

STRIDE PATTERN CHARACTERISTICS AND REGULATION OF GAIT IN THE APPROACH PHASE OF THE LONG JUMP IN VISUALLY IMPAIRED ATHLETES

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The Long Jump approach run

Long Jump approach primary tasks:

- (a) development of a maximal manageable horizontal velocity
- (b) adjustment of body position during the final few steps to reach to an optimal take-off position
- (c) adjustment of step length so that foot placement at jump takeoff is as close as possible to the distal edge of the 20-cm board

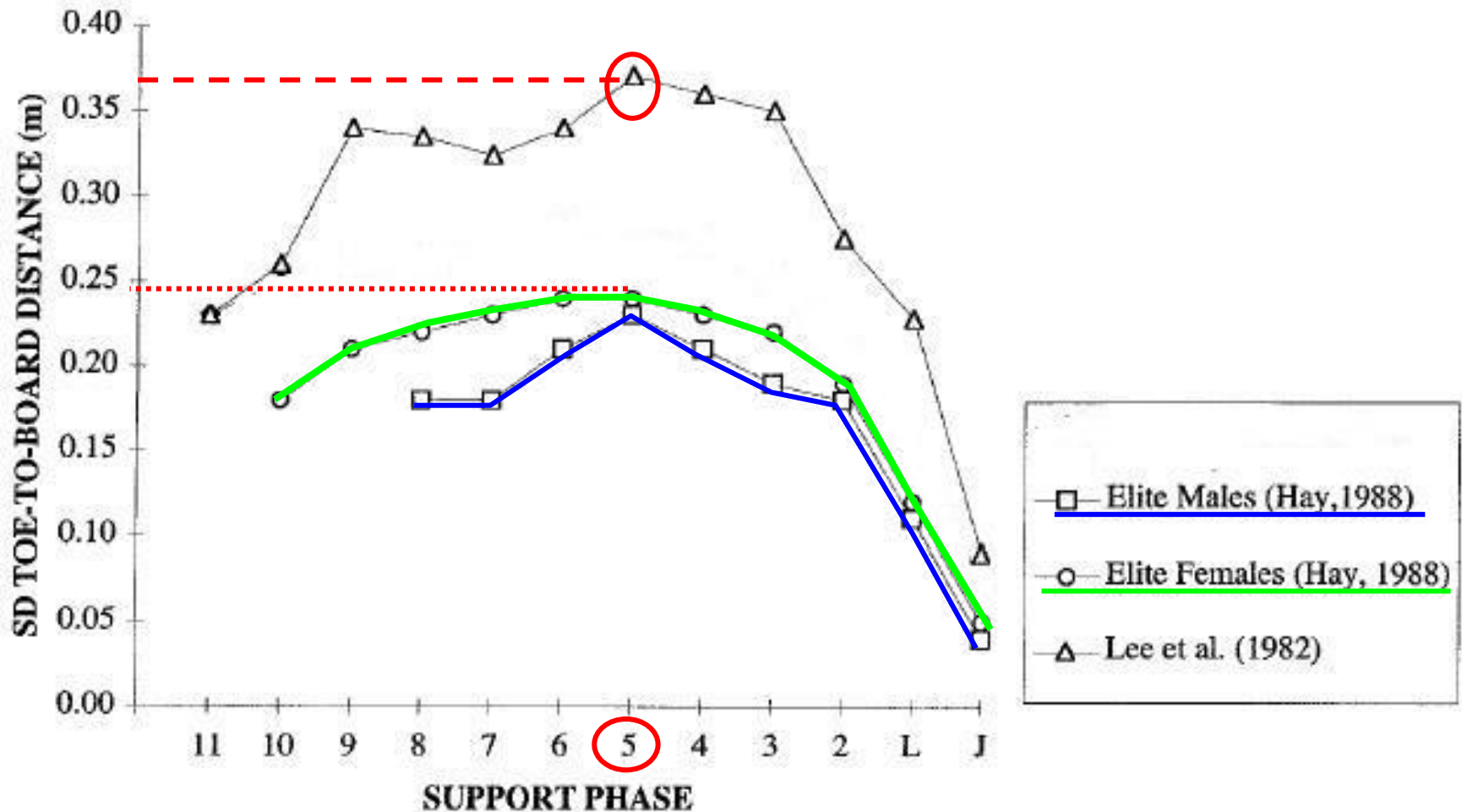
(Hay, 1988; Hay & Koh, 1988).

