Journal of Algorithms and Computations

journal homepage: http://jac.ut.ac.ir

Proposing a novel attention-based deep neural network (ABCL-EHI) for EEG-based human biometric identification

J. Zarean[*1] and T. Khatibi[†1]

[1] School of Industrial and Systems engineering, Tarbiat Modares University, Tehran, Iran.

ABSTRACT

The paper introduces a new method called ABCL-EHI for human identification using electroencephalographic (EEG) signals. EEG signals have unique information among individuals, but current systems lack accuracy and usability. ABCL-EHI addresses this by combining a convolutional neural network and a long short-term memory network with an attention mechanism which enhances the utilization of spatial and temporal characteristics of EEG signals. The proposed system is evaluated using a public dataset of EEG signals. The results demonstrate that ABCL-EHI achieves high accuracy while using high or low number of channels. This outperforms previous studies and highlights the system's reliability and ease of deployment in real-life.

Keywords: Healthcare Data Analytics, Machine Learning, Physiological Signal Processing, CNN, LSTM

AMS subject classification: 68T07, 68T09.

ARTICLE INFO

Article history:
Research paper
Received 03, January 2024
Accepted 28 February 2024
Available online 02, August 2024

[†] Corresponding author: T. Khatibi. Email: toktam.khatibi@modares.ac.ir.

j.zarean@modares.ac.ir