Thesis Advisor Position

Thesis: Instrumentation and Evaluation for Dynamic Program Analysis

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Dynamic program analysis is an important discipline – many essential properties of programs can only be assessed at runtime and dynamic program analysis is a way to do just that. The thesis of Lukáš Marek contributes to two particular aspects of dynamic program analysis – instrumentation, where it helps reduce the effort needed to collect information from the executing program, and evaluation, where it helps reduce the disruption that the analysis introduces to the executing program.

To appreciate the contribution of Lukáš Marek, it is useful to reflect on the differences between theoretical and practical computer science research. In theoretical computer science, it is common to work with simplified models (for example, graphs in place of real data structures in real memory, or abstract machines in place of real languages on real computers) to separate the essential from the incidental. In practical computer science, this is often not possible – the researcher deals not only with the essence of the problem at hand, but also with incidental issues (often of our own making) that complicate the problem and limit the available solutions. Still, this makes the problems no less

worthy of solving.

For this thesis, the abstract problem of dynamic program analysis is complicated by the need to work in the same environment as the practical applications – that is, real virtual machines with their (very) real limitations. I believe Lukáš Marek did an excellent job in tackling many of the incidental issues while not losing track of the conceptual problems associated with program instrumentation and dynamic evaluation. This is also reflected in the publication track, which includes articles at respected conferences such as AOSD (in this research domain, articles at relevant conferences are the dominant form of result dissemination).

I am proud to emphasize that the thesis contributions were achieved within the framework of an international research collaboration with our colleagues at the University of Lugano and elsewhere. All the collaborators, and especially professor Walter Binder from the University of Lugano, deserve credit for their role in the larger research effort that the thesis contributes to. As a participant in the same collaboration, I can also attest that the work of Lukáš Marek forms a significant part of the research outlined in the thesis.

To conclude, I believe Lukáš Marek has made a quality contribution to the dynamic program analysis research. I am honored to recommend that Lukáš Marek be awarded the doctoral degree.

Petr Tůma