Review of: "Prediction and Analysis of Structural Brain Health Indicators Using Deep Learning Models with Functional Brain Images as Input"

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Potential competing interests: No potential competing interests to declare.

Thank you for authors. I would like to submit my review for the manuscript titled "Prediction and Analysis of Structural Brain Health Indicators Using Deep Learning Models with Functional Brain Images as Input".

General Evaluation: This manuscript addresses the use of deep learning models to predict and analyze structural brain health indicators. The research area covered in the study is important and intriguing. Additionally, the utilization of a dataset with a wide age range and comprehensive analysis is a positive aspect. The authors have conducted appropriate analyses to evaluate the model's performance and identify brain regions associated with aging. However, there are some weaknesses and areas for improvement that need to be addressed.

Model Performance: The presented model achieved a moderate performance correlation in predicting GM-BHQ. However, as mentioned by the authors, there is potential for improvement in the model's performance. Specifically, the accuracy of the model's predictions decreased as the values moved towards the lower end of the GM-BHQ distribution. Further investigations should be conducted to understand the reasons behind this weak performance and explore potential solutions.

Method and Data Limitations: The dataset used in the study was collected from a single facility and represents a limited sample. This limitation may affect the generalizability of the obtained results. Additionally, the authors have acknowledged certain methodological limitations and areas for improvement. Specifically, they mentioned limitations in sparse modeling and data analysis methodologies. It is necessary to address these limitations and consider alternative methods.

Interpretation of Results: The manuscript highlights challenges in interpreting the clustering results generated by the model. The authors mention that the utilized sparse modeling approach may have limitations in interpreting complex and abstract data. This may affect the understandability and interpretability of the results. Addressing these challenges is crucial to provide clearer and more robust interpretations of the findings.

In conclusion, this study addresses an important research topic. Recommendations should be made to improve the model's performance, address methodological limitations, and enhance the interpretability of the results. Revising the manuscript in these aspects would strengthen its scientific contribution.

Sincerely,

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