Review of: "Deep Learning Modeling for Prediction of Cognitive Task Related Features from Resting-state fMRI Data"

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Potential competing interests: No potential competing interests to declare.

This manuscript proposed cGCN–LSTM to predict the scores on the offline Kohs block-design test for a total of 615 subjects aged 33–89 years. The results of this paper showed that the cGCN–LSTM was more accurate than the baseline LASSO regression model, and that the predictions correlated significantly with the measured scores of the cognitive function test. The manuscript yielded some useful findings, but there are the following problems.

1.The meaning of Figure 1 (d) is not clear, and the convolution of the figure is not well presented.

2.The formulas are not numbered. All parameters mentioned in the formulas should be explained.

3.The authors compared few models. In the manuscript, the authors mainly compared the difference between their own algorithm and LASSO. It is recommended to compare several of the latest deep learning algorithms in the field of fMRI.

4.It is suggested to add other regression evaluation indicators for model comparison, such as comparing MSE results of different models.

5.In the paper, the authors mentioned cognitive decline with age, but the authors' fMRI results showed that there seemed to be little correlation between cognitive-related brain areas and age. The authors' results do not seem to support the changes in brain regions associated with cognitive decline with age. How did the author arrive at this conclusion?

6.The author mentioned: “The model with both rs-fMRI data and age as inputs recorded a correlation coefficient of 0.63 for the cGCN-LSTM and 0.56 for the LASSO regression model on the Kohs test score.” How was the age data entered into the model for processing?

7.The author mentioned: “Interestingly, the results showed a Spearman correlation of -0.0216 between the Kohs block-design test score and age, which was not significant.” At the same time, the author mentioned: “In particular, the fact that the DMN regions were extracted in this study confirms that this network is central to aging." How the conclusion of the latter sentence is reached, and whether it contradicts the previous sentence?