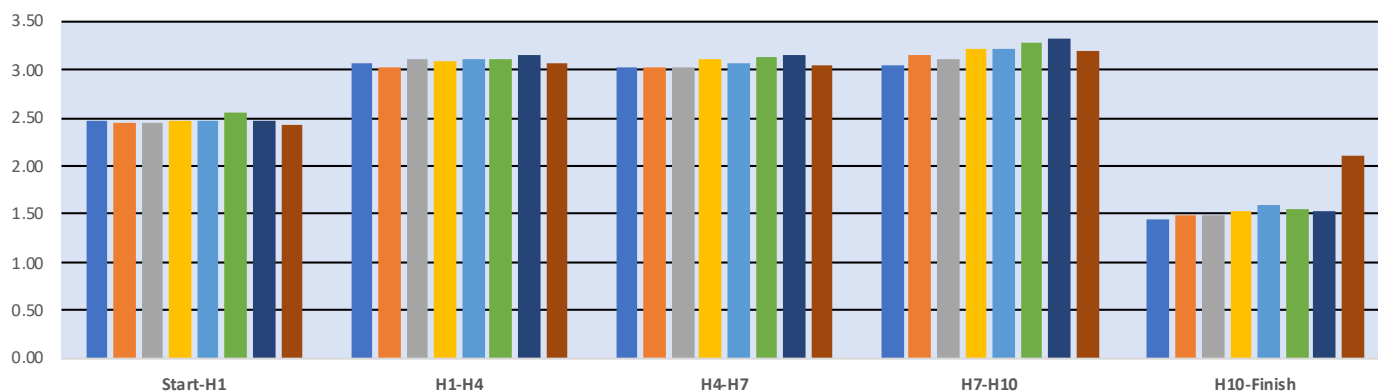
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Ortega, Orlando (ESP) (1991)	time		2.48	3.52	4.54	5.54	6.54	7.54	8.56	9.56	10.56	11.60		13.04	3 / 1			
	reaction time	0.136											1.44	NR		3.06	3.02	3.04
	interval velocity		7 steps	1.04	1.02	1.00	1.00	1.00	1.02	1.00	1.00	1.04	9.74	8.44		8.96	9.08	9.02
Bascou, Dimitri (FRA) (1987)	time		2.44	3.48	4.48	5.46	6.44	7.46	8.48	9.52	10.56	11.64		13.12	6 / 2			
	reaction time	0.136											1.48	PB		3.02	3.02	3.16
	interval velocity		7 steps	1.04	1.00	0.98	0.98	1.02	1.02	1.04	1.04	1.08	9.47	8.38		9.08	9.08	8.68
Martinot-Lagarde, Pascal (FRA) (1991)	time		2.44	3.50	4.52	5.54	6.56	7.56	8.56	9.58	10.60	11.68		13.17	4 / 3			
	reaction time	0.132											1.49			3.10	3.02	3.12
	interval velocity		7 steps	1.06	1.02	1.02	1.02	1.00	1.00	1.02	1.02	1.08	9.41	8.35		8.85	9.08	8.79
Belocian, Wilhem (FRA) (1995)	time		2.48	3.52	4.54	5.56	6.56	7.60	8.66	9.72	10.78	11.88		13.42	2 / 4			
	reaction time	0.129											1.54			3.08	3.10	3.22
	interval velocity			1.04	1.02	1.02	1.00	1.04	1.06	1.06	1.06	1.10	9.10	8.20		8.90	8.85	8.52
Baji, Balázs (HUN) (1989)	time		2.48	3.54	4.56	5.58	6.60	7.60	8.64	9.68	10.72	11.86		13.45	8 / 5			
	reaction time	0.131											1.59			3.10	3.06	3.22
	interval velocity		7 steps	1.06	1.02	1.02	1.02	1.00	1.04	1.04	1.04	1.14	8.82	8.18		8.85	8.96	8.52
Czykier, Damian (POL) (1992)	time		2.56	3.58	4.62	5.66	6.70	7.72	8.80	9.88	10.96	12.08		13.64	1 / 6			
	reaction time	0.157											1.56			3.10	3.14	3.28
	interval velocity		7 steps	1.02	1.04	1.04	1.04	1.02	1.08	1.08	1.08	1.12	8.99	8.06		8.85	8.73	8.36
Alkana, Antonio (RSA) (1990)	time		2.48	3.54	4.60	5.64	6.68	7.76	8.80	9.88	11.04	12.12		13.66	7 / 7			
	reaction time	0.130											1.54			3.16	3.16	3.32
	interval velocity			1.06	1.06	1.04	1.04	1.08	1.04	1.08	1.16	1.08	9.10	8.05		8.68	8.68	8.26
McLeod, Omar (JAM) (1994)	time		2.42	3.48	4.48	5.48	6.48	7.50	8.52	9.60	10.68	11.72		13.82	5 / 8			
	reaction time	0.128											2.10			3.06	3.04	3.20
	interval velocity			1.06	1.00	1.00	1.00	1.02	1.02	1.08	1.08	1.04	6.68	7.96		8.96	9.02	8.57



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=WOJynT2N5Eo>

2016 USA Olympic Trials (Eugene, OR) (TV Analysis)

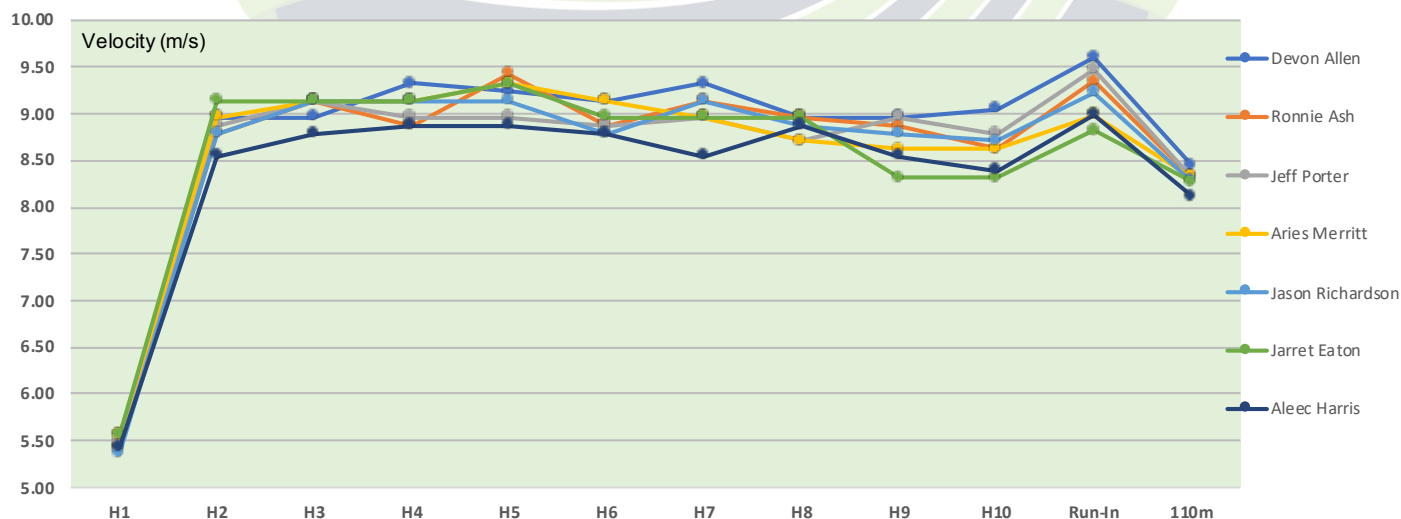
110m Hurdles

Date: 2016.07.09

Wind: 1.0 m/s

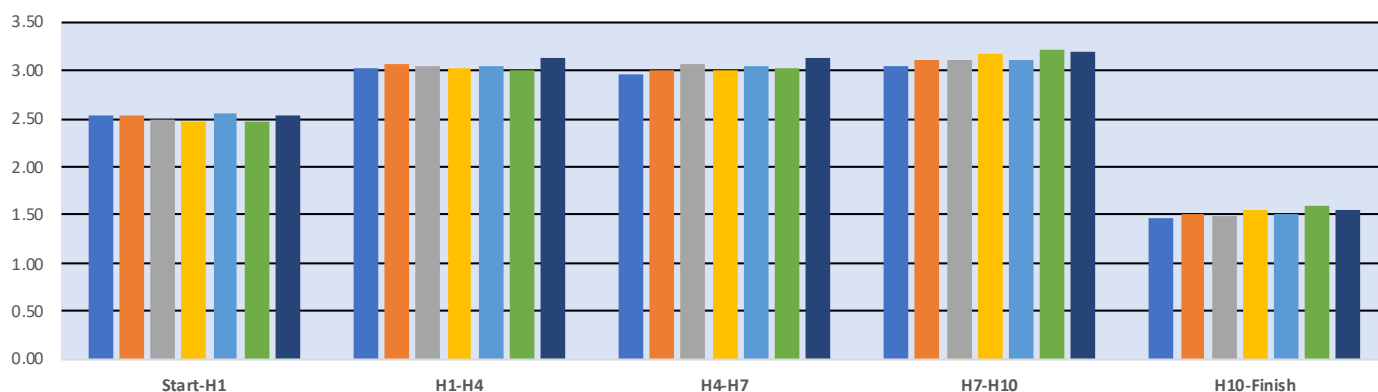
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Allen, Devon (USA) (1994)	time	2.53	3.55	4.57	5.55	6.54	7.54	8.52	9.54	10.56	11.57		13.03	3 / 1			
	reaction time																
	interval		1.02	1.02	0.98	0.99	1.00	0.98	1.02	1.02	1.01	1.46	PB		3.02	2.97	3.05
Ash, Ronnie (USA) (1988)	time	2.53	3.57	4.57	5.60	6.57	7.60	8.60	9.62	10.65	11.71		13.21	4 / 2			
	reaction time																
	interval	7 steps	1.04	1.00	1.03	0.97	1.03	1.00	1.02	1.03	1.06	1.50			3.07	3.00	3.11
Porter, Jeff (USA) (1985)	time	2.50	3.53	4.53	5.55	6.57	7.60	8.62	9.67	10.69	11.73		13.21	6 / 3			
	reaction time																
	interval		1.03	1.00	1.02	1.02	1.03	1.02	1.05	1.02	1.04	1.48			3.05	3.07	3.11
Merritt, Aries (USA) (1985)	time	2.47	3.49	4.49	5.49	6.47	7.47	8.49	9.54	10.60	11.66		13.22	1 / 4			
	reaction time																
	interval	7 steps	1.02	1.00	1.00	0.98	1.00	1.02	1.05	1.06	1.06	1.56			3.02	3.00	3.17
Richardson, Jason (USA) (1986)	time	2.56	3.60	4.60	5.60	6.60	7.64	8.64	9.67	10.71	11.76		13.28	7 / 5			
	reaction time																
	interval	7 steps	1.04	1.00	1.00	1.00	1.04	1.00	1.03	1.04	1.05	1.52			3.04	3.04	3.12
Eaton, Jarret (USA) (1989)	time	2.47	3.47	4.47	5.47	6.45	7.47	8.49	9.51	10.61	11.71		13.30	2 / 6			
	reaction time																
	interval	7 steps	1.00	1.00	1.00	0.98	1.02	1.02	1.10	1.10	1.10	1.59			3.00	3.02	3.22
Harris, Aleec (USA) (1990)	time	2.53	3.60	4.64	5.67	6.70	7.74	8.81	9.84	10.91	12.00		13.56	8 / 7			
	reaction time																
	interval		1.07	1.04	1.03	1.03	1.04	1.07	1.03	1.07	1.09	1.56			3.14	3.14	3.19
	velocity	5.42	8.96	8.96	9.33	9.23	9.14	9.33	8.96	8.96	9.05	9.60	8.44		9.08	9.23	8.99
	velocity	5.42	8.79	9.14	8.87	9.42	8.87	9.14	8.96	8.87	8.62	9.35	8.33		8.93	9.14	8.82
	velocity	5.49	8.87	9.14	8.96	8.96	8.87	8.96	8.70	8.96	8.79	9.47	8.33		8.99	8.93	8.82
	velocity	5.55	8.96	9.14	9.14	9.33	9.14	8.96	8.70	8.62	8.62	8.99	8.32		9.08	9.14	8.65
	velocity	5.36	8.79	9.14	9.14	9.14	8.79	9.14	8.87	8.79	8.70	9.22	8.28		9.02	9.02	8.79
	velocity	5.55	9.14	9.14	9.14	9.33	8.96	8.96	8.96	8.31	8.31	8.82	8.27		9.14	9.08	8.52
	velocity	5.42	8.54	8.79	8.87	8.87	8.79	8.54	8.87	8.54	8.39	8.99	8.11		8.73	8.73	8.60



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=Jag-2UrA0JI>

2016 Jamiacan National Championships (Kingston, JAM) (TV Analysis)

110m Hurdles

Date: 2016.07.02

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
McLeod, Omar (JAM) (1994)	time	2.43	3.50	4.51	5.51	6.49	7.47	8.49	9.51	10.51	11.53		13.01	4 / 1			
	reaction time											1.48			3.08	2.98	3.04
	interval		1.07	1.01	1.00	0.98	0.98	1.02	1.02	1.00	1.02				8.90	9.20	9.02
Carter, Deuce (JAM) (1990)	time	2.46	3.53	4.51	5.49	6.49	7.47	8.49	9.54	10.58	11.64		13.21	5 / 2			
	reaction time											1.57			3.03	3.00	3.15
	interval	7 steps	1.07	0.98	0.98	1.00	0.98	1.02	1.05	1.04	1.06				9.05	9.14	8.70
	velocity	5.65	8.54	9.05	9.14	9.33	9.33	8.96	8.96	9.14	8.96	9.47	8.46				
	velocity	5.58	8.54	9.33	9.33	9.14	9.33	8.96	8.70	8.79	8.62	8.93	8.33				

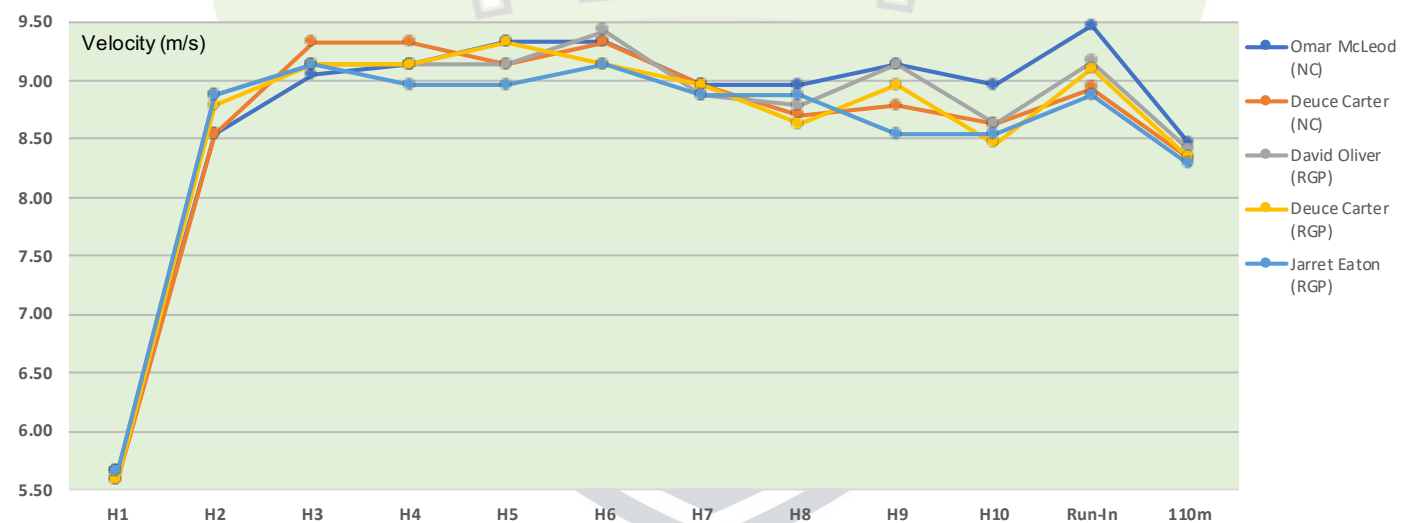
2016 Racers Grand Prix (Kingston, JAM) (TV Analysis)

Date: 2016.06.11

Wind: 0.2 m/s

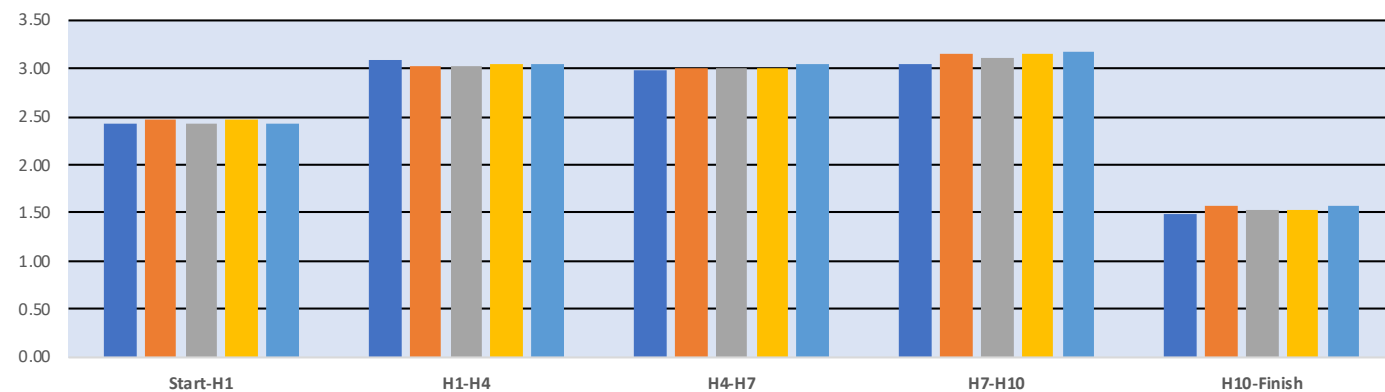
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Oliver, David (USA) (1982)	time	2.43	3.46	4.46	5.46	6.46	7.43	8.46	9.50	10.50	11.56		13.09	4 / 1			
	reaction time											1.53			3.03	3.00	3.10
	interval	7 steps	1.03	1.00	1.00	1.00	0.97	1.03	1.04	1.00	1.06				9.05	9.14	8.85
Carter, Deuce (JAM) (1990)	time	2.46	3.50	4.50	5.50	6.48	7.48	8.50	9.56	10.58	11.66		13.20	2 / 2			
	reaction time											1.54	PB		3.04	3.00	3.16
	interval	7 steps	1.04	1.00	1.00	0.98	1.00	1.02	1.06	1.02	1.08				9.02	9.14	8.68
Eaton, Jarret (USA) (1989)	time	2.43	3.46	4.46	5.48	6.50	7.50	8.53	9.56	10.63	11.70		13.28	5 / 3			
	reaction time											1.58			3.05	3.05	3.17
	interval	7 steps	1.03	1.00	1.02	1.02	1.00	1.03	1.03	1.07	1.07				8.99	8.99	8.65
	velocity	5.65	8.87	9.14	9.14	9.33	9.14	8.96	8.62	8.96	8.46	9.10	8.33				
	velocity	5.65	8.87	9.14	9.14	8.96	8.96	9.14	8.87	8.87	8.54	8.54	8.87	8.28			



Time Intervals (s)

Hurdle Phases



Jamiacan National Championships

Evaluated with: ObjectusVideo

Quality & Frame Rate: 854 x 478 @ 29fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=Nbsn3bCN2IA>

Racers Grand Prix

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1276 x 720 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=7csDpRZqlao>

2016 Golden Gala Pietro Mennea (Roma, ITA) (TV Analysis)

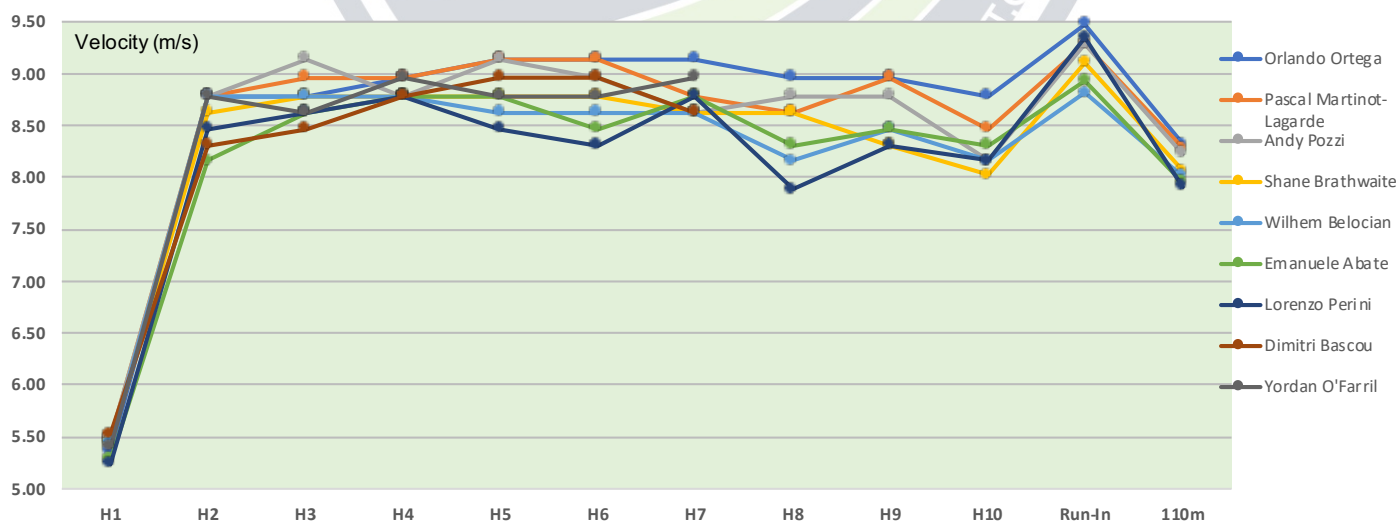
110m Hurdles

Date: 2016.06.02

Wind: 0.6 m/s

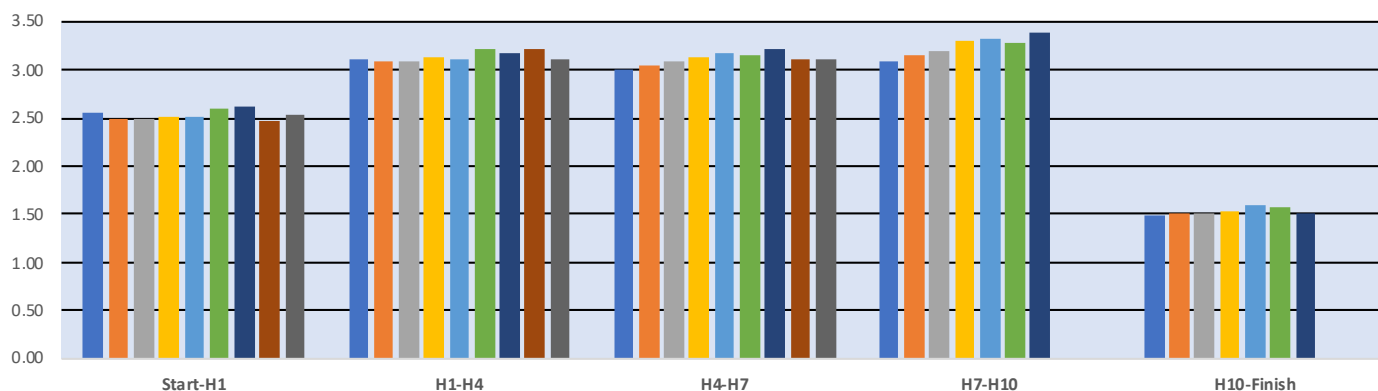
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Ortega, Orlando (ESP) (1991)	time		2.56	3.60	4.64	5.66	6.66	7.66	8.66	9.68	10.70	11.74		13.22	7 / 1			
	reaction time	0.136											1.48			3.10	3.00	3.08
	interval velocity		7 steps	1.04	1.04	1.02	1.00	1.00	1.02	1.02	1.02	1.04	9.47	8.32		8.85	9.14	8.90
Martino-Lagarde, Pascal (FRA) (1991)	time		2.50	3.54	4.56	5.58	6.58	7.58	8.62	9.68	10.70	11.78		13.29	5 / 2			
	reaction time	0.155											1.51			3.08	3.04	3.16
	interval velocity		7 steps	1.04	1.02	1.02	1.00	1.00	1.04	1.06	1.02	1.08	9.28	8.28		8.90	9.02	8.68
Pozzi, Andy (GBR) (1992)	time		2.50	3.54	4.54	5.58	6.58	7.60	8.66	9.70	10.74	11.86		13.37	2 / 3			
	reaction time	0.139											1.51			3.08	3.08	3.20
	interval velocity		7 steps	1.04	1.00	1.04	1.00	1.02	1.06	1.04	1.04	1.12	9.28	8.23		8.90	8.90	8.57
Brathwaite, Shane (BAR) (1990)	time		2.52	3.58	4.62	5.66	6.70	7.74	8.80	9.86	10.96	12.10		13.64	3 / 4			
	reaction time	0.133											1.54			3.14	3.14	3.30
	interval velocity		7 steps	1.06	1.04	1.04	1.04	1.04	1.06	1.06	1.10	1.14	9.10	8.06		8.73	8.73	8.31
Belocian, Wilhem (FRA) (1995)	time		2.52	3.56	4.60	5.64	6.70	7.76	8.82	9.94	11.02	12.14		13.73	8 / 5			
	reaction time	0.132											1.59			3.12	3.18	3.32
	interval velocity		5.44	8.79	8.79	8.79	8.62	8.62	8.62	8.16	8.46	8.16	8.82	8.01		8.79	8.62	8.26
Abate, Emanuele (ITA) (1985)	time		2.60	3.72	4.78	5.82	6.86	7.94	8.98	10.08	11.16	12.26		13.83	9 / 6			
	reaction time	0.149											1.57			3.22	3.16	3.28
	interval velocity		7 steps	1.12	1.06	1.04	1.04	1.08	1.04	1.10	1.08	1.10	8.93	7.95		8.52	8.68	8.36
Perini, Lorenzo (ITA) (1994)	time		2.62	3.70	4.76	5.80	6.88	7.98	9.02	10.18	11.28	12.40		13.90	1 / 7			
	reaction time	0.151											1.50			3.18	3.22	3.38
	interval velocity		5.24	8.46	8.62	8.79	8.46	8.31	8.79	7.88	8.31	8.16	9.35	7.91		8.62	8.52	8.11
Bascou, Dimitri (FRA) (1987)	time		2.48	3.58	4.66	5.70	6.72	7.74	8.80					dnf	4 / --			
	reaction time	0.149														3.22	3.10	
	interval velocity		7 steps	1.10	1.08	1.04	1.02	1.02	1.06							8.52	8.85	
O'Farrell, Yordan (CUB) (1993)	time		2.54	3.58	4.64	5.66	6.70	7.74	8.76					dnf	6 / --			
	reaction time	0.135														3.12	3.10	
	interval velocity		7 steps	1.04	1.06	1.02	1.04	1.04	1.02							8.79	8.85	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=9U8fvRFiBQg>

2016 Prefontaine Classic (Eugene, OR) (TV Analysis)

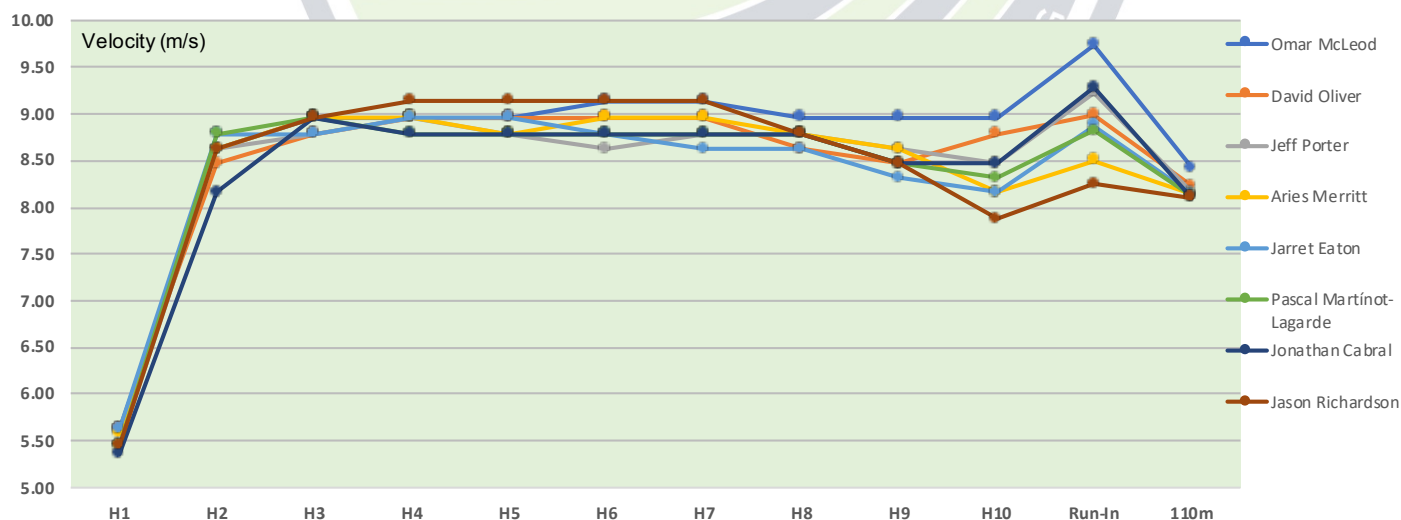
110m Hurdles

Date: 2016.05.28

Wind: 0.7 m/s

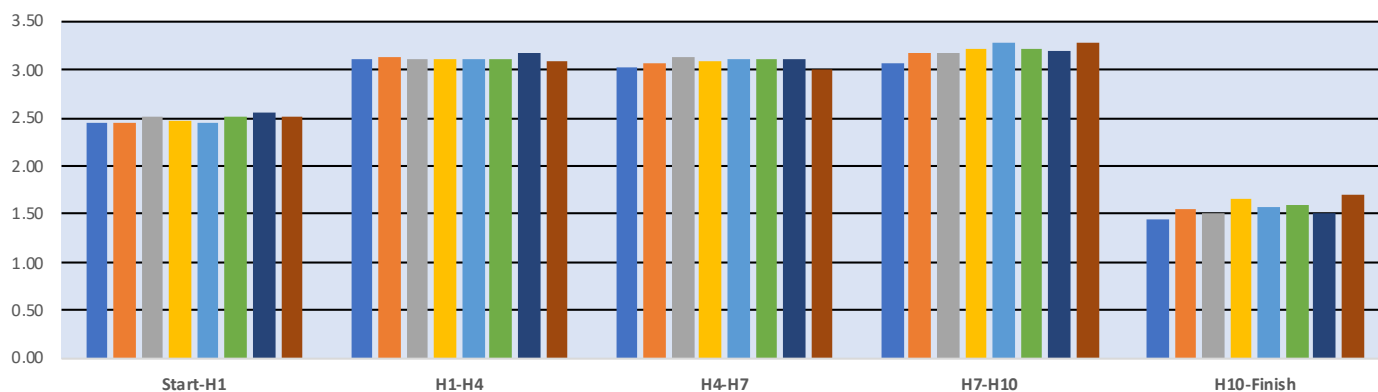
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
McLeod, Omar (JAM) (1994)	time	2.44	3.50	4.52	5.54	6.56	7.56	8.56	9.58	10.60	11.62		13.06	4 / 1			
	reaction time											1.44			3.10	3.02	3.06
	interval		1.06	1.02	1.02	1.02	1.00	1.00	1.02	1.02	1.02	1.44			8.85	9.08	8.96
Oliver, David (USA) (1982)	time	2.44	3.52	4.56	5.58	6.60	7.62	8.64	9.70	10.78	11.82		13.38	6 / 2			
	reaction time											1.56			3.14	3.06	3.18
	interval	7 steps	1.08	1.04	1.02	1.02	1.02	1.02	1.06	1.08	1.04	1.56			8.73	8.96	8.62
Porter, Jeff (USA) (1985)	time	2.52	3.58	4.62	5.64	6.68	7.74	8.78	9.82	10.88	11.96		13.48	1 / 3			
	reaction time											1.52			3.12	3.14	3.18
	interval		1.06	1.04	1.02	1.04	1.06	1.04	1.04	1.06	1.08	1.52			8.79	8.73	8.62
Merritt, Aries (USA) (1985)	time	2.46	3.52	4.54	5.56	6.60	7.62	8.64	9.68	10.74	11.86		13.51	3 / 4			
	reaction time											1.65			3.10	3.08	3.22
	interval	7 steps	1.06	1.02	1.02	1.04	1.02	1.02	1.04	1.06	1.12	1.65			8.85	8.90	8.52
Eaton, Jarret (USA) (1989)	time	2.44	3.48	4.52	5.54	6.56	7.60	8.66	9.72	10.82	11.94		13.52	7 / 5			
	reaction time											1.58			3.10	3.12	3.28
	interval	7 steps	1.04	1.04	1.02	1.02	1.04	1.06	1.06	1.10	1.12	1.58			8.85	8.79	8.36
Martino-Lagarde, Pascal (FRA) (1991)	time	2.52	3.56	4.58	5.62	6.66	7.70	8.74	9.78	10.86	11.96		13.55	5 / 6			
	reaction time											1.59			3.10	3.12	3.22
	interval	7 steps	1.04	1.02	1.04	1.04	1.04	1.04	1.04	1.08	1.10	1.59			8.85	8.79	8.52
Cabral, Jonathan (CAN) (1992)	time	2.56	3.68	4.70	5.74	6.78	7.82	8.86	9.90	10.98	12.06		13.57	8 / 7			
	reaction time											1.51			3.18	3.12	3.20
	interval	7 steps	1.12	1.02	1.04	1.04	1.04	1.04	1.04	1.08	1.08	1.51			8.62	8.79	8.57
Parchment, Hansle (JAM) (1990)	time	2.52	3.58	4.60	5.60	6.60	7.60	8.60	9.64	10.72	11.88		13.58	2 / 8			
	reaction time											1.70			3.08	3.00	3.28
	interval	7 steps	1.06	1.02	1.00	1.00	1.00	1.00	1.04	1.08	1.16	1.70			8.90	9.14	8.36
	velocity	5.62	8.62	8.96	8.96	8.96	9.14	9.14	8.96	8.96	8.96	9.74	8.42				
	velocity	5.62	8.46	8.79	8.96	8.96	8.96	8.96	8.62	8.46	8.79	8.99	8.22				
	velocity	5.44	8.62	8.79	8.96	8.79	8.62	8.79	8.79	8.62	8.46	9.22	8.16				
	velocity	5.58	8.62	8.96	8.96	8.79	8.96	8.96	8.79	8.62	8.16	8.50	8.14				
	velocity	5.62	8.79	8.79	8.96	8.96	8.79	8.62	8.62	8.31	8.16	8.87	8.14				
	velocity	5.44	8.79	8.96	8.96	8.79	8.79	8.79	8.79	8.46	8.31	8.82	8.12				
	velocity	5.36	8.16	8.96	8.79	8.79	8.79	8.79	8.79	8.46	8.46	9.28	8.11				
	velocity	5.44	8.62	8.96	9.14	9.14	9.14	9.14	8.79	8.46	7.88	8.25	8.10				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=Si0Zhl3Q964>

2016 Meeting International Mohammed VI D'Athletisme (Rabat, MAR) (TV Analysis)

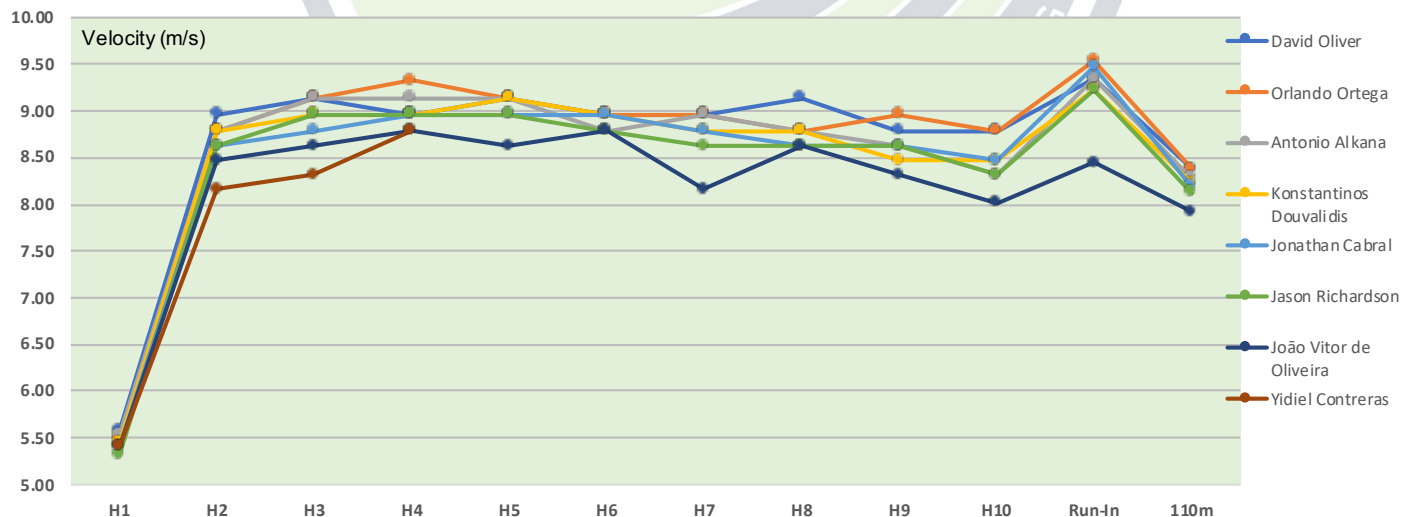
110m Hurdles

Date: 2016.05.22

Wind: 1.4 m/s

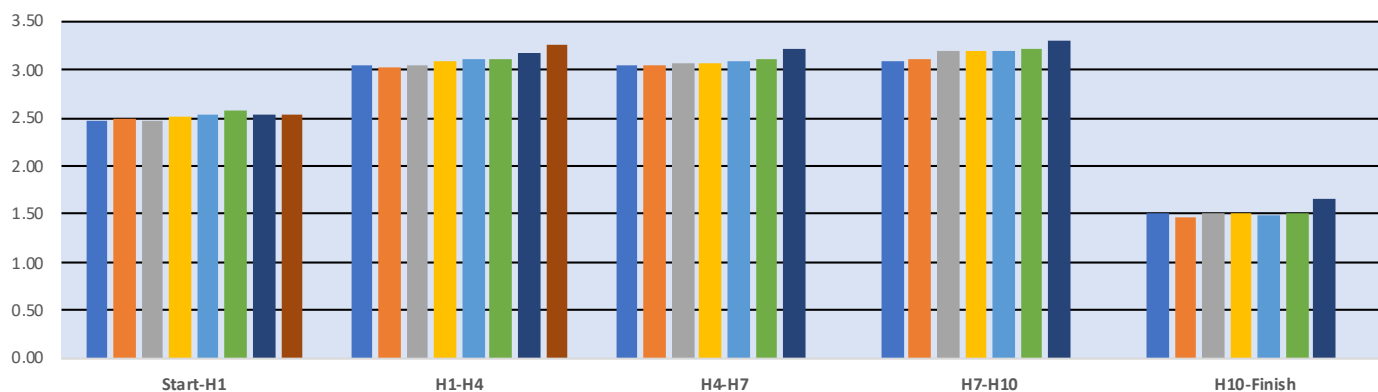
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Oliver, David (USA) (1982)	time		2.46	3.48	4.48	5.50	6.50	7.52	8.54	9.54	10.58	11.62		13.12	7 / 1			
	reaction time	0.152	7 steps	1.02	1.00	1.02	1.00	1.02	1.02	1.00	1.04	1.04	1.50			3.04	3.04	3.08
	interval velocity		5.58	8.96	9.14	8.96	9.14	8.96	8.96	9.14	8.79	8.79	9.35	8.38		9.02	9.02	8.90
Ortega, Orlando (ESP) (1991)	time		2.50	3.54	4.54	5.52	6.52	7.54	8.56	9.60	10.62	11.66		13.13	6 / 2			
	reaction time	0.150	7 steps	1.04	1.00	0.98	1.00	1.02	1.02	1.04	1.02	1.04	1.47			3.02	3.04	3.10
	interval velocity		5.49	8.79	9.14	9.33	9.14	8.96	8.96	8.79	8.96	8.79	9.54	8.38		9.08	9.02	8.85
Alkana, Antonio (RSA) (1990)	time		2.48	3.52	4.52	5.52	6.52	7.56	8.58	9.62	10.68	11.78		13.28	9 / 3			
	reaction time	0.129	interval	1.04	1.00	1.00	1.00	1.04	1.02	1.04	1.06	1.10	1.50	PB		3.04	3.06	3.20
	velocity		5.53	8.79	9.14	9.14	9.14	8.79	8.96	8.79	8.62	8.31	9.35	8.28		9.02	8.96	8.57
Douvalidis, Konstadinos (GRE) (1987)	time		2.52	3.56	4.58	5.60	6.60	7.62	8.66	9.70	10.78	11.86		13.38	3 / 4			
	reaction time	0.113	interval	1.04	1.02	1.02	1.00	1.02	1.04	1.04	1.08	1.08	1.52			3.08	3.06	3.20
	velocity		5.44	8.79	8.96	8.96	9.14	8.96	8.79	8.79	8.46	8.46	9.22	8.22		8.90	8.96	8.57
Cabral, Jonathan (CAN) (1992)	time		2.54	3.60	4.64	5.66	6.68	7.70	8.74	9.80	10.86	11.94		13.42	5 / 5			
	reaction time	0.155	7 steps	1.06	1.04	1.02	1.02	1.02	1.04	1.06	1.06	1.08	1.48			3.12	3.08	3.20
	interval velocity		5.40	8.62	8.79	8.96	8.96	8.96	8.79	8.62	8.62	8.46	9.47	8.20		8.79	8.90	8.57
Richardson, Jason (USA) (1986)	time		2.58	3.64	4.66	5.68	6.70	7.74	8.80	9.86	10.92	12.02		13.54	4 / 6			
	reaction time	0.159	7 steps	1.06	1.02	1.02	1.02	1.04	1.06	1.06	1.06	1.10	1.52			3.10	3.12	3.22
	interval velocity		5.32	8.62	8.96	8.96	8.96	8.79	8.62	8.62	8.62	8.31	9.22	8.12		8.85	8.79	8.52
de Oliveira, João Vitor (BRA) (1992)	time		2.54	3.62	4.68	5.72	6.78	7.82	8.94	10.00	11.10	12.24		13.90	2 / 7			
	reaction time	0.101	interval	1.08	1.06	1.04	1.06	1.04	1.12	1.06	1.10	1.14	1.66			3.18	3.22	3.30
	velocity		5.40	8.46	8.62	8.79	8.62	8.79	8.16	8.62	8.31	8.02	8.45	7.91		8.62	8.52	8.31
Contreras, Yidiel (ESP) (1992)	time		2.54	3.66	4.76	5.80								dnf	8 / --			
	reaction time	0.147	7 steps	1.12	1.10	1.04										3.26		
	interval velocity		5.40	8.16	8.31	8.79										8.41		



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: https://www.youtube.com/watch?v=PZGipMU-y_g

2016 Shanghai Golden Grand Prix (Shanghai, CHN) (TV Analysis)

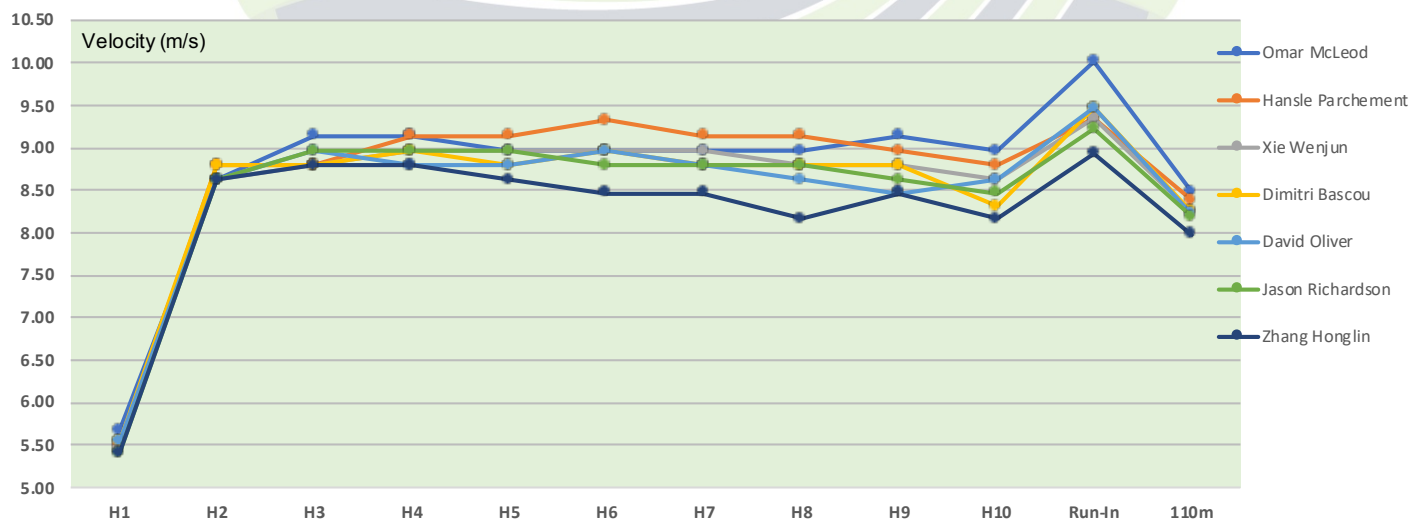
110m Hurdles

Date: 2016.05.14

Wind: 1.2 m/s

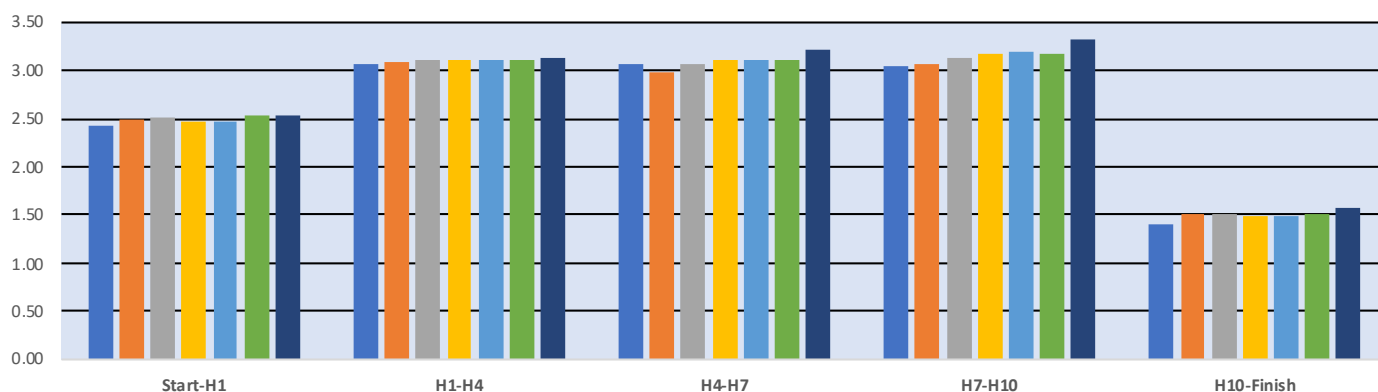
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
McLeod, Omar (JAM) (1994)	time		2.42	3.48	4.48	5.48	6.50	7.52	8.54	9.56	10.56	11.58		12.98	5 / 1			
	reaction time	0.133														3.06	3.06	3.04
	interval			1.06	1.00	1.00	1.02	1.02	1.02	1.02	1.00	1.02	1.40			8.96	8.96	9.02
Parchment, Hansle (JAM) (1990)	time		2.50	3.54	4.58	5.58	6.58	7.56	8.56	9.56	10.58	11.62		13.12	4 / 2			
	reaction time	0.136														3.08	2.98	3.06
	interval		7 steps	1.04	1.04	1.00	1.00	0.98	1.00	1.00	1.02	1.04	1.50			8.90	9.20	8.96
Xie Wenjun (CHN) (1990)	time		2.52	3.58	4.62	5.64	6.66	7.68	8.70	9.74	10.78	11.84		13.34	8 / 3			
	reaction time	0.155														3.12	3.06	3.14
	interval			1.06	1.04	1.02	1.02	1.02	1.02	1.04	1.04	1.06	1.50			8.79	8.96	8.73
Bascou, Dimitri (FRA) (1987)	time		2.48	3.52	4.56	5.58	6.62	7.64	8.68	9.72	10.76	11.86		13.34	2 / 4			
	reaction time	0.141														3.10	3.10	3.18
	interval		7 steps	1.04	1.04	1.02	1.04	1.02	1.04	1.04	1.04	1.10	1.48			8.85	8.85	8.62
Oliver, David (USA) (1982)	time		2.48	3.54	4.56	5.60	6.64	7.66	8.70	9.76	10.84	11.90		13.38	7 / 5			
	reaction time	0.141														3.12	3.10	3.20
	interval		7 steps	1.06	1.02	1.04	1.04	1.02	1.04	1.06	1.08	1.06	1.48			8.79	8.85	8.57
Richardson, Jason (USA) (1986)	time		2.54	3.60	4.62	5.64	6.66	7.70	8.74	9.78	10.84	11.92		13.44	9 / 6			
	reaction time	0.151														3.10	3.10	3.18
	interval		7 steps	1.06	1.02	1.02	1.02	1.04	1.04	1.06	1.08	1.08	1.52			8.85	8.85	8.62
Zhang Honglin (CHN) (1994)	time		2.54	3.60	4.64	5.68	6.74	7.82	8.90	10.02	11.10	12.22		13.79	1 / 7			
	reaction time	0.142														3.14	3.22	3.32
	interval			1.06	1.04	1.04	1.06	1.08	1.08	1.12	1.08	1.12	1.57			8.73	8.52	8.26
	velocity																	
			5.67	8.62	9.14	9.14	8.96	8.96	8.96	8.96	9.14	8.96	10.01	8.47				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=SioZhl3Q964>

2016 Doha Diamond League (Doha, QAT) (TV Analysis)

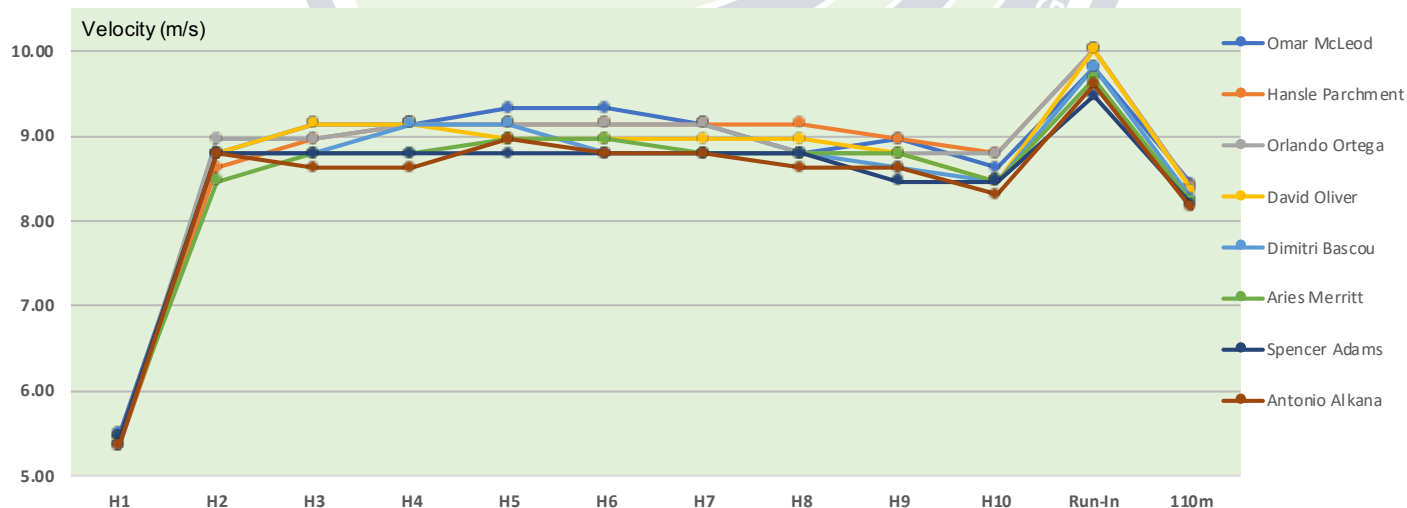
110m Hurdles

Date: 2016.05.06

Wind: 1.4 m/s

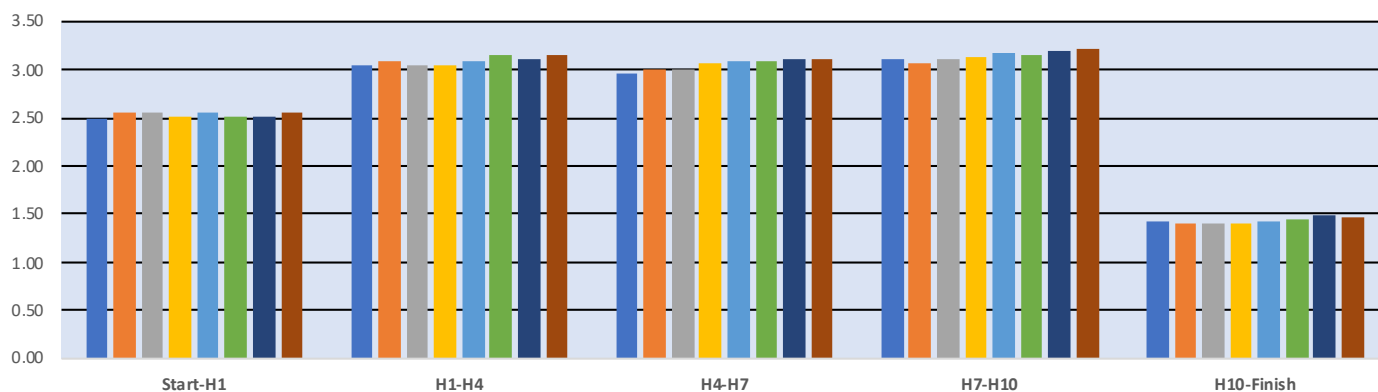
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
McLeod, Omar (JAM) (1994)	time		2.50	3.54	4.54	5.54	6.52	7.50	8.50	9.54	10.56	11.62		13.05	4 / 1			
	reaction time	0.131														3.04	2.96	3.12
	interval			1.04	1.00	1.00	0.98	0.98	1.00	1.04	1.02	1.06	1.43			9.02	9.26	8.79
Parchment, Hansle (JAM) (1990)	time		2.56	3.62	4.64	5.64	6.64	7.64	8.64	9.64	10.66	11.70		13.10	7 / 2			
	reaction time	0.127														3.08	3.00	3.06
	interval		7 steps	1.06	1.02	1.00	1.00	1.00	1.00	1.00	1.02	1.04	1.40			8.90	9.14	8.96
Ortega, Orlando (ESP) (1991)	time		2.56	3.58	4.60	5.60	6.60	7.60	8.60	9.64	10.68	11.72		13.12	6 / 3			
	reaction time	0.118														3.04	3.00	3.12
	interval		7 steps	1.02	1.02	1.00	1.00	1.00	1.00	1.04	1.04	1.04	1.40	NR		9.02	9.14	8.79
Oliver, David (USA) (1982)	time		2.52	3.56	4.56	5.56	6.58	7.60	8.62	9.64	10.68	11.76		13.16	3 / 4			
	reaction time	0.140														3.04	3.06	3.14
	interval		7 steps	1.04	1.00	1.00	1.02	1.02	1.02	1.04	1.08	1.40				9.02	8.96	8.73
Bascou, Dimitri (FRA) (1987)	time		2.56	3.60	4.64	5.64	6.64	7.68	8.72	9.76	10.82	11.90		13.33	2 / 5			
	reaction time	0.153														3.08	3.08	3.18
	interval		7 steps	1.04	1.04	1.00	1.00	1.04	1.04	1.04	1.06	1.08	1.43			8.90	8.90	8.62
Merritt, Aries (USA) (1985)	time		2.52	3.60	4.64	5.68	6.70	7.72	8.76	9.80	10.84	11.92		13.37	5 / 6			
	reaction time	0.125														3.16	3.08	3.16
	interval		7 steps	1.08	1.04	1.04	1.02	1.02	1.04	1.04	1.04	1.08	1.45			8.68	8.90	8.68
Adams, Spencer (USA) (1989)	time		2.52	3.56	4.60	5.64	6.68	7.72	8.76	9.80	10.88	11.96		13.44	8 / 7			
	reaction time	0.124														3.12	3.12	3.20
	interval		7 steps	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.08	1.08	1.48			8.79	8.79	8.57
Alkana, Antonio (RSA) (1990)	time		2.56	3.60	4.66	5.72	6.74	7.78	8.82	9.88	10.94	12.04		13.50	1 / 8			
	reaction time	0.139														3.16	3.10	3.22
	interval			1.04	1.06	1.06	1.02	1.04	1.04	1.06	1.06	1.10	1.46			8.68	8.85	8.52
	velocity		5.36	8.79	8.62	8.62	8.96	8.79	8.79	8.62	8.62	8.31	9.60	8.15				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=qh3ik0vaHCM>

Women's 100m Hurdles

2016 Top 10 Times - Women's 100m Hurdles

Harrison, Kendra (USA) (1992)																
FINAL - 2016 London Anniversary Games (London, GBR)																
date	22-Jul	time	2.49	3.49	4.45	5.40	6.33	7.27	8.21	9.15	10.11	11.10	12.20	6 / 1		
reaction time	0.149	interval		1.00	0.96	0.95	0.93	0.94	0.94	0.94	0.96	0.99	1.10	WR	2.91	2.81
wind	0.3 m/s	velocity	5.22	8.50	8.85	8.95	9.14	9.04	9.04	9.04	8.85	8.59	9.55	8.20	8.76	8.82
Harrison, Kendra (USA) (1992)																
FINAL - 2016 Prefontaine Classic (Eugene, OR) (TV Analysis)																
date	28-May	time	2.42	3.42	4.38	5.32	6.26	7.22	8.14	9.10	10.06	11.02	12.24	6 / 1		
reaction time	0.143	interval		1.00	0.97	0.97	0.94	0.96	0.92	0.96	0.96	0.96	1.22	AR PB	2.90	2.82
wind	0.7 m/s	velocity	5.37	8.50	8.85	9.04	9.04	8.85	9.24	8.85	8.85	8.85	8.61	8.17	8.79	8.85
Rollins, Brianna (USA) (1991)																
FINAL - 2016 USA Olympic Trials (Eugene, OR) (TV Analysis)																
date	8-Jul	time	2.40	3.40	4.37	5.34	6.27	7.20	8.14	9.11	10.11	11.11	12.34	4 / 1		
reaction time		interval		1.00	0.97	0.97	0.93	0.93	0.94	0.97	1.00	1.00	1.23		2.94	2.80
wind	1.2 m/s	velocity	5.42	8.50	8.76	8.76	9.14	9.14	9.04	8.76	8.50	8.50	8.54	8.10	8.67	8.59
Harrison, Kendra (USA) (1992)																
FINAL - 2016 Spec Towns Invitational (Athens, GA)																
date	8-Apr	time											12.36	/ 1		
reaction time		interval	No Information Available										PB			
wind	1.4 m/s	velocity														
Harrison, Kendra (USA) (1992)																
Heat 2 - 2016 London Anniversary Games (London, GBR)																
date	22-Jul	time	2.55	3.56	4.55	5.53	6.47	7.42	8.38	9.34	10.33	11.33	12.40	4 / 1		
reaction time	0.143	interval		1.01	0.99	0.98	0.94	0.95	0.96	0.96	0.99	1.00	1.07		2.98	2.85
wind	0.2 m/s	velocity	5.10	8.42	8.59	8.67	9.04	8.95	8.85	8.85	8.59	8.50	9.81	8.06	8.56	8.64
Harrison, Kendra (USA) (1992)																
FINAL - 2016 Cayman Invitational (George Town, CAY)																
date	14-May	time											12.42	/ 1		
reaction time		interval	No Information Available													
wind	0.1 m/s	velocity														
Harrison, Kendra (USA) (1992)																
FINAL - 2016 Athletissima (Lausanne, SUI) (TV Analysis)																
date	25-Aug	time	2.48	3.50	4.48	5.44	6.40	7.36	8.32	9.28	10.26	11.26	12.42	5 / 1		
reaction time	0.148	interval		1.02	0.98	0.96	0.96	0.96	0.96	0.96	0.98	1.00	1.16		2.96	2.88
wind	0.7 m/s	velocity	5.24	8.33	8.67	8.85	8.85	8.85	8.85	8.85	8.67	8.50	9.05	8.05	8.61	8.67
Harrison, Kendra (USA) (1992)																
FINAL - 2016 Meeting Paris (Saint-Denis, FRA) (TV Analysis)																
date	27-Aug	time	2.46	3.48	4.48	5.44	6.40	7.36	8.32	9.28	10.26	11.24	12.44	5 / 1		
reaction time	0.178	interval		1.02	1.00	0.96	0.96	0.96	0.96	0.96	0.98	0.98	1.20		2.98	2.88
wind	0.2 m/s	velocity	5.28	8.33	8.50	8.85	8.85	8.85	8.85	8.85	8.67	8.67	8.75	8.04	8.56	8.73
Harrison, Kendra (USA) (1992)																
FINAL - 2016 Birmingham Diamond League (Birmingham, GBR) (TV Analysis)																
date	5-Jun	time	2.46	3.48	4.46	5.43	6.40	7.33	8.30	9.27	10.27	11.27	12.46	6 / 1		
reaction time	0.212	interval		1.02	0.98	0.97	0.97	0.93	0.97	0.97	1.00	1.00	1.19		2.97	2.87
wind	-0.3 m/s	velocity	5.28	8.33	8.67	8.76	8.76	9.14	8.76	8.76	8.50	8.50	8.82	8.03	8.59	8.59
Rollins, Brianna (USA) (1991)																
Semi-Final 1 - 2016 Olympic Games (Rio de Janeiro, BRA)																
date	17-Aug	time											12.47	7 / 1		
reaction time	0.197	interval	No Information Available													
wind	0.2 m/s	velocity														
Rollins, Brianna (USA) (1991)																
FINAL - 2016 Olympic Games (Rio de Janeiro, BRA) (TV Analysis)																
date	17-Aug	time	2.30	3.32	4.30	5.27	6.24	7.20	8.17	9.15	10.14	11.14	12.48	6 / 1		
reaction time	0.158	interval		1.02	0.98	0.97	0.97	0.96	0.97	0.98	0.99	1.00	1.34		2.97	2.90
wind	0.0 m/s	velocity	5.65	8.33	8.67	8.76	8.76	8.85	8.76	8.67	8.59	8.50	7.84	8.01	8.59	8.59
Castlin, Kristi (USA) (1988)																
FINAL - 2016 USA Olympic Trials (Eugene, OR) (TV Analysis)																
date	8-Jul	time	2.50	3.53	4.53	5.50	6.47	7.40	8.37	9.34	10.34	11.31	12.50	3 / 2		
reaction time		interval		1.03	1.00	0.97	0.97	0.93	0.97	0.97	1.00	0.97	1.19	PB	3.00	2.87
wind	1.2 m/s	velocity	5.20	8.25	8.50	8.76	8.76	9.14	8.76	8.76	8.50	8.76	8.82	8.00	8.50	8.67

2016 Memorial van Damme (Brussels, BEL) (TV Analysis)

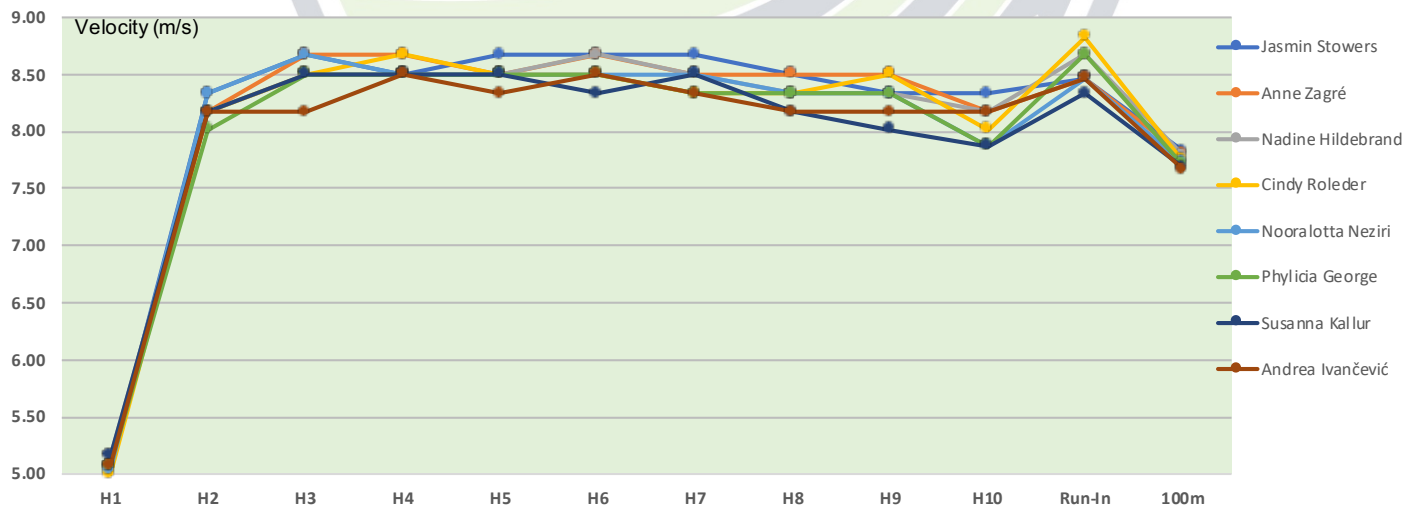
100m Hurdles

Date: 2016.09.09

Wind: 0.1 m/s

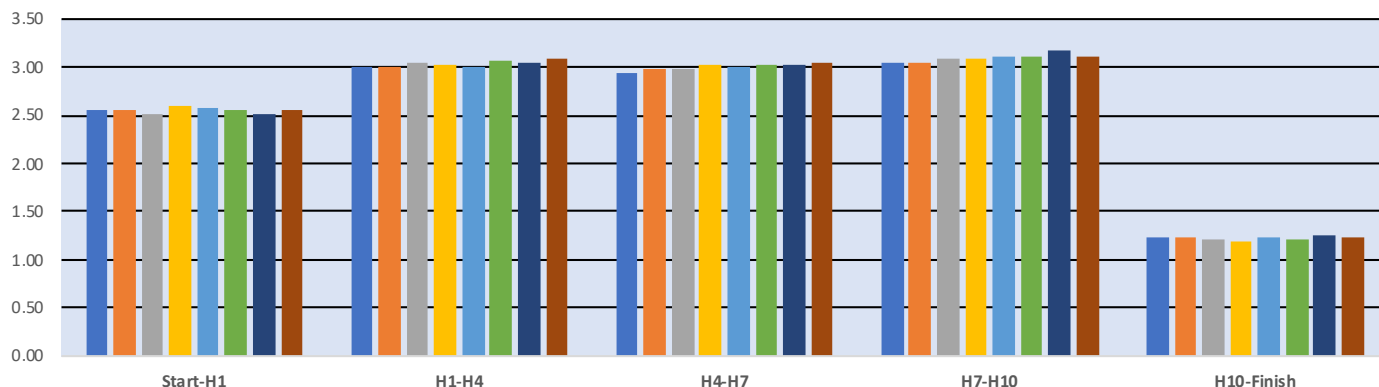
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Stowers, Jasmin (USA) (1991)	time		2.56	3.58	4.56	5.56	6.54	7.52	8.50	9.50	10.52	11.54		12.78	6 / 1	3.00	2.94	3.04
	reaction time	0.186		1.02	0.98	1.00	0.98	0.98	0.98	1.00	1.02	1.02	1.24					
	velocity		5.08	8.33	8.67	8.50	8.67	8.67	8.67	8.50	8.33	8.33	8.47	7.82				
Zagr�, Anne (BEL) (1990)	time		2.56	3.60	4.58	5.56	6.56	7.54	8.54	9.54	10.54	11.58		12.82	5 / 2	3.00	2.98	3.04
	reaction time	0.152		1.04	0.98	0.98	1.00	0.98	1.00	1.00	1.00	1.04	1.24					
	velocity		5.08	8.17	8.67	8.67	8.50	8.67	8.50	8.50	8.50	8.17	8.47	7.80				
Hildebrand, Nadine (GER) (1987)	time		2.52	3.56	4.56	5.56	6.56	7.54	8.54	9.56	10.58	11.62		12.83	7 / 3	3.04	2.98	3.08
	reaction time	0.141		1.04	1.00	1.00	1.00	0.98	1.00	1.02	1.02	1.04	1.21					
	velocity		5.16	8.17	8.50	8.50	8.50	8.67	8.50	8.33	8.33	8.17	8.68	7.79				
Roleder, Cindy (GER) (1989)	time		2.60	3.64	4.64	5.62	6.62	7.62	8.64	9.66	10.66	11.72		12.91	4 / 4	3.02	3.02	3.08
	reaction time	0.125		1.04	1.00	0.98	1.00	1.00	1.02	1.02	1.00	1.06	1.19					
	velocity		5.00	8.17	8.50	8.67	8.50	8.50	8.33	8.33	8.50	8.02	8.82	7.75				
Neziri, Nooralotta (FIN) (1992)	time		2.58	3.60	4.58	5.58	6.58	7.58	8.58	9.60	10.62	11.70		12.94	8 / 5	3.00	3.00	3.12
	reaction time	0.146		1.02	0.98	1.00	1.00	1.00	1.00	1.02	1.02	1.08	1.24					
	velocity		5.04	8.33	8.67	8.50	8.50	8.50	8.50	8.33	8.33	7.87	8.47	7.73				
George, Phylcia (CAN) (1987)	time		2.56	3.62	4.62	5.62	6.62	7.62	8.64	9.66	10.68	11.76		12.97	3 / 6	3.06	3.02	3.12
	reaction time	0.120		1.06	1.00	1.00	1.00	1.00	1.02	1.02	1.02	1.08	1.21					
	velocity		5.08	8.02	8.50	8.50	8.50	8.50	8.33	8.33	8.33	7.87	8.68	7.71				
Kallur, Susanna (SWE) (1981)	time		2.52	3.56	4.56	5.56	6.56	7.58	8.58	9.62	10.68	11.76		13.02	1 / 7	3.04	3.02	3.18
	reaction time	0.144		1.04	1.00	1.00	1.00	1.02	1.00	1.04	1.06	1.08	1.26					
	velocity		5.16	8.17	8.50	8.50	8.50	8.33	8.50	8.17	8.02	7.87	8.33	7.68				
Ivan�evi�, Andrea (CRO) (1984)	time		2.56	3.60	4.64	5.64	6.66	7.66	8.68	9.72	10.76	11.80		13.04	2 / 8	3.08	3.04	3.12
	reaction time	0.141		1.04	1.04	1.00	1.02	1.00	1.02	1.04	1.04	1.04	1.24					
	velocity		5.08	8.17	8.17	8.50	8.33	8.50	8.33	8.17	8.17	8.17	8.47	7.67				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=B3DGeV21PMA>

2016 Weltklasse (Zürich, SUI) (TV Analysis)

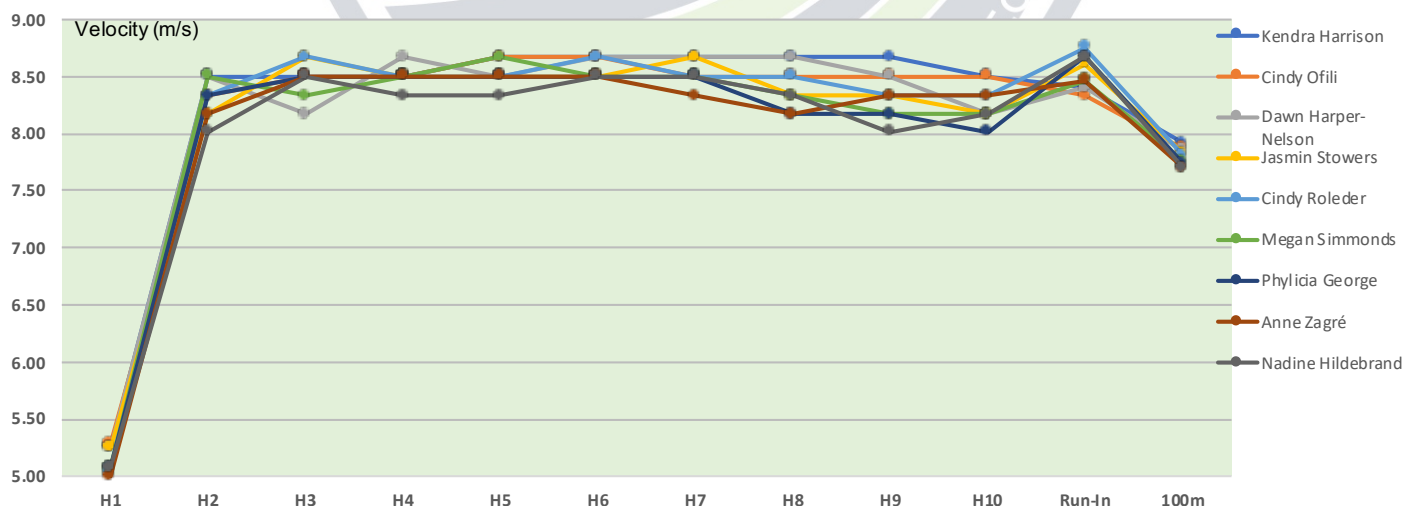
100m Hurdles

Date: 2016.09.01

Wind: 0.4 m/s

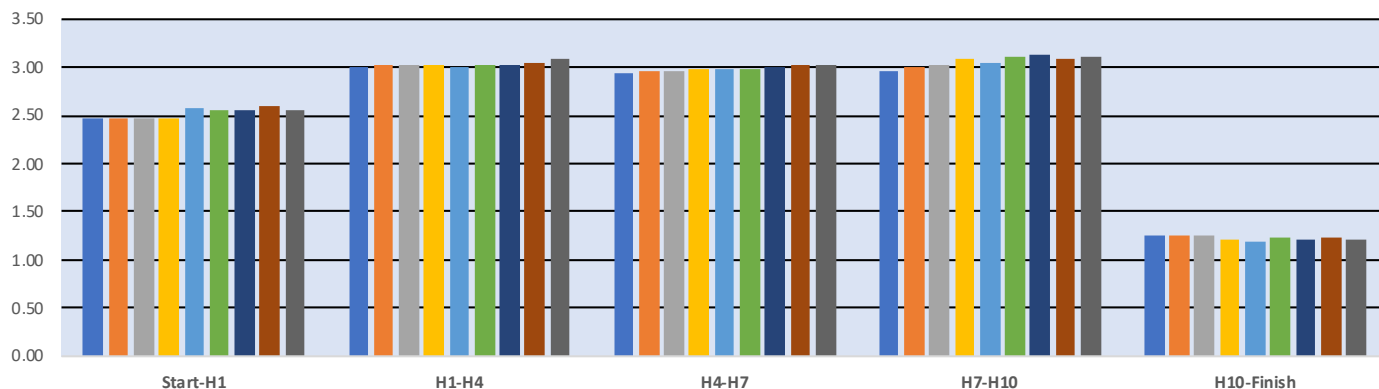
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.48	3.48	4.48	5.48	6.46	7.44	8.42	9.40	10.38	11.38		12.63	5 / 1			
	reaction time	0.168													3.00	2.94	2.96
	interval		1.00	1.00	1.00	0.98	0.98	0.98	0.98	0.98	1.00	1.25			8.50	8.67	8.61
Ofili, Cindy (GBR) (1994)	time	2.46	3.48	4.48	5.48	6.46	7.44	8.44	9.44	10.44	11.44		12.70	6 / 2			
	reaction time	0.139													3.02	2.96	3.00
	interval		1.02	1.00	1.00	0.98	0.98	1.00	1.00	1.00	1.00	1.26			8.44	8.61	8.50
Harper-Nelson, Dawn (USA) (1984)	time	2.48	3.48	4.52	5.50	6.50	7.48	8.46	9.44	10.44	11.48		12.73	7 / 3			
	reaction time	0.148													3.02	2.96	3.02
	interval		1.00	1.04	0.98	1.00	0.98	0.98	0.98	1.00	1.04	1.25			8.44	8.61	8.44
Stowers, Jasmin (USA) (1991)	time	2.48	3.52	4.50	5.50	6.50	7.50	8.48	9.50	10.52	11.56		12.78	3 / 4			
	reaction time	0.120													3.02	2.98	3.08
	interval		1.04	0.98	1.00	1.00	1.00	0.98	1.02	1.02	1.04	1.22			8.44	8.56	8.28
Roleder, Cindy (GER) (1989)	time	2.58	3.60	4.58	5.58	6.58	7.56	8.56	9.56	10.58	11.60		12.80	4 / 5			
	reaction time	0.120													3.00	2.98	3.04
	interval		1.02	0.98	1.00	1.00	0.98	1.00	1.00	1.02	1.02	1.20			8.50	8.56	8.39
Simmonds, Megan (JAM) (1994)	time	2.56	3.56	4.58	5.58	6.56	7.56	8.56	9.58	10.62	11.66		12.90	8 / 6			
	reaction time	0.180													3.02	2.98	3.10
	interval		1.00	1.02	1.00	0.98	1.00	1.00	1.02	1.04	1.04	1.24			8.44	8.56	8.23
George, Phylisia (CAN) (1987)	time	2.56	3.58	4.58	5.58	6.58	7.58	8.58	9.62	10.66	11.72		12.93	2 / 7			
	reaction time	0.102													3.02	3.00	3.14
	interval		1.02	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.06	1.21			8.44	8.50	8.12
Zagré, Anne (BEL) (1990)	time	2.60	3.64	4.64	5.64	6.64	7.64	8.66	9.70	10.72	11.74		12.98	9 / 8			
	reaction time	0.146													3.04	3.02	3.08
	interval		1.04	1.00	1.00	1.00	1.00	1.02	1.04	1.02	1.02	1.24			8.39	8.44	8.28
Hildebrand, Nadine (GER) (1987)	time	2.56	3.62	4.62	5.64	6.66	7.66	8.66	9.68	10.74	11.78		12.99	1 / 9			
	reaction time	0.149													3.08	3.02	3.12
	interval		1.06	1.00	1.02	1.02	1.00	1.00	1.02	1.06	1.04	1.21			8.28	8.44	8.17
	velocity	5.24	8.17	8.67	8.50	8.50	8.50	8.67	8.33	8.33	8.33	8.47	7.70				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=iMrcWIO-67M>

