

Review of a Doctoral Thesis at FIT BUT

Doctoral thesis (title of the thesis): Modelling and Analysis of Logistics Processes by Applying Process and Data Mining Techniques

Name of the doctoral student (name and surname): Julia Rudnitckaia

Name and institution of the reviewer (full name of the reviewer, full name and country of the institution):

Hao Wang, Norwegian University of Science and Technology

Please state your opinion on the following aspects of (I) the candidate's doctoral thesis and (II) the candidate's overall achievements, and (III) state your conclusion (a minimum of approx. 300 characters for each item? point below is recommended):

I. Doctoral Thesis

Appropriateness and Relevance

Is the area addressed by the thesis appropriate to the particular scientific discipline of the doctoral thesis and does the thesis address relevant problems within the chosen area?

This thesis presents a systematic study on complicated logistics processes and makes valid proposals on techniques for representing, evaluating and predicting the processes and their performances. I think the thesis successfully addresses the problems with valid proposals for solutions.

A summary of the Contributions of the Thesis

From your point of view, please summarize what the goal of the thesis is, what the main contributions of the thesis are, and whether the thesis has achieved the chosen goal.

Please indicate also specific contributions of the doctoral student.

The thesis, and the doctoral student Julia, made solid and novel contributions on process representation and performance evaluation and predictions:

- **The thesis proposes a framework for unstructured and unknown process modelling. The framework helps revealing hidden subprocesses and handling spaghetti process models as well as presenting new perspectives/types of the process;**
- **The thesis proposes a new combined bottleneck detection method for the defined process model using context-aware information to detect weak points;**
- **The thesis proposes predictive models based on machine learning, statistics and process mining technologies.**
- **The study has been built based on a real-world seaport logistics area, which makes the proposals and analysis results more convincing and meaningful for the domain.**

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Novelty and Significance:

Please assess the level of novelty of the results and their significance for the given scientific area, for its further development, and if applicable for possible applications in practice.

Process modelling, mining, and predictive analysis have been very challenging topics for logistics, especially for the maritime seaport area. I think the novelty and results are solid and valuable for practice.

Evaluation of the Formal Aspects of the Thesis:

Please evaluate formal qualities of the doctoral thesis and its language level.

Overall the formal qualities and written English have been in good quality. Reading the thesis has been pleasant. The qualities of several diagrams can be further improved, figures should be composed in vector graphics, and fonts and their sizes in diagrams should be consistent.

Quality of Publications

Has the core of the thesis been published at an appropriate level? Please judge the quantity and quality of the publications. When judging the quality, please take into account internationally recognized standards (WoS/Scopus quartiles, CORE ranks, specific knowledge of flagship publication channels of a given community, etc.) in a way appropriate for the given area of the thesis.

With 1 journal paper and 5 conference papers, I think the core of the thesis has been published at a satisfactory level, according to my understanding and experiences in assessing PhD theses from Norway and France.

II. Candidate's Overall Achievements

Overall R&D Activities Evaluation:

Does the student's doctoral thesis, the results included into it, and possible other scientific achievements listed in the list of scientific activities indicate that he/she is a person with scientific erudition and creative abilities?

Yes, I think Julia is a person with scientific erudition and creative abilities. Also, through her rigorous scientific outreach activities with academic and industrial collaborators, I think she is a highly independent and proactive researcher.

Assessment of Other Candidate Characteristics (optional):

More characteristics of the doctoral student may be added here in a separate paragraph (e.g., awards, grant participation, international collaboration, etc.).

I think the doctoral student has worked quite rigorously in seeking scientific and industrial collaborations to build up her doctoral research.

III. Conclusion

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The conclusion should contain an explicit statement saying whether, in your opinion, the doctoral thesis and the student's achievements until now meet the generally accepted requirements for the award of an academic degree (in accordance with Section 47 of Act No. 111/1998 Coll., on higher education institution).*

In my personal opinion, the doctoral thesis and the doctoral student's achievements until now has met the generally accepted requirements for the award of the PhD degree.

Thesis has successfully addressed its relevant research questions and make solid and novel contributions to complex logistics process modelling, analysis and predictions.

The enclosed publications have also reached satisfactory levels and formed the solid core and foundation for the thesis.

* Short overview of both the Act and corresponding internal BUT regulations is enclosed.

Gjøvik, Norway, 09.05.2023

Place (e.g. Brno) DD.MM.YYYY

Signature of the reviewer: