

Review of: "An Improved Hybrid Transfer Learning-Based Deep Learning Model for Alzheimer's Disease Detection Using CT and MRI Scans"

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Potential competing interests: No potential competing interests to declare.

This paper presents a comparison between deep learning techniques in early stage Alzheimer diseases classification based on MRI imaging. The introduction is clear and state of the art is sufficiently detailed. Nevertheless, I have some comments and criticism:

- Most of the figure presents errors or confusionary parts: In Fig. 1 the name of each layers does reflect the actual layer. Figure 3 can be more clear if a single profile with all the corresponding augmentation techniques is shown. Figure 4 and 5 are probably confused.
- The role of the augmentation is not clear; the number of samples considered for the training, validation and testing steps seems to be the same of the original dataset (as shown in table 2)
- In the introduction the acronyms EMCI and LMCI are not defined.
- In page 5, line 2 the it is not clear the sentence "This literature review..." which paper refers to.
- Page 6, second line of section 4, "each measuring 224X224, please write explicitly the measurement unit (pixels, centimeters...).
- Please write explicitly the improvement in terms of accuracy of the proposed method compared to literature methods.
- The authors affirm that the transfer learning techniques improve the performance of the classification both in terms of accuracy and training time, a comparison with a from scratch training can enforce this statement.
- Since this is a multi-class classification task, is not clear how recall, precision and F1 score that, typically are binary metrics, are calculated.
- In my opinion, further analysis can be reported, for example: repeat the training with a reduced number of training samples evaluating the impact of training size; add some noise in the images and compare the classification results with the noise-free case in order to evaluate the robustness of the approach.