

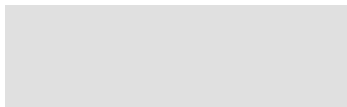
Name of Candidate: Sabah Farshad

PhD Program: Engineering Systems

Title of Thesis: Improving Collaborative Engineering Design and Learning through Feedback Systems in the Age of Digitalization and AI

Supervisor: Professor Clement Fortin

Name of the Reviewer: Tatiana Podladchikova

<p>I confirm the absence of any conflict of interest</p> <p>(Alternatively, Reviewer can formulate a possible conflict)</p>	 <p>Date: 12-01-2024</p>
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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 doctoral thesis “Improving Collaborative Engineering Design and Learning through Feedback Systems in the Age of Digitalization and AI” submitted by Sabah Farshad represents a high quality and relevant research. The thesis has a logical structure, starting with Chapter 1 - Introduction to the topic of research, which is followed by Literature Review (Chapter 2), Research Methodology, Thesis Objectives and Questions (Chapter 3). Chapter 4 presents detailed case studies and the thesis is concluded by Chapter 6, which also revisits the initial research questions, discussing the results obtained as well as providing insights for future research.

The topic of the dissertation work is relevant to its actual content. The research questions of the thesis are clear and precise, and methods of analysis presented in the thesis are at the state of the art for the field. The methods, findings and outcomes of the thesis are important and relevant for the field, which is confirmed by a number of first-author publications in prestigious international journals and presentations at top international conferences.

The summary of issues to be addressed before/during the thesis defense

I have several comments below which may be addressed.

1) Abstract

- Summary of conclusions in the abstract would benefit from more precise indication of the problem statement, novelty, relevance, and positions advocated for defense.
- Conclusion (1) "Cloud-based collaboration platforms are becoming the dominate tool for collaborative design and learning" presents rather introductory phrase than a conclusion. If it is important as a conclusion, could you please sharpen this phrase indicating also implications of this conclusions for the field with respect to the research questions.
- Conclusion (3) "Unbalanced AE is a serious challenge in PBL" also represents rather an intro than a conclusion. First, it is not clear what does it mean "unbalanced", second, if it is a challenge, how should it be taken into account with respect to the research questions.
- Conclusion (7) "ML techniques based on text-classification methods ar.e able to predict AE in BPL team's communication". Is it possible to be more specific, providing also some accuracy characteristics of such predictions and probably lead times of predictions (if applicable).

2) In content section, Chapter 5, there is latex typo

"Limitations Error! Bookmark not defined."

- 3) Page 32, Chapter 7 should not be assigned to References, these are just references at the end of the manuscript.
- 4) Figure numbering. Some figure numbers are given in format Figure 2-4, but some Figure 2.1. Please homogenize to for instance to Figure 2.1. as Figure 2-4 is confusing. If it is a composite figure of several panels, it still can have one number, but panels (a), (b) and so on.
- 5) Chapter (3) with the thesis objectives goes after an extensive literature review. Would it be logically better to introduce the thesis objectives before the literature review, that it can be read with a clear formulation of thesis objectives?
- 6) Please provide equation numbers at the right of the page, not immediately close to an equation.
- 7) Chapter 5 Discussion, title "Improving understanding". Could you please be more specific in the title, understanding of what?
- 8) Chapter 5, Overall View and limitations. Please either use all capital letters in the words or only the first word.
- 9) Conclusions section would also benefit from a more explicit indication of achievements and emphasis on novelty and implications of the results and outcomes for the field.

I think that the issues above do not decrease the scientific quality of the thesis and Sabah Farshad deserves to be awarded with Skoltech PhD degree.

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