Applicant: Jan Kofroň, Ph.D.

Name of the thesis: Verification of Software

Overview

The general topic of the presented thesis is a quality assurance of software. The topic is very actual. The automated quality assurance of computer systems is a hot research topic related to practical problems. The importance of the topic can be demonstrated on the fact that big companies as, e.g., Microsoft, Intel, Facebook, or IBM has their own research teams working on this problem. Despite the progress in last 20 years, there is still a lot of open questions and unsolved problems.

The presented thesis of Jan Kofroň is a collection of 9 research papers linked together by an introduction part. The papers can be roughly divided into four parts, namely (i) specification of required behavior with special attention to component-based design, (ii) explicit model checking with an attention to partial order reduction, (iii) static analysis of real-live PHP code, and (iv) symbolic representations of program states with a special attention to interpolation techniques.

The introduction part shortly describes importance of the solved problems and links the results presented in next chapters with the related work.

Scientific Results

The 9 papers, which are part of the thesis, can be divided as follows:

- 4 journal papers (2 in journals with IF)

- 4 full conference papers (1 at CORE-A conference, 2 at CORE-B conferences)

- 1 tool paper (CORE-B)

All the venues are relevant to the topic of the thesis. According to the Scopus database, all these papers gain 21 citation (when the self-citations are excluded). In addition, Jan Kofroň co-authored other 17 research papers and all his work gain more then 360 citations. I appreciate that the presented work include both theoretical results on one side and practical results on the other side. Among the practical results, the tool WeVerca manages to automatically find unknown security problems in real-live PHP code.

Other activities

Jan Kofroň was involved in teaching of several courses in topics tightly related to the topic of the thesis. In particular, these courses are related to programming languages, behavior modeling, model checking and static analysis. He lead a number of bachelor and master students and also 3 Ph.D

students. He participated in several research projects as a team member and also as a co-principal investigator. In the last ten years, he was also a member of program committees of a set of conferences and workshop including QoSA conference labeled by CORE-A (in 2013). He was also a co-chair of a set of conferences and workshops including ETAPS'2019, which is a joint event of several CORE-A conferences.

Conclusion

The presented thesis is a solid piece of work with one main topic – quality assurance of software projects. All the parts of the thesis were published on solid venues or solid journals and gain nontrivial impact in terms of citations. Together with other activities, the applicant proved the ability to become an associate professor. Therefore **I recommend to accept the habilitation**.

Brno, 29th May 2019

Adam Rogalewicz