2016 Meeting Paris (Saint-Denis, FRA) (TV Analysis)

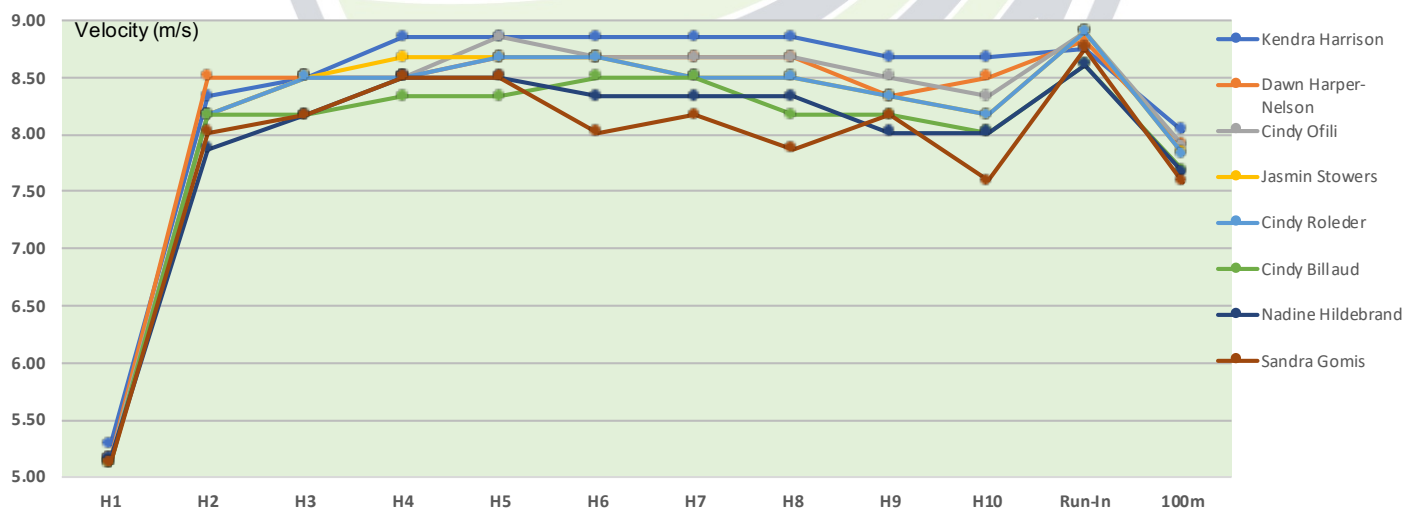
100m Hurdles

Date: 2016.08.27

Wind: 0.2 m/s

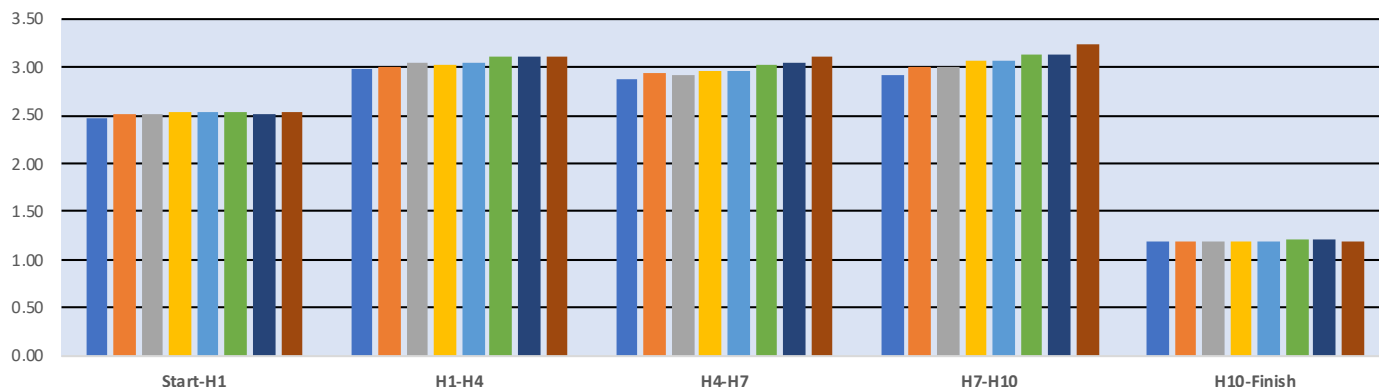
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.46	3.48	4.48	5.44	6.40	7.36	8.32	9.28	10.26	11.24		12.44	5 / 1			
	reaction time	0.178										1.20			2.98	2.88	2.92
	interval velocity		1.02	1.00	0.96	0.96	0.96	0.96	0.96	0.98	0.98	1.20			8.56	8.85	8.73
Harper-Nelson, Dawn (USA) (1984)	time	2.52	3.52	4.52	5.52	6.50	7.48	8.46	9.44	10.46	11.46		12.65	3 / 2			
	reaction time	0.132										1.19			3.00	2.94	3.00
	interval velocity		1.00	1.00	1.00	0.98	0.98	0.98	0.98	1.02	1.00	1.19			8.50	8.67	8.50
Ofili, Cindy (GBR) (1994)	time	2.52	3.56	4.56	5.56	6.52	7.50	8.48	9.46	10.46	11.48		12.66	7 / 3			
	reaction time	0.146										1.18			3.04	2.92	3.00
	interval velocity		1.04	1.00	1.00	0.96	0.98	0.98	0.98	1.00	1.02	1.18			8.39	8.73	8.50
Stowers, Jasmin (USA) (1991)	time	2.54	3.58	4.58	5.56	6.54	7.52	8.52	9.52	10.54	11.58		12.76	6 / 4			
	reaction time	0.140										1.18			3.02	2.96	3.06
	interval velocity		1.04	1.00	0.98	0.98	0.98	1.00	1.00	1.02	1.04	1.18			8.44	8.61	8.33
Roleder, Cindy (GER) (1989)	time	2.54	3.58	4.58	5.58	6.56	7.54	8.54	9.54	10.56	11.60		12.78	4 / 5			
	reaction time	0.129										1.18			3.04	2.96	3.06
	interval velocity		1.04	1.00	1.00	0.98	0.98	1.00	1.00	1.02	1.04	1.18			8.39	8.61	8.33
Billaud, Cindy (FRA) (1986)	time	2.54	3.58	4.62	5.64	6.66	7.66	8.66	9.70	10.74	11.80		13.02	2 / 6			
	reaction time	0.106										1.22			3.10	3.02	3.14
	interval velocity		1.04	1.04	1.02	1.02	1.00	1.00	1.04	1.04	1.06	1.22			8.23	8.44	8.12
Hildebrand, Nadine (GER) (1987)	time	2.52	3.60	4.64	5.64	6.64	7.66	8.68	9.70	10.76	11.82		13.04	8 / 7			
	reaction time	0.142										1.22			3.12	3.04	3.14
	interval velocity		1.08	1.04	1.00	1.00	1.02	1.02	1.02	1.06	1.06	1.22			8.17	8.39	8.12
Gomis, Sandra (FRA) (1983)	time	2.54	3.60	4.64	5.64	6.64	7.70	8.74	9.82	10.86	11.98		13.18	9 / 8			
	reaction time	0.161										1.20			3.10	3.10	3.24
	interval velocity		1.06	1.04	1.00	1.00	1.06	1.04	1.08	1.04	1.12	1.20			8.23	8.23	7.87



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=gaqb706YS9U>

2016 Athletissime (Luusanne, SUI) (TV Analysis)

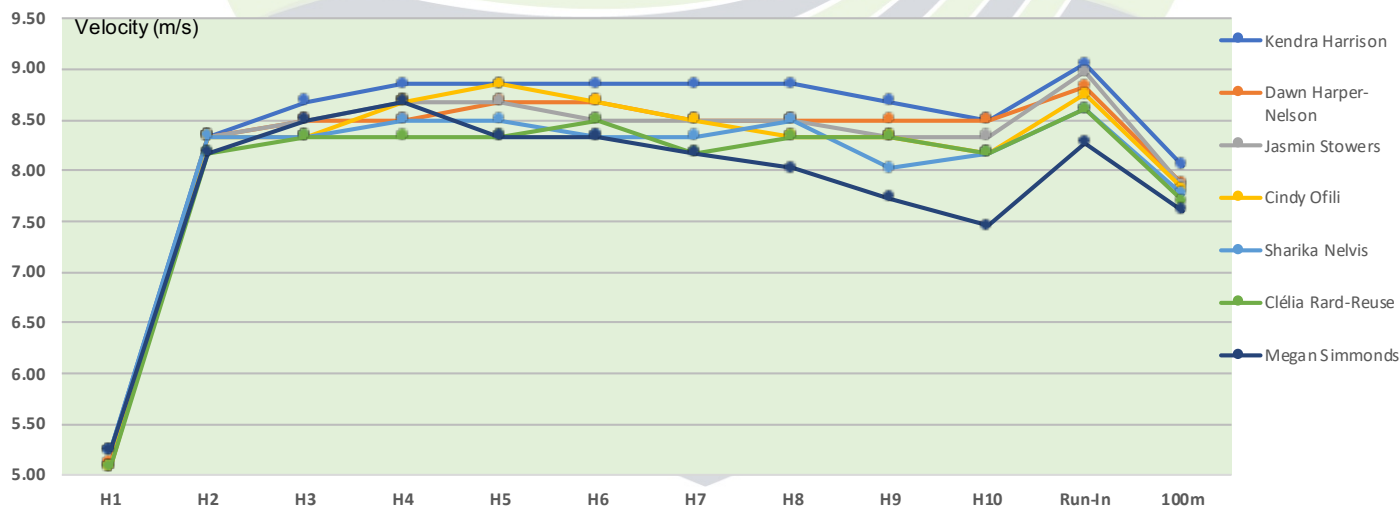
100m Hurdles

Date: 2016.08.25

Wind: 0.7 m/s

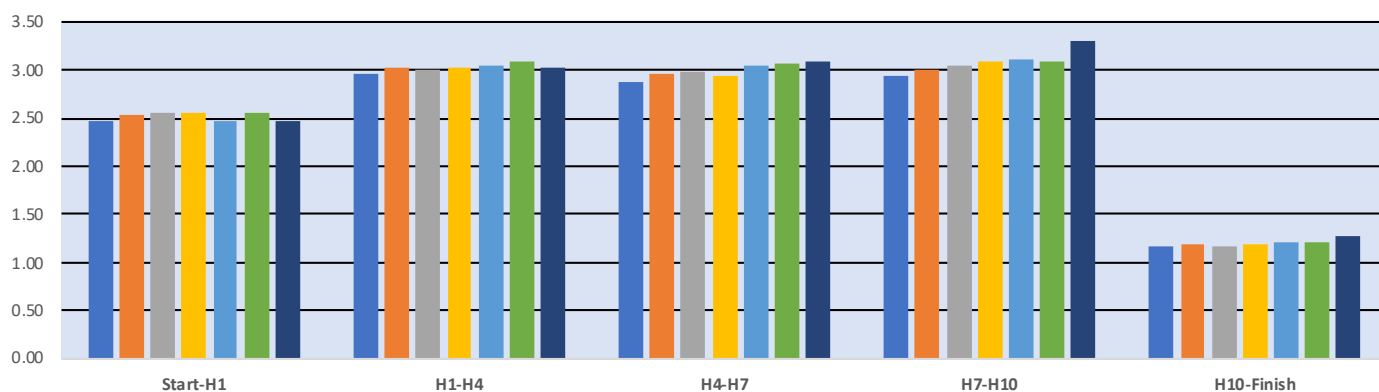
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.48	3.50	4.48	5.44	6.40	7.36	8.32	9.28	10.26	11.26		12.42	5 / 1			
	reaction time	0.148										1.16			2.96	2.88	2.94
	interval velocity		1.02	0.98	0.96	0.96	0.96	0.96	0.96	0.98	1.00	1.16	8.05		8.61	8.85	8.67
Harper-Nelson, Dawn (USA) (1984)	time	2.54	3.56	4.56	5.56	6.54	7.52	8.52	9.52	10.52	11.52		12.71	8 / 2			
	reaction time	0.145										1.19			3.02	2.96	3.00
	interval velocity		1.02	1.00	1.00	0.98	0.98	1.00	1.00	1.00	1.00	1.19	8.82		8.44	8.61	8.50
Stowers, Jasmin (USA) (1991)	time	2.56	3.58	4.58	5.56	6.54	7.54	8.54	9.54	10.56	11.58		12.75	6 / 3			
	reaction time	0.135										1.17			3.00	2.98	3.04
	interval velocity		1.02	1.00	0.98	0.98	1.00	1.00	1.00	1.02	1.02	1.17	8.97		8.50	8.56	8.39
Ofili, Cindy (GBR) (1994)	time	2.56	3.58	4.60	5.58	6.54	7.52	8.52	9.54	10.56	11.60		12.80	7 / 4			
	reaction time	0.145										1.20			3.02	2.94	3.08
	interval velocity		1.02	1.02	0.98	0.96	0.98	1.00	1.02	1.02	1.04	1.20	8.75		8.44	8.67	8.28
Nelvis, Sharika (USA) (1990)	time	2.48	3.50	4.52	5.52	6.52	7.54	8.56	9.56	10.62	11.66		12.88	4 / 5			
	reaction time	0.137										1.22			3.04	3.04	3.10
	interval velocity		1.02	1.02	1.00	1.00	1.02	1.02	1.00	1.06	1.04	1.22	8.61		8.39	8.39	8.23
Rard-Reuse, Clélia (SUI) (1988)	time	2.56	3.60	4.62	5.64	6.66	7.66	8.70	9.72	10.74	11.78		13.00	3 / 6			
	reaction time	0.142										1.22			3.08	3.06	3.08
	interval velocity		1.04	1.02	1.02	1.02	1.00	1.04	1.02	1.02	1.04	1.22	8.61		8.28	8.33	8.28
Simmonds, Megan (JAM) (1994)	time	2.48	3.52	4.52	5.50	6.52	7.54	8.58	9.64	10.74	11.88		13.15	2 / 7			
	reaction time	0.174										1.14			3.02	3.08	3.30
	interval velocity		1.04	1.00	0.98	1.02	1.02	1.04	1.06	1.10	1.14	1.27	7.60		8.44	8.28	7.73



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=k2t5cmH4rkU>

2016 Olympic Games (Rio de Janeiro, BRA) (TV Analysis)

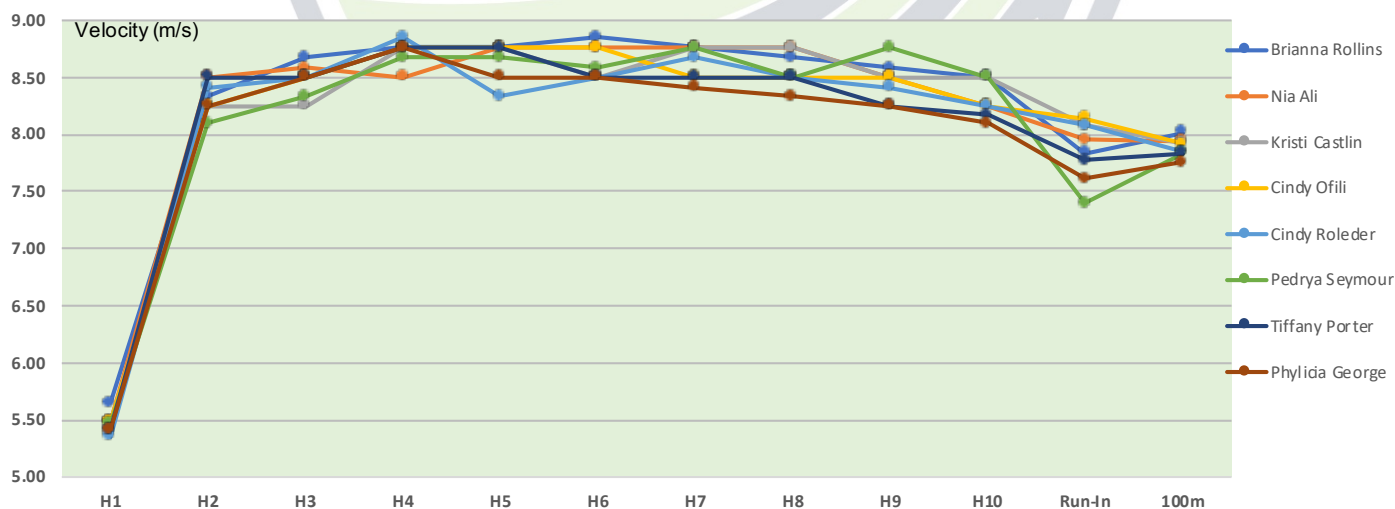
100m Hurdles

Date: 2016.08.17

Wind: 0.0 m/s

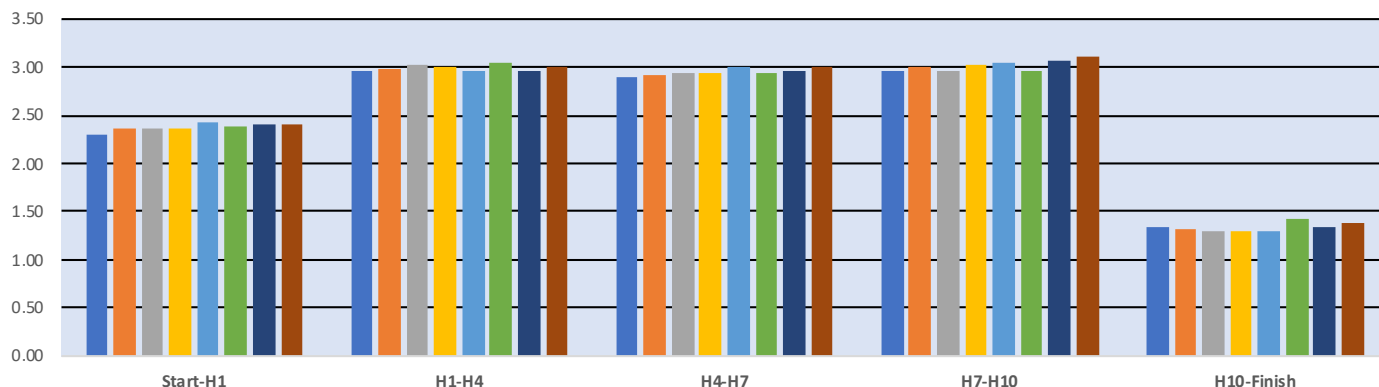
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Rollins, Brianna (USA) (1991)	time		2.30	3.32	4.30	5.27	6.24	7.20	8.17	9.15	10.14	11.14		12.48	6 / 1			
	reaction time	0.158														2.97	2.90	2.97
	interval			1.02	0.98	0.97	0.97	0.96	0.97	0.98	0.99	1.00	1.34			8.59	8.79	8.59
Ali, Nia (USA) (1988)	time		2.37	3.37	4.36	5.36	6.33	7.30	8.27	9.24	10.24	11.27		12.59	4 / 2			
	reaction time	0.154														2.99	2.91	3.00
	interval			1.00	0.99	1.00	0.97	0.97	0.97	1.00	1.03	1.32				8.53	8.76	8.50
Castlin, Kristi (USA) (1988)	time		2.37	3.40	4.43	5.40	6.37	7.37	8.34	9.31	10.31	11.31		12.61	7 / 3			
	reaction time	0.152														3.03	2.94	2.97
	interval			1.03	1.03	0.97	0.97	1.00	0.97	0.97	1.00	1.00	1.30			8.42	8.67	8.59
Ofili, Cindy (GBR) (1994)	time		2.37	3.40	4.40	5.37	6.34	7.31	8.31	9.31	10.31	11.34		12.63	8 / 4			
	reaction time	0.161														3.00	2.94	3.03
	interval			1.03	1.00	0.97	0.97	0.97	1.00	1.00	1.00	1.03	1.29			8.50	8.67	8.42
Roleder, Cindy (GER) (1989)	time		2.43	3.44	4.44	5.40	6.42	7.42	8.40	9.40	10.41	11.44		12.74	2 / 5			
	reaction time	0.130														2.97	3.00	3.04
	interval			1.01	1.00	0.96	1.02	1.00	0.98	1.00	1.01	1.03	1.30			8.59	8.50	8.39
Seymour, Pedrya (BAH) (1995)	time		2.38	3.43	4.45	5.43	6.41	7.40	8.37	9.37	10.34	11.34		12.76	5 / 6			
	reaction time	0.179														3.05	2.94	2.97
	interval			1.05	1.02	0.98	0.98	0.99	0.97	1.00	0.97	1.00	1.42			8.36	8.67	8.59
Porter, Tiffany (GBR) (1987)	time		2.40	3.40	4.40	5.37	6.34	7.34	8.34	9.34	10.37	11.41		12.76	3 / 7			
	reaction time	0.142														2.97	2.97	3.07
	interval			1.00	1.00	0.97	0.97	1.00	1.00	1.00	1.03	1.04	1.35			8.59	8.59	8.31
George, Phylicia (CAN) (1987)	time		2.40	3.43	4.43	5.40	6.40	7.40	8.41	9.43	10.46	11.51		12.89	9 / 8			
	reaction time	0.143														3.00	3.01	3.10
	interval			1.03	1.00	0.97	1.00	1.00	1.01	1.02	1.03	1.05	1.38			8.50	8.47	8.23
	velocity																	
			5.65	8.33	8.67	8.76	8.76	8.85	8.76	8.67	8.59	8.50	7.84	8.01				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 60fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=sPzOBd5c38o>

2016 London Anniversary Games (London, GBR)

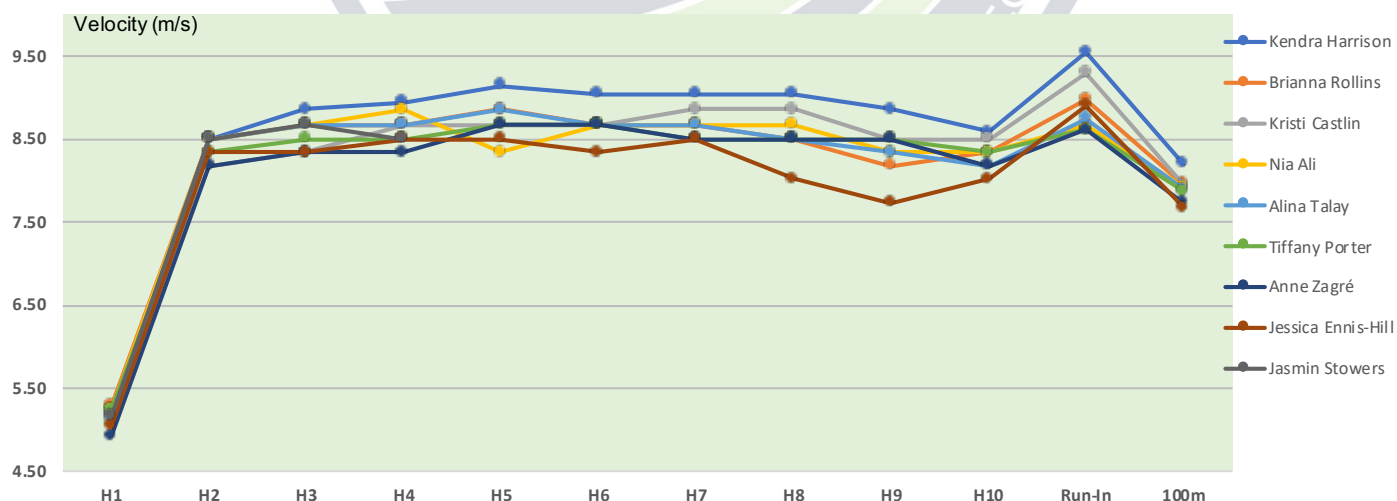
100m Hurdles

Date: 2016.07.22

Wind: 0.3 m/s

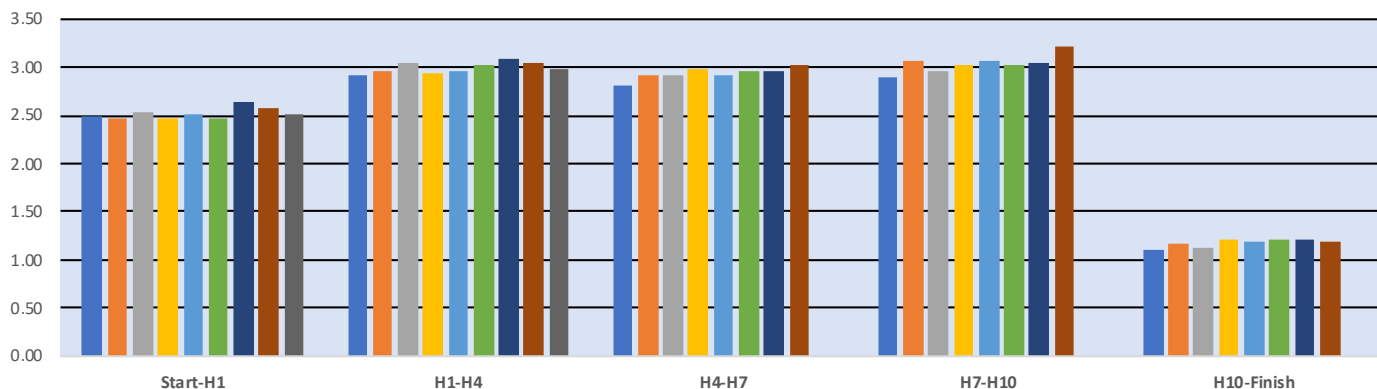
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time		2.49	3.49	4.45	5.40	6.33	7.27	8.21	9.15	10.11	11.10		12.20	6 / 1	2.91	2.81	2.89
	reaction time	0.149		1.00	0.96	0.95	0.93	0.94	0.94	0.94	0.96	0.99	1.10	WR				
	velocity		5.22	8.50	8.85	8.95	9.14	9.04	9.04	9.04	8.85	8.59	9.55	8.20				
Rollins, Brianna (USA) (1991)	time		2.46	3.46	4.44	5.42	6.38	7.36	8.34	9.34	10.38	11.40		12.57	7 / 2	2.96	2.92	3.06
	reaction time	0.140		1.00	0.98	0.98	0.96	0.98	0.98	1.00	1.04	1.02	1.17					
	velocity		5.28	8.50	8.67	8.67	8.85	8.67	8.67	8.50	8.17	8.33	8.97	7.96				
Castlin, Kristi (USA) (1988)	time		2.54	3.58	4.60	5.58	6.56	7.54	8.50	9.46	10.46	11.46		12.59	9 / 3	3.04	2.92	2.96
	reaction time	0.144		1.04	1.02	0.98	0.98	0.98	0.96	0.96	1.00	1.00	1.13					
	velocity		5.12	8.17	8.33	8.67	8.67	8.67	8.85	8.85	8.50	8.50	9.29	7.94				
Ali, Nia (USA) (1988)	time		2.48	3.48	4.46	5.42	6.44	7.42	8.40	9.38	10.40	11.42		12.63	5 / 4	2.94	2.98	3.02
	reaction time	0.145		1.00	0.98	0.96	1.02	0.98	0.98	0.98	1.02	1.02	1.21					
	velocity		5.24	8.50	8.67	8.85	8.33	8.67	8.67	8.67	8.33	8.33	8.68	7.92				
Talay, Alina (BLR) (1989)	time		2.52	3.52	4.50	5.48	6.44	7.42	8.40	9.40	10.42	11.46		12.66	3 / 5	2.96	2.92	3.06
	reaction time	0.118		1.00	0.98	0.98	0.96	0.98	0.98	1.00	1.02	1.04	1.20					
	velocity		5.16	8.50	8.67	8.67	8.85	8.67	8.67	8.50	8.33	8.17	8.75	7.90				
Porter, Tiffany (GBR) (1987)	time		2.48	3.50	4.50	5.50	6.48	7.46	8.46	9.46	10.46	11.48		12.70	2 / 6	3.02	2.96	3.02
	reaction time	0.119		1.02	1.00	1.00	0.98	0.98	1.00	1.00	1.00	1.02	1.22					
	velocity		5.24	8.33	8.50	8.50	8.67	8.67	8.50	8.50	8.50	8.33	8.61	7.87				
Zagr�, Anne (BEL) (1990)	time		2.64	3.68	4.70	5.72	6.70	7.68	8.68	9.68	10.68	11.72		12.94	1 / 7	3.08	2.96	3.04
	reaction time	0.160		1.04	1.02	1.02	0.98	0.98	1.00	1.00	1.00	1.04	1.22					
	velocity		4.92	8.17	8.33	8.33	8.67	8.67	8.50	8.50	8.50	8.17	8.61	7.73				
Ennis-Hill, Jessica (GBR) (1986)	time		2.58	3.60	4.62	5.62	6.62	7.64	8.64	9.70	10.80	11.86		13.04	8 / 8	3.04	3.02	3.22
	reaction time	0.155		1.02	1.02	1.00	1.00	1.02	1.00	1.06	1.10	1.06	1.18					
	velocity		5.04	8.33	8.33	8.50	8.50	8.33	8.50	8.02	7.73	8.02	8.90	7.67				
Stowers, Jasmin (USA) (1991)	time		2.52	3.52	4.50	5.50								dnf	4 / --	2.98	8.56	
	reaction time	0.132		1.00	0.98	1.00												
	velocity		5.16	8.50	8.67	8.50												



Time Intervals (s)

Hurdle Phases



Kendra Harrison

Source: Vazel, P.J. (2016) Analysis of Keni Harrison's World Record 100m Hurdles Race. Retrieved from <https://simplifaster.com/articles/analysis-of-keni-harrisons-world-record-100m-hurdles-race/>

2nd - 8th Place (TV Analysis)

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=j.1995waE9kU>

2016 London Anniversary Games (London, GBR)

100m Hurdles

Date: 2016.07.22

Wind: 0.2 m/s

Heat 2

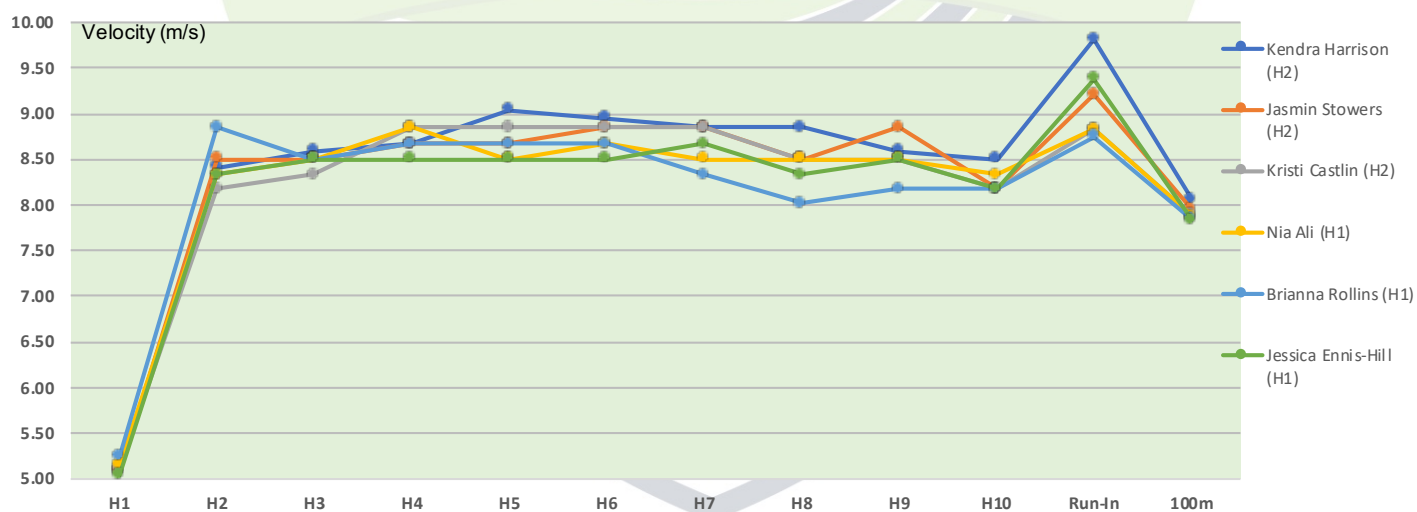
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.55	3.56	4.55	5.53	6.47	7.42	8.38	9.34	10.33	11.33		12.40	4 / 1			
	reaction time	0.143													2.98	2.85	2.95
	interval		1.01	0.99	0.98	0.94	0.95	0.96	0.96	0.99	1.00	1.07			8.56	8.95	8.64
Stowers, Jasmin (USA) (1991)	time	2.56	3.56	4.56	5.54	6.52	7.48	8.44	9.44	10.40	11.44		12.58	7 / 2			
	reaction time	0.143													2.98	2.90	3.00
	interval		1.00	1.00	0.98	0.98	0.96	0.96	1.00	0.96	1.04	1.14			8.56	8.79	8.50
Castlin, Kristi (USA) (1988)	time	2.54	3.58	4.60	5.56	6.52	7.48	8.44	9.44	10.44	11.48		12.67	5 / 3			
	reaction time	0.140													3.02	2.88	3.04
	interval		1.04	1.02	0.96	0.96	0.96	0.96	1.00	1.00	1.04	1.19			8.44	8.85	8.39

Date: 2016.07.22

Wind: 0.3 m/s

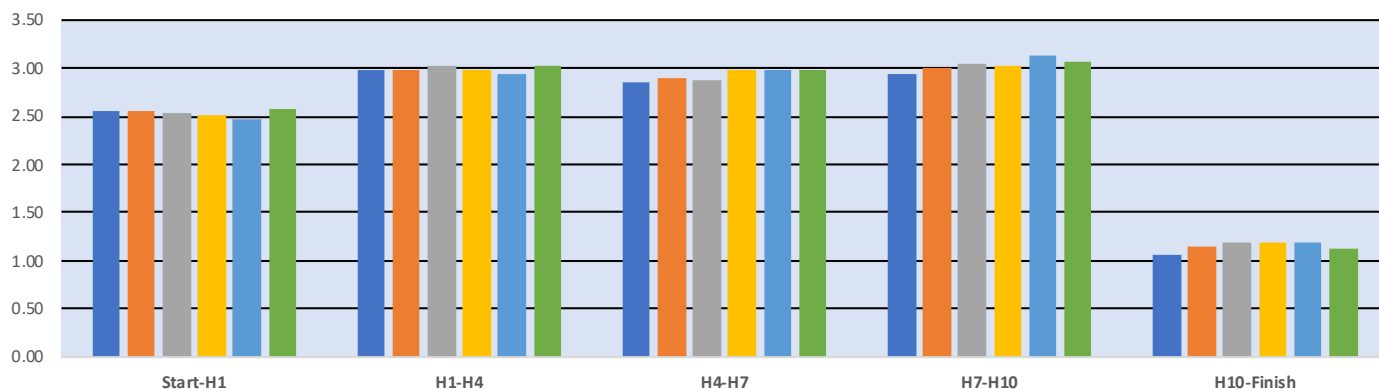
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Ali, Nia (USA) (1988)	time	2.52	3.54	4.54	5.50	6.50	7.48	8.48	9.48	10.48	11.50		12.69	7 / 1			
	reaction time	0.156													2.98	2.98	3.02
	interval		1.02	1.00	0.96	1.00	0.98	1.00	1.00	1.00	1.02	1.19			8.56	8.56	8.44
Rollins, Brianna (USA) (1991)	time	2.48	3.44	4.44	5.42	6.40	7.38	8.40	9.46	10.50	11.54		12.74	6 / 2			
	reaction time	0.135													2.94	2.98	3.14
	interval		0.96	1.00	0.98	0.98	0.98	1.02	1.06	1.04	1.04	1.20			8.67	8.56	8.12
Ennis-Hill, Jessica (GBR) (1986)	time	2.58	3.60	4.60	5.60	6.60	7.60	8.58	9.60	10.60	11.64		12.76	9 / 3			
	reaction time	0.152													3.02	2.98	3.06
	interval		1.02	1.00	1.00	1.00	1.00	0.98	1.02	1.00	1.04	1.12			8.44	8.56	8.33



Time Intervals (s)

Hurdle Phases



Heat 2 - Kendra Harrison

Source: Brice, P. (2017) Critical determinants of sprint hurdle performance

Heat 2 - 2nd & 3rd (TV Analysis)

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

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

Heat 1 (TV Analysis)

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=0E2tuF2-i-k>

2016 USA Olympic Trials (Eugene, OR) (TV Analysis)

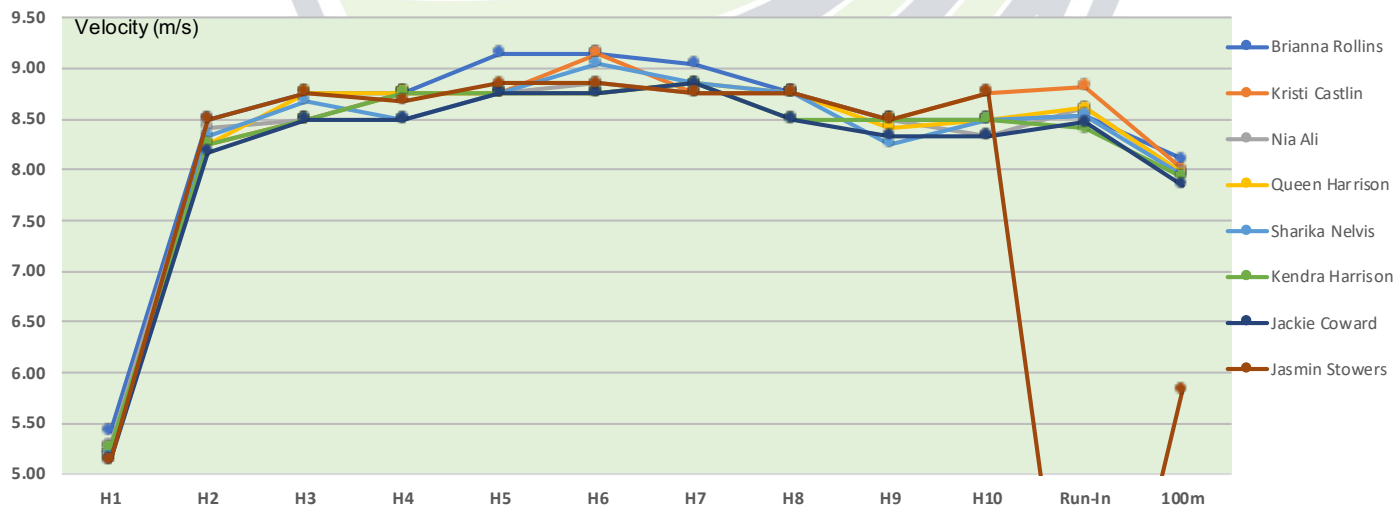
100m Hurdles

Date: 2016.07.08

Wind: 1.2 m/s

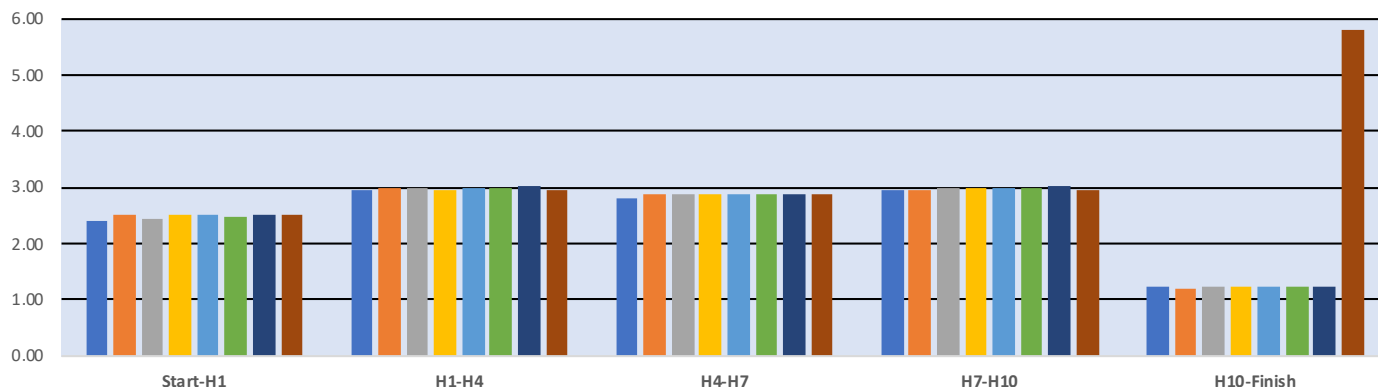
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Rollins, Brianna (USA) (1991)	time	2.40	3.40	4.37	5.34	6.27	7.20	8.14	9.11	10.11	11.11		12.34	4 / 1			
	reaction time														2.94	2.80	2.97
	interval		1.00	0.97	0.97	0.93	0.93	0.94	0.97	1.00	1.00	1.23			8.67	9.11	8.59
Castlin, Kristi (USA) (1988)	time	2.50	3.53	4.53	5.50	6.47	7.40	8.37	9.34	10.34	11.31		12.50	3 / 2			
	reaction time														3.00	2.87	2.94
	interval		1.03	1.00	0.97	0.97	0.93	0.97	0.97	1.00	0.97	1.19			8.50	8.89	8.67
Ali, Nia (USA) (1988)	time	2.46	3.47	4.47	5.44	6.41	7.37	8.34	9.31	10.31	11.33		12.55	6 / 3			
	reaction time														2.98	2.90	2.99
	interval		1.01	1.00	0.97	0.97	0.96	0.97	0.97	1.00	1.02	1.22			8.56	8.79	8.53
Harrison, Queen (USA) (1988)	time	2.50	3.53	4.50	5.47	6.44	7.41	8.37	9.34	10.35	11.35		12.57	5 / 4			
	reaction time														2.97	2.90	2.98
	interval		1.03	0.97	0.97	0.97	0.97	0.96	0.97	1.01	1.00	1.22			8.59	8.79	8.56
Nelvis, Sharika (USA) (1990)	time	2.50	3.52	4.50	5.50	6.47	7.41	8.37	9.34	10.37	11.37		12.60	8 / 5			
	reaction time														3.00	2.87	3.00
	interval		1.02	0.98	1.00	0.97	0.94	0.96	0.97	1.03	1.00	1.23			8.50	8.89	8.50
Harrison, Kendra (USA) (1992)	time	2.47	3.50	4.50	5.47	6.44	7.41	8.37	9.37	10.37	11.37		12.62	2 / 6			
	reaction time														3.00	2.90	3.00
	interval		1.03	1.00	0.97	0.97	0.97	0.96	1.00	1.00	1.00	1.25			8.50	8.79	8.50
Coward, Jackie (USA) (1989)	time	2.53	3.57	4.57	5.57	6.54	7.51	8.47	9.47	10.49	11.51		12.75	1 / 7			
	reaction time														3.04	2.90	3.04
	interval		1.04	1.00	1.00	0.97	0.97	0.96	1.00	1.02	1.02	1.24			8.39	8.79	8.39
Stowers, Jasmin (USA) (1991)	time	2.53	3.53	4.50	5.48	6.44	7.40	8.37	9.34	10.34	11.31		17.13	7 / 8			
	reaction time														2.95	2.89	2.94
	interval		1.00	0.97	0.98	0.96	0.96	0.97	0.97	1.00	0.97	5.82			8.64	8.82	8.67
	velocity	5.42	8.50	8.76	8.76	9.14	9.14	9.04	8.76	8.50	8.50	8.54	8.10				
	velocity	5.20	8.25	8.50	8.76	8.76	9.14	8.76	8.76	8.50	8.76	8.82	8.00				
	velocity	5.28	8.42	8.50	8.76	8.76	8.85	8.76	8.76	8.50	8.33	8.61	7.97				
	velocity	5.20	8.25	8.76	8.76	8.76	8.76	8.85	8.76	8.42	8.50	8.61	7.96				
	velocity	5.20	8.33	8.67	8.50	8.76	9.04	8.85	8.76	8.25	8.50	8.54	7.94				
	velocity	5.26	8.25	8.50	8.76	8.76	8.76	8.85	8.50	8.50	8.50	8.40	7.92				
	velocity	5.14	8.17	8.50	8.50	8.76	8.76	8.85	8.50	8.33	8.33	8.47	7.84				
	velocity	5.14	8.50	8.76	8.67	8.85	8.85	8.76	8.76	8.50	8.76	1.80	5.84				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=iJ995weE9kU>

