

# Review of: "EEG-based Emotion Classification using Deep Learning: Approaches, Trends and Bibliometrics"

Vedantham Ramachandran

**Potential competing interests:** No potential competing interests to declare.

The authors have done a good survey on manuscripts available up to Dec 2023. The potential advancements based on trends and existing research up to that point are covered very well.

In my perspective, the introduction of novel CNN architectures specifically tailored for EEG-based emotion detection is to be surveyed. The models entailing hybrid architectures such as fusion of CNNs with other types of neural networks or signal processing techniques to better capture the temporal and spatial dynamics of EEG signals are to be identified. The other attention mechanisms such as integration of attention mechanisms within CNN architectures could allow the model to focus on relevant EEG signal segments for emotion detection while ignoring irrelevant noise or artifacts. The Graph Convolutional Networks (GCNs), which have gained traction in various signal processing tasks, including EEG analysis, can also be considered. The CNN-GCN hybrid models that leverage both spatial and temporal information inherent in EEG data for improved emotion detection are also to be surveyed.

Many AutoML techniques that automatically search and optimize CNN architectures for EEG-based emotion detection tasks, potentially leading to more efficient and effective models, are significantly covered by the authors.

Models designed for continual or incremental learning need to be explored, allowing the CNN to adapt and learn from new EEG data without catastrophic forgetting of previously learned emotions.

Interpretable models, in medical and psychological applications, that focus on developing CNN models provide insights into the neural correlates of emotions, allowing clinicians and researchers to better understand the underlying mechanisms, are very few explored in this survey work.

Finally, privacy-preserving models that show growing concern about data privacy are realized with CNN models designed for EEG-based emotion detection. These models, incorporated with privacy-preserving techniques for sensitive EEG data while still achieving high accuracy in emotion classification, are to be explored.

As a conclusion, I recommend the authors to explore even more specific models for EEG-based emotion detection available in non-Scopus databases that have advanced deep learning and EEG signal processing techniques, which have led to the development of more sophisticated and effective CNN architectures tailored to this specific application domain.