Review of: "Mastering Artifact Correction in Neuroimaging Analysis: A Retrospective Approach"

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Potential competing interests: No potential competing interests to declare.

1. The proposed MOANA model seems to be a good contribution to MRI artifact correction, particularly with its two-model approach that simulates and corrects artifacts. The addition of a fourth contrast also provides an innovative edge, potentially addressing limitations in existing MRI correction methods.

2. Although MOANA shows high SSIM and NMI values, a detailed comparison with other state-of-the-art methods would provide more insight into its relative advantages and limitations. Including these comparisons in the study would help validate the model's effectiveness.

3. While three artifact types are simulated, there is no indication of whether this covers the full range of artifacts encountered in clinical practice. Testing MOANA on a wider variety of artifact types could broaden its applicability.

4. Since MOANA relies on simulated artifacts due to a lack of publicly available motion-corrupted datasets, its performance on real-world MRI data with genuine artifacts remains unverified. Testing on real MRI scans would provide stronger evidence of its clinical value.

5. The dual-model approach may introduce added computational complexity, which could hinder its practical implementation in resource-constrained environments. The authors could provide more details on computational requirements and possible optimizations.

6. The motivation for the increase in performance isn't clear in theory. Can you really compare results from two networks with a different number of layers? Tomorrow, a deeper network may yield better results. Or a slightly different learning scheme, e.g., using a different dropout parameter and a different optimization strategy, may lead to a change in the results. The take-home message isn't clear.

7. An ablation study may be done to determine which of the proposed modifications leads to the largest improvement.

8. The numbers look high in comparison to other methods, but they are not comparable, and it seems model development/selection and testing have been done on the same subset, thus overfitting them. Thus, no conclusions can be drawn about generalization capabilities.