2016 European Championships (Amsterdam, NED) (TV Analysis)

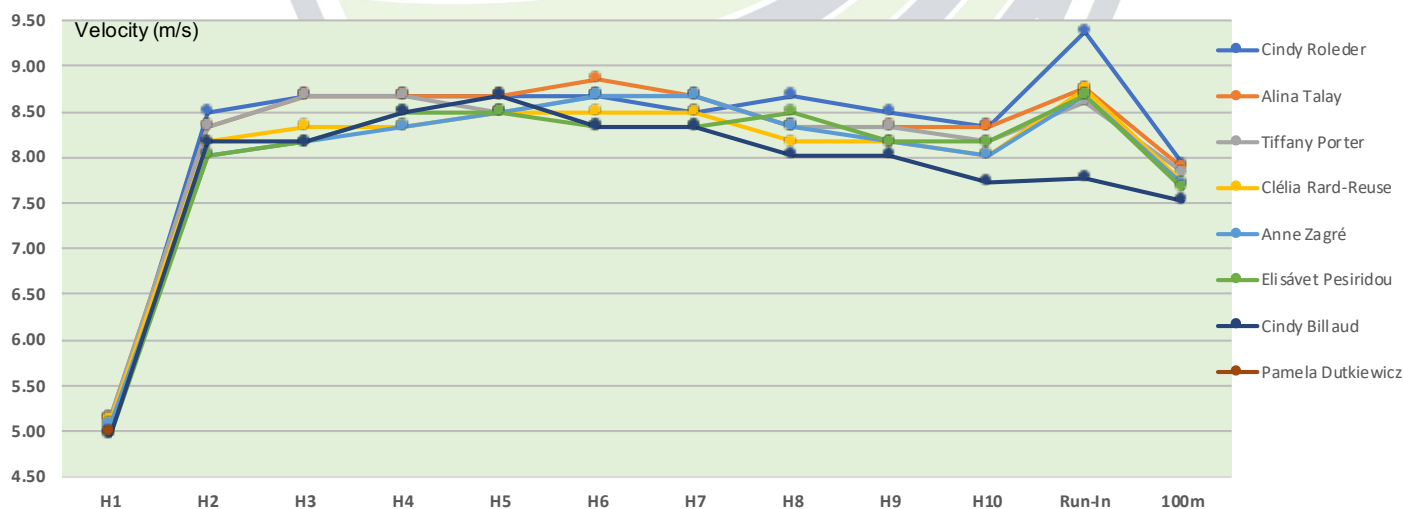
100m Hurdles

Date: 2016.07.07

Wind: -0.7 m/s

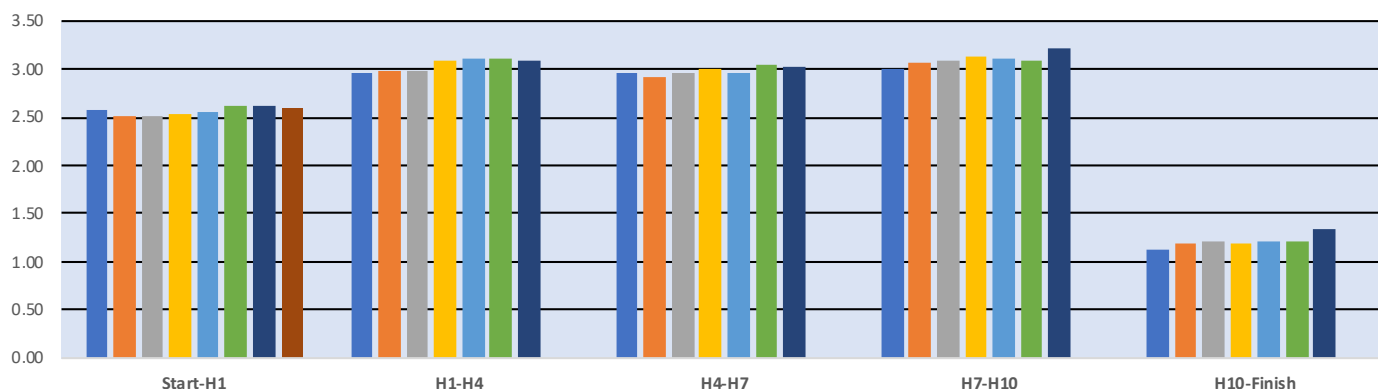
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Roleder, Cindy (GER) (1989)	time		2.58	3.58	4.56	5.54	6.52	7.50	8.50	9.48	10.48	11.50		12.62	7 / 1			
	reaction time	0.135											1.12			2.96	2.96	3.00
	interval velocity		5.04	8.50	8.67	8.67	8.67	8.67	8.50	8.67	8.50	8.33	9.38	7.92		8.61	8.61	8.50
Talay, Alina (BLR) (1989)	time		2.52	3.54	4.52	5.50	6.48	7.44	8.42	9.44	10.46	11.48		12.68	5 / 2			
	reaction time	0.153											1.20			2.98	2.92	3.06
	interval velocity		5.16	8.33	8.67	8.67	8.67	8.85	8.67	8.33	8.33	8.33	8.75	7.89		8.56	8.73	8.33
Porter, Tiffany (GBR) (1987)	time		2.52	3.54	4.52	5.50	6.50	7.48	8.46	9.48	10.50	11.54		12.76	4 / 3			
	reaction time	0.133											1.22			2.98	2.96	3.08
	interval velocity		5.16	8.33	8.67	8.67	8.50	8.67	8.67	8.33	8.33	8.17	8.61	7.84		8.56	8.61	8.28
Rard-Reuse, Clélia (SUI) (1988)	time		2.54	3.58	4.60	5.62	6.62	7.62	8.62	9.66	10.70	11.76		12.96	6 / 4			
	reaction time	0.133											1.20			3.08	3.00	3.14
	interval velocity		5.12	8.17	8.33	8.33	8.50	8.50	8.50	8.17	8.17	8.02	8.75	7.72		8.28	8.50	8.12
Zagré, Anne (BEL) (1990)	time		2.56	3.62	4.66	5.68	6.68	7.66	8.64	9.66	10.70	11.76		12.97	2 / 5			
	reaction time	0.126											1.21			3.12	2.96	3.12
	interval velocity		5.08	8.02	8.17	8.33	8.50	8.67	8.67	8.33	8.17	8.02	8.68	7.71		8.17	8.61	8.17
Pesiridou, Elisávet (GRE) (1992)	time		2.62	3.68	4.72	5.72	6.72	7.74	8.76	9.76	10.80	11.84		13.05	8 / 6			
	reaction time	0.142											1.21			3.10	3.04	3.08
	interval velocity		4.96	8.02	8.17	8.50	8.50	8.33	8.33	8.50	8.17	8.17	8.68	7.66		8.23	8.39	8.28
Billaud, Cindy (FRA) (1986)	time		2.62	3.66	4.70	5.70	6.68	7.70	8.72	9.78	10.84	11.94		13.29	3 / 7			
	reaction time	0.143											1.35			3.08	3.02	3.22
	interval velocity		4.96	8.17	8.17	8.50	8.67	8.33	8.33	8.02	8.02	7.73	7.78	7.52		8.28	8.44	7.92
Dutkiewicz, Pamela (GER) (1991)	time		2.60											dnf	9 / --			
	reaction time	0.145																
	interval velocity		5.00															



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=7p34WeT7o-E>

2016 Bauhaus Athletics (Stockholm, SWE) (TV Analysis)

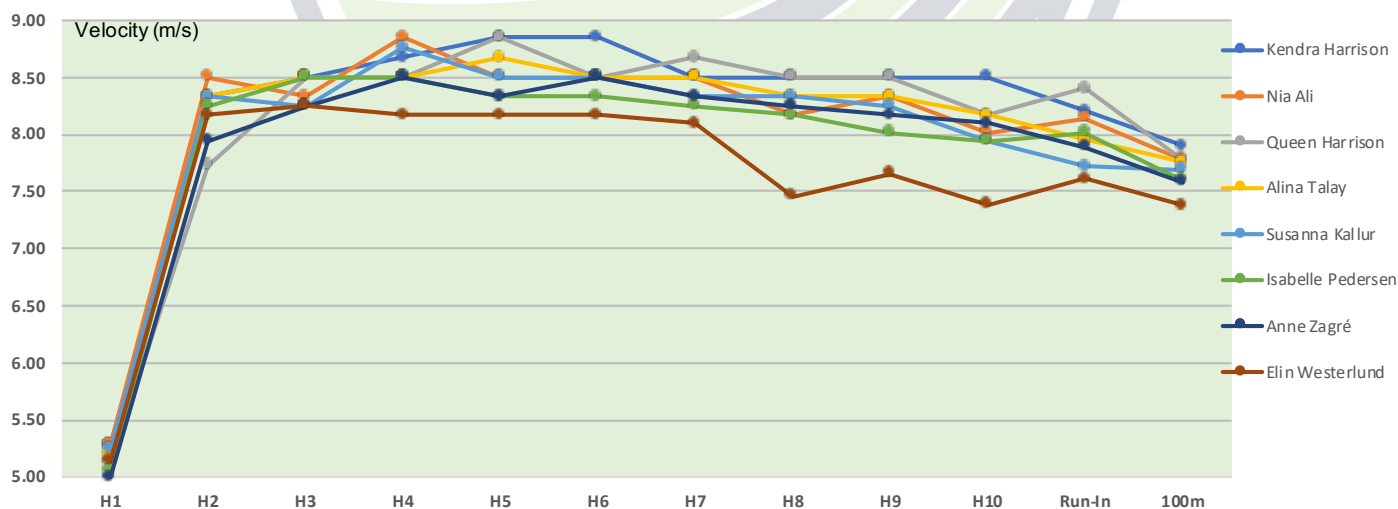
100m Hurdles

Date: 2016.06.16

Wind: -0.4 m/s

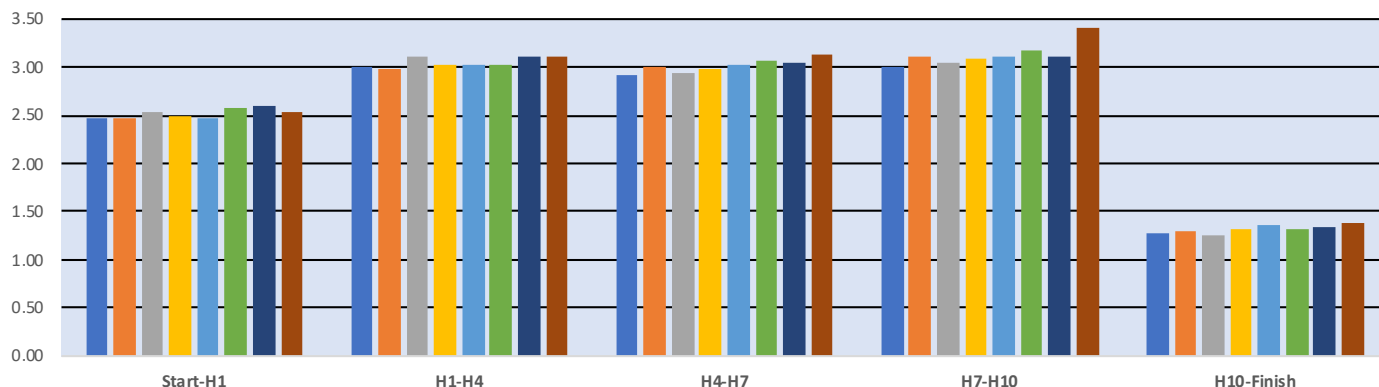
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time		2.46	3.48	4.48	5.46	6.42	7.38	8.38	9.38	10.38	11.38		12.66	5 / 1			
	reaction time	0.185														3.00	2.92	3.00
	interval			1.02	1.00	0.98	0.96	0.96	1.00	1.00	1.00	1.00	1.28			8.50	8.73	8.50
Ali, Nia (USA) (1988)	time		2.46	3.46	4.48	5.44	6.44	7.44	8.44	9.48	10.50	11.56		12.85	2 / 2			
	reaction time	0.145														2.98	3.00	3.12
	interval			1.00	1.02	0.96	1.00	1.00	1.00	1.04	1.02	1.06	1.29			8.56	8.50	8.17
Harrison, Queen (USA) (1988)	time		2.54	3.64	4.64	5.64	6.60	7.60	8.58	9.58	10.58	11.62		12.87	6 / 3			
	reaction time	0.175														3.10	2.94	3.04
	interval			1.10	1.00	1.00	0.96	1.00	0.98	1.00	1.00	1.04	1.25			8.23	8.67	8.39
Talay, Alina (BLR) (1989)	time		2.50	3.52	4.52	5.52	6.50	7.50	8.50	9.52	10.54	11.58		12.90	3 / 4			
	reaction time	0.148														3.02	2.98	3.08
	interval			1.02	1.00	1.00	0.98	1.00	1.00	1.02	1.02	1.04	1.32			8.44	8.56	8.28
Kallur, Susanna (SWE) (1981)	time		2.48	3.50	4.53	5.50	6.50	7.50	8.52	9.54	10.57	11.64		13.00	4 / 5			
	reaction time	0.163														3.02	3.02	3.12
	interval			1.02	1.03	0.97	1.00	1.00	1.02	1.02	1.03	1.07	1.36			8.44	8.44	8.17
Pedersen, Isabelle (NOR) (1992)	time		2.57	3.60	4.60	5.60	6.62	7.64	8.67	9.71	10.77	11.84		13.15	8 / 6			
	reaction time	0.190														3.03	3.07	3.17
	interval			1.03	1.00	1.00	1.02	1.02	1.03	1.04	1.06	1.07	1.31			8.42	8.31	8.04
Zagr�, Anne (BEL) (1990)	time		2.60	3.67	4.70	5.70	6.72	7.72	8.74	9.77	10.81	11.86		13.19	7 / 7			
	reaction time	0.192														3.10	3.04	3.12
	interval			1.07	1.03	1.00	1.02	1.00	1.02	1.03	1.04	1.05	1.33			8.23	8.39	8.17
Westerlund, Elin (SWE) (1990)	time		2.53	3.57	4.60	5.64	6.68	7.72	8.77	9.91	11.02	12.17		13.55	1 / 8			
	reaction time	0.148														3.11	3.13	3.40
	interval			1.04	1.03	1.04	1.04	1.04	1.05	1.14	1.11	1.15	1.38			8.20	8.15	7.50
	velocity																	
			5.28	8.33	8.50	8.67	8.85	8.85	8.50	8.50	8.50	8.50	8.20	7.90				



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=AJTCbn_dFO4

2016 Bislett Games (Oslo, NOR) (TV Analysis)

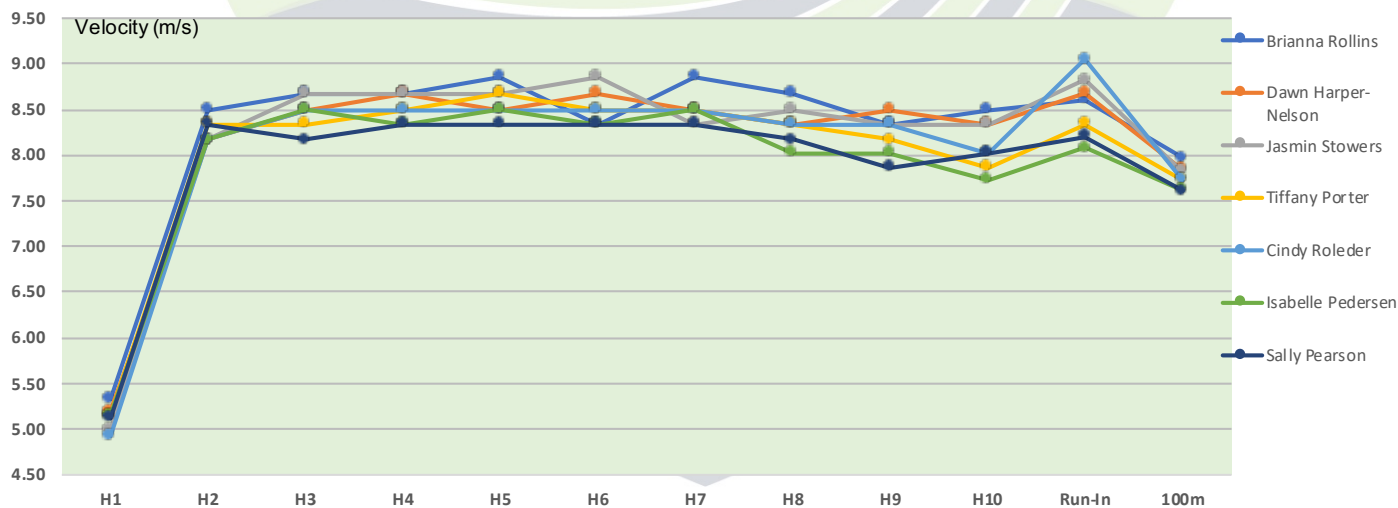
100m Hurdles

Date: 2016.06.09

Wind: -0.4 m/s

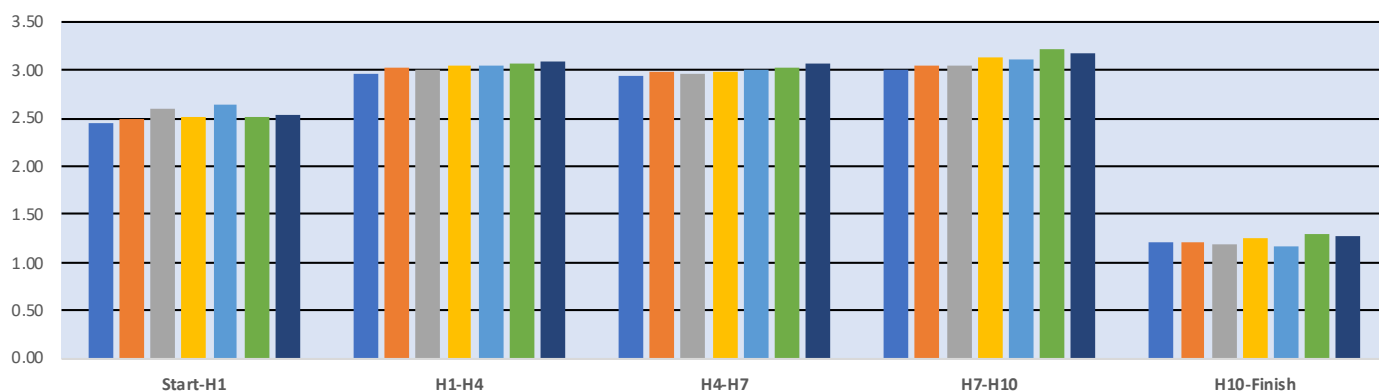
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Rollins, Brianna (USA) (1991)	time	2.44	3.44	4.42	5.40	6.36	7.38	8.34	9.32	10.34	11.34		12.56	5 / 1			
	reaction time	0.143													2.96	2.94	3.00
	interval		1.00	0.98	0.98	0.96	1.02	0.96	0.98	1.02	1.00	1.22			8.61	8.67	8.50
Harper-Nelson, Dawn (USA) (1984)	time	2.50	3.54	4.54	5.52	6.52	7.50	8.50	9.52	10.52	11.54		12.75	3 / 2			
	reaction time	0.161													3.02	2.98	3.04
	interval		1.04	1.00	0.98	1.00	0.98	1.00	1.02	1.00	1.02	1.21			8.44	8.56	8.39
Stowers, Jasmin (USA) (1991)	time	2.60	3.64	4.62	5.60	6.58	7.54	8.56	9.56	10.58	11.60		12.79	6 / 3			
	reaction time	0.188													3.00	2.96	3.04
	interval		1.04	0.98	0.98	0.98	0.96	1.02	1.00	1.02	1.02	1.19			8.50	8.61	8.39
Porter, Tiffany (GBR) (1987)	time	2.52	3.54	4.56	5.56	6.54	7.54	8.54	9.56	10.60	11.68		12.94	7 / 4			
	reaction time	0.143													3.04	2.98	3.14
	interval		1.02	1.02	1.00	0.98	1.00	1.00	1.02	1.04	1.08	1.26			8.39	8.56	8.12
Roleder, Cindy (GER) (1989)	time	2.64	3.68	4.68	5.68	6.68	7.68	8.68	9.70	10.72	11.78		12.94	8 / 5			
	reaction time	0.145													3.04	3.00	3.10
	interval		1.04	1.00	1.00	1.00	1.00	1.00	1.02	1.02	1.06	1.16			8.39	8.50	8.23
Pedersen, Isabelle (NOR) (1992)	time	2.52	3.56	4.56	5.58	6.58	7.60	8.60	9.66	10.72	11.82		13.12	2 / 6			
	reaction time	0.156													3.06	3.02	3.22
	interval		1.04	1.00	1.02	1.00	1.02	1.00	1.06	1.06	1.10	1.30			8.33	8.44	7.92
Pearson, Sally (AUS) (1986)	time	2.54	3.56	4.60	5.62	6.64	7.66	8.68	9.72	10.80	11.86		13.14	1 / 7			
	reaction time	0.116													3.08	3.06	3.18
	interval		1.02	1.04	1.02	1.02	1.02	1.02	1.04	1.08	1.06	1.28			8.28	8.33	8.02
	velocity		5.33	8.50	8.67	8.67	8.85	8.33	8.85	8.67	8.33	8.50	8.61				
	velocity		5.20	8.17	8.50	8.67	8.50	8.67	8.50	8.33	8.50	8.33	8.68				
	velocity		5.00	8.17	8.67	8.67	8.67	8.85	8.33	8.50	8.33	8.33	8.82				
	velocity		5.16	8.33	8.33	8.50	8.67	8.50	8.33	8.17	7.87	8.33	7.73				
	velocity		4.92	8.17	8.50	8.50	8.50	8.50	8.33	8.33	8.02	9.05	7.73				
	velocity		5.16	8.17	8.50	8.33	8.50	8.33	8.50	8.02	8.02	8.08	7.62				
	velocity		5.12	8.33	8.17	8.33	8.33	8.33	8.17	7.87	8.02	8.20	7.61				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=PIGE0rSUIS0>

2016 Birmingham Diamond League (Birmingham, GBR) (TV Analysis)

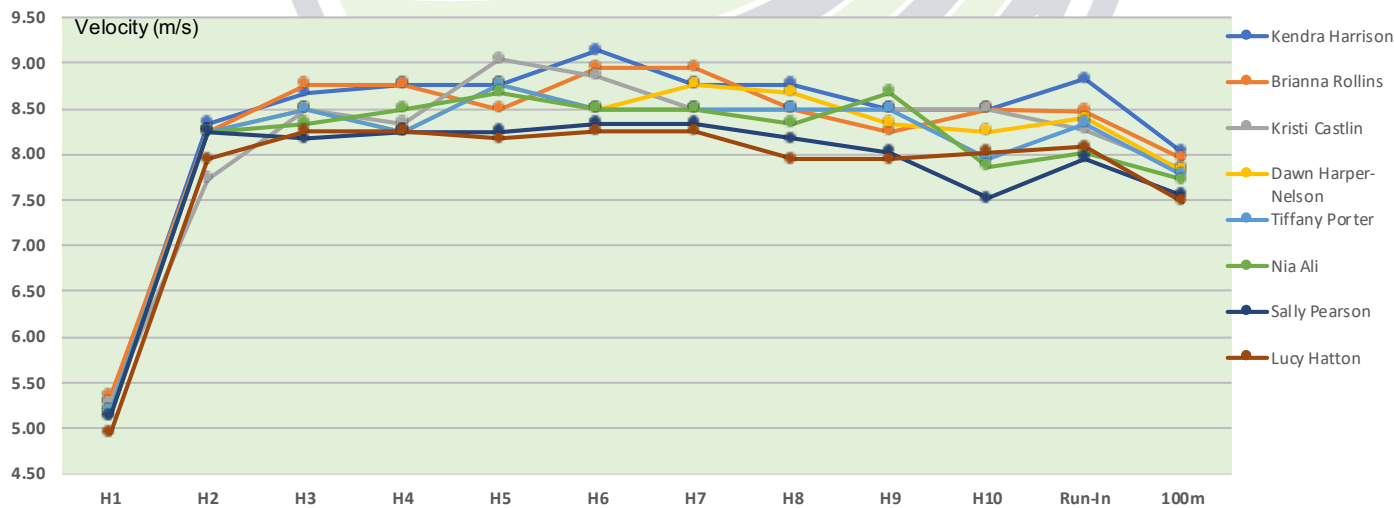
100m Hurdles

Date: 2016.06.05

Wind: -0.3 m/s

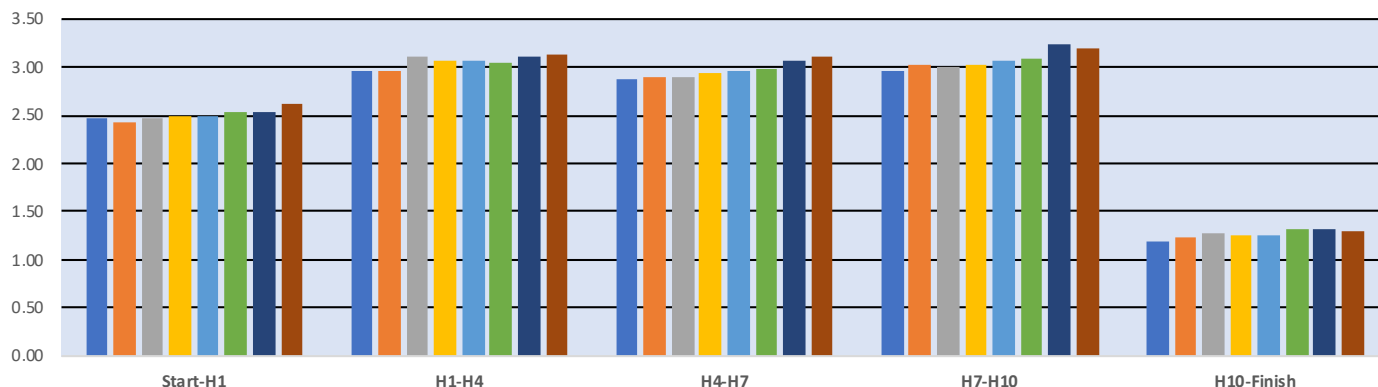
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.46	3.48	4.46	5.43	6.40	7.33	8.30	9.27	10.27	11.27		12.46	6 / 1			
	reaction time	0.212										1.19			2.97	2.87	2.97
	interval velocity		1.02	0.98	0.97	0.97	0.93	0.97	0.97	1.00	1.00	1.19			8.59	8.89	8.59
Rollins, Brianna (USA) (1991)	time	2.43	3.46	4.43	5.40	6.40	7.35	8.30	9.30	10.33	11.33		12.57	7 / 2			
	reaction time	0.144										1.24			2.97	2.90	3.03
	interval velocity		1.03	0.97	0.97	1.00	0.95	0.95	1.00	1.03	1.00	1.24			8.59	8.79	8.42
Castlin, Kristi (USA) (1988)	time	2.46	3.56	4.56	5.58	6.52	7.48	8.48	9.48	10.48	11.48		12.75	5 / 3			
	reaction time	0.164										1.27			3.12	2.90	3.00
	interval velocity		1.10	1.00	1.02	0.94	0.96	1.00	1.00	1.00	1.00	1.27			8.17	8.79	8.50
Harper-Nelson, Dawn (USA) (1984)	time	2.50	3.53	4.53	5.56	6.53	7.53	8.50	9.48	10.50	11.53		12.78	2 / 4			
	reaction time	0.151										1.25			3.06	2.94	3.03
	interval velocity		1.03	1.00	1.03	0.97	1.00	0.97	0.98	1.02	1.03	1.25			8.33	8.67	8.42
Porter, Tiffany (GBR) (1987)	time	2.50	3.53	4.53	5.56	6.53	7.53	8.53	9.53	10.53	11.60		12.86	3 / 5			
	reaction time	0.136										1.26			3.06	2.97	3.07
	interval velocity		1.03	1.00	1.03	0.97	1.00	1.00	1.00	1.00	1.07	1.26			8.33	8.59	8.31
Ali, Nia (USA) (1988)	time	2.53	3.56	4.58	5.58	6.56	7.56	8.56	9.58	10.56	11.64		12.95	8 / 6			
	reaction time	0.198										1.31			3.05	2.98	3.08
	interval velocity		1.03	1.02	1.00	0.98	1.00	1.00	0.98	1.08	1.08	1.31			8.36	8.56	8.28
Pearson, Sally (AUS) (1986)	time	2.53	3.56	4.60	5.63	6.66	7.68	8.70	9.74	10.80	11.93		13.25	4 / 7			
	reaction time	0.129										1.32			3.10	3.07	3.23
	interval velocity		1.03	1.04	1.03	1.03	1.02	1.02	1.04	1.06	1.13	1.32			8.23	8.31	7.89
Hatton, Lucy (GBR) (1994)	time	2.63	3.70	4.73	5.76	6.80	7.83	8.86	9.93	11.00	12.06		13.36	9 / 8			
	reaction time	0.232										1.30			3.13	3.10	3.20
	interval velocity		1.07	1.03	1.03	1.04	1.03	1.03	1.07	1.07	1.06	1.30			8.15	8.23	7.97



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=BRUoSXAt4Q>

2016 Prefontaine Classic (Eugene, OR) (TV Analysis)

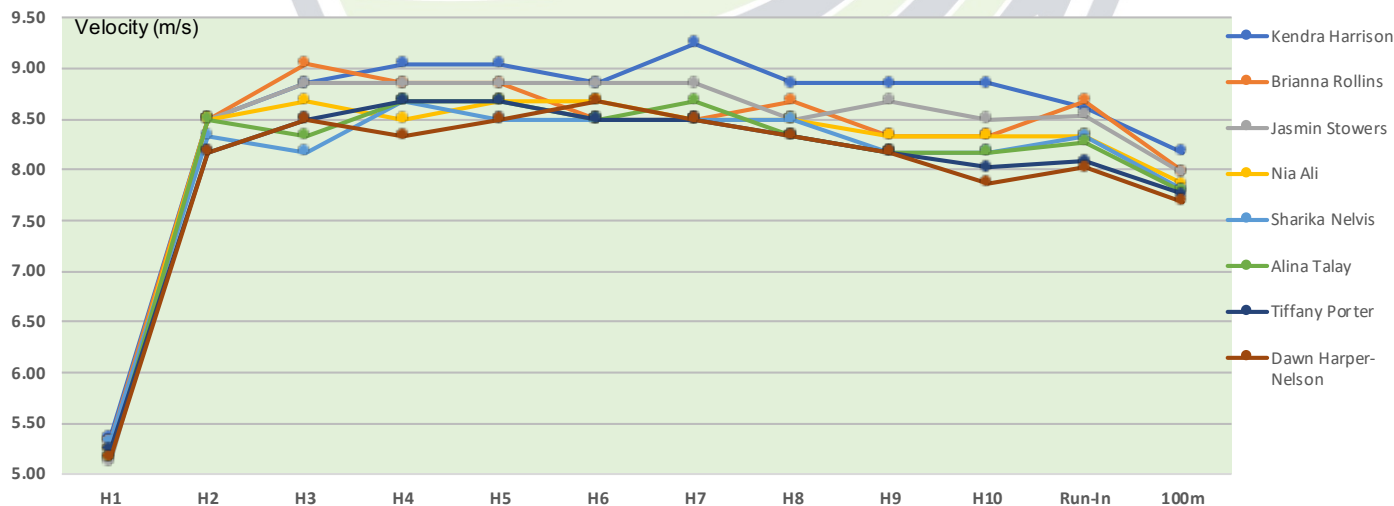
100m Hurdles

Date: 2016.05.28

Wind: 0.7 m/s

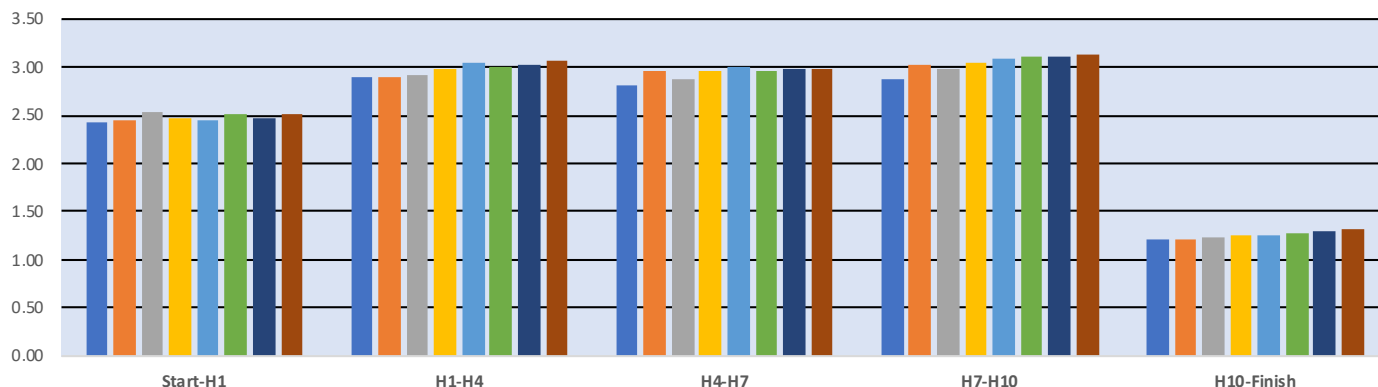
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.42	3.42	4.38	5.32	6.26	7.22	8.14	9.10	10.06	11.02	12.24	12.24	6 / 1			
	reaction time														2.90	2.82	2.88
	interval		1.00	0.96	0.94	0.94	0.96	0.92	0.96	0.96	0.96	1.22	AR PB		8.79	9.04	8.85
Rollins, Brianna (USA) (1991)	time	2.44	3.44	4.38	5.34	6.30	7.30	8.30	9.28	10.30	11.32		12.53	3 / 2			
	reaction time														2.90	2.96	3.02
	interval		1.00	0.94	0.96	0.96	1.00	1.00	0.98	1.02	1.02	1.21			8.79	8.61	8.44
Stowers, Jasmin (USA) (1991)	time	2.54	3.54	4.50	5.46	6.42	7.38	8.34	9.34	10.32	11.32		12.55	7 / 3			
	reaction time														2.92	2.88	2.98
	interval		1.00	0.96	0.96	0.96	0.96	0.96	1.00	0.98	1.00	1.23			8.73	8.85	8.56
Ali, Nia (USA) (1988)	time	2.48	3.48	4.46	5.46	6.44	7.42	8.42	9.42	10.44	11.46		12.72	1 / 4			
	reaction time														2.98	2.96	3.04
	interval		1.00	0.98	1.00	0.98	0.98	1.00	1.00	1.02	1.02	1.26			8.56	8.61	8.39
Nelvis, Sharika (USA) (1990)	time	2.44	3.46	4.50	5.48	6.48	7.48	8.48	9.48	10.52	11.56		12.82	5 / 5			
	reaction time														3.04	3.00	3.08
	interval		1.02	1.04	0.98	1.00	1.00	1.00	1.00	1.04	1.04	1.26			8.39	8.50	8.28
Talay, Alina (BLR) (1989)	time	2.52	3.52	4.54	5.52	6.50	7.50	8.48	9.50	10.54	11.58		12.85	8 / 6			
	reaction time														3.00	2.96	3.10
	interval		1.00	1.02	0.98	0.98	1.00	0.98	1.02	1.04	1.04	1.27			8.50	8.61	8.23
Porter, Tiffany (GBR) (1987)	time	2.48	3.52	4.52	5.50	6.48	7.48	8.48	9.50	10.54	11.60		12.90	7 / 7			
	reaction time														3.02	2.98	3.12
	interval		1.04	1.00	0.98	0.98	1.00	1.00	1.02	1.04	1.06	1.30			8.44	8.56	8.17
Harper-Nelson, Dawn (USA) (1984)	time	2.52	3.56	4.56	5.58	6.58	7.56	8.56	9.58	10.62	11.70		13.01	4 / 8			
	reaction time														3.06	2.98	3.14
	interval		1.04	1.00	1.02	1.00	0.98	1.00	1.02	1.04	1.08	1.31			8.33	8.56	8.12
	velocity	5.37	8.50	8.85	9.04	9.04	8.85	9.24	8.85	8.85	8.85	8.61	8.17				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=TLq0UUtXw1Q>

