HABILITATION THESIS REVIEWER'S REPORT

Masaryk University

Applicant	Bruno Rossi, PhD
Habilitation thesis	Experimental Research Towards Software Systems Quality
Reviewer	Paolo Arcaini (associate professor)
Reviewer's home unit, institution	National Institute of Informatics, Tokyo, Japan

Dr. Rossi habilitation thesis provides a comprehensive overview of his works in the last 10 years. Dr. Rossi's work is positioned in the Evidence-Based Software Engineering (EBSE) research field, with works on software development process quality and software product quality. Different works are positioned around the area of smart grids, from anomaly detection to co-simulation.

Overall, the thesis provides a solid contribution in the EBSE research area. All the works are characterized by the rigorous application of EBSE research methods.

A positive aspect of the research of Dr. Rossi is the collaboration with industry, with notable works like [57] and [102].

The research has been published in good SE conferences, such as CSE-SEET, EASE, and MSR; and journals such as Journal of Software: Evolution and Process, IEEE Transactions on Industrial Informatics, and Sustainable Computing: Informatics and Systems.

In the analysed years, Dr. Rossi has constantly published in different venues with different authors.

To conclude, I think that Dr. Rossi deserves the habilitation. The following questions are meant to better clarify his contributions in the last 10 years and to understand his plans for his future position.

Reviewer's questions for the habilitation thesis defence (number of questions up to the reviewer)

Q1. Dr. Rossi has extensively worked on different approaches for smart grids. How much are the proposed approaches specific to that domain? Would it be possible to apply or adapt them

to other domains? If so, which other application domains are a good target for the developed techniques?

Q2. The thesis already provides some future research directions (Sects. 2.1.7 and 3.1.3). However, these seem research directions for the immediate near future. Instead, what are the long-term research plans (e.g., in 10 years)?

Q3. Given the fruitful collaboration with industry (e.g., [57]), does the applicant have plans to further collaborate with companies in the (near) future? Specifically, how does the collaboration with industry is conducted? Are industries approached by Dr. Rossi or the other way round?

Q4. By definition, a habilitation thesis collects papers that span a long period of time. Inevitably, some of conclusions of some papers may be no more valid or would require some new investigation. According to Dr. Rossi, what of his previous studies are still valid and what would require a new investigation? For example, I found the study [87] from 2016 on mutation testing interesting; however, different new developments have been done on mutation testing and evidence from industry has shown its application in practice (e.g., [Beller+, ICSE-SEIP'21], [Petrović+, ICSE-SEIP'18], [Petrović+, ICSE'21]).

Q5. Nowadays, the SE community is conducting different types of studies on using LLMs for different SE tasks. In Dr. Rossi's opinion, what activities of his research could benefit from the application of LLMs (or, at least, for what activities it would make sense to investigate the application of LLMs)? This is already partially mentioned in Sect. 2.1.7, but it would be nice if Dr. Rossi could provide a more general reflection on the application of LLMs in the EBSE community.

Q6. What is the experience of Dr. Rossi in grant proposal and fund acquisition? What are the plans for future grants application (i.e., which type of grant, national or European, which topic, etc.)?

Conclusion

The habilitation thesis entitled Experimental Research Towards Software Systems Quality by Bruno Rossi, PhD **fulfils** requirements expected of a habilitation thesis in the field of Informatics.

Date: Signature:

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