The Long Jump approach run

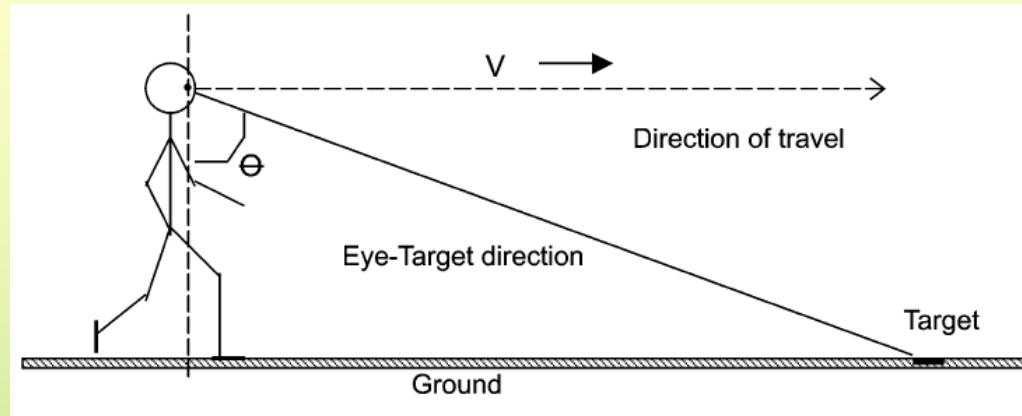
The approach phase of the long jump consists of :

a) an accelerative phase

b) a zeroing-in phase.



The Long Jump approach run



Bradshaw et al.2001



Purpose of the study

Examine whether:

Visually Impaired (VI) long jumpers, *whose training and performance is based exclusively on repeating and producing stereotyped gait patterns,*

and producing stereotyped gait patterns,

demonstrate a similar pattern of variability in footfall

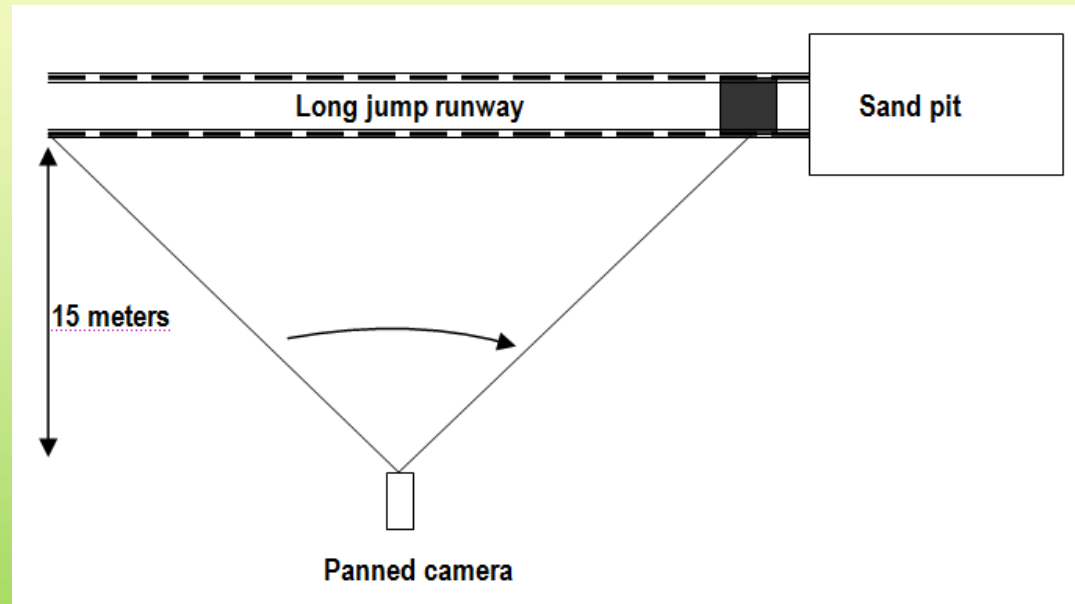
placement across trials compared with non-VI

athletes

Methods

Participants

The four finalists of the men's long jump (category B1; no light perception in either eye), of the IBSA 2009 European Athletics Championship were recorded using a panned video camera.

