

Facial fingerprint analysis using artificial intelligence techniques and its ability to respond quickly during karate (kumite)

MOHAMMED ASIM GHAZI^{1,2} , MAYASA ABD ALI KADHIM³, LAMYAA HASAN ALDEWAN⁴, SANAA JAWAD KADHIM ALMAYAH⁴

¹Faculty Physical Education. Alexandria University. Alexandria, Egypt.

²Faculty of Physical Education and Science Sport. Al-Mustaqbal University. Babylon, Iraq.

³College of Education and Sports Sciences. University of Kufa. Iraq.

⁴College of Physical Education and Sports Sciences. University of Basra. Iraq.

ABSTRACT

The document discusses the use of facial fingerprint analysis using artificial intelligence (AI) techniques to quickly respond during karate matches. The integration of AI with sports technical analysis has the potential to improve the technical and tactical level of athletes. Traditional methods for tactical intelligence analysis in competitive sports have limitations such as high cost, data loss, delay, and low accuracy, but the use of convolutional neural networks and graph convolution models has shown promising results in the automatic, intelligent analysis of karate athletes' technical action recognition, action frequency statistics, and trajectory tracking. Eye-tracking technology is also used to analyse various aspects of performance and help identify visual strategies employed by athletes. By analysing video footage of facial biometrics during karate competition performances, performance criteria can be measured based on relevant skills in karate, and an objective scoring rubric can be developed for each criterion. Then, the scores can be compared between performers to see individual strengths and weaknesses and to optimize training, technique, and performance. Ultimately, the study seeks to investigate how to improve performance and decision-making in kumite by using AI techniques to analyse the eye print during an exhibition performance.

Keywords: Performance analysis, Facial fingerprint, Artificial intelligence techniques, High-Performance sports organizations, Gap-Size.

Cite this article as:

Ghazi, M. A., Kadhim, M. A. A., Aldewan, L. H., & Almayah, S. J. K. (2024). Facial fingerprint analysis using artificial intelligence techniques and its ability to respond quickly during karate (kumite). *Journal of Human Sport and Exercise*, 19(2), 679-689. <https://doi.org/10.55860/r05vhj78>



Corresponding author. Faculty Physical Education. Alexandria University. Alexandria, Egypt. <https://orcid.org/0000-0003-1311-6400>

E-mail: mohammed.asim.ghazi@uomus.edu.iq

Submitted for publication January 01, 2024.

Accepted for publication January 26, 2024.

Published April 01, 2024 (in press March 04, 2024).

JOURNAL OF HUMAN SPORT & EXERCISE ISSN 1988-5202.

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doi: <https://doi.org/10.55860/r05vhj78>