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.

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

The authors propose an extension of connectivity-based graph convolutional network (cGCN) to predict Kohs block block-design test score from 615 healthy subjects aged from 33-89. This is a very well written clinical study. The variation of cGCN comes from the problem studied - regression vs. binary or multi-class classification. Though the methodology contribution is marginal, the clinical analysis and interpretation are strong. Detailed comments are:

(1) The authors shall provide statistics of the IQ scores. From Figure 2, it seems the data skewed to the right (high scores). Will this impact the prediction accuracy?

(2) In preparing the three subsets (3:1:1) for training, validation and testing, was the data age matched?

(3) cGCN is designed to derive spatio-temporal features, in this case, what is the purpose of LSTM? It would be interesting to see how the cGCN model with MSE loss function performs (assuming cross entropy loss is used for the classification task).

(4) In cGCN paper, the use of 5 neighbors was justified from ASD experiments. This may not apply for healthy cohorts - it is noted the authors did acknowledge this as a limitation. It is recommended the authors present some future plans.

(5) It would be interesting to interrogate sex as a covariate in the prediction.