Men's 400m Hurdles

2016 Top 10 Times - Men's 400m Hurdles

Clement, Kerron (USA) (1985)																
FINAL - 2016 Olympic Games (Rio de Janeiro, BRA)																
date	18-Aug	time													47.73	5 / 1
reaction time	0.227	interval	No Information Available													
H1 lead leg		velocity														
		strides														
Mucheru, Bonface (KEN) (1992)																
FINAL - 2016 Olympic Games (Rio de Janeiro, BRA)																
date	18-Aug	time													47.78	7 / 2
reaction time	0.165	interval	No Information Available												NR PB	
H1 lead leg		velocity														
		strides														
Copello, Yasmani (TUR) (1987)																
FINAL - 2016 Olympic Games (Rio de Janeiro, BRA)																
date	18-Aug	time													47.92	2 / 3
reaction time	0.186	interval	No Information Available												NR PB	
H1 lead leg		velocity														
		strides														
Barr, Thomas (IRL) (1992)																
FINAL - 2016 Olympic Games (Rio de Janeiro, BRA)																
date	18-Aug	time													47.97	4 / 4
reaction time	0.191	interval	No Information Available												NR PB	
H1 lead leg		velocity														
		strides														
Bett, Nicholas (KEN) (1990)																
FINAL - 2016 Meeting Paris (Saint-Denis, FRA) (TV Analysis)																
date	27-Aug	time	6.04	9.72	13.48	17.32	21.24	25.24	29.28	33.52	37.96	42.72	Henson (2020) - Athlete First: 2016 year end hurdle report			
reaction time	0.167	interval		3.68	3.76	3.84	3.92	4.00	4.04	4.24	4.44	4.76	5.29		11.28	11.96
		velocity	7.45	9.51	9.31	9.11	8.93	8.75	8.66	8.25	7.88	7.35	7.56	8.33	9.31	8.78
H1 lead leg	R	strides	21	13	13	13	13	13	13	13	13	15	17	157		7.81
Whyte, Annsert (JAM) (1987)																
FINAL - 2016 Olympic Games (Rio de Janeiro, BRA)																
date	18-Aug	time													48.07	6 / 5
reaction time	0.167	interval	No Information Available												PB	
H1 lead leg		velocity														
		strides														
Dutch, Johnny (USA) (1989)																
FINAL - 2016 Racers Grand Prix (Kingston, JAM) (TV Analysis)																
date	11-Jun	time	5.67	9.33	13.13	17.03	21.10	25.27	29.43	33.77	38.17	42.70	Henson (2020) - Athlete First: 2016 year end hurdle report			
reaction time		interval		3.66	3.80	3.90	4.07	4.17	4.16	4.34	4.40	4.53	5.40		11.36	12.40
		velocity	7.94	9.56	9.21	8.97	8.60	8.39	8.41	8.06	7.95	7.73	7.41	8.32	9.24	8.47
H1 lead leg	R	strides	22	13	13	13	13	14	14	15	15	15	18.2	165.2		7.91
Clement, Kerron (USA) (1985)																
FINAL - 2016 Meeting Paris (Saint-Denis, FRA) (TV Analysis)																
date	27-Aug	time	5.88	9.60	13.32	17.08	21.00	25.08	29.24	33.56	38.04	42.92	Henson (2020) - Athlete First: 2016 year end hurdle report			
reaction time	0.137	interval		3.72	3.72	3.76	3.92	4.08	4.16	4.32	4.48	4.88	5.27		11.20	12.16
		velocity	7.65	9.41	9.41	9.31	8.93	8.58	8.41	8.10	7.81	7.17	7.59	8.30	9.38	8.63
H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	14	16.7	154.7		7.68
Copello, Yasmani (TUR) (1987)																
FINAL - 2016 Meeting Paris (Saint-Denis, FRA) (TV Analysis)																
date	27-Aug	time	5.88	9.52		17.24	21.24	25.28		33.92	38.40	43.00	Henson (2020) - Athlete First: 2016 year end hurdle report			
reaction time	0.186	interval		3.64		7.72	4.00	4.04		8.64	4.48	4.60	5.24		11.36	
		velocity	7.65	9.62		9.07	8.75	8.66		8.10	7.81	7.61	7.63	8.29	9.24	
H1 lead leg	R	strides	20	13			13	13			14	14	17.5	104.5		
Clement, Kerron (USA) (1985)																
Semi-Final 1 - 2016 Olympic Games (Rio de Janeiro, BRA)																
date	16-Aug	time													48.26	8 / 1
reaction time	0.141	interval	No Information Available													
H1 lead leg		velocity														
		strides														

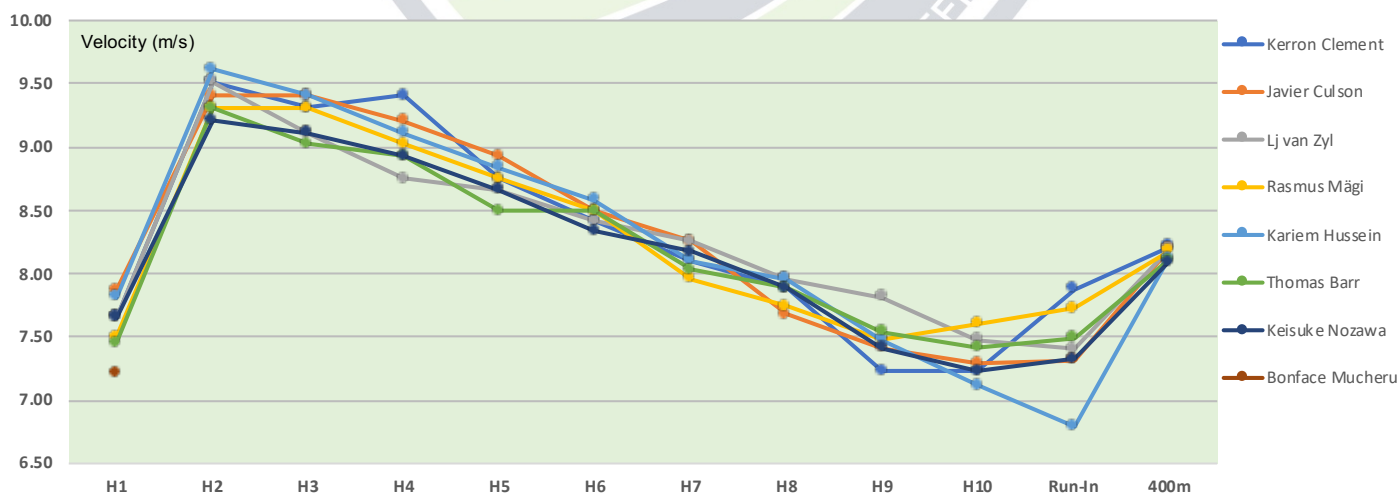
2016 Weltklasse (Zürich, SUI) (TV Analysis)

Men's 400m Hurdles

Date 2016.09.01

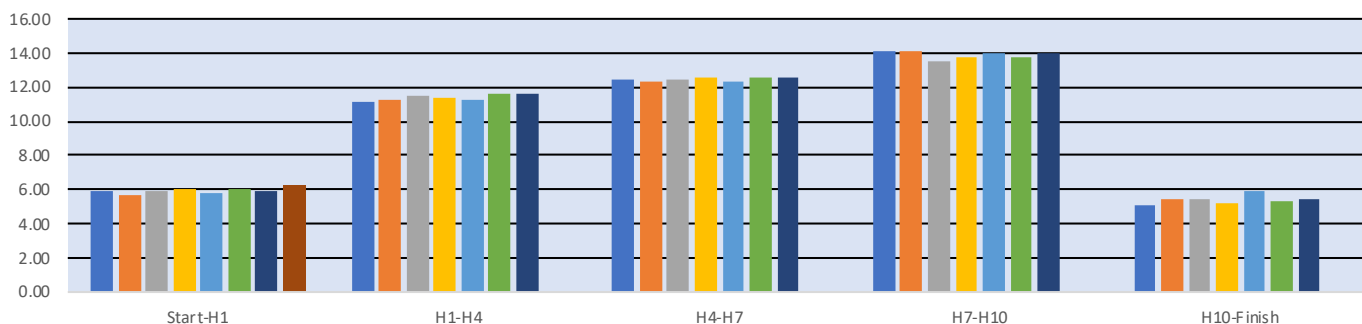
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Clement, Kerron (USA) (1985)	time		5.88	9.56	13.32	17.04	21.04	25.20	29.52	33.96	38.80	43.64		48.72	6 / 1			
	reaction time	0.132																
	interval			3.68	3.76	3.72	4.00	4.16	4.32	4.44	4.84	4.84	5.08			11.16	12.48	14.12
	velocity		7.65	9.51	9.31	9.41	8.75	8.41	8.10	7.88	7.23	7.23	7.87	8.21		9.41	8.41	7.44
Culson, Javier (PUR) (1984)	time		5.72	9.44	13.16	16.96	20.88	25.00	29.24	33.80	38.52	43.32		48.79	3 / 2			
	reaction time	0.175																
	interval			3.72	3.72	3.80	3.92	4.12	4.24	4.56	4.72	4.80	5.47			11.24	12.28	14.08
	velocity		7.87	9.41	9.41	9.21	8.93	8.50	8.25	7.68	7.42	7.29	7.31	8.20		9.34	8.55	7.46
van Zyl, LJ (RSA) (1985)	time		5.88	9.56	13.40	17.40	21.44	25.60	29.84	34.24	38.72	43.40		48.80	1 / 3			
	reaction time	0.147																
	interval			3.68	3.84	4.00	4.04	4.16	4.24	4.40	4.48	4.68	5.40			11.52	12.44	13.56
	velocity		7.65	9.51	9.11	8.75	8.66	8.41	8.25	7.95	7.81	7.48	7.41	8.20		9.11	8.44	7.74
Mägi, Rasmus (EST) (1992)	time		6.00	9.76	13.52	17.40	21.40	25.52	29.92	34.44	39.12	43.72		48.90	8 / 4			
	reaction time	0.114																
	interval			3.76	3.76	3.88	4.00	4.12	4.40	4.52	4.68	4.60	5.18			11.40	12.52	13.80
	velocity		7.50	9.31	9.31	9.02	8.75	8.50	7.95	7.74	7.48	7.61	7.72	8.18		9.21	8.39	7.61
Hussein, Kariem (SUI) (1989)	time		5.76	9.40	13.12	16.96	20.92	25.00	29.32	33.72	38.40	43.32		49.21	7 / 5			
	reaction time	0.147																
	interval			3.64	3.88	3.84	3.96	4.08	4.32	4.40	4.68	4.92	5.89			11.20	12.36	14.00
	velocity		7.81	9.62	9.41	9.11	8.84	8.58	8.10	7.95	7.48	7.11	6.79	8.13		9.38	8.50	7.50
Barr, Thomas (IRL) (1992)	time		6.04	9.80	13.68	17.60	21.72	25.84	30.20	34.64	39.28	44.00		49.34	4 / 6			
	reaction time	0.174																
	interval			3.76	3.88	3.92	4.12	4.36	4.44	4.64	4.72	5.34				11.56	12.60	13.80
	velocity		7.45	9.31	9.02	8.93	8.50	8.50	8.03	7.88	7.54	7.42	7.49	8.11		9.08	8.33	7.61
Nozawa, Keisuke (JPN) (1991)	time		5.88	9.68	13.52	17.44	21.48	25.68	29.96	34.40	39.12	43.96		49.42	2 / 7			
	reaction time	0.134																
	interval			3.80	3.84	3.92	4.04	4.20	4.28	4.44	4.72	4.84	5.46			11.56	12.52	14.00
	velocity		7.65	9.21	9.11	8.93	8.66	8.33	8.18	7.88	7.42	7.23	7.33	8.09		9.08	8.39	7.50
Mucheru, Bonface (KEN) (1992)	time		6.24											dnf	5 / 8			
	reaction time	0.132																
	interval																	
	velocity		7.21															
H1 lead leg	time																	
	interval																	
	velocity																	
	strides																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=SZFwIADt-ds>

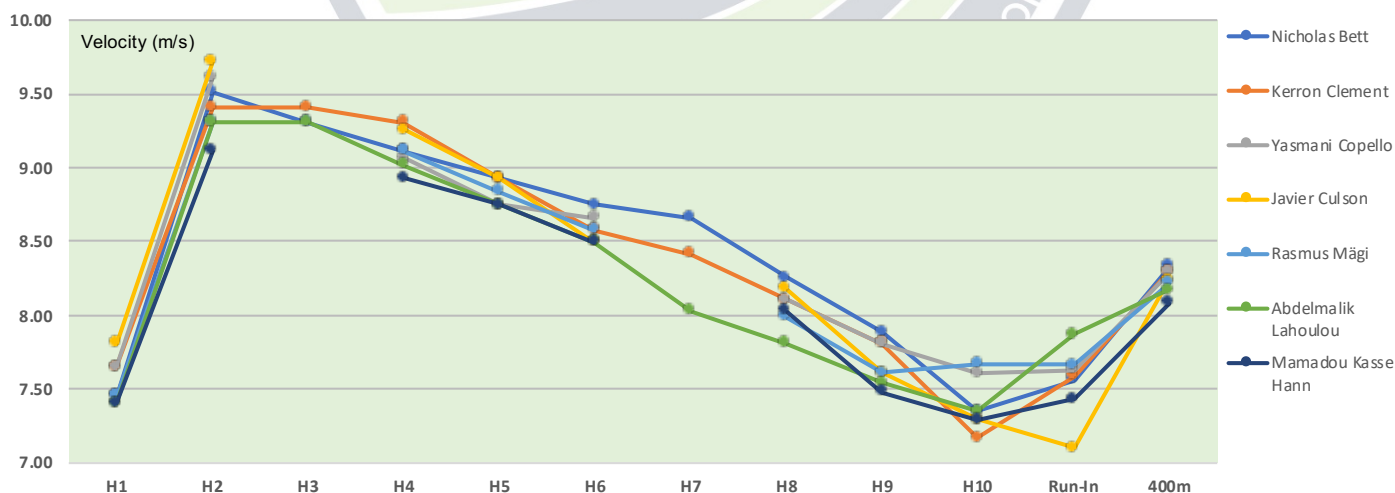
2016 Meeting Paris (Saint-Denis, FRA) (TV Analysis)

Men's 400m Hurdles

Date 2016.08.27

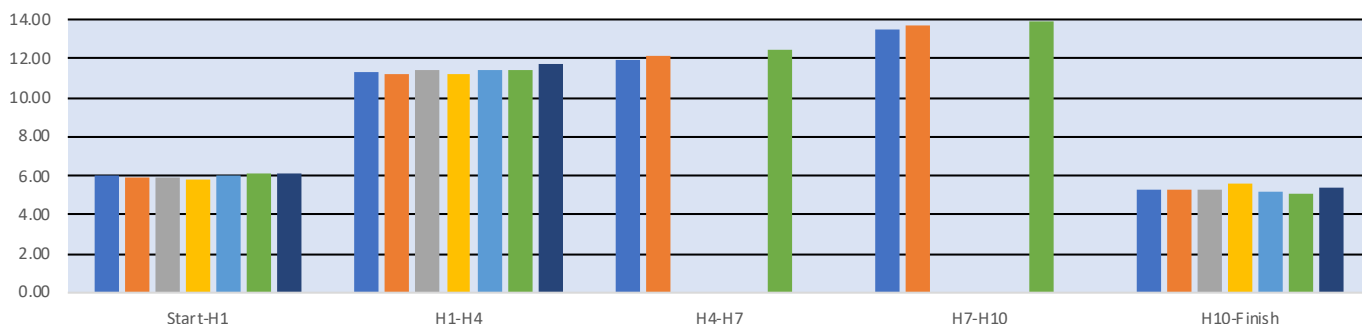
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bett, Nicholas (KEN) (1990)	time		6.04	9.72	13.48	17.32	21.24	25.24	29.28	33.52	37.96	42.72		48.01	7 / 1			
	reaction time	0.167																
	interval			3.68	3.76	3.84	3.92	4.00	4.04	4.24	4.44	4.76	5.29			11.28	11.96	13.44
	velocity		7.45	9.51	9.31	9.11	8.93	8.75	8.66	8.25	7.88	7.35	7.56	8.33		9.31	8.78	7.81
	H1 lead leg	R																
	strides		21	13	13	13	13	13	13	13	13	15	17	157				
	time		5.88	9.60	13.32	17.08	21.00	25.08	29.24	33.56	38.04	42.92		48.19	6 / 2			
	reaction time	0.137																
	interval			3.72	3.72	3.76	3.92	4.08	4.16	4.32	4.48	4.88	5.27			11.20	12.16	13.68
	velocity		7.65	9.41	9.41	9.31	8.93	8.58	8.41	8.10	7.81	7.17	7.59	8.30		9.38	8.63	7.68
	H1 lead leg	R																
	strides		20	13	13	13	13	13	13	13	13	14	16.7	154.7				
Copello, Yasmani (TUR) (1987)	time		5.88	9.52	13.32	17.24	21.24	25.28	29.24	33.92	38.40	43.00		48.24	4 / 3			
	reaction time	0.186																
	interval			3.64	3.72	3.76	3.92	4.04	4.04	4.24	4.48	4.60	5.24			11.36		
	velocity		7.65	9.62	9.07	8.75	8.66			8.10	7.81	7.61	7.63	8.29		9.24		
	H1 lead leg	R																
	strides		20	13			13	13			14	14	17.5	104.5				
Culson, Javier (PUR) (1984)	time		5.76	9.36	13.60	17.48	21.44	25.52	29.96	34.44	39.08	43.84		48.55	5 / 4			
	reaction time	0.207																
	interval			3.60	3.76	3.88	3.96	4.12	4.36	4.48	4.64	4.76	5.08			11.16		
	velocity		7.81	9.72	9.26	8.93	8.50			8.18	7.61	7.29	7.10	8.24		9.41		
	H1 lead leg	L																
	strides		20	13			13	13			14	14	17.2	104.2				
Mägi, Rasmus (EST) (1992)	time		6.04	9.80	13.60	17.48	21.44	25.52	29.96	34.44	39.08	43.84		48.66	3 / 5			
	reaction time	0.147																
	interval			3.76	3.76	3.88	3.96	4.08	4.36	4.48	4.64	4.76	5.22			11.44		
	velocity		7.45	9.31	9.11	8.84	8.58			7.99	7.61	7.68	7.66	8.22		9.18		
	H1 lead leg	L																
	strides		20	13			13	13			14	14	17	104				
Lahoulou, Abdelmalik (ALG) (1992)	time		6.08	9.84	13.60	17.48	21.48	25.60	29.96	34.44	39.08	43.84		48.92	8 / 6			
	reaction time	0.191																
	interval			3.76	3.76	3.88	4.00	4.12	4.36	4.48	4.64	4.76	5.08			11.40	12.48	13.88
	velocity		7.40	9.31	9.31	9.02	8.75	8.50	8.03	7.81	7.54	7.35	7.87	8.18		9.21	8.41	7.56
	H1 lead leg	L																
	strides		21	13	13	13	13	13	14	14	15	15		144				
Hann, Mamadou Kasse (FRA) (1986)	time		6.08	9.92	13.60	17.76	21.76	25.88	29.96	34.60	39.28	44.08		49.46	1 / 7			
	reaction time	0.115																
	interval			3.84	3.76	3.88	4.00	4.12	4.36	4.48	4.68	4.80	5.38			11.68		
	velocity		7.40	9.11	8.93	8.75	8.50			8.03	7.48	7.29	7.43	8.09		8.99		
	H1 lead leg	R																
	strides		20	13			13	13			14	14		87				



Time Intervals (s)

Hurdle Phases



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

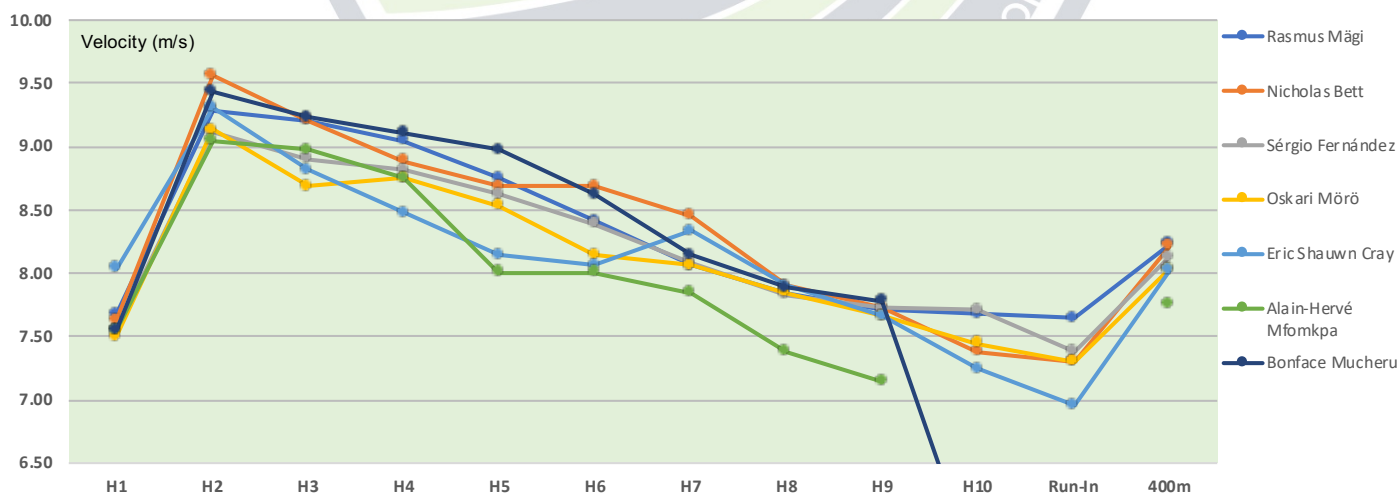
2016 Athletissime (Laussane, SUI) (TV Analysis)

Men's 400m Hurdles

Date 2016.08.25

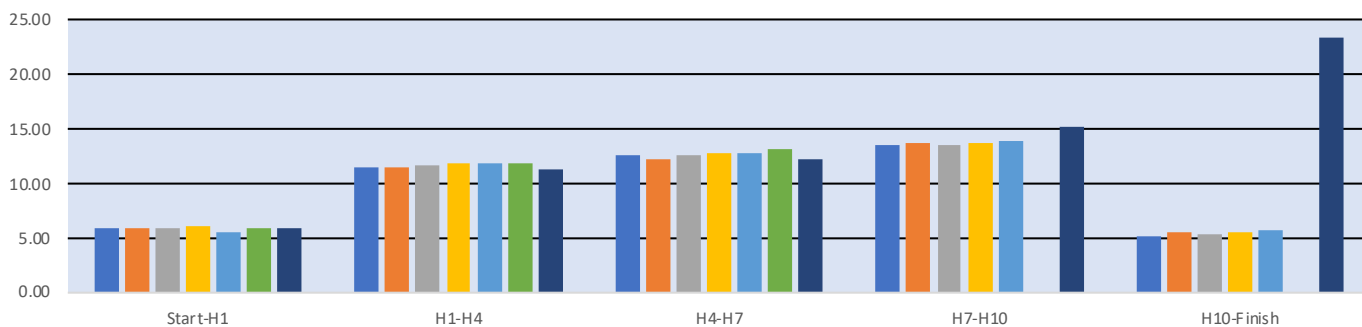
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Mägi, Rasmus (EST) (1992)	time		5.86	9.63	13.43	17.30	21.30	25.46	29.80	34.26	38.80	43.36		48.59	4 / 1			
reaction time	0.113	interval		3.77	3.80	3.87	4.00	4.16	4.34	4.46	4.54	4.56	5.23			11.44	12.50	13.56
		velocity	7.68	9.28	9.21	9.04	8.75	8.41	8.06	7.85	7.71	7.68	7.65	8.23		9.18	8.40	7.74
H1 lead leg	L	strides	21	13	13	13	13	13	14	14	14	14	17.2	159.2				
Bett, Nicholas (KEN) (1990)	time		5.90	9.56	13.36	17.30	21.33	25.36	29.50	33.93	38.46	43.20		48.68	6 / 2			
reaction time	0.162	interval		3.66	3.80	3.94	4.03	4.03	4.14	4.43	4.53	4.74	5.48			11.40	12.20	13.70
		velocity	7.63	9.56	9.21	8.88	8.68	8.68	8.45	7.90	7.73	7.38	7.30	8.22		9.21	8.61	7.66
H1 lead leg	R	strides	20	13	13	13	13	13	13	15	15	15	17	160				
Fernández, Sérgio (ESP) (1993)	time		5.96	9.80	13.73	17.70	21.76	25.93	30.26	34.73	39.26	43.80		49.22	3 / 3			
reaction time	0.146	interval		3.84	3.93	3.97	4.06	4.17	4.33	4.47	4.53	4.54	5.42			11.74	12.56	13.54
		velocity	7.55	9.11	8.91	8.82	8.62	8.39	8.08	7.83	7.73	7.71	7.38	8.13		8.94	8.36	7.75
H1 lead leg	L	strides	20	13	13	13	13	13	14	14	14	14	17	158				
Mörö, Oskari (FIN) (1993)	time		6.00	9.83	13.86	17.86	21.96	26.26	30.60	35.06	39.63	44.33		49.81	2 / 4			
reaction time	0.129	interval		3.83	4.03	4.00	4.10	4.30	4.34	4.46	4.57	4.70	5.48			11.86	12.74	13.73
		velocity	7.50	9.14	8.68	8.75	8.54	8.14	8.06	7.85	7.66	7.45	7.30	8.03		8.85	8.24	7.65
H1 lead leg	L	strides	21	14	14	13	13	14	14	15	15	15	18	166				
Cray, Eric Shauwn (PHI) (1988)	time		5.60	9.36	13.33	17.46	21.76	26.10	30.30	34.73	39.30	44.13		49.88	7 / 5			
reaction time	0.132	interval		3.76	3.97	4.13	4.30	4.34	4.20	4.43	4.57	4.83	5.75			11.86	12.84	13.83
		velocity	8.04	9.31	8.82	8.47	8.14	8.06	8.33	7.90	7.66	7.25	6.96	8.02		8.85	8.18	7.59
H1 lead leg	R	strides	22	14	14	14	14	15	15	15	15	16		154				
Mfomkpa, Alain-Hervé (SUI) (1996)	time		5.96	9.83	13.73	17.73	22.10	26.47	30.93	35.67	40.57			51.58	8 / 6			
reaction time	0.182	interval		3.87	3.90	4.00	4.37	4.46	4.74	4.90						11.77	13.20	
		velocity	7.55	9.04	8.97	8.75	8.01	8.01	7.85	7.38	7.14			7.75		8.92	7.95	
H1 lead leg	L	strides	21	13	13	13	14	14	15	15	15			133				
Mucheru, Bonface (KEN) (1992)	time		5.96	9.67	13.46	17.30	21.20	25.26	29.56	34.00	38.50	44.73		68.05	5 / 7			
reaction time	0.153	interval		3.71	3.79	3.84	3.90	4.06	4.30	4.44	4.50	6.23	23.32			11.34	12.26	15.17
		velocity	7.55	9.43	9.23	9.11	8.97	8.62	8.14	7.88	7.78	5.62	1.72	5.88		9.26	8.56	6.92
H1 lead leg	R	strides	22	13	13	13	13	13	15	15	15	17		149				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1272 x 720 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=UPMPNSi8prA>

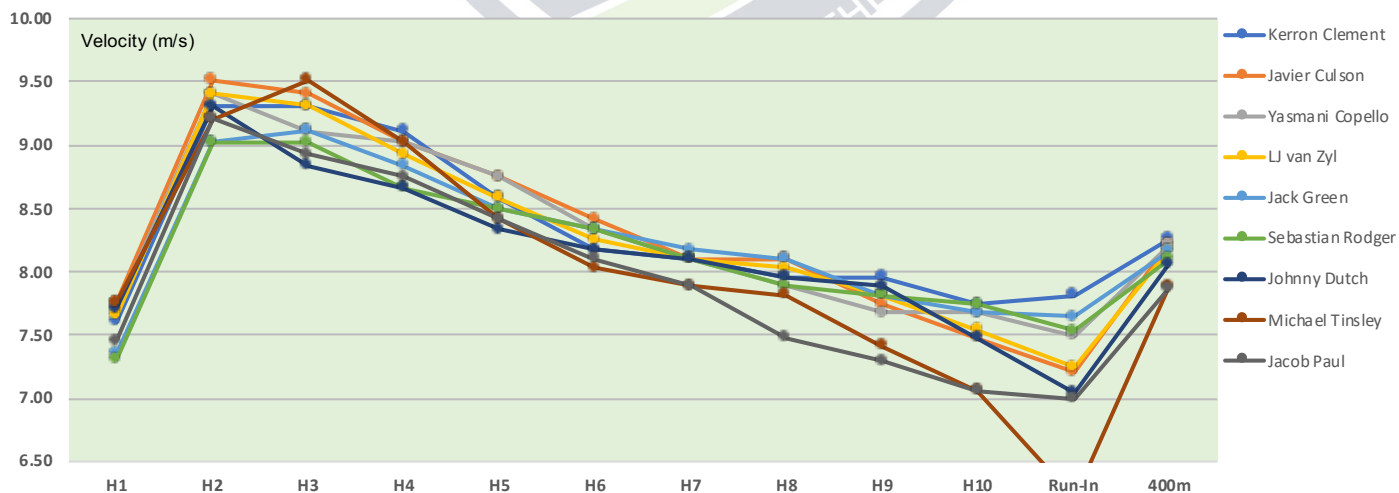
2016 London Anniversary Games (London, GBR) (TV Analysis)

Men's 400m Hurdles

Date 2016.07.23

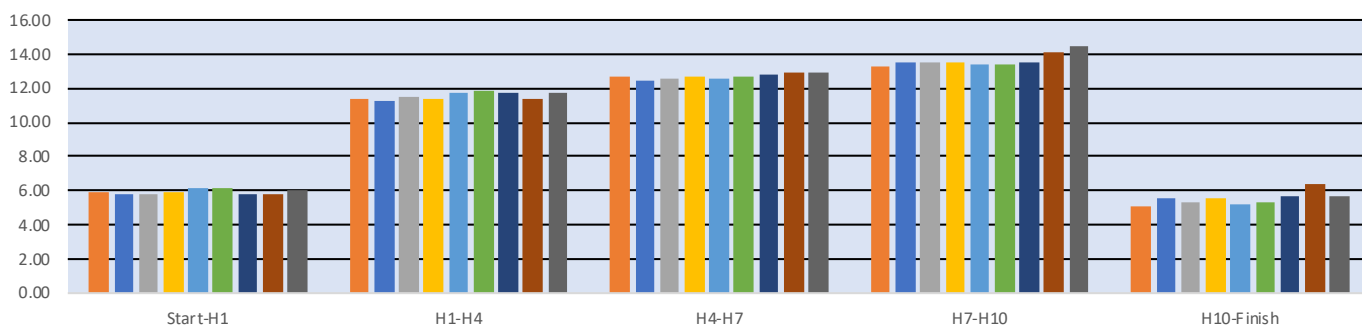
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Clement, Kerron (USA) (1985)	time		5.92	9.68	13.44	17.28	21.36	25.64	29.96	34.36	38.76	43.28		48.40	7 / 1			
	reaction time	0.164																
	interval		7.60	3.76	3.76	3.84	4.08	4.28	4.32	4.40	4.40	4.52	5.12			11.36	12.68	13.32
	velocity		7.60	9.31	9.31	9.11	8.58	8.18	8.10	7.95	7.74	7.74	7.81	8.26		9.24	8.28	7.88
Culson, Javier (PUR) (1984)	time		5.80	9.48	13.20	17.08	21.08	25.24	29.56	33.88	38.40	43.08		48.63	3 / 2			
	reaction time	0.173																
	interval		7.76	3.68	3.72	3.88	4.00	4.16	4.32	4.32	4.52	4.68	5.55			11.28	12.48	13.52
	velocity		7.76	9.51	9.41	9.02	8.75	8.41	8.10	8.10	7.74	7.48	7.21	8.23		9.31	8.41	7.77
Copello, Yasmani (TUR) (1987)	time		5.84	9.56	13.40	17.28	21.28	25.48	29.80	34.24	38.80	43.36		48.70	6 / 3			
	reaction time	0.189																
	interval		7.71	3.72	3.84	3.88	4.00	4.20	4.32	4.44	4.56	4.56	5.34			11.44	12.52	13.56
	velocity		7.71	9.41	9.11	9.02	8.75	8.33	8.10	7.88	7.68	7.68	7.49	8.21		9.18	8.39	7.74
van Zyl, LJ (RSA) (1985)	time		5.88	9.60	13.36	17.28	21.36	25.60	29.92	34.28	38.76	43.40		48.92	2 / 4			
	reaction time	0.153																
	interval		7.65	3.72	3.76	3.92	4.08	4.24	4.32	4.36	4.48	4.64	5.52			11.40	12.64	13.48
	velocity		7.65	9.41	9.31	8.93	8.58	8.25	8.10	8.03	7.81	7.54	7.25	8.18		9.21	8.31	7.79
Green, Jack (GBR) (1991)	time		6.12	10.00	13.84	17.80	21.92	26.12	30.40	34.72	39.20	43.76		48.99	9 / 5			
	reaction time	0.187																
	interval		7.35	3.88	3.84	3.96	4.12	4.20	4.28	4.32	4.48	4.56	5.23			11.68	12.60	13.36
	velocity		7.35	9.02	9.11	8.84	8.50	8.33	8.18	8.10	7.81	7.68	7.65	8.16		8.99	8.33	7.86
Rodger, Sebastian (GBR) (1991)	time		6.16	10.04	13.92	17.96	22.08	26.28	30.60	35.04	39.52	44.04		49.35	8 / 6			
	reaction time	0.155																
	interval		7.31	3.88	3.88	4.04	4.12	4.20	4.32	4.44	4.48	4.52	5.31			11.80	12.64	13.44
	velocity		7.31	9.02	9.02	8.66	8.50	8.33	8.10	7.88	7.81	7.74	7.53	8.11		8.90	8.31	7.81
Dutch, Johnny (USA) (1989)	time		5.84	9.60	13.56	17.60	21.80	26.08	30.40	34.80	39.24	43.92		49.60	5 / 7			
	reaction time	0.193																
	interval		7.71	3.76	3.96	4.04	4.20	4.28	4.32	4.40	4.44	4.68	5.68			11.76	12.80	13.52
	velocity		7.71	9.31	8.84	8.66	8.33	8.18	8.10	7.95	7.88	7.48	7.04	8.06		8.93	8.20	7.77
Tinsley, Michael (USA) (1984)	time		5.80	9.60	13.28	17.16	21.32	25.68	30.12	34.60	39.32	44.28		50.72	4 / 8			
	reaction time	0.188																
	interval		7.76	3.80	3.68	3.88	4.16	4.36	4.44	4.48	4.72	4.96	6.44			11.36	12.96	14.16
	velocity		7.76	9.21	9.51	9.02	8.41	8.03	7.88	7.81	7.42	7.06	6.21	7.89		9.24	8.10	7.42
Paul, Jacob (GBR) (1995)	time		6.04	9.84	13.76	17.76	21.92	26.24	30.68	35.36	40.16	45.12		50.84	1 / 9			
	reaction time	0.136																
	interval		7.45	3.80	3.92	4.00	4.16	4.32	4.44	4.68	4.80	4.96	5.72			11.72	12.92	14.44
	velocity		7.45	9.21	8.93	8.75	8.41	8.10	7.88	7.48	7.29	7.06	6.99	7.87		8.96	8.13	7.27



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1276 x 720 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=VipGzSofxZ4>

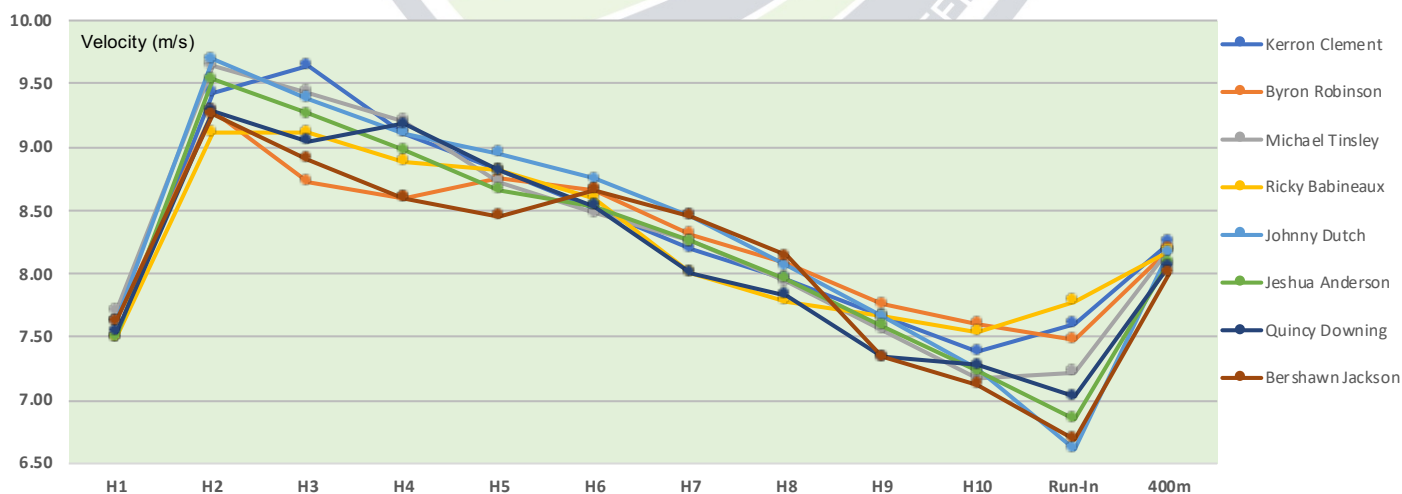
2016 USA Olympic Trials (Eugene, OR) (TV Analysis)

