Evaluating the Fidelity of Explanations for Convolutional Neural Networks in Alzheimer's Disease Detection

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Who are we?

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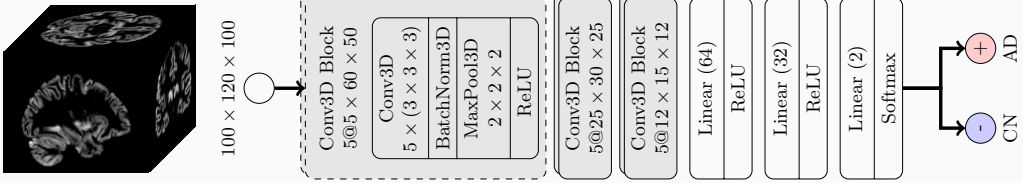
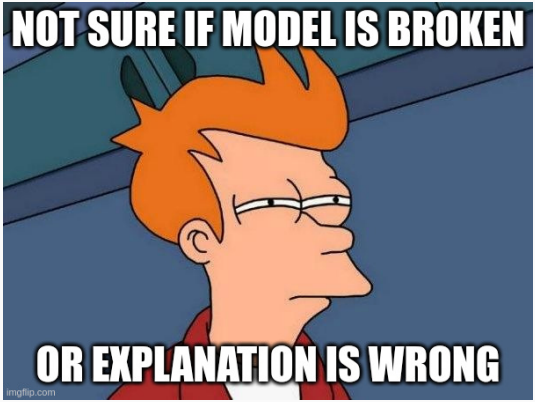
Deep Learning for Medical Image processing

Data

Model


100 × 120 × 100
Conv3D Block
5@5 × 60 × 50
Conv3D
5 × (3 × 3 × 3)
BatchNorm3D
MaxPool3D
2 × 2 × 2
ReLU
Conv3D Block
5@25 × 30 × 25
Conv3D Block
5@12 × 15 × 12
Linear (64)
ReLU
Linear (32)
ReLU
Linear (2)
Softmax
+
-
AD
CN

eXplainable AI and Feature Attribution Methods


NOT SURE IF MODEL IS BROKEN
OR EXPLANATION IS WRONG
imgflip.com

Perturbation Tests: Insertion and Deletion

Attribution Maps

Relevance per ROI

results

Conclusion

Take-Aways

1. Perturbation tests offer a model-agnostic fidelity metric.
2. The baseline should be chosen carefully w.r.t. to context.
3. Attribution Maps need interpretation to actually explain anything.