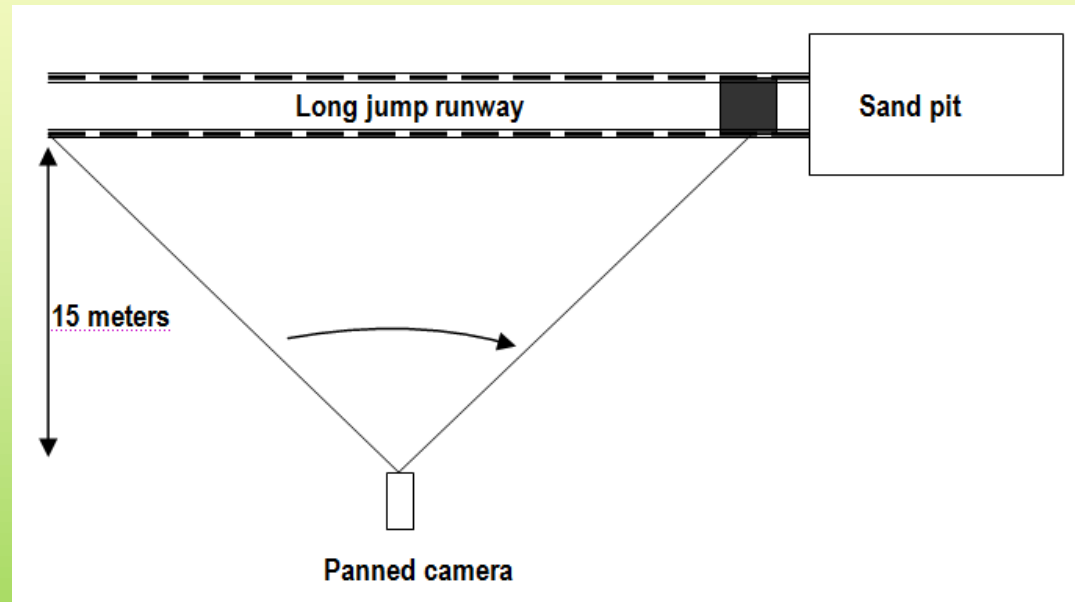


Methods

Data collection

Forty (40) 1m zones were established on the runway and were designated by white markers placed on either side of the runway

(Berg & Mark 2005; Hay, 1988; Hay & Koh 1988)

