

Review 1

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Review

General comment:

This extended abstract presents a project on anomaly detection in brain MRI based on self-supervised reconstruction models. The authors first train a convolutional autoencoder (CNN AE) on T1 slices of healthy brains to detect tumours via the reconstruction error, then plan to implement a Masked Autoencoder (MAE) based on a Vision Transformer in order to compare it with the CNN and see whether a model that captures the global structure of the brain improves anomaly localisation.

Strengths:

The problem is well motivated and well explained: the scarcity of annotations and the difficulty of annotating tumours due to their variability justify the self-supervised approach. The context related to CNNs and MAEs is clearly presented, with relevant references. The structure of the abstract (summary, background, aim, methods, expected results) is clear. In addition, a first model is already in place with a CNN AE using BraTS 2021 and a ResNet18 encoder, and quantitative metrics are reported (ROC–AUC ≈ 0.95 , PR–AUC ≈ 0.45), which provides a first indication of the model's performance and shows that the project is already grounded in experiments.

Weaknesses / points for improvement:

From what I understood, some experimental details are still missing: the number of patients and slices used for training and testing is not specified, and the choice to use only T1 slices is not really discussed or justified, even though the dataset is multimodal. The PR–AUC, which seems modest on a 0–1 scale, could be better interpreted (class imbalance, comparison with simple baselines). Finally, the planned comparison between the CNN AE and the MAE could be better defined: which additional metrics will be used to assess “better localisation” of anomalies and to compare the two models?

Writing quality:

The text is well written, clear and coherent, with an appropriate scientific style. I noted only minor possible comments: some repetitions between the Aim and Expected results sections, and possibly the harmonisation of certain terms. Overall, the abstract is pleasant to read and presents a promising project.

Reviewer's confidence

1: No, I don't feel comfortable with this topic and/or methods

Usage of LLM

3: Yes, a lot

Confidential remarks for the program committee

I would like to disclose that I used an AI assistant to help me investigate the sources, understand the subject before reading the abstract myself, and finally to refine my English.