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KINEMATIC COMPARISON FOR SINGLE SHOOTING AND FAST SHOOTING IN TRADITIONAL ARCHERY

(Perbandingan Kinematik Terhadap Panahan Tunggal dan Berturutan dalam Panahan Tradisional)

MUHAMMAD SHAHIMI ARIFFIN*, AZMIN SHAM RAMBELY, NORATIQAH MOHD ARIFF, ROHILAH SAHAK, SYAZWANA AZIZ & MUHAMMAD ATHIF MAT ZIN

ABSTRACT

The aim of this paper is to compare performance single shooting (SS) and fast shootings (FS) in Mameluke traditional archery. A group of 10 elites archer participated in the study with total of 100 shots perform. Joint angles of bow arm (BA) and draw arm (DA) are measured to compare the similarities and differences between the two shooting techniques. Angles data are aligned using Functional Data Analysis (FDA) and single averaged curve representating each shot is compared. Performance measurement such as Pearson correlation coefficient (r), Sprague and Geers metrics are used. Result shows that value of r falls in a range of 0.7 to 0.99, while Sprague and Geer metrics of magnitude and phase are between [0.03,0.14] and [0.03,0.16], respectively. The metrics values show a near-zero value and r is closed to one. Thus, the two shots are found to be relatively similar despite the difference biomechanically in completing 10 shots for each shooting technique.

Keywords: curve registration; kinematics; single shooting; fast shooting; mameluke technique

ABSTRAK

Tujuan kajian ini adalah untuk membandingkan prestasi panahan tunggal (PT) dan panahan berturutan (PB) dalam panahan tradisional Mamluk. Sekumpulan 10 orang pemanah elit mengambil bahagian dalam kajian dengan melakukan 100 panahan. Sudut bagi lengan busur (LB) dan lengan menarik (LM) digunakan untuk mengukur persamaan atau perbezaan antara kedua-dua teknik panahan. Data sudut dijajarkan menggunakan Analisis Data Fungsian (ADF) dan purata lengkung tunggal yang mewakili setiap panahan dibandingkan. Pengukuran prestasi seperti pekali korelasi Pearson (r), metrik Sprague dan Geers digunakan. Keputusan kajian menunjukkan bahawa nilai r berada dalam julat 0.7 hingga 0.99, manakala metrik magnitud dan fasa bagi Sprague dan Geer masing-masing diberikan antara [0.03, 0.14] dan [0.03, 0.16]. Nilai metrik yang dihasilkan adalah menghampiri angka sifar dan r pula menghampiri kepada angka satu. Oleh itu, kedua-dua panahan didapati serupa walaupun berbeza secara biomekanik dalam menyelesaikan 10 panahan untuk setiap teknik yang dilakukan.

Kata kunci: pendaftaran lengkung; kinematik; panahan tunggal; panahan berturutan; teknik mamluk

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Department of Mathematical Sciences,
Faculty of Science and Technology,
Universiti Kebangsaan Malaysia,
43600 Bangi, Selangor, Malaysia
E-mail: asr@ukm.edu.my, tqah@ukm.edu.my

School of Mathematical Sciences,
College of Computing, Informatics and Mathematics,
Universiti Teknologi MARA, Sarawak Branch, Mukah Campus, Mukah, Malaysia
E-mail: mshahimi@uitm.edu.my[*]

Pusat Perkembangan Minda Indera,
A15, Tingkat 1, Jalan IM2/6,
25200 Kuantan, Pahang.
E-mail: rohilahsahak@yahoo.com

Department of Mathematics,
Centre for Foundation Defence Studies,
National Defence University of Malaysia,
57000 Kuala Lumpur, Malaysia.
E-mail: noorsyazwana@upnm.edu.my

ASASIpintar Programme, Pusat PERMATA@Pintar Negara,
Universiti Kebangsaan Malaysia,
43600 Bangi, Selangor, Malaysia.
E-mail: athifmatzin@gmail.com

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[*]Corresponding author