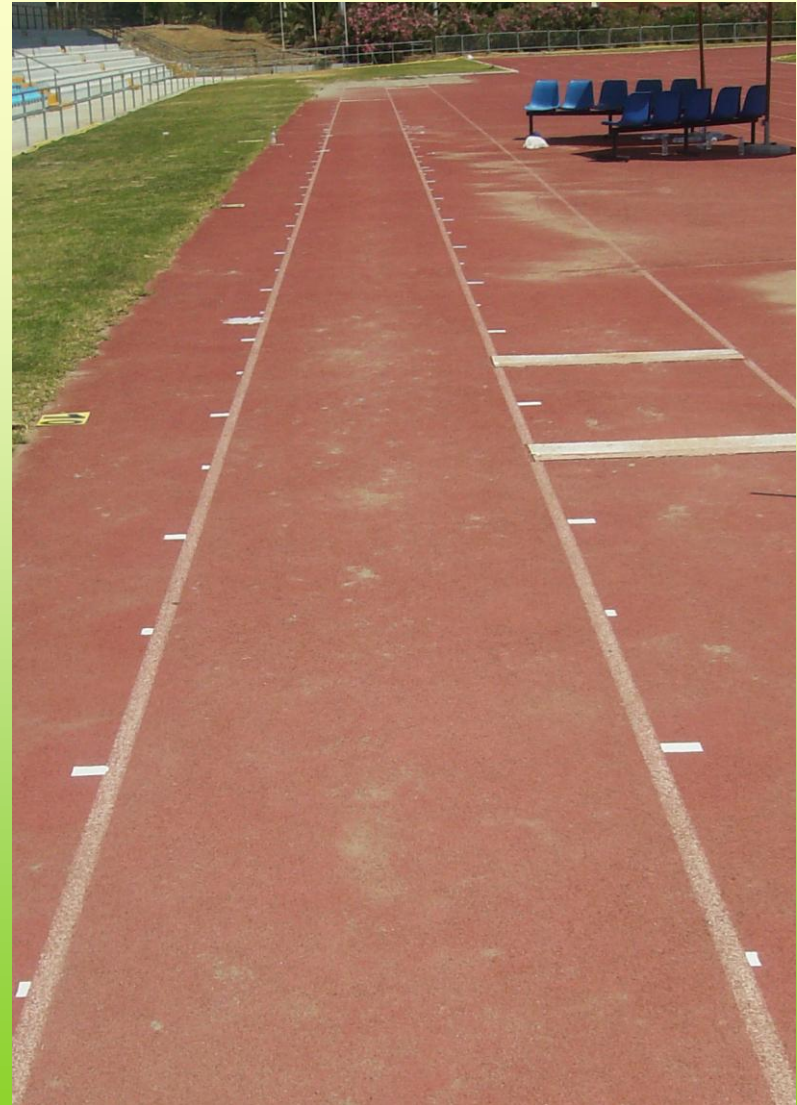


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Data collection



Methods

Example: 10th stride from take off board



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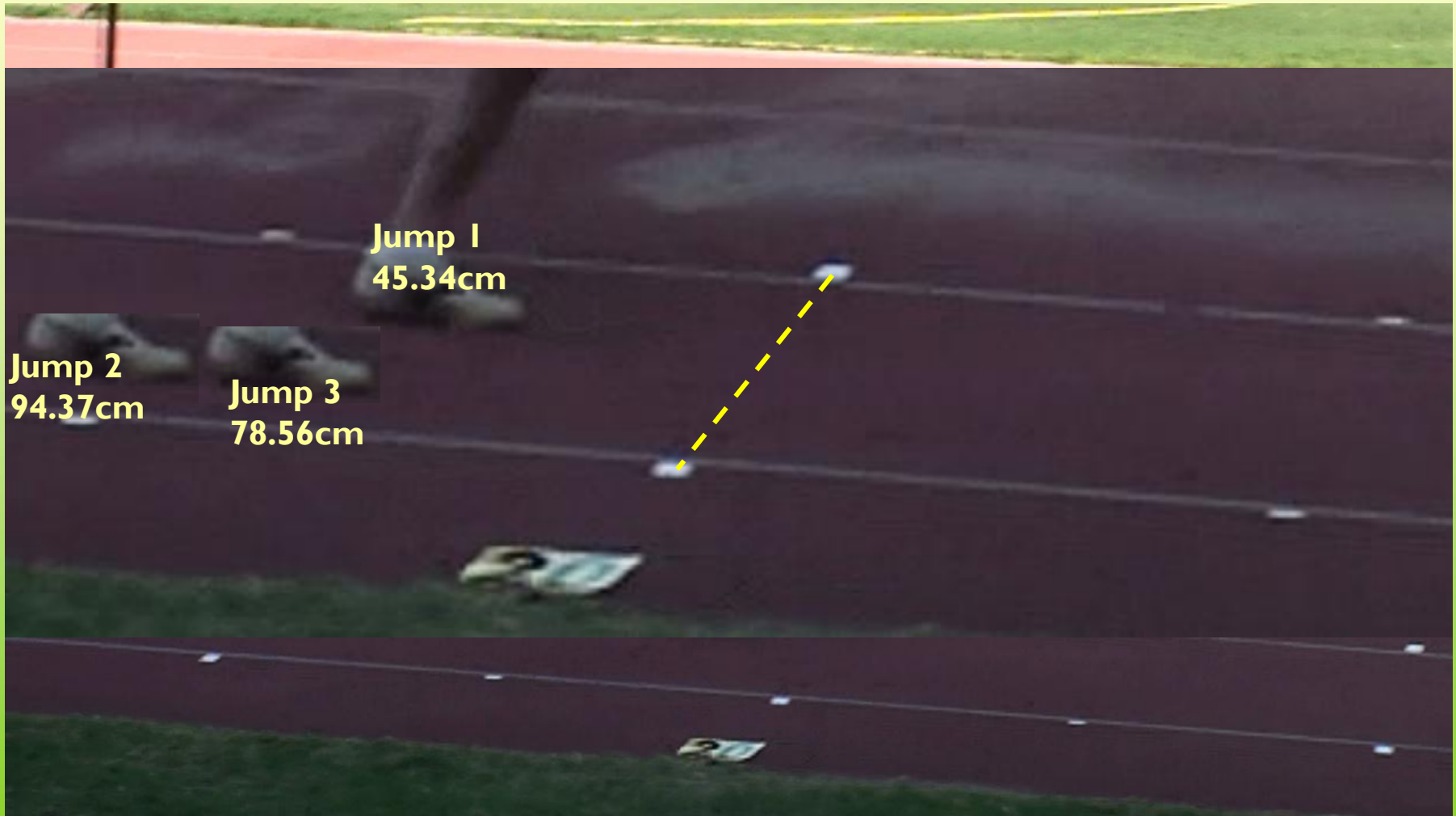
Methods

