

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.

- The paper addresses a significant challenge in healthcare: early and accurate detection of Alzheimer's disease.
- The authors propose a method using transfer learning with pre-trained CNN models (VGG16, DenseNet121, ResNet50) to classify Alzheimer's disease stages using MRI scans.
- The study utilizes a large dataset (3400 images) from the ADNI database.
- Different data augmentation techniques are applied to increase the dataset size and improve model performance.
- The paper provides a clear explanation of transfer learning, the chosen pre-trained models (VGG16, DenseNet121, ResNet50), and evaluation metrics (accuracy, precision, recall, F1-score).

Weaknesses:

- The paper does not mention if informed consent was obtained for the use of patient data in the ADNI dataset.
- The accuracy of the proposed model (reported as 96.6%) is not compared to other recent studies to determine its novelty or competitiveness.
- The limitations of the study, such as potential biases in the dataset or generalizability to other populations, are not discussed.
- The paper could benefit from a more concise presentation, potentially by combining Figures 5, 6, and 8, which show similar information for different models.

Overall, the paper presents a promising approach for Alzheimer's disease detection using transfer learning and CNNs. However, it would be strengthened by addressing the weaknesses mentioned above.

Additional Notes:

- The paper mentions using CT scans along with MRI scans in the title and abstract, but the methodology focuses solely on MRI scans. This inconsistency should be addressed.
- Future work could involve applying the model to other brain disorders or investigating its performance with different modalities like CT scans.