

Preliminary high frequency 2D kinematic analysis of “touche” and “touche after dodge” on elite paralympic fencers

Daniel Dinu, Nicolas Houel, Marc Elipot, Emily Martineau, Pascal Godet,
Didier Seyfried

► **To cite this version:**

Daniel Dinu, Nicolas Houel, Marc Elipot, Emily Martineau, Pascal Godet, et al.. Preliminary high frequency 2D kinematic analysis of “touche” and “touche after dodge” on elite paralympic fencers. *Procedia Engineering*, Elsevier, 2012, ENGINEERING OF SPORT CONFERENCE 2012, 34, pp.878. 10.1016/j.proeng.2012.04.155 . hal-01869812

HAL Id: hal-01869812

<https://hal-insep.archives-ouvertes.fr/hal-01869812>

Submitted on 6 Sep 2018

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/274036686>

Preliminary high frequency 2D kinematic analysis of “touche” and “touche after dodge” on elite paralympic fencers

Article in *Procedia Engineering* · December 2012

DOI: 10.1016/j.proeng.2012.04.155

CITATIONS

0

READS

22

6 authors, including:



Nicolas Houel

Ecole Supérieure d'Ostéopathie

36 PUBLICATIONS 141 CITATIONS

[SEE PROFILE](#)



Marc Elipot

Australian Institute of Sport (AIS)

9 PUBLICATIONS 56 CITATIONS

[SEE PROFILE](#)



Daniel Dinu

Institut National du Sport, de l'Expertise et de la Performance

21 PUBLICATIONS 26 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



STUDY OF PUNCHES PERFORMANCE IN BOXE USING INETIAL SENSORS [View project](#)



Study of Lunge Biomechanics in modern fencing sabre, foil, and sword [View project](#)

9th Conference of the International Sports Engineering Association (ISEA)

Poster Session - Abstract

Preliminary high frequency 2D kinematic analysis of
“touche” and “touche after dodge” on elite paralympic fencers

Nicolas N. Houel^{a*}, Emily Martineau^b, Pascal Godet^b, Marc Elipot^a,
Daniel Dinu^a, Didier Seyfried^a

^a*Institut National du Sport, de l'Expertise et de la Performance, 11 avenue du tremblay, Paris 75012, France*

^b*Fédération Française Handisport 42, rue Louis Lumière, Paris 75020, France*

Abstract

The purpose of this preliminary study was to compare the maximal velocity of two fencing movements currently used by elite Paralympic fencers. Three elite fencers in wheelchair selected on the national team voluntarily participated to this study. Each subject was asked to perform three “touches” and three “touches after dodges”. The “touche” is assimilated to a pointing task toward a normalized target. A high speed camera (casio exilim EXFH25, 240fps) recorded a sagittal view of the fencer’s motions. Five anatomic markers were identified on the fencer (forward hip, shoulder, elbow, wrist and finger). DLT2D algorithm was used to calculate the markers trajectories in space. Space mean reconstruction accuracy was 4.7 mm. The marker’s positions associated with Dempster’s anthropometric data (1959) were used to compute the velocity of the centre of mass of the segments trunk, arm, forearm and hand. A Butterworth II filter was used with 13 Hz cut-off frequency. Wilcoxon signed rank test was used to compare the centre of mass maximal velocity of each segment between the two movements performed by the fencers. The results showed no significant difference between the centre of mass maximal velocity of each segment for the two movements ($p = 0.25$). In line with Latash’s concept on the effects of the uncontrolled manifold hypothesis, it is suggested that the fencers selected subtasks in complex movement in the aim to maintain maximal velocity constant at the “touche”.

© 2012 Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Keywords: Fencing; wheelchair; kinematics; velocity; motor control

* Corresponding author. Tel.: +33-141-744-477; fax: +33-141-744-535.

E-mail address: nicolas.houel@insep.fr or nicolas.houel@yahoo.fr.