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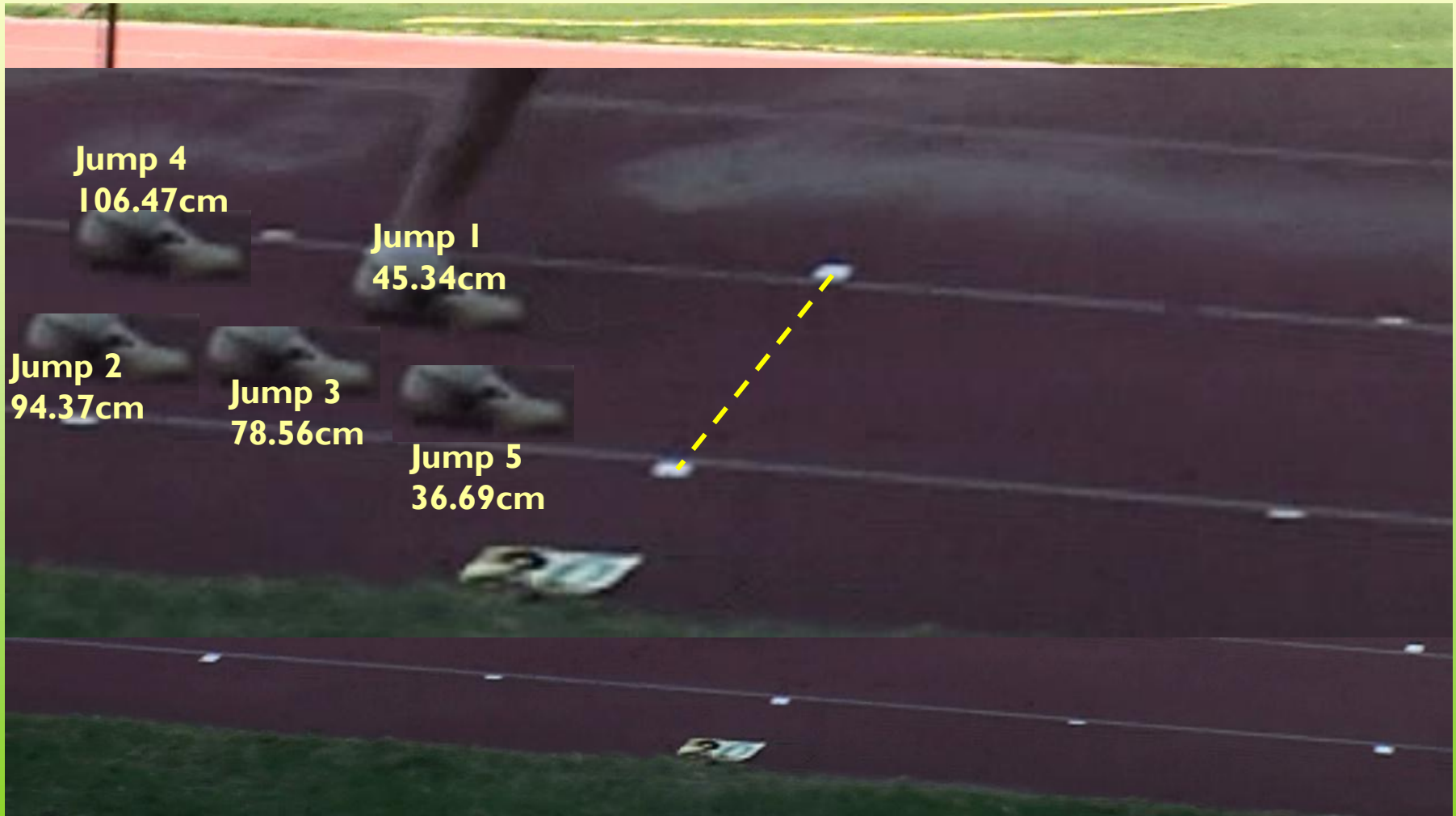
Methods

