



Thesis Advisor Position

Thesis: Performance Awareness in Agile Software Development
Author: Vojtěch Horký
Advisor: Petr Tůma
Submitted: March 2018

In software, performance and functionality are often equally important – a correct function performed late may be as useless as an incorrect function performed fast. Interestingly, it is difficult to reflect this balance in the software development processes – while we have many methods and tools that help build and maintain software functionality in reasonably predictable gradual steps, software performance tends to be more of an emergent property. This is particularly apparent in agile software development, where practices such as lean documentation or test driven development do not have an obvious extension from functionality to performance.

To bridge the gap between functionality and performance, the thesis proposes multiple methods to increase performance awareness during software development. First, it outlines a unit testing framework that evaluates performance requirements expressed through annotations. Next, it extends the annotations to integrate performance measurement results into standard software documentation. And finally, it also examines dynamic instrumentation as a measurement mechanism that can supplement possibly artificial unit test measurements with real world data.

Although the individual contributions of the thesis have merit in their own right, I want to attract attention to the broader picture that the work paints. To increase performance awareness in software development, it is not enough to just come up with ideas, no matter how innovative. It is important to follow through with experiments on actual software projects and to deliver tools that the developers will find attractive. These steps are very time consuming and often not very well aligned with the typical publication pressures in research environments – which is why I find it commendable that in addition to the work presented in the thesis, Vojtěch has also created multiple software prototypes that implement the proposed methods and tested them with real data from real projects. As a measure of success, these activities resulted in a research contract with Oracle Labs, where the very methods Vojtěch proposed are being applied to track performance of the recently released Graal compiler.

To conclude, I believe the work of Vojtěch Horký represents an original contribution to the performance evaluation community, which excels in the careful and honest approach to practical application. I am happy to recommend the thesis for defense.

Petr Tůma

A handwritten signature in blue ink, appearing to read 'Petr Tuma'.