Men's 400m Hurdles

Date 2016.07.10

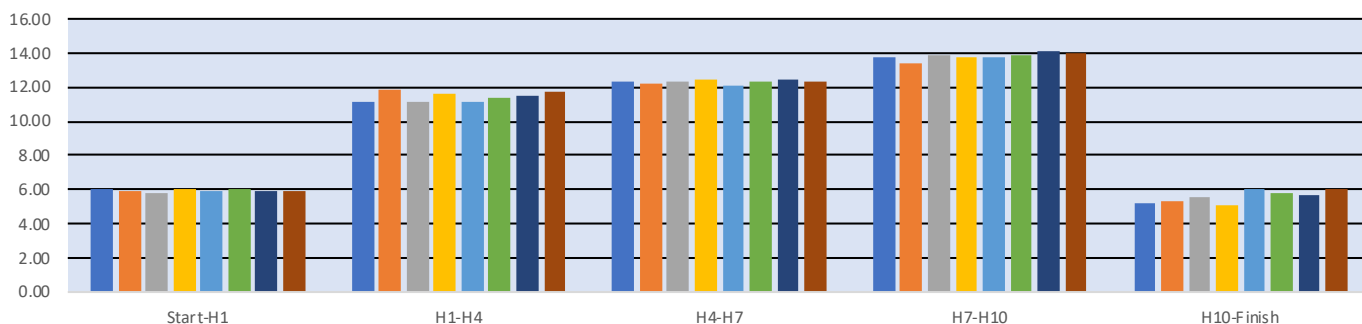
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Clement, Kerron (USA) (1985)	time		6.00	9.71	13.34	17.18	21.15	25.26	29.53	33.93	38.50	43.24		48.50	7 / 1			
	reaction time	0.180																
	interval		7.50	3.71	3.63	3.84	3.97	4.11	4.27	4.40	4.57	4.74	5.26			11.18	12.35	13.71
	velocity		7.50	9.43	9.64	9.11	8.82	8.52	8.20	7.95	7.66	7.38	7.60	8.25		9.39	8.50	7.66
Robinson, Byron (USA) (1994)	time		5.90	9.67	13.68	17.75	21.75	25.79	30.00	34.33	38.84	43.44		48.79	2 / 2			
	reaction time	0.185																
	interval		7.63	3.77	4.01	4.07	4.00	4.04	4.21	4.33	4.51	4.60	5.35	PB		11.85	12.25	13.44
	velocity		7.63	9.28	8.73	8.60	8.75	8.66	8.31	8.08	7.76	7.61	7.48	8.20		8.86	8.57	7.81
Tinsley, Michael (USA) (1984)	time		5.84	9.47	13.18	16.98	20.99	25.12	29.36	33.77	38.40	43.28		48.82	6 / 3			
	reaction time	0.180																
	interval		7.71	3.63	3.71	3.80	4.01	4.13	4.24	4.41	4.63	4.88	5.54			11.14	12.38	13.92
	velocity		7.71	9.64	9.43	9.21	8.73	8.47	8.25	7.94	7.56	7.17	7.22	8.19		9.43	8.48	7.54
Babineaux, Ricky (USA) (1990)	time		6.00	9.84	13.68	17.62	21.59	25.66	30.03	34.53	39.10	43.74		48.88	4 / 4			
	reaction time	0.187																
	interval		7.50	3.84	3.84	3.94	3.97	4.07	4.37	4.50	4.57	4.64	5.14	PB		11.62	12.41	13.71
	velocity		7.50	9.11	9.11	8.88	8.82	8.60	8.01	7.78	7.66	7.54	7.78	8.18		9.04	8.46	7.66
Dutch, Johnny (USA) (1989)	time		5.90	9.51	13.24	17.08	20.99	24.99	29.13	33.47	38.04	42.87		48.92	5 / 5			
	reaction time	0.227																
	interval		7.63	3.61	3.73	3.84	3.91	4.00	4.14	4.34	4.57	4.83	6.05			11.18	12.05	13.74
	velocity		7.63	9.70	9.38	9.11	8.95	8.75	8.45	8.06	7.66	7.25	6.61	8.18		9.39	8.71	7.64
Anderson, Jeshua (USA) (1989)	time		6.00	9.67	13.45	17.35	21.39	25.49	29.73	34.13	38.74	43.58		49.42	8 / 6			
	reaction time	0.191																
	interval		7.50	3.67	3.78	3.90	4.04	4.10	4.24	4.40	4.61	4.84	5.84	DQ		11.35	12.38	13.85
	velocity		7.50	9.54	9.26	8.97	8.66	8.54	8.25	7.95	7.59	7.23	6.85	8.09		9.25	8.48	7.58
Downing, Quincy (USA) (1993)	time		5.97	9.74	13.61	17.42	21.39	25.49	29.86	34.33	39.10	43.91		49.60	3 / 6			
	reaction time	0.196																
	interval		7.54	3.77	3.87	3.81	3.97	4.10	4.37	4.47	4.77	4.81	5.69			11.45	12.44	14.05
	velocity		7.54	9.28	9.04	9.19	8.82	8.54	8.01	7.83	7.34	7.28	7.03	8.06		9.17	8.44	7.47
Jackson, Bershawn (USA) (1983)	time		5.90	9.68	13.61	17.68	21.82	25.86	30.00	34.30	39.07	43.98		49.96	1 / 7			
	reaction time	0.233																
	interval		7.63	3.78	3.93	4.07	4.14	4.04	4.14	4.30	4.77	4.91	5.98			11.78	12.32	13.98
	velocity		7.63	9.26	8.91	8.60	8.45	8.66	8.45	8.14	7.34	7.13	6.69	8.01		8.91	8.52	7.51



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=u3zVRliiuV4>

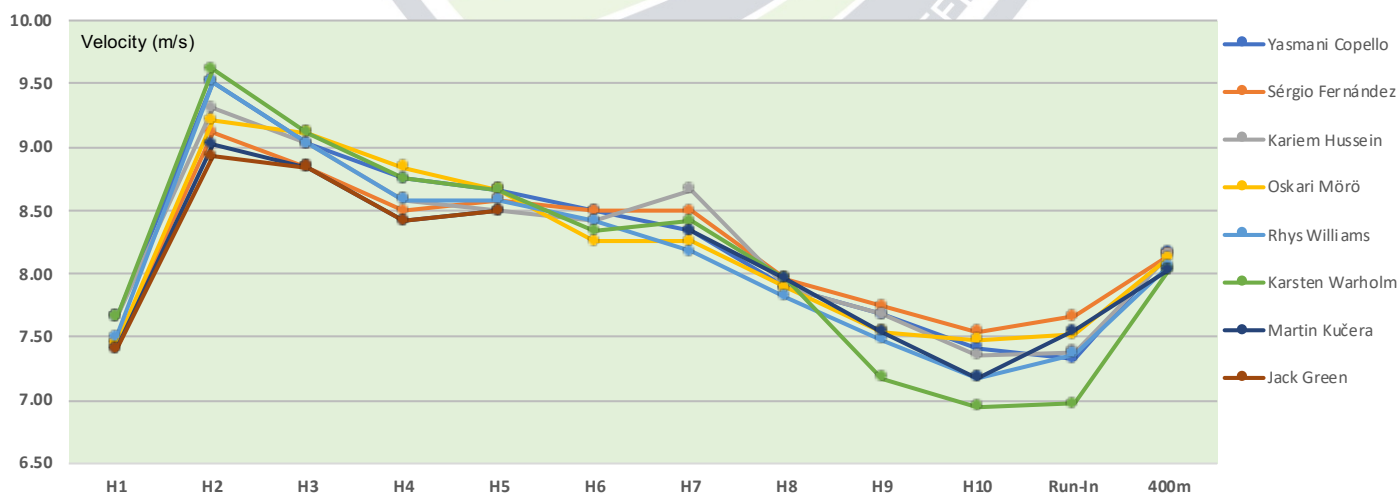
2016 European Championships (Amsterdam, NED) (TV Analysis)

Men's 400m Hurdles

Date 2016.07.08

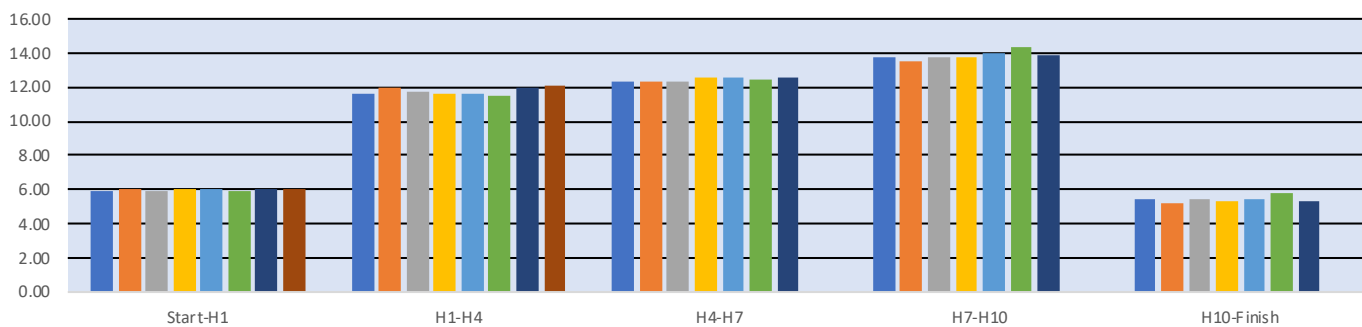
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Copello, Yasmani (TUR) (1987)	time		5.88	9.56	13.44	17.44	21.48	25.60	29.80	34.24	38.80	43.52		48.98	6 / 1			
	reaction time	0.175																
	interval			3.68	3.88	4.00	4.04	4.12	4.20	4.44	4.56	4.72	5.46			11.56	12.36	13.72
	velocity		7.65	9.51	9.02	8.75	8.66	8.50	8.33	7.88	7.68	7.42	7.33	8.17		9.08	8.50	7.65
Fernández, Sérgio (ESP) (1993)	time		6.04	9.88	13.84	17.96	22.04	26.16	30.28	34.68	39.20	43.84		49.06	5 / 2			
	reaction time	0.138																
	interval			3.84	3.96	4.12	4.08	4.12	4.12	4.40	4.52	4.64	5.22			11.92	12.32	13.56
	velocity		7.45	9.11	8.84	8.50	8.58	8.50	8.50	7.95	7.74	7.54	7.66	8.15		8.81	8.52	7.74
Hussein, Kariem (SUI) (1989)	time		5.88	9.64	13.52	17.60	21.72	25.88	29.92	34.36	38.92	43.68		49.10	3 / 3			
	reaction time	0.134																
	interval			3.76	3.88	4.08	4.12	4.16	4.04	4.44	4.56	4.76	5.42			11.72	12.32	13.76
	velocity		7.65	9.31	9.02	8.58	8.50	8.41	8.66	7.88	7.68	7.35	7.38	8.15		8.96	8.52	7.63
Mörö, Oskari (FIN) (1993)	time		6.04	9.84	13.68	17.64	21.68	25.92	30.16	34.60	39.24	43.92		49.24	7 / 4			
	reaction time	0.155																
	interval			3.80	3.84	3.96	4.08	4.24	4.24	4.44	4.64	4.68	5.32			11.60	12.52	13.76
	velocity		7.45	9.21	9.11	8.84	8.66	8.25	8.25	7.88	7.54	7.48	7.52	8.12		9.05	8.39	7.63
Williams, Rhys (GBR) (1984)	time		6.00	9.68	13.56	17.64	21.72	25.88	30.16	34.64	39.32	44.20		49.63	8 / 5			
	reaction time	0.141																
	interval			3.68	3.88	4.08	4.08	4.16	4.28	4.48	4.68	4.88	5.43			11.64	12.52	14.04
	velocity		7.50	9.51	9.02	8.58	8.58	8.41	8.18	7.81	7.48	7.17	7.37	8.06		9.02	8.39	7.48
Warholm, Karsten (NOR) (1996)	time		5.88	9.52	13.36	17.36	21.40	25.60	29.76	34.16	39.04	44.08		49.82	4 / 6			
	reaction time	0.153																
	interval			3.64	3.84	4.00	4.04	4.20	4.16	4.40	4.88	5.04	5.74			11.48	12.40	14.32
	velocity		7.65	9.62	9.11	8.75	8.66	8.33	8.41	7.95	7.17	6.94	6.97	8.03		9.15	8.47	7.33
Kučera, Martin (SVK) (1990)	time		6.08	9.96	13.92	18.08	22.20		30.60	35.00	39.64	44.52		49.82	1 / 7			
	reaction time	0.121																
	interval			3.88	3.96	4.16	4.12		8.40	4.40	4.64	4.88	5.30			12.00	12.52	13.92
	velocity		7.40	9.02	8.84	8.41	8.50		8.33	7.95	7.54	7.17	7.55	8.03		8.75	8.39	7.54
Green, Jack (GBR) (1991)	time		6.08	10.00	13.96	18.12	22.24							dnf	2 / --			
	reaction time	0.187																
	interval			3.92	3.96	4.16	4.12									12.04		
	velocity		7.40	8.93	8.84	8.41	8.50									8.72		
H1 lead leg	time																	
	interval																	
	velocity																	
	strides																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=uNoffclVh6A>

2016 Bauhaus Athletics (Stockholm, SWE) (TV Analysis)

Men's 400m Hurdles

Date 2016.06.16

FINAL

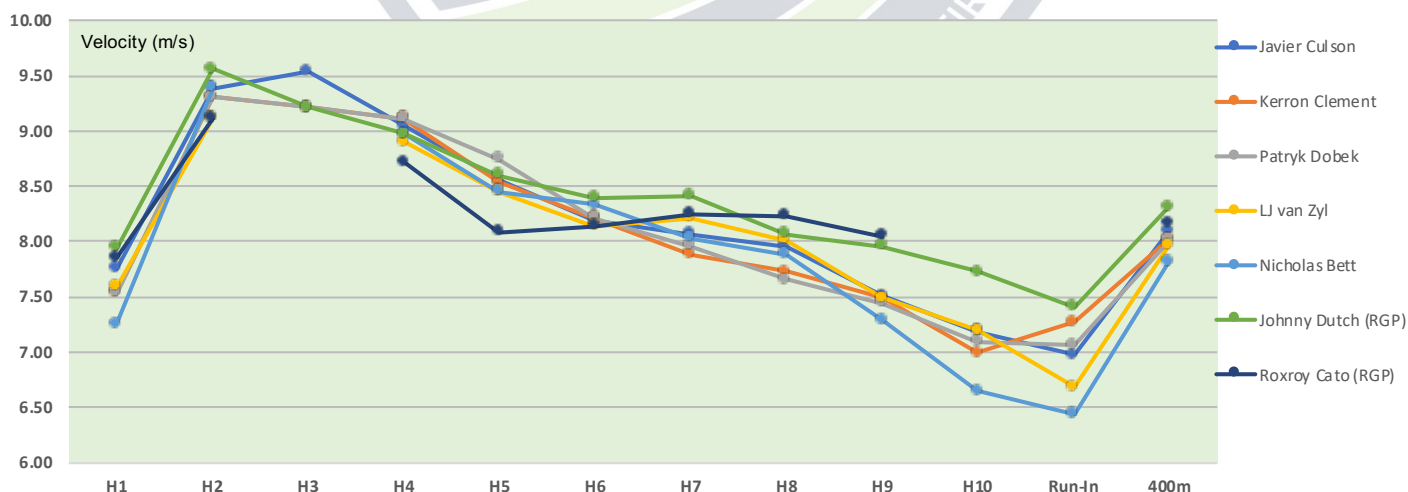
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Culson, Javier (PUR) (1984)	time		5.80	9.53	13.20	17.07	21.16	25.43	29.77	34.17	38.83	43.70		49.43	5 / 1			
	reaction time	0.184																
	interval			3.73	3.67	3.87	4.09	4.27	4.34	4.40	4.66	4.87	5.73			11.27	12.70	13.93
	velocity	□	7.76	9.38	9.54	9.04	8.56	8.20	8.06	7.95	7.51	7.19	6.98	8.09		9.32	8.27	7.54
Clement, Kerron (USA) (1985)	time		5.97	9.73	13.53	17.37	21.47	25.73	30.17	34.70	39.37	44.37		49.87	6 / 2			
	reaction time	0.150																
	interval			3.76	3.80	3.84	4.10	4.26	4.44	4.53	4.67	5.00	5.50			11.40	12.80	14.20
	velocity	□	7.54	9.31	9.21	9.11	8.54	8.22	7.88	7.73	7.49	7.00	7.27	8.02		9.21	8.20	7.39
Dobek, Patryk (POL) (1994)	time		5.97	9.73	13.53	17.37	21.37	25.63	30.03	34.60	39.30	44.23		49.89	7 / 3			
	reaction time	0.163																
	interval			3.76	3.80	3.84	4.00	4.26	4.40	4.57	4.70	4.93	5.66			11.40	12.66	14.20
	velocity	□	7.54	9.31	9.21	9.11	8.75	8.22	7.95	7.66	7.45	7.10	7.07	8.02		9.21	8.29	7.39
van Zyl, LJ (RSA) (1985)	time		5.93	9.77		17.63	21.77	26.07	30.33	34.70	39.37	44.23		50.21	3 / 4			
	reaction time	0.159																
	interval			3.84		7.86	4.14	4.30	4.26	4.37	4.67	4.86	5.98			11.70	12.70	13.90
	velocity	□	7.59	9.11		8.91	8.45	8.14	8.22	8.01	7.49	7.20	6.69	7.97		8.97	8.27	7.55
Bett, Nicholas (KEN) (1990)	time		6.20	9.93		17.73	21.87	26.07	30.43	34.87	39.67	44.93		51.14	2 / 5			
	reaction time	0.159																
	interval			3.73		7.80	4.14	4.20	4.36	4.44	4.80	5.26	6.21			11.53	12.70	14.50
	velocity	□	7.26	9.38		8.97	8.45	8.33	8.03	7.88	7.29	6.65	6.44	7.82		9.11	8.27	7.24
	time																	
	interval																	
	velocity																	
	strides																	

2016 Racers Grand Prix (Kingston, JAM) (TV Analysis)

Date 2016.06.11

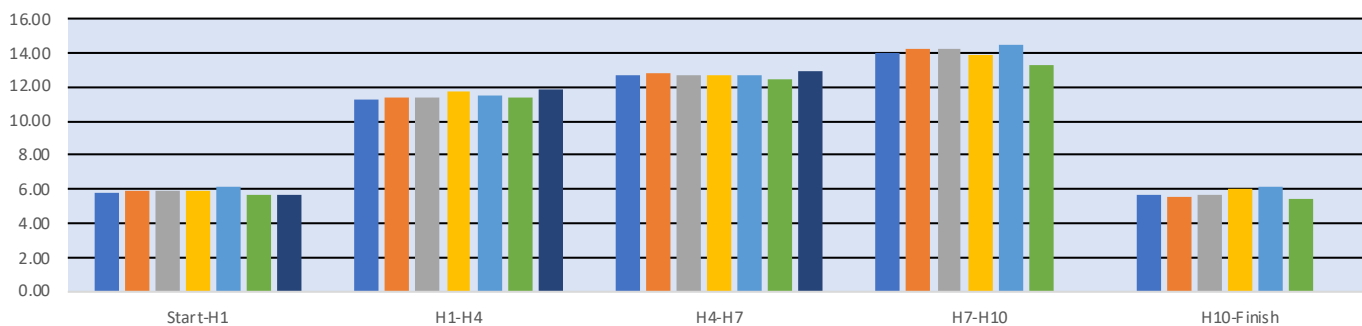
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Dutch, Johnny (USA) (1989)	time		5.67	9.33	13.13	17.03	21.10	25.27	29.43	33.77	38.17	42.70		48.10	5 / 1			
	reaction time																	
	interval			3.66	3.80	3.90	4.07	4.17	4.16	4.34	4.40	4.53	5.40			11.36	12.40	13.27
	velocity	□	7.94	9.56	9.21	8.97	8.60	8.39	8.41	8.06	7.95	7.73	7.41	8.32		9.24	8.47	7.91
Cato, Roxroy (JAM) (1988)	time		5.73	9.57		17.60	21.93	26.23	30.47	34.72	39.07		48.98	7 / 2				
	reaction time																	
	interval			3.84		8.03	4.33	4.30	4.24	4.25	4.35					11.87	12.87	
	velocity	□	7.85	9.11		8.72	8.08	8.14	8.25	8.24	8.05			8.17		8.85	8.16	
	time																	
	interval																	
	velocity																	
	strides																	



Time Intervals (s)

Hurdle Phases



Bauhaus Athletics

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1276 x 720 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=gJFF2U62Ji4>

Racers Grand Prix

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=CpdKwvY1KiA>

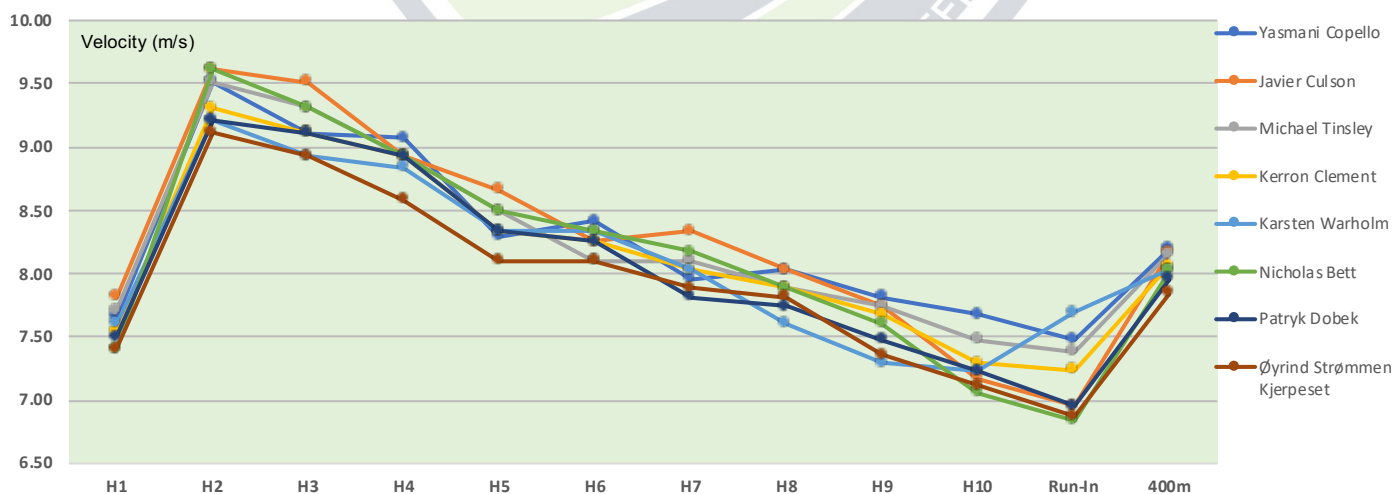
2016 Bislett Games (Oslo, NOR) (TV Analysis)

Men's 400m Hurdles

Date 2016.06.09

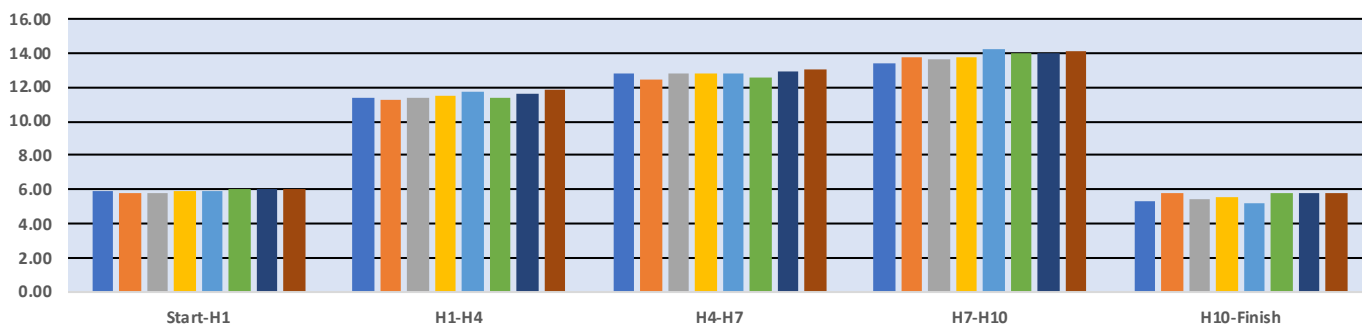
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Copello, Yasmani (TUR) (1987)	time		5.88	9.56	13.40	17.26	21.48	25.64	30.04	34.40	38.88	43.44		48.79	1 / 1			
	reaction time	0.164																
	interval		7.65	3.68	3.84	3.86	4.22	4.16	4.40	4.36	4.48	4.56	5.35			11.38	12.78	13.40
	velocity		7.65	9.51	9.11	9.07	8.29	8.41	7.95	8.03	7.81	7.68	7.48	8.20		9.23	8.22	7.84
Culson, Javier (PUR) (1984)	time		5.76	9.40	13.08	17.00	21.04	25.28	29.48	33.84	38.36	43.24		48.99	8 / 2			
	reaction time	0.175																
	interval		7.81	3.64	3.68	3.92	4.04	4.24	4.20	4.36	4.52	4.88	5.75			11.24	12.48	13.76
	velocity		7.81	9.62	9.51	8.93	8.66	8.25	8.33	8.03	7.74	7.17	6.96	8.16		9.34	8.41	7.63
Tinsley, Michael (USA) (1984)	time		5.84	9.52	13.28	17.20	21.32	25.64	29.96	34.40	38.92	43.60		49.02	5 / 3			
	reaction time	0.121																
	interval		7.71	3.68	3.76	3.92	4.12	4.32	4.32	4.44	4.52	4.68	5.42			11.36	12.76	13.64
	velocity		7.71	9.51	9.31	8.93	8.50	8.10	8.10	7.88	7.74	7.48	7.38	8.16		9.24	8.23	7.70
Clement, Kerron (USA) (1985)	time		5.96	9.72	13.56	17.48	21.68	25.92	30.28	34.72	39.28	44.08		49.61	6 / 4			
	reaction time	0.194																
	interval		7.55	3.76	3.84	3.92	4.20	4.24	4.36	4.44	4.56	4.80	5.53			11.52	12.80	13.80
	velocity		7.55	9.31	9.11	8.93	8.33	8.25	8.03	7.88	7.68	7.29	7.23	8.06		9.11	8.20	7.61
Warholm, Karsten (NOR) (1996)	time		5.92	9.72	13.64	17.60	21.80	26.00	30.36	34.96	39.76	44.60		49.80	7 / 5			
	reaction time	0.163																
	interval		7.60	3.80	3.92	3.96	4.20	4.20	4.36	4.60	4.80	4.84	5.20			11.68	12.76	14.24
	velocity		7.60	9.21	8.93	8.84	8.33	8.33	8.03	7.61	7.29	7.23	7.69	8.03		8.99	8.23	7.37
Bett, Nicholas (KEN) (1990)	time		6.08	9.72	13.48	17.40	21.52	25.72	30.00	34.44	39.04	44.00		49.85	4 / 6			
	reaction time	0.177																
	interval		7.40	3.64	3.76	3.92	4.12	4.20	4.28	4.44	4.60	4.96	5.85			11.32	12.60	14.00
	velocity		7.40	9.62	9.31	8.93	8.50	8.33	8.18	7.88	7.61	7.06	6.84	8.02		9.28	8.33	7.50
Dobek, Patryk (POL) (1994)	time		6.00	9.80	13.64	17.56	21.76	26.00	30.48	35.00	39.68	44.52		50.27	3 / 7			
	reaction time	0.174																
	interval		7.50	3.80	3.84	3.92	4.20	4.24	4.48	4.52	4.68	4.84	5.75			11.56	12.92	14.04
	velocity		7.50	9.21	9.11	8.93	8.33	8.25	7.81	7.74	7.48	7.23	6.96	7.96		9.08	8.13	7.48
Kjerpeset, Øyvind Strømme (NOR) (1994)	time		6.08	9.92	13.84	17.92	22.24	26.56	31.00	35.48	40.24	45.16		50.98	2 / 8			
	reaction time	0.153																
	interval		7.40	3.84	3.92	4.08	4.32	4.32	4.44	4.48	4.76	4.92	5.82			11.84	13.08	14.16
	velocity		7.40	9.11	8.93	8.58	8.10	8.10	7.88	7.81	7.35	7.11	6.87	7.85		8.87	8.03	7.42



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

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

2016 Prefontaine Classic (Eugene, OR) (TV Analysis)

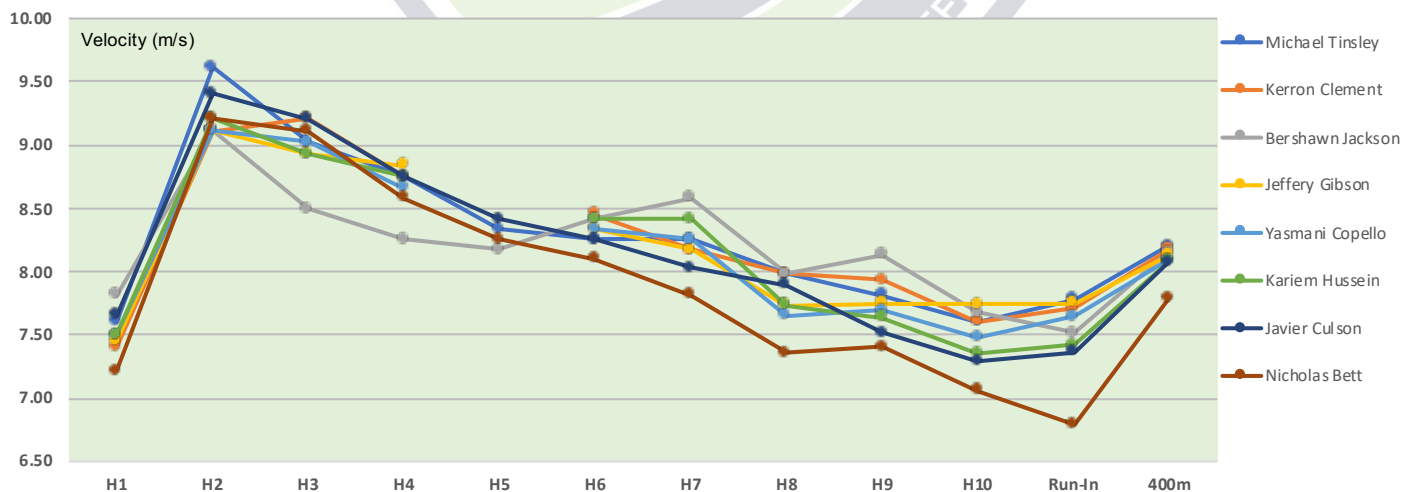
Men's 400m Hurdles

Date 2016.05.14

(H8 5m short)

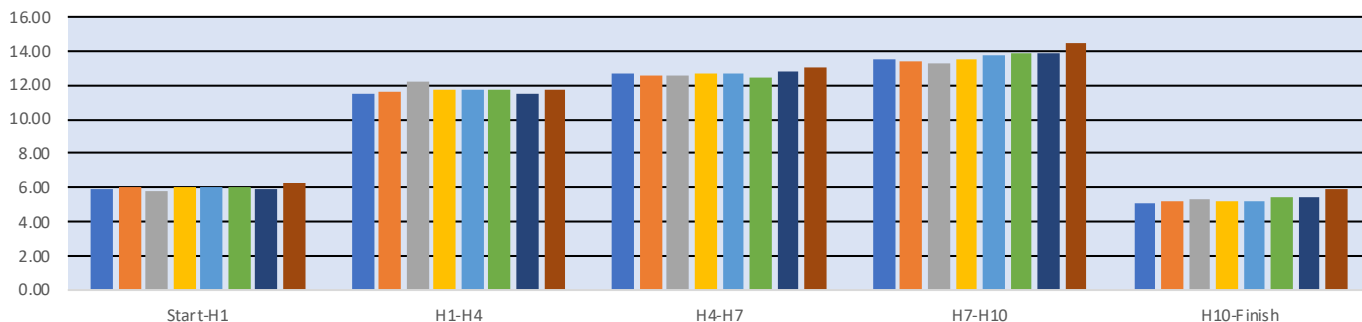
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Tinsley, Michael (USA) (1984)	time		5.92	9.56	13.44	17.44	21.64	25.88	30.12	33.88	39.00	43.60		48.74	3 / 1			
	reaction time																	
	interval			3.64	3.88	4.00	4.20	4.24	4.24	3.76	5.12	4.60	5.14			11.52	12.68	13.48
	velocity		7.60	9.62	9.02	8.75	8.33	8.25	7.98	7.81	7.61	7.61	7.78	8.21		9.11	8.28	7.79
Clement, Kerron (USA) (1985)	H1 lead leg	L	21	13	13	13	14	14			17	15	18	138				
	time		6.08	9.92	13.72	17.72		26.00	30.28	34.04	39.08	43.68		48.87	7 / 2			
	reaction time																	
	interval			3.84	3.80	4.00		8.28	4.28	3.76	5.04	4.60	5.19			11.64	12.56	13.40
Jackson, Bershawn (USA) (1983)	velocity		7.40	9.11	9.21	8.75		8.45	8.18	7.98	7.94	7.61	7.71	8.18		9.02	8.36	7.84
	H1 lead leg	R	20	13	13	13			13	13		15	17	117				
	time		5.76	9.60	13.72	17.96	22.24	26.40	30.48	34.24	39.16	43.72		49.04	4 / 3			
	reaction time																	
Gibson, Jeffery (BAH) (1990)	interval			3.84	4.12	4.24	4.28	4.16	4.08	3.76	4.92	4.56	5.32			12.20	12.52	13.24
	velocity		7.81	9.11	8.50	8.25	8.18	8.41	8.58	7.98	8.13	7.68	7.52	8.16		8.61	8.39	7.93
	H1 lead leg	L	22	15	15	15	15	15			17	15	19	148				
	time		6.04	9.88	13.80	17.76		26.16	30.44	34.32	39.48	44.00		49.16	6 / 4			
Copello, Yasmani (TUR) (1987)	reaction time																	
	interval			3.84	3.92	3.96		8.40	4.28	3.88	5.16	4.52	5.16			11.72	12.68	13.56
	velocity		7.45	9.11	8.93	8.84		8.33	8.18	7.73	7.75	7.74	7.75	8.14		8.96	8.28	7.74
	H1 lead leg	R	20	13	13	13			13	11	16	14	17	130				
Hussein, Kariem (SUI) (1989)	time		6.00	9.84	13.72	17.76		26.16	30.40	34.32	39.52	44.20		49.43	1 / 5			
	reaction time																	
	interval			3.84	3.88	4.04		8.40	4.24	3.92	5.20	4.68	5.23			11.76	12.64	13.80
	velocity		7.50	9.11	9.02	8.66		8.33	8.25	7.65	7.69	7.48	7.65	8.09		8.93	8.31	7.61
Culson, Javier (PUR) (1984)	H1 lead leg	R	20	13	13	13			13	12	16	14	17.5	131.5				
	time		6.00	9.80	13.72	17.72		26.04	30.20	34.08	39.32	44.08		49.47	8 / 6			
	reaction time																	
	interval			3.80	3.92	4.00		8.32	4.16	3.88	5.24	4.76	5.39			11.72	12.48	13.88
Bett, Nicholas (KEN) (1990)	velocity		7.50	9.21	8.93	8.75		8.41	8.41	7.73	7.63	7.35	7.42	8.09		8.96	8.41	7.56
	H1 lead leg	L	20	13	13	13			13	13		15	17.7	117.7				
	time		5.88	9.60	13.40	17.40	21.56	25.80	30.16	33.96	39.28	44.08		49.51	2 / 7			
	reaction time																	
Bett, Nicholas (KEN) (1990)	interval			3.72	3.80	4.00	4.16	4.24	4.36	3.80	5.32	4.80	5.43			11.52	12.76	13.92
	velocity		7.65	9.41	9.21	8.75	8.41	8.25	8.03	7.89	7.52	7.29	7.37	8.08		9.11	8.23	7.54
	H1 lead leg	L	20	13	13	13	13	13		11	16	14	17	143				
	time		6.24	10.04	13.88	17.96	22.20	26.52	31.00	35.08	40.48	45.44		51.33	5 / 8			
	reaction time																	
	interval			3.80	3.84	4.08	4.24	4.32	4.48	4.08	5.40	4.96	5.89			11.72	13.04	14.44
	velocity		7.21	9.21	9.11	8.58	8.25	8.10	7.81	7.35	7.41	7.06	6.79	7.79		8.96	8.05	7.27
	H1 lead leg	R	21	13	13	13	13	13		13	17	15		131				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=TLc0UUIXw1Q>

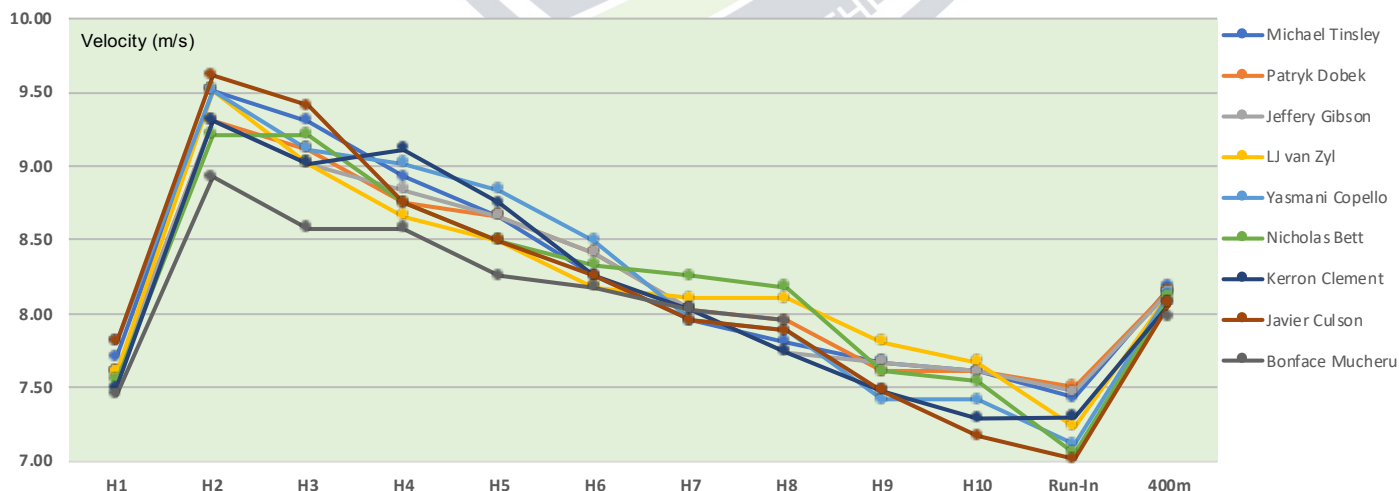
2016 Shanghai Golden Grand Prix (Shanghai, CHN) (TV Analysis)

Men's 400m Hurdles

Date 2016.05.14

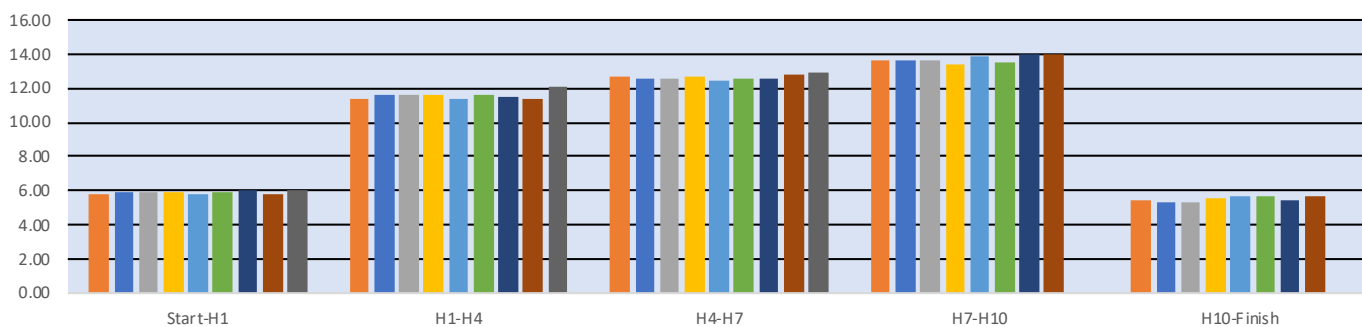
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Tinsley, Michael (USA) (1994)	time		5.84	9.52	13.28	17.20	21.24	25.48	29.88	34.36	38.92	43.52		48.90	6 / 1			
	reaction time	0.198																
	interval		3.68	3.76	3.92	4.04	4.24	4.40	4.48	4.56	4.60	5.38				11.36	12.68	13.64
	velocity		7.71	9.51	9.31	8.93	8.66	8.25	7.95	7.81	7.68	7.61	7.43	8.18		9.24	8.28	7.70
Dobek, Patryk (POL) (1994)	time		5.92	9.68	13.52	17.52	21.56	25.72	30.08	34.48	39.08	43.68		49.01	1 / 2			
	reaction time	0.178																
	interval		3.76	3.84	4.00	4.04	4.16	4.36	4.40	4.60	4.60	5.33				11.60	12.56	13.60
	velocity		7.60	9.31	9.11	8.75	8.66	8.41	8.03	7.95	7.61	7.50	8.16			9.05	8.36	7.72
Gibson, Jeffery (BAH) (1990)	time		5.92	9.68	13.56	17.52	21.56	25.72	30.08	34.60	39.16	43.76		49.11	4 / 3			
	reaction time	0.213																
	interval		3.76	3.88	3.96	4.04	4.16	4.36	4.52	4.56	4.60	5.35				11.60	12.56	13.68
	velocity		7.60	9.31	9.02	8.84	8.66	8.41	8.03	7.74	7.68	7.61	7.48	8.14		9.05	8.36	7.68
van Zyl, LJ (RSA) (1985)	time		5.92	9.60	13.48	17.52	21.64	25.92	30.24	34.56	39.04	43.60		49.13	8 / 4			
	reaction time	0.168																
	interval		3.68	3.88	4.04	4.12	4.28	4.32	4.42	4.48	4.56	5.53				11.60	12.72	13.36
	velocity		7.60	9.51	9.02	8.66	8.50	8.18	8.10	8.10	7.81	7.68	7.23	8.14		9.05	8.25	7.86
Copello, Yasmani (TUR) (1987)	time		5.76	9.44	13.28	17.16	21.12	25.24	29.64	34.08	38.80	43.52		49.14	2 / 5			
	reaction time	0.162																
	interval		3.68	3.84	3.88	3.96	4.12	4.20	4.24	4.44	4.72	4.72	5.62			11.40	12.48	13.88
	velocity		7.81	9.51	9.11	9.02	8.84	8.50	7.95	7.88	7.42	7.42	7.12	8.14		9.21	8.41	7.56
Bett, Nicholas (KEN) (1990)	time		5.96	9.76	13.56	17.56	21.68	25.88	30.12	34.40	39.00	43.64		49.31	5 / 6			
	reaction time	0.150																
	interval		3.80	3.80	4.00	4.12	4.20	4.24	4.28	4.60	4.64	5.67				11.60	12.56	13.52
	velocity		7.55	9.21	9.21	8.75	8.50	8.33	8.25	8.18	7.61	7.54	7.05	8.11		9.05	8.36	7.77
Clement, Kerron (USA) (1985)	time		6.00	9.76	13.64	17.48	21.48	25.72	30.08	34.60	39.28	44.08		49.56	3 / 7			
	reaction time	0.180																
	interval		3.76	3.88	3.84	4.00	4.24	4.36	4.52	4.68	4.80	5.48				11.48	12.60	14.00
	velocity		7.50	9.31	9.02	9.11	8.75	8.25	8.03	7.74	7.48	7.29	7.30	8.07		9.15	8.33	7.50
Culson, Javier (PUR) (1984)	time		5.76	9.40	13.12	17.12	21.24	25.48	29.88	34.32	39.00	43.88		49.58	7 / 8			
	reaction time	0.211																
	interval		3.64	3.72	4.00	4.12	4.24	4.40	4.44	4.68	4.88	5.70				11.36	12.76	14.00
	velocity		7.81	9.62	9.41	8.75	8.50	8.25	7.95	7.88	7.48	7.17	7.02	8.07		9.24	8.23	7.50
Mucheru, Bonface (KEN) (1992)	time		6.04	9.96	14.04	18.12	22.36	26.64	31.00	35.40				50.16	9 / 9			
	reaction time	0.123																
	interval		3.92	4.08	4.08	4.24	4.28	4.36	4.40							12.08	12.88	
	velocity		7.45	8.93	8.58	8.58	8.25	8.18	8.03	7.95						8.69	8.15	
	H1 lead leg	R																
	strides		21	13	13	13	13	14	14	15	15	15	18.2					
			22	14	14	14	14	14	15	15	15	15	19	171				
			20	13	13	13	13	13	13	14	14	14	17.5	159.5				
			20	13	13	13	13	13	13	14	14	14	17.5	157.5				
			22	14	14	14	14	14	15	15	15	15	19	171				
			20	13	13	13	13	13	14	14	15	15	18	161				
			21	13	13	13	13	13	13	13	15	13	17.2	157.2				
			20	13	13	13	13	13	13	13	13	13	16.5	153.5				
			20	13	13	13	13	13	13	13	14	14	17.2	156.2				
			22	15	15	15	15	15	15	15				127				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1276 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=eza0hJu6yUI>