Example: 10th stride from take off board



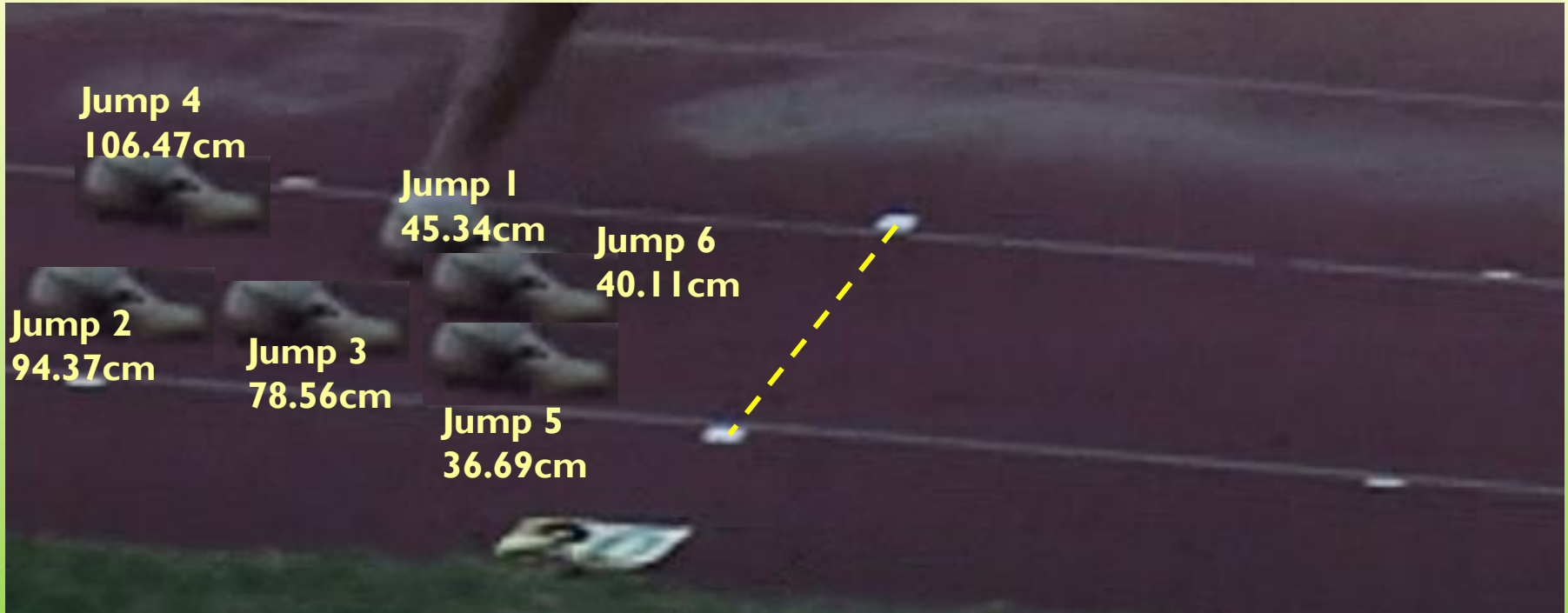
Methods

Example: 10th stride from take off board



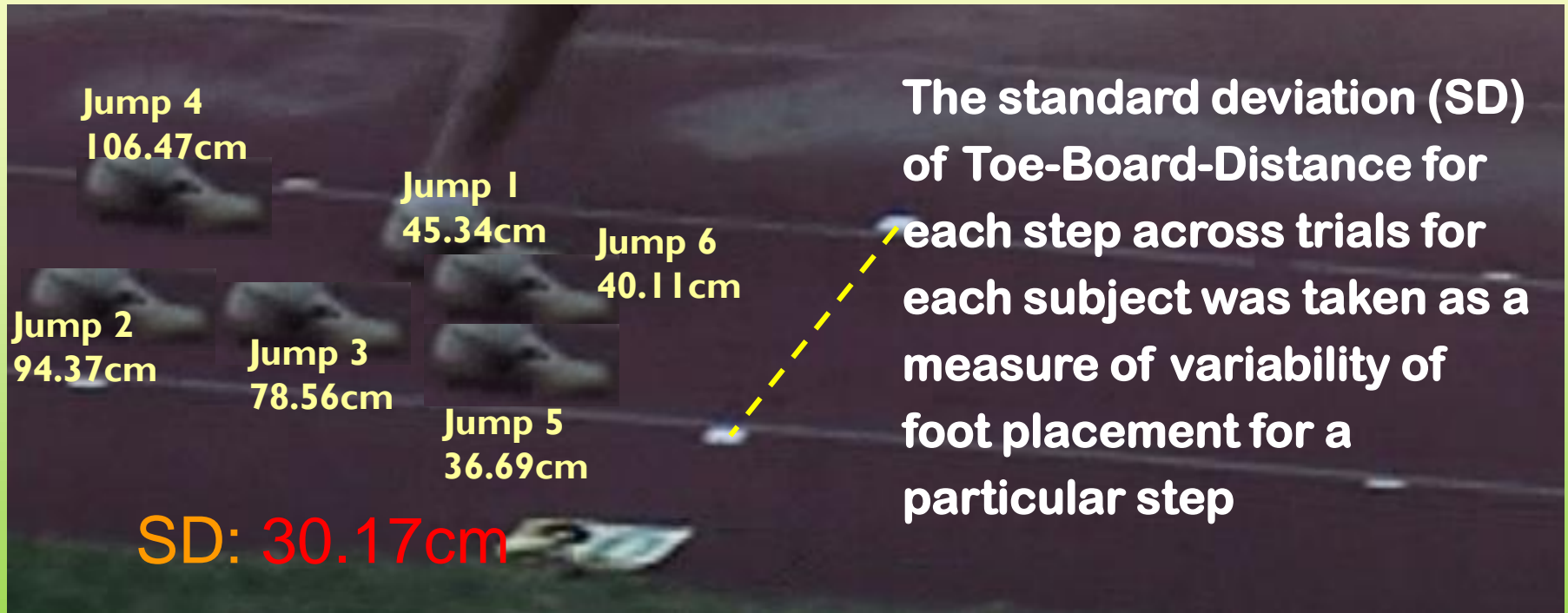
Methods

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Example: 10th stride from take off board

