View Reviews

Paper ID

529

Paper Title

BIOMETRIC IDENTIFICATION THROUGH AUDITORY EEG SIGNATURES

Track Name

APSIPAASC2025

Reviewer #1

Questions

4. Comments for Author

this paper developed a biometric authentication
system based on auditory-stimulated EEG signals, integrating
machine learning, deep learning, and Deep Metric Learning
techniques. Evaluated on a public EEG dataset (20 subjects,
12 sessions) under open-set conditions, the system delivered
good results. However, the presentation is not very clear, and the size of the dataset is too
small.

Reviewer #2

Questions

4. Comments for Author

This paper presents a comparative study of existing machine learning methods for
biometric signal analysis. While it does not introduce new algorithms or architectures, it
could serve as a useful introductory resource for readers interested in the topic. The focus
on biometric identification using EEG signals in response to audio stimuli is particularly
interesting. The experiments appear well-designed, and the evaluation results are
presented clearly.

However, the paper suffers from several major formal issues.

First, the novelty of the work is not clearly stated. Claims in the abstract regarding a
"proposed framework" and "unfamiliar subjects" are not substantiated within the main text.
It remains unclear what the paper's specific contributions are in comparison with the

current state of the art.

Second, the paper lacks proper in-text citations. The survey of the state of the art is provided only in Tables 1 and 2, but the cited works are not included in the reference list at the end of the paper. Furthermore, the discussion of related work is limited to listing the methods used (e.g., deep metric learning) without offering any accompanying textual commentary or critical analysis. This omission makes it difficult for readers to locate and consult the relevant literature.

Finally, important references are missing. For example, there are no citations for widely used methods such as Contrastive Loss, Triplet Loss, and ArcFace Loss. Including these would strengthen the paper's grounding in the literature and help situate its contributions within the broader research context.

Reviewer #3

Questions

4. Comments for Author

The authors aim to securely authenticate users with EEG. It is original in that it uses an Auditory Stimulus-Induced EEG signal as an authentication factor.
The corpus in PhysioNet is used to evaluate the proposed method. The three evaluation points are the classification system of the classification task, the inference speed, and the detection of new classes.

In the first place, it is necessary to explain what an Auditory Stimulus-Induced EEG signal is. What kind of characteristics is it? On what basis does the signal contain unique personal characteristics that can be used for authentication? It is necessary to add these explanation. It is necessary to indicate the accuracy evaluation conditions in Table 1. Tables 2 and 4 Figures 2, 3, 4, and 5 are not referenced from the text. Figures and tables in the paper must be cited in the text.

The fonts of the characters in Figures 2 to 4 are too small to read. The font size in figures must comply with the submission regulations.

The measurement time is sufficiently long compared to the inference time, so there is little meaning in evaluating real-time performance. Evaluation including measurement time is necessary.

Isn't a classification task of 20 people too easy to compare performance between

methods? This should be confirmed in a larger classification task. Handcrafted features must be compared under a wide variety of evaluation conditions, which makes classification difficult.

Learning methods based on statistical principles require more training data and diversity as the complexity of the learning model increases. In this experiment, the amount of data used for learning was limited, so rather than comparing methods and metrics, it is considered that the experiment was limited to a unique evaluation of the dataset used this time. It is difficult to say that the content provides new knowledge to the readers.

Reviewer #4

Questions

4. Comments for Author

There are some differences about the format.
For example,
there are no indent for many paragraphs.
In some cases,
capital letter is used in the middle of the sentence.

I think
bold "Metric learning" and "Deep Metric Learning (DML)"
are not required in subsection II-A.
As same as the above,
please modify the expression in section 3-C.

In section 3-C,
I think "ResNet18/34/50" may be represented as "ResNet-18/34/50."

In section II-B,
"Deep Metric Learning" should be "DML."

In page 2,
the sentence is not completely written, that is,
"Figure 1" is only shown.

Tables II and V are not referred in any sentences.

Table 3 and 4 should be shown as "Tables 3 and 4."

In the left column of page 3,
the additional space in front of "5" should be deleted in "(5% /class)"

The format of references should be followed as the guideline of the manuscript.

I recommend to use English proofread service just in case.