

Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Maame Gyamfua Asante-Mensah

PhD Program: Computational and Data Science and Engineering

Title of Thesis: Automatic noise and artifacts removal from biomedical signals and images using tensor completion

Supervisor: Professor Andrzej Cichocki

Name of the Reviewer:

I confirm the absence of any conflict of interest Qibin Zhao (Alternatively, Reviewer can formulate a possible conflict)	Date: 30-April-2023
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The purpose of this report is to obtain an independent review from the members of PhD defense Jury before the thesis defense. The members of PhD defense Jury are asked to submit signed copy of the report at least 30 days prior the thesis defense. The Reviewers are asked to bring a copy of the completed report to the thesis defense and to discuss the contents of each report with each other before the thesis defense.

If the reviewers have any queries about the thesis which they wish to raise in advance, please contact the Chair of the Jury.

Reviewer's Report

Reviewers report should contain the following items:

- Brief evaluation of the thesis quality and overall structure of the dissertation.
- The relevance of the topic of dissertation work to its actual content
- The relevance of the methods used in the dissertation
- The scientific significance of the results obtained and their compliance with the international level and current state of the art
- The relevance of the obtained results to applications (if applicable)
- The quality of publications
- The summary of issues to be addressed before/during the thesis defense

The thesis has presented novel research works on tensor based denoising methods and their applications to biomedical data. There are three main contributions with novel algorithms proposed supported by extensive experimental evaluations. The thesis is generally well written, the organization is clear and easy to follow. The topic of dissertation work is consistent with its content. The methods presented in this thesis are closely related and are all based on tensor methods but from different perspectives. The results show that the improvements of performance and computational complexity are significant and comparable with state-of-the-art in the whole research field. The newly proposed methods can be applied to real-world applications such as the preprocess and denoising of MRI/EEG signals. These findings were published in good international journals and conferences.

There are some issues or suggestions that could be addressed.

1. Deep learning methods for data completion or denoising are discussed in the thesis, it would be better to compare with deep learning-based methods for at least some experiments.
2. In Sec. 1.5, all challenges are related to real world applications. Since this thesis focuses on the tensor methods, it would be better to also discuss the challenges from perspectives of methods.
3. Sec 1.6 presented many related methods and works; it is good to discuss more on the strength and weakness of those methods and point out the main challenging issues that need to be solved.

Provisional Recommendation

I recommend that the candidate should defend the thesis by means of a formal thesis defense

I recommend that the candidate should defend the thesis by means of a formal thesis defense only after appropriate changes would be introduced in candidate's thesis according to the recommendations of the present report

The thesis is not acceptable and I recommend that the candidate be exempt from the formal thesis defense