Women's 400m Hurdles

2016 Top 10 Times - Women's 400m Hurdles

Muhammad, Dalilah (USA) (1990)																		
FINAL - 2016 USA Olympic Trials (Eugene, OR) (TV Analysis)																		
date	10-Jul	time	6.17	10.18	14.35	18.68	23.15	27.56	32.13	36.80	41.74	46.88	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
reaction time		interval		4.01	4.17	4.33	4.47	4.41	4.57	4.67	4.94	5.14	6.00	52.88	6 / 1	12.51	13.45	14.75
		velocity	7.29	8.73	8.39	8.08	7.83	7.94	7.66	7.49	7.09	6.81	6.67	7.56		8.39	7.81	7.12
H1 lead leg	R	strides	23	15	15	15	15	15	15	15	16	16	20	180				
Muhammad, Dalilah (USA) (1990)																		
FINAL - 2016 Olympic Games (Rio de Janeiro, BRA)																		
date	18-Aug	time	6.00	10.00	14.16	18.44	22.84	27.24	31.88	36.68	41.80	47.08	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
reaction time	0.143	interval		4.00	4.16	4.28	4.40	4.40	4.64	4.80	5.12	5.28	6.05	53.13	3 / 1	12.44	13.44	15.20
		velocity	7.50	8.75	8.41	8.18	7.95	7.95	7.54	7.29	6.84	6.63	6.61	7.53		8.44	7.81	6.91
H1 lead leg	R	strides	23	15	15	15	15	15	15	15	16	16	20	180				
Little, Shamier (USA) (1995)																		
FINAL - 2016 NCAA Championships (Eugene, OR)																		
date	11-Jun	time											53.51		/ 1			
reaction time		interval	No Information Available										PB					
H1 lead leg		strides																
Petersen, Sara Slott (DEN) (1987)																		
FINAL - 2016 Olympic Games (Rio de Janeiro, BRA)																		
date	18-Aug	time	6.32	10.44	14.72	19.00	23.36	27.84	32.48	37.40	42.36	47.64	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
reaction time	0.161	interval		4.12	4.28	4.28	4.36	4.48	4.64	4.92	4.96	5.28	6.91	NR PB	4 / 2	12.68	13.48	15.16
		velocity	7.12	8.50	8.18	8.18	8.03	7.81	7.54	7.11	7.06	6.63	5.79	7.33		8.28	7.79	6.93
H1 lead leg	R	strides	22	15	15	15	15	15	15	16	16	17	20	181				
Spencer, Ashley (USA) (1993)																		
FINAL - 2016 Olympic Games (Rio de Janeiro, BRA)																		
date	18-Aug	time	6.52	10.84	15.24	19.60	24.12	28.72	33.40	38.16	42.96	47.92	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
reaction time	0.172	interval		4.32	4.40	4.36	4.52	4.60	4.68	4.76	4.80	4.96	5.80	PB	5 / 3	13.08	13.80	14.52
		velocity	6.90	8.10	7.95	8.03	7.74	7.61	7.48	7.35	7.29	7.06	6.90	7.45		8.03	7.61	7.23
H1 lead leg	L	strides	22	15	15	14	15	15	15	15	15	15	18.5	174.5				
Muhammad, Dalilah (USA) (1990)																		
FINAL - 2016 Athletissima (Laussane, SUI) (TV Analysis)																		
date	25-Aug	time	6.12	10.20	14.56	18.96	23.48	28.04	32.68	37.52	42.52	47.76	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
reaction time	0.118	interval		4.08	4.36	4.40	4.52	4.56	4.64	4.84	5.00	5.24	6.02	53.78	5 / 1	12.84	13.72	15.08
		velocity	7.35	8.58	8.03	7.95	7.74	7.68	7.54	7.23	7.00	6.68	6.64	7.44		8.18	7.65	6.96
H1 lead leg	R	strides	23	15	15	15	15	15	15	16	16	16	19.7	180.7				
Muhammad, Dalilah (USA) (1990)																		
Semi-Final 3 - 2016 Olympic Games (Rio de Janeiro, BRA)																		
date	16-Aug	time											53.89		3 / 1			
reaction time	0.158	interval	No Information Available															
H1 lead leg		strides																
Muhammad, Dalilah (USA) (1990)																		
FINAL - 2016 Müller Anniversary Games (London, GBR)																		
date	22-Jul	time	6.10	10.23	14.53	18.90	23.53	28.00	32.70	37.50	42.53	47.83	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
reaction time	0.138	interval		4.13	4.30	4.37	4.63	4.47	4.70	4.80	5.03	5.30	6.07	53.90	6 / 1	12.80	13.80	15.13
		velocity	7.38	8.47	8.14	8.01	7.56	7.83	7.45	7.29	6.96	6.60	6.59	7.42		8.20	7.61	6.94
H1 lead leg	R	strides	23	15	15	15	15	15	15	15	16	16	19.5	179.5				
Hejnová, Zuzana (CZE) (1986)																		
FINAL - 2016 Olympic Games (Rio de Janeiro, BRA)																		
date	18-Aug	time	6.48	10.64	14.88	19.20	23.56	28.12	32.76	37.60	42.60	47.76	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
reaction time	0.157	interval		4.16	4.24	4.32	4.36	4.56	4.64	4.84	5.00	5.16	6.16	53.92	6 / 4	12.72	13.56	15.00
		velocity	6.94	8.41	8.25	8.10	8.03	7.68	7.54	7.23	7.00	6.78	6.49	7.42		8.25	7.74	7.00
H1 lead leg	R	strides	22	15	15	15	15	15	15	16	16	16	20	180				
Russell, Janeive (JAM) (1993)																		
FINAL - 2016 Golden Gala Pietro Mennea (Rome, ITA)																		
date	2-Jun	time	6.52	10.68	14.92	19.28	23.72	28.16	32.72	37.48	42.56	47.80	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
reaction time	0.180	interval		4.16	4.24	4.36	4.44	4.44	4.56	4.76	5.08	5.24	6.16	PB	7 / 1	12.76	13.44	15.08
		velocity	6.90	8.41	8.25	8.03	7.88	7.88	7.68	7.35	6.89	6.68	6.49	7.41		8.23	7.81	6.96
H1 lead leg	R	strides	22	14	14	15	15		15	15		16	19.5	145.5				

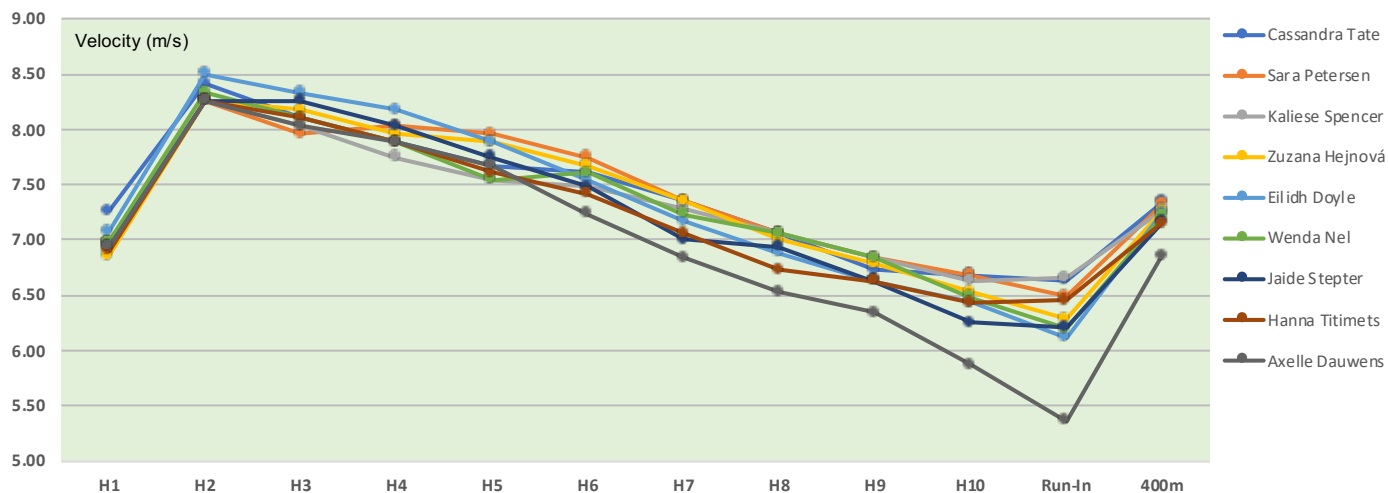
2016 Memorial van Damme (Brussels, BEL) (TV Analysis)

Women's 400m Hurdles

Date 2016.09.09

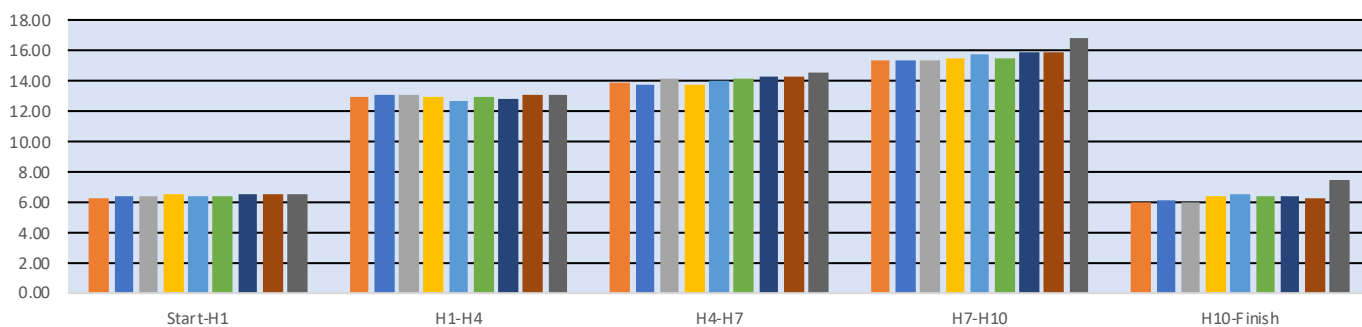
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Tate, Cassandra (USA) (1990)	time		6.20	10.36	14.68	19.12	23.68	28.28	33.04	38.00	43.20	48.44		54.47	7 / 1			
	reaction time	0.228														12.92	13.92	15.40
	interval		7.26	4.16	4.32	4.44	4.56	4.60	4.76	4.96	5.20	5.24	6.03			8.13	7.54	6.82
	velocity																	
Petersen, Sara Slott (DEN) (1987)	time		6.44	10.68	15.08	19.44	23.84	28.36	33.12	38.08	43.20	48.44		54.60	5 / 2			
	reaction time	0.162														13.00	13.68	15.32
	interval		6.99	4.24	4.40	4.36	4.40	4.52	4.76	4.96	5.12	5.24	6.16			8.08	7.68	6.85
	velocity																	
Spencer, Kaliese (JAM) (1987)	time		6.44	10.68	15.04	19.56	24.20	28.88	33.68	38.64	43.76	49.04		55.05	6 / 3			
	reaction time	0.182														13.12	14.12	15.36
	interval		6.99	4.24	4.36	4.52	4.64	4.68	4.80	4.96	5.12	5.28	6.01			8.00	7.44	6.84
	velocity																	
Hejnová, Zuzana (CZE) (1986)	time		6.56	10.80	15.08	19.48	23.92	28.48	33.24	38.24	43.40	48.76		55.12	3 / 4			
	reaction time	0.159														12.92	13.76	15.52
	interval		6.86	4.24	4.28	4.40	4.44	4.56	4.76	5.00	5.16	5.36	6.36			8.13	7.63	6.77
	velocity																	
Doyle, Eilidh (GBR) (1987)	time		6.36	10.48	14.68	18.96	23.40	28.04	32.92	38.00	43.28	48.72		55.26	4 / 5			
	reaction time	0.204														12.60	13.96	15.80
	interval		7.08	4.12	4.20	4.28	4.44	4.64	4.88	5.08	5.28	5.44	6.54			8.33	7.52	6.65
	velocity																	
Nel, Wenda (RSA) (1988)	time		6.44	10.64	14.96	19.40	24.04	28.64	33.48	38.44	43.56	48.96		55.41	2 / 6			
	reaction time	0.186														12.96	14.08	15.48
	interval		6.99	4.20	4.32	4.44	4.64	4.60	4.84	4.96	5.12	5.40	6.45			8.10	7.46	6.78
	velocity																	
Stepter, Jaide (USA) (1994)	time		6.48	10.72	14.96	19.32	23.84	28.52	33.52	38.56	43.84	49.44		55.88	9 / 7			
	reaction time	0.235														12.84	14.20	15.92
	interval		6.94	4.24	4.24	4.36	4.52	4.68	5.00	5.04	5.28	5.60	6.44			8.18	7.39	6.60
	velocity																	
Titimets, Hanna (UKR) (1989)	time		6.52	10.76	15.08	19.52	24.12	28.84	33.80	39.00	44.28	49.72		55.92	1 / 8			
	reaction time	0.205														13.00	14.28	15.92
	interval		6.90	4.24	4.32	4.44	4.60	4.72	4.96	5.20	5.28	5.44	6.20			8.08	7.35	6.60
	velocity																	
Dauwens, Axelle (BEL) (1990)	time		6.48	10.72	15.08	19.52	24.08	28.92	34.04	39.40	44.92	50.88		58.34	8 / 9			
	reaction time	0.172														13.04	14.52	16.84
	interval		6.94	4.24	4.36	4.44	4.56	4.84	5.12	5.36	5.52	5.96	7.46			8.05	7.23	6.24
	velocity																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=B3DGeV21PMA>

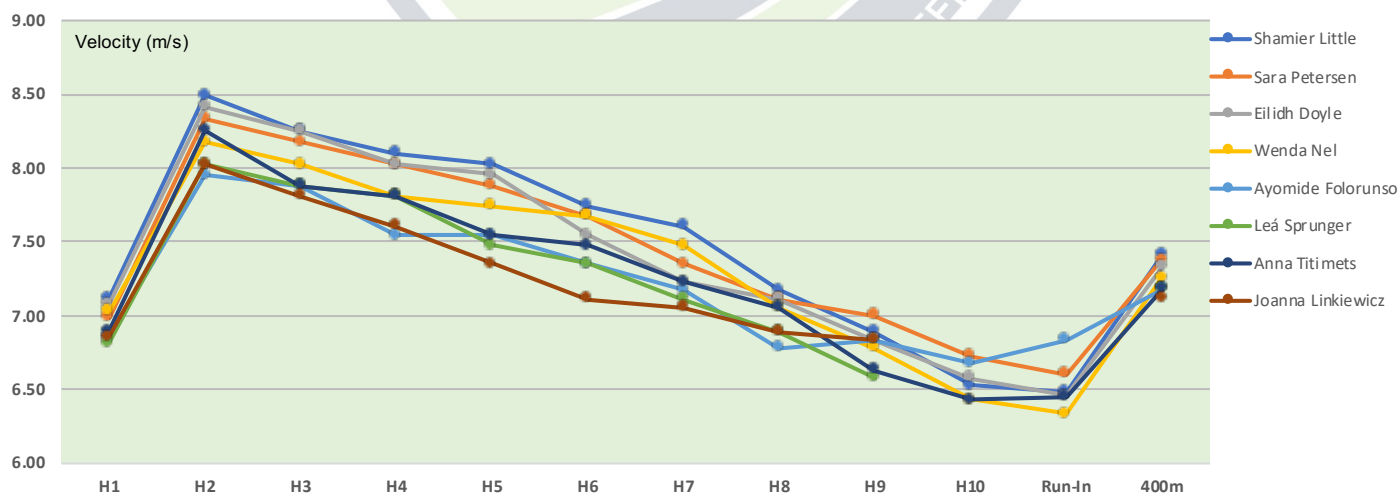
2016 Weltklasse (Zürich, SUI) (TV Analysis)

Women's 400m Hurdles

Date 2016.09.01

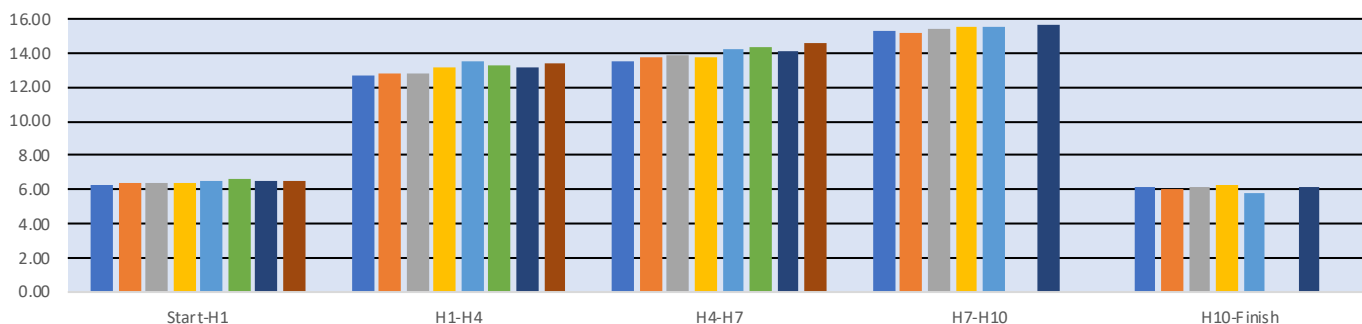
FINAL

			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		6.32	10.44	14.68	19.00	23.36	27.88	32.48	37.36	42.44	47.80		53.97	3 / 1			
	reaction time	0.215																
	interval		7.12	4.12	4.24	4.32	4.36	4.52	4.60	4.88	5.08	5.36	6.17			12.68	13.48	15.32
	velocity		8.50	8.25	8.10	8.03	8.03	7.74	7.61	7.17	6.89	6.53	6.48	7.41		8.28	7.79	6.85
Petersen, Sara Slott (DEN) (1987)	time		6.44	10.64	14.92	19.28	23.72	28.28	33.04	37.96	42.96	48.16		54.22	6 / 2			
	reaction time	0.160																
	interval		6.99	4.20	4.28	4.36	4.44	4.56	4.76	4.92	5.00	5.20	6.06			12.84	13.76	15.12
	velocity		8.33	8.18	8.03	7.88	7.68	7.35	7.11	7.00	6.73	6.60	7.38			8.18	7.63	6.94
Doyle, Eilidh (GBR) (1987)	time		6.36	10.52	14.76	19.12	23.52	28.16	33.00	37.92	43.04	48.36		54.55	4 / 3			
	reaction time	0.184																
	interval		7.08	4.16	4.24	4.36	4.40	4.64	4.84	4.92	5.12	5.32	6.19			12.76	13.88	15.36
	velocity		8.41	8.25	8.03	7.95	7.54	7.23	7.11	6.84	6.58	6.46	7.33			8.23	7.56	6.84
Nel, Wenda (RSA) (1988)	time		6.40	10.68	15.04	19.52	24.04	28.60	33.28	38.24	43.40	48.84		55.15	5 / 4			
	reaction time	0.193																
	interval		7.03	4.28	4.36	4.48	4.52	4.56	4.68	4.96	5.16	5.44	6.31			13.12	13.76	15.56
	velocity		8.18	8.03	7.81	7.74	7.68	7.48	7.06	6.78	6.43	6.34	7.25			8.00	7.63	6.75
Folorunso, Ayomide (ITA) (1996)	time		6.56	10.96	15.40	20.04	24.68	29.44	34.32	39.48	44.60	49.84		55.69	1 / 5			
	reaction time	0.203																
	interval		4.40	4.44	4.64	4.64	4.76	4.88	5.16	5.12	5.24	5.85				13.48	14.28	15.52
	velocity		6.86	7.95	7.88	7.54	7.54	7.35	7.17	6.78	6.84	6.68	6.84	7.18		7.79	7.35	6.77
Sprunger, Leá (SUI) (1990)	time		6.60	10.96	15.40	19.88	24.56	29.32	34.24	39.32	44.64			55.71	7 / 6			
	reaction time	0.127																
	interval		4.36	4.44	4.48	4.68	4.76	4.92	5.08	5.32						13.28	14.36	
	velocity		6.82	8.03	7.88	7.81	7.48	7.35	7.11	6.89	6.58			7.18		7.91	7.31	
Titimets, Anna (UKR) (1989)	time		6.52	10.76	15.20	19.68	24.32	29.00	33.84	38.80	44.08	49.52		55.72	2 / 7			
	reaction time	0.180																
	interval		6.90	4.24	4.44	4.48	4.64	4.68	4.84	4.96	5.28	5.44	6.20			13.16	14.16	15.68
	velocity		8.25	7.88	7.81	7.54	7.48	7.23	7.06	6.63	6.43	6.45	7.18			7.98	7.42	6.70
Linkiewicz, Joanna (POL) (1990)	time		6.56	10.92	15.40	20.00	24.76	29.68	34.64	39.72	44.84			56.24	8 / 8			
	reaction time	0.183																
	interval		6.86	4.36	4.48	4.60	4.76	4.92	4.96	5.08	5.12					13.44	14.64	
	velocity		8.03	7.81	7.61	7.35	7.11	7.06	6.89	6.84			7.11			7.81	7.17	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

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

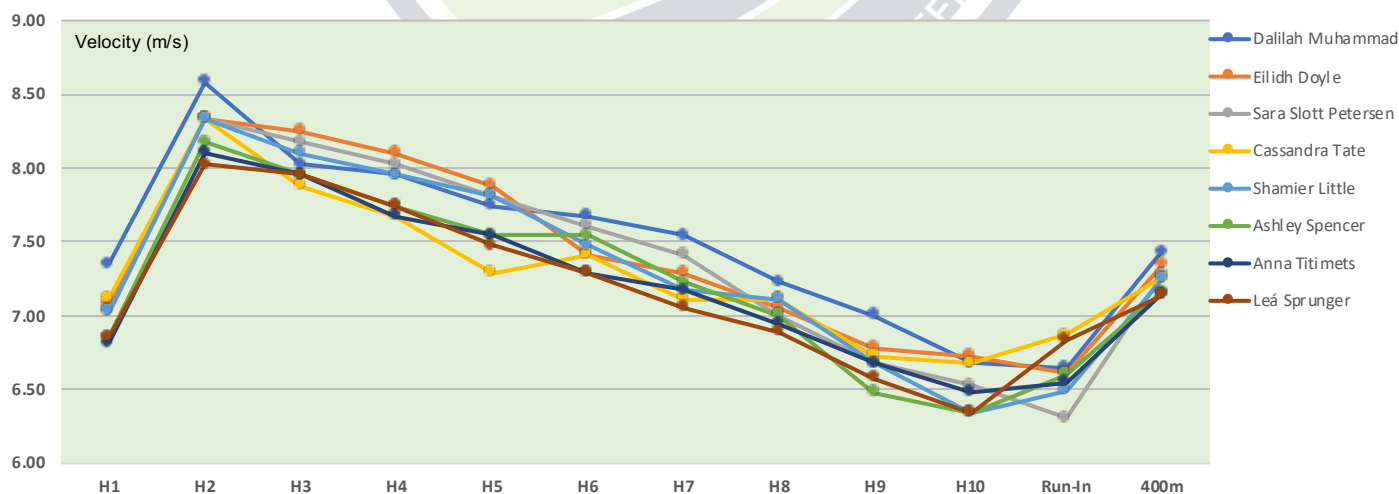
2016 Athletissime (Laussane, SUI) (TV Analysis)

Women's 400m Hurdles

Date 2016.08.25

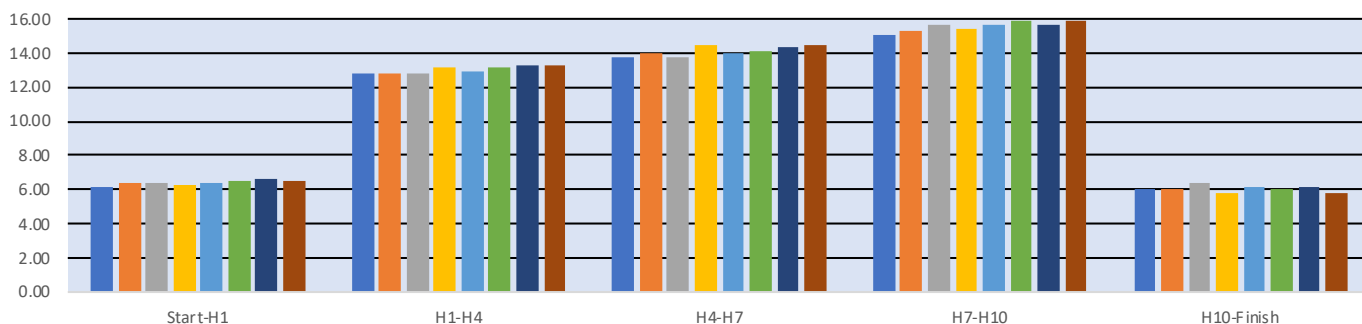
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Muhammad, Dalilah (USA) (1990)	time		6.12	10.20	14.56	18.96	23.48	28.04	32.68	37.52	42.52	47.76		53.78	5 / 1			
	reaction time	0.118														12.84	13.72	15.08
	interval velocity		7.35	8.58	8.03	7.95	7.74	7.68	7.54	7.23	7.00	6.68	6.64	7.44		8.18	7.65	6.96
Doyle, Eilidh (GBR) (1987)	time		6.36	10.56	14.80	19.12	23.56	28.28	33.08	38.04	43.20	48.40		54.45	3 / 2			
	reaction time	0.157														12.76	13.96	15.32
	interval velocity		7.08	8.33	8.25	8.10	7.88	7.42	7.29	7.06	6.78	6.73	6.61	7.35		8.23	7.52	6.85
Petersen, Sara Slott (DEN) (1987)	time		6.40	10.60	14.88	19.24	23.72	28.32	33.04	38.04	43.28	48.64		54.98	6 / 3			
	reaction time	0.123														12.84	13.80	15.60
	interval velocity		7.03	8.33	8.18	8.03	7.81	7.61	7.42	7.00	6.68	6.53	6.31	7.28		8.18	7.61	6.73
Tate, Cassandra (USA) (1990)	time		6.32	10.52	14.96	19.52	24.32	29.04	33.96	38.88	44.08	49.32		55.14	8 / 4			
	reaction time	0.235														13.20	14.44	15.36
	interval velocity		7.12	8.33	7.88	7.68	7.29	7.42	7.11	7.11	6.73	6.68	6.87	7.25		7.95	7.27	6.84
Little, Shamier (USA) (1995)	time		6.40	10.60	14.92	19.32	23.80	28.48	33.36	38.28	43.52	49.04		55.20	4 / 5			
	reaction time	0.249														12.92	14.04	15.68
	interval velocity		7.03	8.33	8.10	7.95	7.81	7.48	7.17	7.11	6.68	6.34	6.49	7.25		8.13	7.48	6.70
Spencer, Ashley (USA) (1993)	time		6.56	10.84	15.24	19.76	24.40	29.04	33.88	38.88	44.28	49.80		55.86	2 / 6			
	reaction time	0.159														13.20	14.12	15.92
	interval velocity		6.86	8.18	7.95	7.74	7.54	7.54	7.23	7.00	6.48	6.34	6.60	7.16		7.95	7.44	6.60
Titimets, Anna (UKR) (1989)	time		6.60	10.92	15.32	19.88	24.52	29.32	34.20	39.24	44.48	49.88		55.99	1 / 7			
	reaction time	0.188														13.28	14.32	15.68
	interval velocity		6.82	8.10	7.95	7.68	7.54	7.29	7.17	6.94	6.68	6.48	6.55	7.14		7.91	7.33	6.70
Sprunger, Leá (SUI) (1990)	time		6.56	10.92	15.32	19.84	24.52	29.32	34.28	39.36	44.68	50.20		56.05	7 / 8			
	reaction time	0.136														13.28	14.44	15.92
	interval velocity		6.86	8.03	7.95	7.74	7.48	7.29	7.06	6.89	6.58	6.34	6.84	7.14		7.91	7.27	6.60



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

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

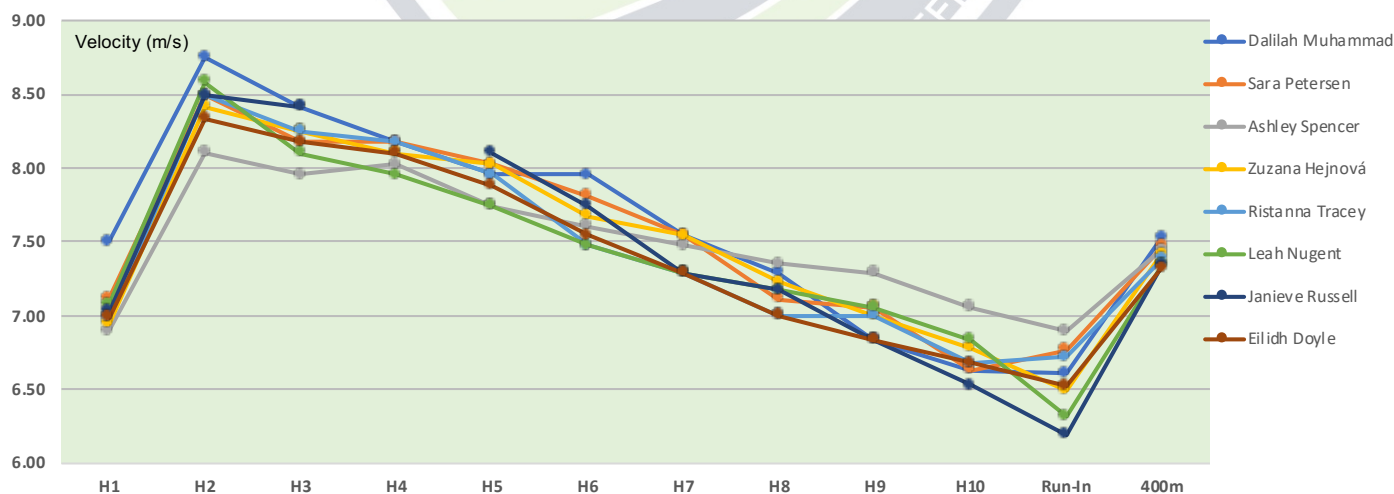
2016 Olympic Games (Rio de Janeiro, BRA) (TV Analysis)

Women's 400m Hurdles

Date 2016.08.16

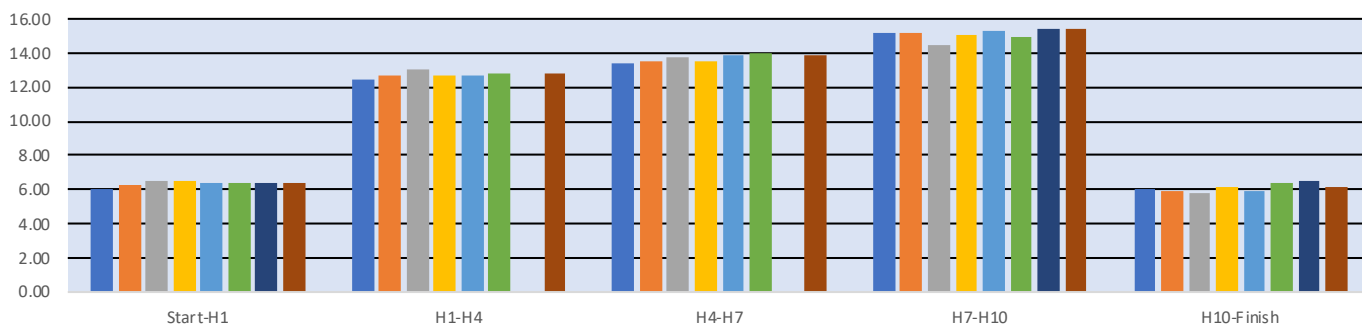
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Muhammad, Dalilah (USA) (1990)	time		6.00	10.00	14.16	18.44	22.84	27.24	31.88	36.68	41.80	47.08		53.13	3 / 1			
	reaction time	0.143														12.44	13.44	15.20
	interval		7.50	8.75	4.16	4.28	4.40	4.40	4.64	4.80	5.12	5.28	6.05			8.44	7.81	6.91
	velocity																	
Petersen, Sara Slott (DEN) (1987)	time		6.32	10.44	14.72	19.00	23.36	27.84	32.48	37.40	42.36	47.64		53.55	4 / 2			
	reaction time	0.161														12.68	13.48	15.16
	interval		7.12	8.50	4.28	4.28	4.36	4.48	4.64	4.92	4.96	5.28	5.91	NR PB		8.28	7.79	6.93
	velocity																	
Spencer, Ashley (USA) (1993)	time		6.52	10.84	15.24	19.60	24.12	28.72	33.40	38.16	42.96	47.92		53.72	5 / 3			
	reaction time	0.172														13.08	13.80	14.52
	interval		6.90	8.10	4.32	4.36	4.52	4.60	4.68	4.76	4.80	4.96	5.80	PB		8.03	7.61	7.23
	velocity																	
Hejnová, Zuzana (CZE) (1986)	time		6.48	10.64	14.88	19.20	23.56	28.12	32.76	37.60	42.60	47.76		53.92	6 / 4			
	reaction time	0.157														12.72	13.56	15.00
	interval		6.94	8.41	4.24	4.32	4.36	4.56	4.64	4.84	5.00	5.16	6.16			8.25	7.74	7.00
	velocity																	
Tracey, Ristanna (JAM) (1992)	time		6.44	10.56	14.80	19.08	23.48	28.16	32.96	37.96	42.96	48.20		54.15	7 / 5			
	reaction time	0.213														12.64	13.88	15.24
	interval		6.99	8.50	4.24	4.28	4.40	4.68	4.80	4.88	4.96	5.24	5.95	PB		8.31	7.56	6.89
	velocity																	
Nugent, Leah (JAM) (1992)	time		6.36	10.44	14.76	19.16	23.68	28.36	33.16	38.04	43.00	48.12		54.45	2 / 6			
	reaction time	0.226														12.80	14.00	14.96
	interval		7.08	8.58	4.32	4.40	4.52	4.68	4.80	4.88	4.96	5.12	6.33	PB		8.20	7.50	7.02
	velocity																	
Russell, Janieve (JAM) (1993)	time		6.40	10.52	14.68		23.32	27.84	32.64	37.52	42.64	48.00		54.46	8 / 7			
	reaction time	0.140														-6.40	32.64	15.36
	interval		7.03	8.50	4.16		8.64	4.52	4.80	4.88	5.12	5.36	6.46			-16.41	3.22	6.84
	velocity																	
Doyle, Eilidh (GBR) (1987)	time		6.44	10.64	14.92	19.24	23.68	28.32	33.12	38.12	43.24	48.48		54.61	1 / 8			
	reaction time	0.171														12.80	13.88	15.36
	interval		6.99	8.33	4.28	4.32	4.44	4.64	4.80	5.00	5.12	5.24	6.13			8.20	7.56	6.84
	velocity																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=INNNKZZ-hYM&t=27s>

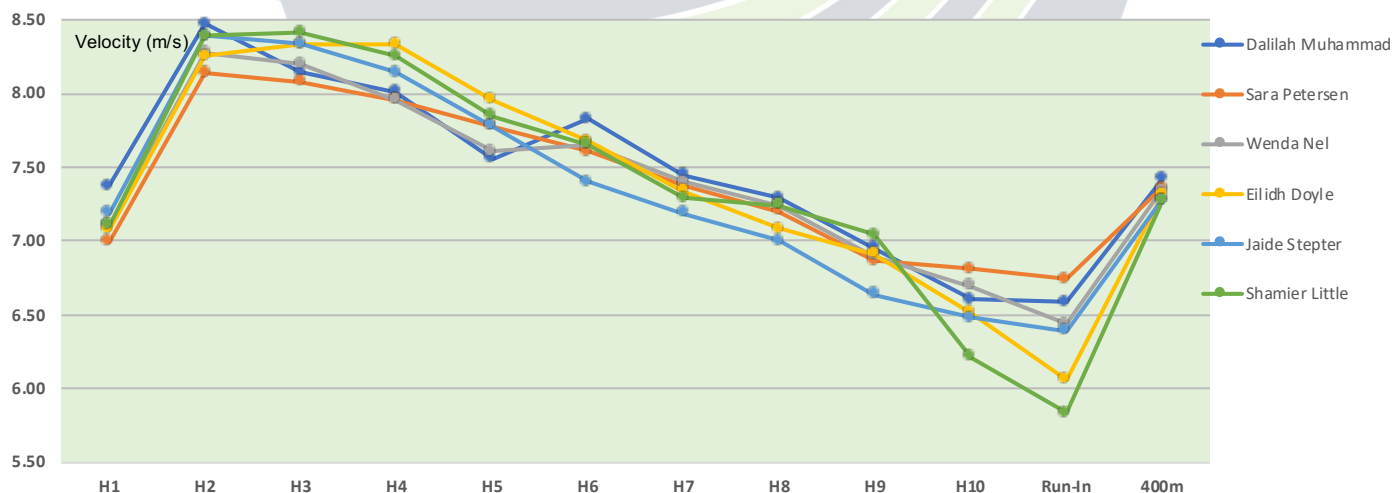
2016 London Anniversary Games (London, GBR) (TV Analysis)