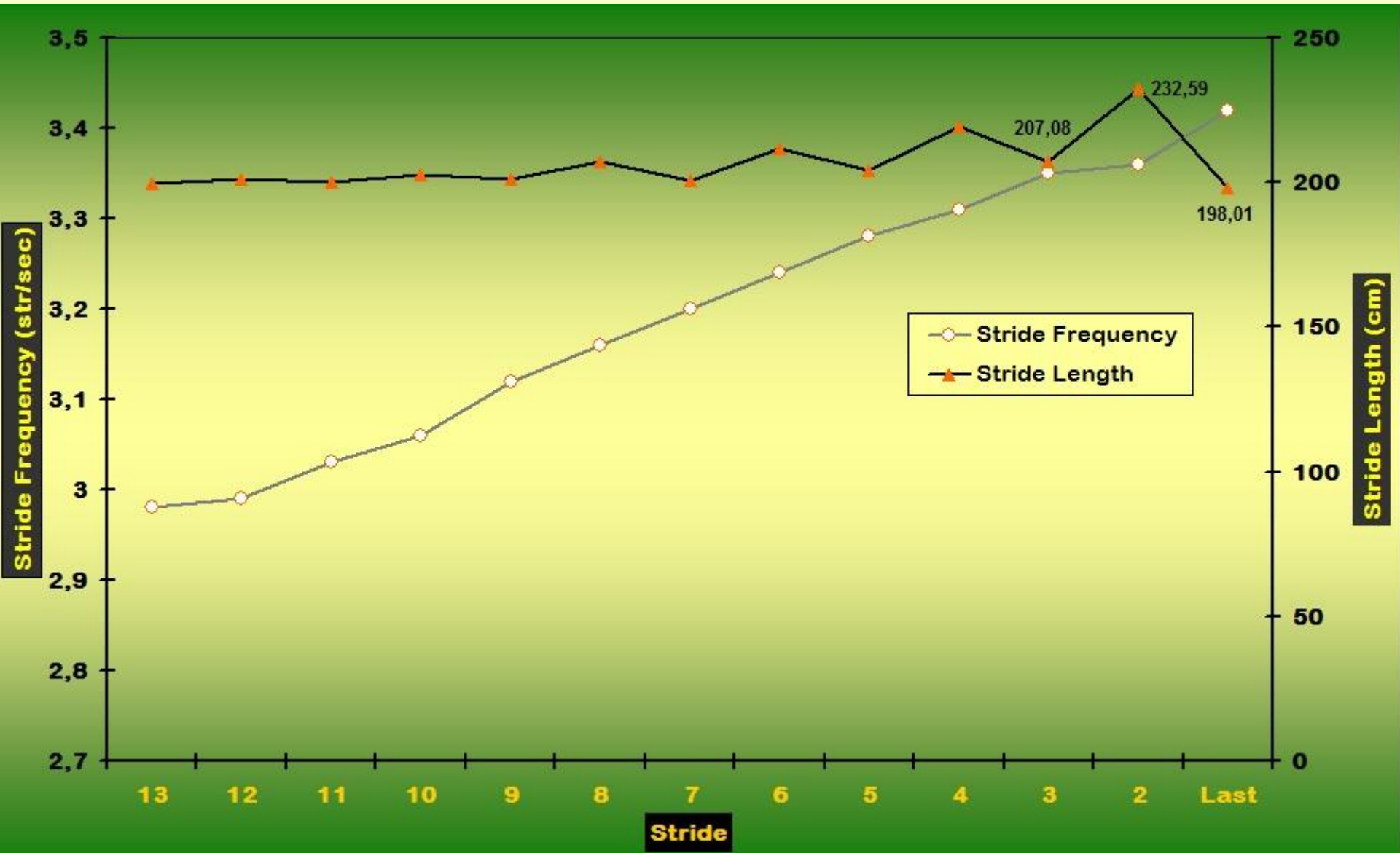


Results

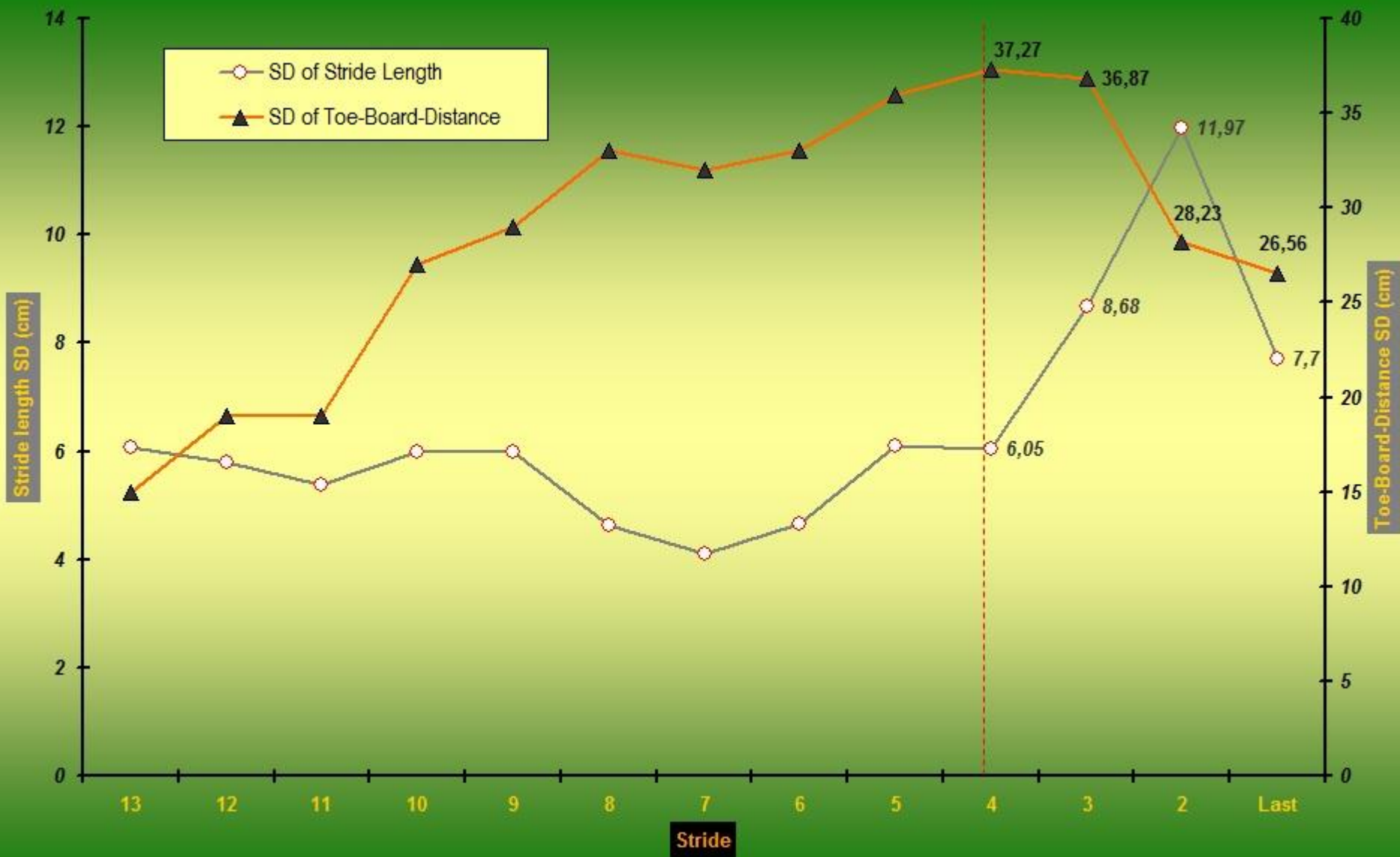
Stride characteristics

Athlete	Place	Best Jump (m)	Mean performance (m±SD)	No of strides	Run-up length (m±SD)	Stride length (cm±SD)	Stride Frequency (HZ±SD)	Speed m.sec ⁻¹
Mparakas	1	5.97	5.81 ±0.10	16	35,27 ±0.26	216.25 ±26.5	3.28 ±0.10	7.22 ±0.81
Porras	2	5.90	5.74 ±0.17	16	33,50 ±0.32	208.22 ±16.7	2.72 ±0.26	5.71 ±0.49
Koptev	3	5.71	5.56 ±0.13	16	31.52 ±0,11	194.56 ±23.2	3.29 ±0.16	6.56 ±0.58
Hendry	4	5.45	5.26 ±0.18	16	29.89 ±0,7	182.92 ±24.1	3.47 ±0.11	6.50 ±0.73

Results



Results



Conclusions

VI athletes

- Max SD of Toe-Board Distance

37 cm

- Commencement of zeroing-in phase

3rd stride from board

- Accuracy of foot placement on the board

25 cm

- Step length adjustment

Last 2 strides

Non-VI athletes

- Max SD of Toe-Board Distance

22-36 cm

- Commencement of zeroing-in phase

4 - 5th stride from board

- Accuracy of foot placement on the board

6 - 15 cm

- Step length adjustment

Last 2 strides

Conclusions

VI athletes

- Demonstrate **similar pattern of ascending-descending variability** as non-VI athletes
- Use kinaesthetic elements to localize their position during the approach phase
- **Acoustic information** provided by the coach may be used as a time-to-arrival signal to initiate modification of step length to compensate for previous errors.