Institute for Programme Structures and Data Organisation
IPD Koziolek

Jun.-Prof. Dr.-Ing. Anne Koziolek

Am Fasanengarten 5, Geb. 50.34
76131 Karlsruhe

Phone: +49 721-608-4-3473
Fax: +49 721-608-4-5990
Email: koziolek@kit.edu
Web: are.ipd.kit.edu

Date: 2018-05-11

KIT Campus South | IPD | Am Fasanengarten 5 | Karlsruhe, Germany

Studijní oddělení-dotorské studium
Univerzita Karlova
Vyřizuje: Ing. D. Rejnušová
Ke Karlovu 3
121 16 Praha 2

Evaluation of Doctoral Thesis by Vojtěch Horký

Dear Professor Kratochvíl,

I gladly provide an evaluation of the doctoral thesis «Performance Awareness in Agile Software Development» by Mgr. Vojtěch Horký. I am familiar with the area of software performance engineering, having published several papers at one of the main international events (ICPE) on the topic myself.

Summary of the thesis

The thesis by Mr Horký is concerned with several challenges of software performance engineering in the context of agile software development and aims at improving the awareness of developers for the performance of their code and systems. Mr Horký addresses three main challenges: (1) how to express and assess performance requirements in an agile development context with fast feedback cycles, (2) how to document performance knowledge about an individual software component so that is becomes accessible to users using that components, and (3) what the limits of precision and overhead of performance monitoring in this context are.

The thesis is composed of introductory sections that describe motivation and background as well as the overall contributions of the thesis, of a collection of three internationally published research papers, and of concluding sections on related work and overall conclusions.

Assessment of contributions

Mr Horký makes three novel scientific contributions to the field, each related to the challenges mentioned above. I see a particularly important contribution in two areas: The assessment of performance requirements (related to challenge (1) above) and the analysis of performance monitoring overhead (related to challenge (3) above).

Regarding the assessment of performance requirements, Mr Horký researched and evaluated a robust regression detection based on interpretation of stochastic performance logic expressions. The research problem is well formulated, creatively solved, and evaluated thoroughly.

Regarding the analysis of performance monitoring overhead, Mr Horký provided an extensive study on the overhead of dynamic instrumentation. Both the presented methodology as well as the determined results can be used by other researchers to further work on automation of performance tests and monitoring in agile development settings.

The scientific value of the three contributions is further supported by the three strong publications of Mr Horký, which are included in the thesis. He published his results in one paper at the Automated Software Engineering conference (ASE) and two papers at the International Conference on Performance Engineering (ICPE). ASE is one of the most highly ranked conference in software engineering. ICPE is one of the main more specific international events on performance engineering. Both conferences have a rigorous peer review process with international referees.

Importance for the area

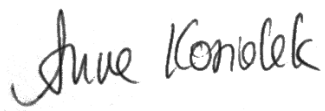
The contributions by Mr Horký address important challenges of performance engineering in one of the most widespread type of software development process, namely agile development. His studies showed that the state of practice with respect to performance testing has deficiencies, for which he suggests convincing solutions. Thus, his work is an important contribution to the area.

Applications to other areas

The results of the thesis open up additional interesting opportunities. Automated performance testing, to which he contributes, is a precondition to further increasing the automation level of modern software development. Additionally, his results could be used to reconcile model-based performance engineering with measurement-based performance engineering. These two strands of research in the performance evaluation community are often seen as contrasting. However, increasing the level of automation, annotating performance requirements and automatically assessing the measurement results can be used as an input top automated performance model building.

Overall, the thesis proves Mr Horký's ability for creative scientific work and I recommend the acceptance of the thesis to obtain the doctoral degree.

Yours sincerely,



Anne Koziolek