Women's 400m Hurdles

Date 2016.07.22

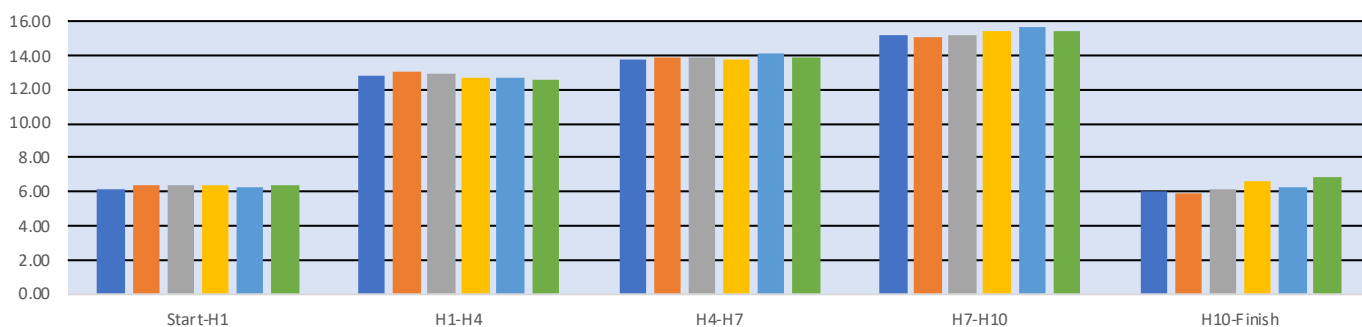
FINAL

				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Muhammad, Dalilah (USA) (1990)	time			6.10	10.23	14.53	18.90	23.53	28.00	32.70	37.50	42.53	47.83		53.90	6 / 1			
	reaction time	0.138	interval		4.13	4.30	4.37	4.63	4.47	4.70	4.80	5.03	5.30	6.07			12.80	13.80	15.13
	velocity			7.38	8.47	8.14	8.01	7.56	7.83	7.45	7.29	6.96	6.60	6.59	7.42		8.20	7.61	6.94
	H1 lead leg	R	strides	23	15	15	15	15	15	15	15	16	16	19.5	179.5				
Petersen, Sara Slott (DEN) (1987)	time			6.43	10.73	15.06	19.46	23.96	28.56	33.30	38.16	43.26	48.40		54.33	7 / 2			
	reaction time	0.157	interval		4.30	4.33	4.40	4.50	4.60	4.74	4.86	5.10	5.14	5.93			13.03	13.84	15.10
	velocity			7.00	8.14	8.08	7.95	7.78	7.61	7.38	7.20	6.86	6.81	6.75	7.36		8.06	7.59	6.95
	H1 lead leg	R	strides	22	15	15	15	15	15	15	16	16	16	20	180				
Nel, Wenda (RSA) (1988)	time			6.33	10.56	14.83	19.23	23.83	28.40	33.13	37.96	43.03	48.26		54.47	8 / 3			
	reaction time	0.182	interval		4.23	4.27	4.40	4.60	4.57	4.73	4.83	5.07	5.23	6.21			12.90	13.90	15.13
	velocity			7.11	8.27	8.20	7.95	7.61	7.66	7.40	7.25	6.90	6.69	6.44	7.34		8.14	7.55	6.94
	H1 lead leg	L	strides	23	15	15	15	16	16	17	17	17	17	21.5	189.5				
Doyle, Eilidh (GBR) (1987)	time			6.36	10.60	14.80	19.00	23.40	27.96	32.73	37.67	42.73	48.10		54.70	4 / 4			
	reaction time	0.162	interval		4.24	4.20	4.20	4.40	4.56	4.77	4.94	5.06	5.37	6.60			12.64	13.73	15.37
	velocity			7.08	8.25	8.33	8.33	7.95	7.68	7.34	7.09	6.92	6.52	6.06	7.31		8.31	7.65	6.83
	H1 lead leg	L	strides	23	15	15	15	15	16	16	17	17	18	22	189				
Stepter, Jaide (USA) (1994)	time			6.26	10.43	14.63	18.93	23.43	28.16	33.03	38.03	43.30	48.70		54.96	3 / 5			
	reaction time	0.146	interval		4.17	4.20	4.30	4.50	4.73	4.87	5.00	5.27	5.40	6.26			12.67	14.10	15.67
	velocity			7.19	8.39	8.33	8.14	7.78	7.40	7.19	7.00	6.64	6.48	6.39	7.28		8.29	7.45	6.70
	H1 lead leg	L	strides	22	15	15	15	15	16	16	17	17	17	19.7	184.7				
Little, Shamier (USA) (1995)	time			6.33	10.50	14.66	18.90	23.36	27.93	32.73	37.56	42.53	48.16		55.01	5 / 6			
	reaction time	0.263	interval		4.17	4.16	4.24	4.46	4.57	4.80	4.83	4.97	5.63	6.85			12.57	13.83	15.43
	velocity			7.11	8.39	8.41	8.25	7.85	7.66	7.29	7.25	7.04	6.22	5.84	7.27		8.35	7.59	6.80
	H1 lead leg	R	strides	23	16	16	16	16	16	16	17	17	17	20.5	190.5				



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=U1bd39ix550>

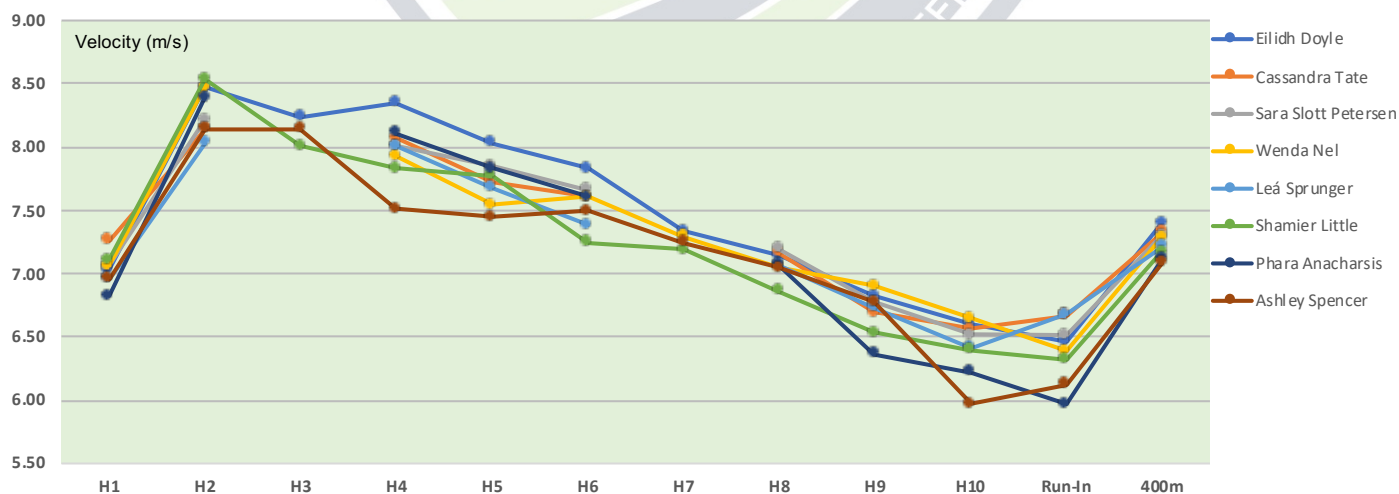
2016 Herculis Meeting International d'Athlétisme (Monaco, MON) (TV Analysis)

Women's 400m Hurdles

Date 2016.07.15

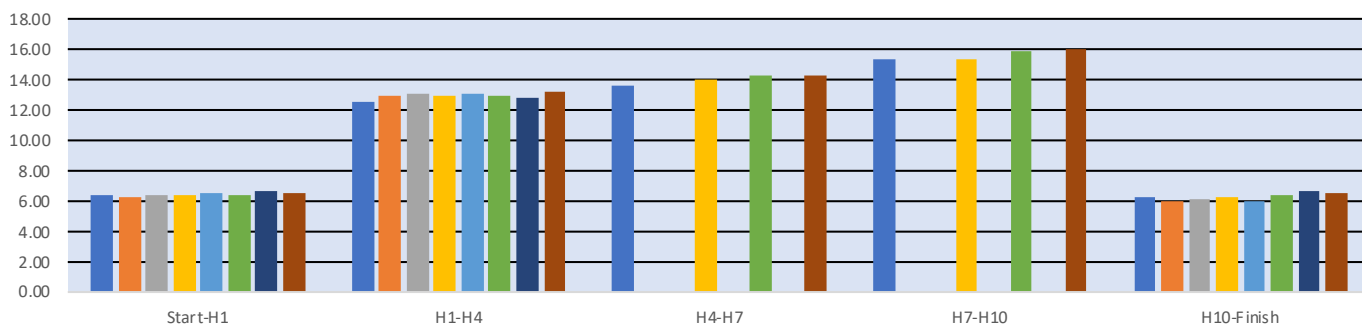
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Doyle, Eilidh (GBR) (1987)	time		6.40	10.53	14.78	18.97	23.33	27.80	32.57	37.47	42.60	47.90		54.09	3 / 1			
	reaction time	0.163																
	interval			4.13	4.25	4.19	4.36	4.47	4.77	4.90	5.13	5.30	6.19	PB		12.57	13.60	15.33
	velocity		7.03	8.14	8.24	8.35	8.03	7.83	7.34	7.14	6.82	6.60	6.46	7.40		8.35	7.72	6.85
Tate, Cassandra (USA) (1990)	time		6.20	10.50		19.17	23.70	28.30		38.07	43.30	48.63		54.63	7 / 2			
	reaction time	0.234																
	interval			4.30		8.67	4.53	4.60		9.77	5.23	5.33	6.00			12.97		
	velocity		7.26	8.14		8.07	7.73	7.61		7.16	6.69	6.57	6.67	7.32		8.10		
Petersen, Sara Slott (DEN) (1987)	time		6.37	10.63		19.37	23.83	28.40		38.13	43.30	48.67		54.81	6 / 3			
	reaction time	0.154																
	interval			4.26		8.74	4.46	4.57		9.73	5.17	5.37	6.14			13.00		
	velocity		7.06	8.22		8.01	7.85	7.66		7.19	6.77	6.52	6.51	7.30		8.08		
Nel, Wenda (RSA) (1988)	time		6.37	10.50		19.33	23.97	28.57	33.37	38.33	43.40	48.67		54.93	2 / 4			
	reaction time	0.206																
	interval			4.13		8.83	4.64	4.60	4.80	4.96	5.07	5.27	6.26			12.96	14.04	15.30
	velocity		7.06	8.47		7.93	7.54	7.61	7.29	7.06	6.90	6.64	6.39	7.28		8.10	7.48	6.86
Sprunger, Leá (SUI) (1990)	time		6.47	10.83		19.57	24.13	28.87		38.77	43.97	49.43		55.42	8 / 5			
	reaction time	0.133																
	interval			4.36		8.74	4.56	4.74		9.90	5.20	5.46	5.99			13.10		
	velocity		6.96	8.03		8.01	7.68	7.38		7.07	6.73	6.41	6.68	7.22		8.02		
Little, Shamier (USA) (1995)	time		6.33	10.43	14.80	19.27	23.77	28.60	33.47	38.57	43.93	49.40		55.73	5 / 6			
	reaction time	0.243																
	interval			4.10	4.37	4.47	4.50	4.83	4.87	5.10	5.36	5.47	6.33			12.94	14.20	15.93
	velocity		7.11	8.54	8.01	7.83	7.78	7.25	7.19	6.86	6.53	6.40	6.32	7.18		8.11	7.39	6.59
Anacharsis, Phara (FRA) (1983)	time		6.60	10.77		19.40	23.87	28.47		38.37	43.87	49.50		56.20	1 / 7			
	reaction time	0.183																
	interval			4.17		8.63	4.47	4.60		9.90	5.50	5.63	6.70			12.80		
	velocity		6.82	8.39		8.11	7.83	7.61		7.07	6.36	6.22	5.97	7.12		8.20		
Spencer, Ashley (USA) (1993)	time		6.47	10.77	15.07	19.73	24.43	29.10	33.93	38.90	44.07	49.93		56.46	4 / 8			
	reaction time	0.167																
	interval			4.30	4.30	4.66	4.70	4.67	4.83	4.97	5.17	5.86	6.53			13.26	14.20	16.00
	velocity		6.96	8.14	8.14	7.51	7.45	7.49	7.25	7.04	6.77	5.97	6.13	7.08		7.92	7.39	6.56
H1 lead leg	time																	
	interval																	
	velocity																	
	strides																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1276 x 720 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=DC7zIOY-C30>

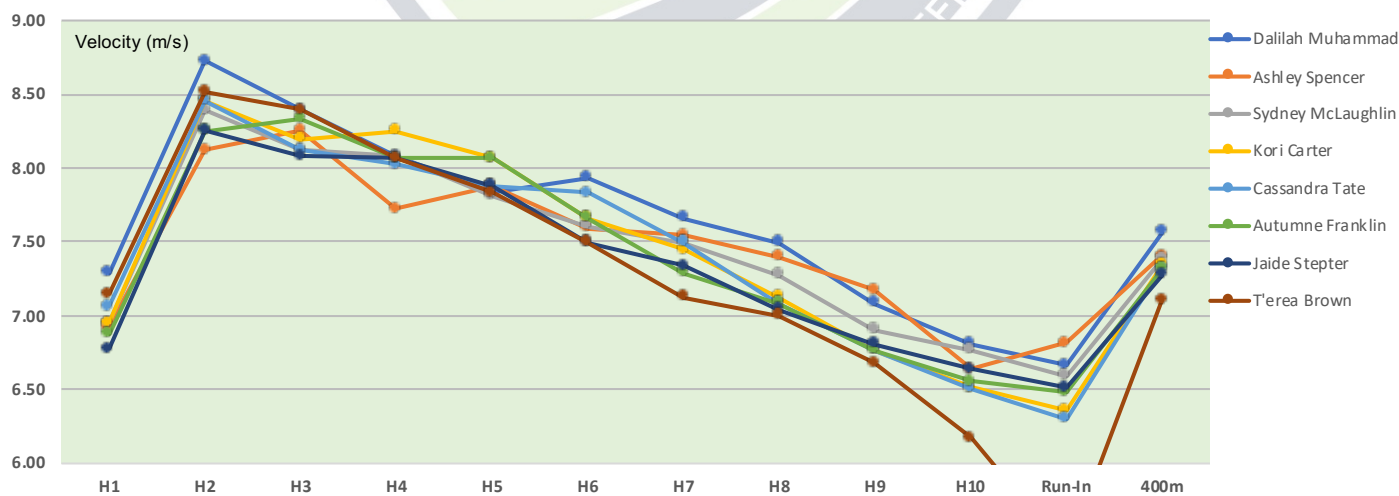
2016 USA Olympic Trials (Eugene, OR) (TV Analysis)

Women's 400m Hurdles

Date 2016.07.10

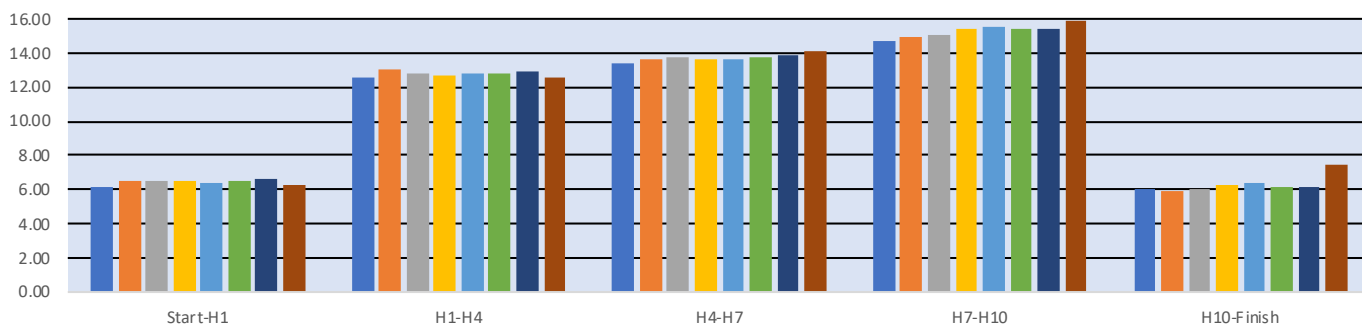
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Muhammad, Dalilah (USA) (1990)	time		6.17	10.18	14.35	18.68	23.15	27.56	32.13	36.80	41.74	46.88		52.88	6 / 1			
	reaction time																	
	interval			4.01	4.17	4.33	4.47	4.41	4.57	4.67	4.94	5.14	6.00	PB		12.51	13.45	14.75
	velocity		7.29	8.03	8.39	8.08	7.83	7.94	7.66	7.49	7.09	6.81	6.67	7.56		8.39	7.81	7.12
Spencer, Ashley (USA) (1993)	time		6.50	10.81	15.05	19.58	24.02	28.63	33.27	38.00	42.88	48.15		54.02	8 / 2			
	reaction time																	
	interval			4.31	4.24	4.53	4.44	4.61	4.64	4.73	4.88	5.27	5.87	PB		13.08	13.69	14.88
	velocity		6.92	8.12	8.25	7.73	7.88	7.59	7.54	7.40	7.17	6.64	6.81	7.40		8.03	7.67	7.06
McLaughlin, Sydney (USA) (1999)	time		6.47	10.64	14.95	19.28	23.76	28.36	33.03	37.84	42.91	48.08		54.15	5 / 3			
	reaction time																	
	interval			4.17	4.31	4.33	4.48	4.60	4.67	4.81	5.07	5.17	6.07	WJR WYB PB		12.81	13.75	15.05
	velocity		6.96	8.39	8.12	8.08	7.81	7.61	7.49	7.28	6.90	6.77	6.59	7.39		8.20	7.64	6.98
Carter, Kori (USA) (1992)	time		6.47	10.61	14.88	19.12	23.46	28.03	32.73	37.64	42.81	48.18		54.47	3 / 4			
	reaction time																	
	interval			4.14	4.27	4.24	4.34	4.57	4.70	4.91	5.17	5.37	6.29			12.65	13.61	15.45
	velocity		6.96	8.45	8.20	8.25	8.06	7.66	7.45	7.13	6.77	6.52	6.36	7.34		8.30	7.71	6.80
Tate, Cassandra (USA) (1990)	time		6.37	10.51	14.82	19.18	23.62	28.09	32.76	37.70	42.87	48.25		54.60	1 / 5			
	reaction time																	
	interval			4.14	4.31	4.36	4.44	4.47	4.67	4.94	5.17	5.38	6.35			12.81	13.58	15.49
	velocity		7.06	8.45	8.12	8.03	7.88	7.83	7.49	7.09	6.77	6.51	6.30	7.33		8.20	7.73	6.78
Franklin, Autumnne (USA) (1994)	time		6.54	10.78	14.98	19.32	23.66	28.23	33.03	37.97	43.14	48.48		54.65	4 / 6			
	reaction time																	
	interval			4.24	4.20	4.34	4.34	4.57	4.80	4.94	5.17	5.34	6.17	PB		12.78	13.71	15.45
	velocity		6.88	8.25	8.33	8.06	8.06	7.66	7.29	7.09	6.77	6.55	6.48	7.32		8.22	7.66	6.80
Stepter, Jaide (USA) (1994)	time		6.64	10.88	15.21	19.55	23.99	28.66	33.43	38.40	43.54	48.81		54.95	2 / 7			
	reaction time																	
	interval			4.24	4.33	4.34	4.44	4.67	4.77	4.97	5.14	5.27	6.14	PB		12.91	13.88	15.38
	velocity		6.78	8.25	8.08	8.06	7.88	7.49	7.34	7.04	6.81	6.64	6.51	7.28		8.13	7.56	6.83
Brown, T'erea (USA) (1989)	time		6.30	10.41	14.58	18.92	23.39	28.06	32.97	37.97	43.21	48.88		56.29	7 / 8			
	reaction time																	
	interval			4.11	4.17	4.34	4.47	4.67	4.91	5.00	5.24	5.67	7.41			12.62	14.05	15.91
	velocity		7.14	8.52	8.39	8.06	7.83	7.49	7.13	7.00	6.68	6.17	5.40	7.11		8.32	7.47	6.60



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=bZ97dYiq068>

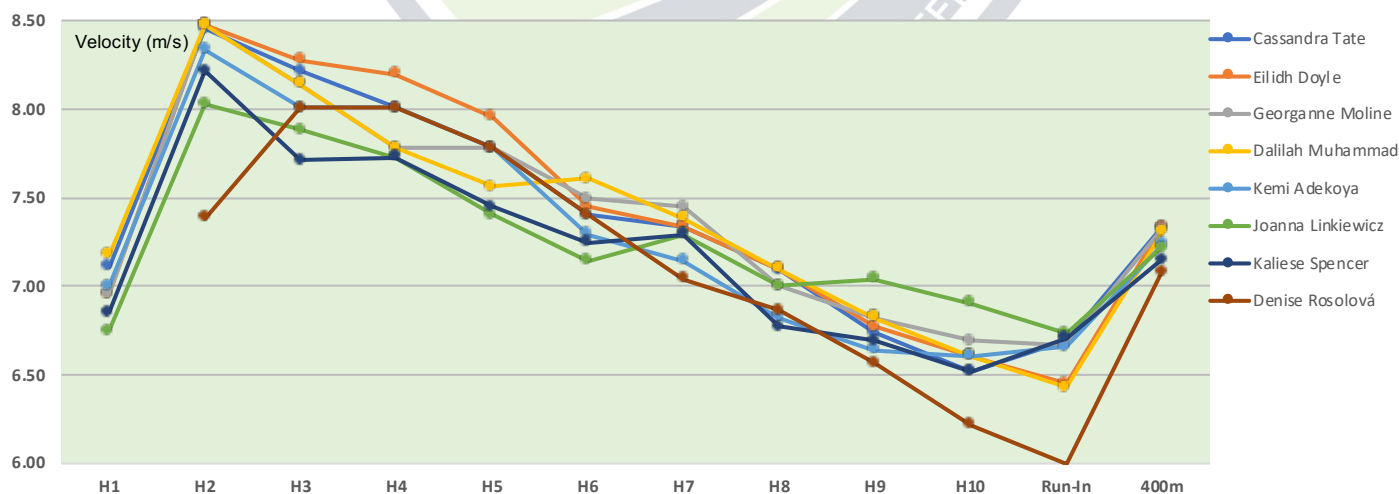
2016 Birmingham Diamond League (Birmingham, GBR) (TV Analysis)

Women's 400m Hurdles

Date 2016.06.05

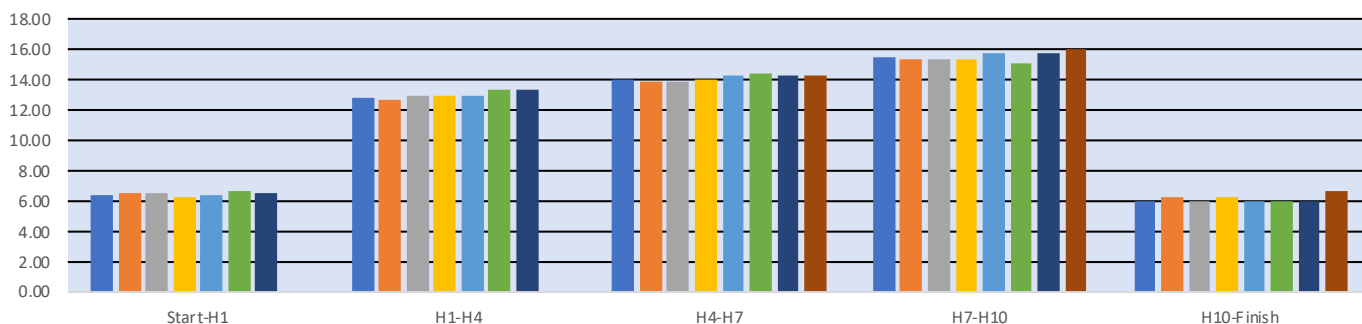
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Tate, Cassandra (USA) (1990)	time		6.33	10.47	14.73	19.10	23.60	28.33	33.10	38.03	43.23	48.60		54.57	4 / 1			
	reaction time	0.207																
	interval		7.11	4.14	4.26	4.37	4.50	4.73	4.77	4.93	5.20	5.37	5.97			12.77	14.00	15.50
	velocity		8.45	8.22	8.01	7.78	7.40	7.34	7.09	6.74	6.52	6.20	7.33			8.22	7.50	6.77
Doyle, Eilidh (GBR) (1987)	time		6.47	10.60	14.83	19.10	23.50	28.20	32.97	37.90	43.07	48.37		54.57	5 / 2			
	reaction time	0.171																
	interval		6.96	4.13	4.23	4.27	4.40	4.70	4.77	4.93	5.17	5.30	6.20			12.63	13.87	15.40
	velocity		8.47	8.27	8.20	7.95	7.45	7.34	7.10	6.77	6.60	6.45	7.33			8.31	7.57	6.82
Moline, Georganne (USA) (1990)	time		6.47	10.60	14.90	19.40	23.90	28.57	33.27	38.27	43.40	48.63		54.63	7 / 3			
	reaction time	0.214																
	interval		6.96	4.13	4.30	4.50	4.50	4.67	4.70	5.00	5.13	5.23	6.00			12.93	13.87	15.36
	velocity		8.47	8.14	7.78	7.78	7.49	7.45	7.00	6.82	6.69	6.67	7.32			8.12	7.57	6.84
Muhammad, Dalilah (USA) (1990)	time		6.27	10.40	14.70	19.20	23.83	28.43	33.17	38.10	43.23	48.53		54.75	3 / 4			
	reaction time	0.131																
	interval		4.13	4.30	4.50	4.63	4.60	4.74	4.93	5.13	5.30	6.22				12.93	13.97	15.36
	velocity		7.18	8.47	8.14	7.78	7.56	7.61	7.38	7.10	6.82	6.60	7.31			8.12	7.52	6.84
Adekoya, Kemi (BRN) (1993)	time		6.43	10.63	15.00	19.37	23.87	28.67	33.57	38.70	43.97	49.27		55.28	6 / 5			
	reaction time	0.195																
	interval		4.20	4.37	4.37	4.50	4.80	4.90	5.13	5.27	5.30	6.01				12.94	14.20	15.70
	velocity		7.00	8.33	8.01	8.01	7.78	7.29	7.14	6.82	6.64	6.60	7.24			8.11	7.39	6.69
Linkiewicz, Joanna (POL) (1990)	time		6.67	11.03	15.47	20.00	24.73	29.63	34.43	39.43	44.40	49.47		55.41	8 / 6			
	reaction time	0.165																
	interval		4.36	4.44	4.53	4.73	4.90	4.80	5.00	4.97	5.07	5.94				13.33	14.43	15.04
	velocity		6.75	8.03	7.88	7.73	7.40	7.14	7.29	7.00	7.04	6.90	7.22			7.88	7.28	6.98
Spencer, Kaliese (JAM) (1987)	time		6.57	10.83	15.37	19.90	24.60	29.43	34.23	39.40	44.63	50.00		55.96	2 / 7			
	reaction time	0.157																
	interval		4.26	4.54	4.53	4.70	4.83	4.80	5.17	5.23	5.37	5.96				13.33	14.33	15.77
	velocity		6.85	8.22	7.71	7.73	7.45	7.25	6.77	6.69	6.52	6.71	7.15			7.88	7.33	6.66
Rosolová, Denisa (CZE) (1986)	time			10.83	15.20	19.57	24.07	28.80	33.77	38.87	44.20	49.83		56.50	1 / 8			
	reaction time	0.152																
	interval			4.37	4.37	4.50	4.73	4.97	5.10	5.33	5.63	6.67						
	velocity			7.39	8.01	8.01	7.78	7.40	7.04	6.86	6.57	6.22	6.00	7.08			14.20	16.06
	H1 lead leg				15	15	15	15	16	16	17	17		126			7.39	6.54



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1276 x 720 @ 30fps

Timing From: First Movement

Source: https://www.youtube.com/watch?v=zcbpl_o3Pork

Women's 400m Hurdles

Date 2016.06.02

FINAL

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

2016 Meeting International Mohammed VI D'Athletisme (Rabat, MAR) (TV Analysis)

Women's 400m Hurdles

Date 2016.05.22

FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-in	400m	Lane / Place	H1-H4	H4-H7	H7-H10	
Russell, Jeneive (JAM) (1993)	time		6.44	10.60	14.84	19.12	23.52	28.00	32.64	37.60	42.60	47.88		54.16	4 / 1				
	reaction time	0.139														12.68	13.52	15.24	
	interval		6.99	8.41	8.25	8.18	7.95	7.81	7.54	7.06	7.00	6.63	6.37	7.39		8.28	7.77	6.89	
	velocity																		
H1 lead leg	R	strides	22	15	15	15	15	15	15	16	16	17	20	181					
	Tate, Cassandra (USA) (1990)	time		6.20	10.52	14.76	19.16	23.60	28.16	32.92	37.96	43.12	48.56		54.69	3 / 2			
		reaction time	0.209														12.96	13.76	15.64
		interval		4.32	4.24	4.40	4.44	4.56	4.76	5.04	5.16	5.44	6.13				8.10	7.63	6.71
velocity			7.26	8.10	8.25	7.95	7.88	7.68	7.35	6.94	6.78	6.43	6.53	7.31					
H1 lead leg	R	strides	22	15	15	15	15	15	15	16	16	17	20	181					
	Nel, Wenda (RSA) (1988)	time		6.32	10.64	14.88	19.24	23.76	28.28	33.00	37.88	43.08	48.48		54.88	5 / 3			
		reaction time	0.198														12.92	13.76	15.48
		interval		4.32	4.24	4.36	4.52	4.52	4.72	4.88	5.20	5.40	6.40				8.13	7.63	6.78
velocity			7.12	8.10	8.25	8.03	7.74	7.74	7.42	7.17	6.73	6.48	6.25	7.29					
H1 lead leg	L	strides	23	16	16	16	16	16	17	17	18	18	21.5	194.5					
	Titimets, Anna (UKR) (1989)	time		6.48	10.76	15.08	19.40	23.80	28.32	33.00	38.04	43.36	48.88		55.10	7 / 4			
		reaction time	0.208														12.92	13.60	15.88
		interval		4.28	4.32	4.32	4.40	4.52	4.68	5.04	5.32	5.52	6.22				8.13	7.72	6.61
velocity			6.94	8.18	8.10	8.10	7.95	7.74	7.48	6.94	6.58	6.34	6.43	7.26					
H1 lead leg	L	strides	22	15	15	15	15	15	15	16	17	17	20	182					
	Adekoya, Kemi (BRN) (1993)	time		6.40	10.76	15.12	19.56	24.04	28.72	33.60	38.72	43.92	49.28		55.33	6 / 5			
		reaction time	0.180														13.16	14.04	15.68
		interval		4.36	4.36	4.44	4.48	4.68	4.88	5.12	5.20	5.36	6.05				7.98	7.48	6.70
velocity			7.03	8.03	8.03	7.88	7.81	7.48	7.17	6.84	6.73	6.53	6.61	7.23					
H1 lead leg	L	strides	24	16	16	16	16	16	17	17	17	17	20.2	192.2					
	Ankiewicz, Emilia (POL) (1990)	time		6.64	11.12	15.72	20.36	25.12	29.96	35.00	40.32	45.64	51.08		57.25	2 / 6			
		reaction time	0.148														13.72	14.64	16.08
		interval		4.48	4.60	4.64	4.76	4.76	4.84	5.04	5.32	5.32	5.44	6.17			7.65	7.17	6.53
velocity			6.78	7.81	7.61	7.54	7.35	7.23	6.94	6.58	6.58	6.43	6.48	6.99					
H1 lead leg	L	strides	23	16	16	16	16	16	16	17	17	17	20.5	190.5					

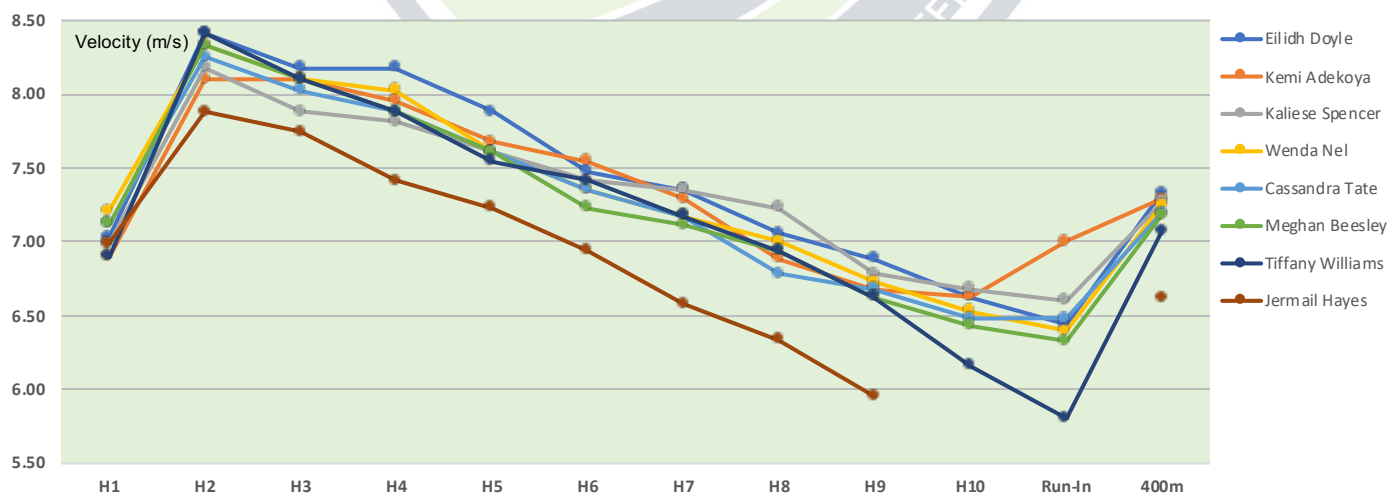
2016 Doha Diamond League (Doha, QAT) (TV Analysis)

Women's 400m Hurdles

Date 2016.05.06

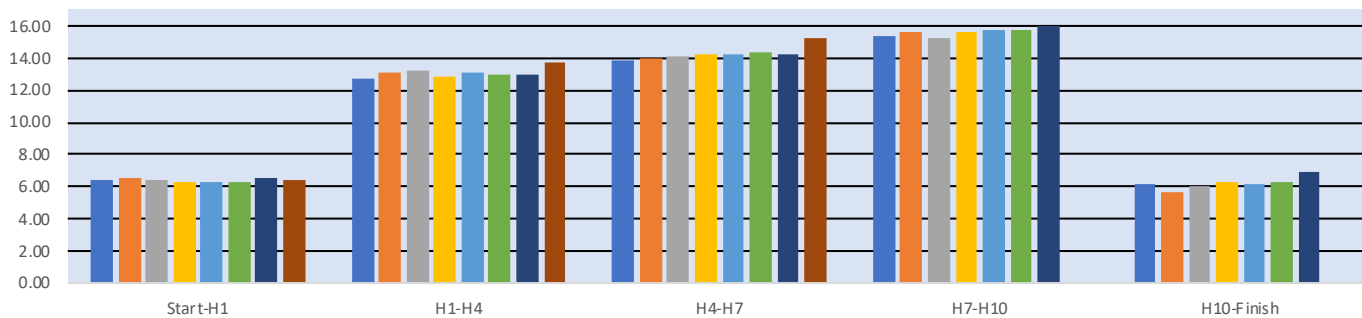
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Doyle, Eilidh (GBR) (1987)	time		6.40	10.56	14.84	19.12	23.56	28.24	33.00	37.96	43.04	48.32		54.53	3 / 1			
	reaction time	0.191																
	interval		7.03	4.16	4.28	4.28	4.44	4.68	4.76	4.96	5.08	5.28	6.21			12.72	13.88	15.32
	velocity		8.41	8.10	8.18	8.18	7.88	7.48	7.35	7.06	6.89	6.63	6.44	7.34		8.25	7.56	6.85
Adekoya, Kemi (BRN) (1993)	time		6.52	10.84	15.16	19.56	24.12	28.76	33.56	38.64	43.88	49.16		54.87	2 / 2			
	reaction time	0.178																
	interval		6.90	4.32	4.32	4.40	4.56	4.64	4.80	5.08	5.24	5.28	5.71			13.04	14.00	15.60
	velocity		8.10	8.10	8.10	7.95	7.68	7.54	7.29	6.89	6.68	6.63	7.01	7.29		8.05	7.50	6.73
Spencer, Kaliese (JAM) (1987)	time		6.44	10.72	15.16	19.64	24.24	28.96	33.72	38.56	43.72	48.96		55.02	4 / 3			
	reaction time	0.144																
	interval		6.99	4.28	4.44	4.48	4.60	4.72	4.76	4.84	5.16	5.24	6.06			13.20	14.08	15.24
	velocity		8.18	8.18	7.88	7.81	7.61	7.42	7.35	7.23	6.78	6.68	6.60	7.27		7.95	7.46	6.89
Nel, Wenda (RSA) (1988)	time		6.24	10.44	14.76	19.12	23.72	28.48	33.36	38.36	43.56	48.92		55.17	6 / 4			
	reaction time	0.184																
	interval		7.21	4.20	4.32	4.36	4.60	4.76	4.88	5.00	5.20	5.36	6.25			12.88	14.24	15.56
	velocity		8.33	8.33	8.10	8.03	7.61	7.35	7.17	7.00	6.73	6.53	6.40	7.25		8.15	7.37	6.75
Tate, Cassandra (USA) (1990)	time		6.32	10.56	14.92	19.36	23.96	28.72	33.60	38.76	44.00	49.40		55.57	5 / 5			
	reaction time	0.230																
	interval		4.24	4.36	4.44	4.44	4.60	4.84	4.92	5.04	5.28	5.44	6.17			13.04	14.24	15.80
	velocity		8.25	8.25	8.03	7.88	7.61	7.35	7.17	6.78	6.68	6.48	6.48	7.20		8.05	7.37	6.65
Beesley, Meghan (GBR) (1989)	time		6.32	10.52	14.84	19.28	23.88	28.72	33.64	38.68	43.96	49.40		55.72	7 / 6			
	reaction time	0.166																
	interval		4.20	4.32	4.44	4.44	4.60	4.84	4.92	5.04	5.28	5.44	6.32			12.96	14.36	15.76
	velocity		8.33	8.33	8.10	7.88	7.61	7.23	7.11	6.94	6.63	6.43	6.33	7.18		8.10	7.31	6.66
Williams, Tiffany (USA) (1983)	time		6.52	10.68	15.00	19.44	24.08	28.80	33.68	38.72	44.00	49.68		56.57	8 / 7			
	reaction time	0.225																
	interval		6.90	4.16	4.32	4.44	4.64	4.72	4.88	5.04	5.28	5.68	6.89			12.92	14.24	16.00
	velocity		8.41	8.10	8.10	7.88	7.54	7.42	7.17	6.94	6.63	6.16	5.81	7.07		8.13	7.37	6.56
Hayes, Jernail (USA) (1988)	time		6.44	10.88	15.40	20.12	24.96	30.00	35.32	40.84	46.72			60.48	1 / 8			
	reaction time	0.146																
	interval		6.99	4.44	4.52	4.72	4.84	5.04	5.32	5.52	5.88					13.68	15.20	
	velocity		7.88	7.74	7.74	7.42	7.23	6.94	6.58	6.34	5.95					7.68	6.91	
	H1 lead leg	L	23	15	15	15	15	15	15	15	15	16	16	18.7	177.7			
	H1 lead leg	L	23	16	16	16	16	17	17	17	18	18	21.5	195.5				
	H1 lead leg	R	22	15	15	15	15	15	15	16	16	16	20	180				
	H1 lead leg	L	24	16	16	16	16	17	17	17	18	18	22	197				
	H1 lead leg	L	24	15	15	15	16	16	17	17	17	18	22	192				
	H1 lead leg	L	23	16	16	16	16	17	17	17	18			156				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=-nIVNOMaa0k&t=12s>