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

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The study proposed a deep learning model of cGCN-LSTM for conducting rs-FC analysis. The Kohs score and the relation with instrinsic networks were used as features for the experiment. The proposed model achieved a correlation coefficient of 0.63 when using rs-fMRI data and age as inputs in the experiment, which is higher than LASSO regression model of 0.56 . However, several issues need to be addressed.

Q1: Introduction, why do these advantages indicate that rs-FC is highly compatible with recent machine-learning-based disease diagnoses and age prediction? Could you provide further explanation?

Q2: In my opinion, the extensive discussion in the introduction regarding the characteristics and advantages of rs-FC seems unnecessary.

Q3: The Figure 1 is not clear which does not even depict the basic cuboid accurately.

Q4: LSTM is a relatively complex structure, but the LSTM depicted in Figure 1 by 'f' consists of only a few rectangles. When creating visual representations, it is advisable to either clearly depict the internal structure or single module as a substitute.

Q5: It is requested to upload all the figures with high-resolution.

Q6: The proposed model merely replaces the RNN component of cGCN from 2021 with LSTM, and no comparison is performed between the modified model and the original cGCN in the experiments. As a result, it is challenging to demonstrate the significance and improvement brought about by this modification. Therefore, I would like to suggest to include cGCN as one of the baseline models at least.

Q7: It is necessary to clarify the rationale of replacing RNN with LSTM. Is LSTM more suitable for regression tasks, or is it due to the inadequate performance of RNN on your data? Instead of using the phrase "by connecting to a new LSTM, time-series features could be extracted through the fully connected layer such that the regression process can be achieved," which should be rephrased.

Q8: The considerable impact observed in Figure 2, upon removing the age input, reminds us to question whether the experimental results are primarily driven by the age input rather than the rs-FC data. If this is true, it would be

controversial with the primary objective of the model proposed in the current study. To further explore this possibility, it is recommended to perform additional experiments in which the rs-FC data is omitted, and the age is only utilized to predict the Kohs score.