

## **A Review of the Ph.D. Thesis of Luděk Dolíhal Entitled "Testing of Generated C Compilers for Processors in Embedded Systems"**

The thesis of Luděk Dolíhal targets automation of the testing process in a specific context of hardware-software co-design. In particular, it concentrates on testing of development tools (compilers, assemblers, simulators, etc.) that are automatically generated from a high-level model of an application-specific processor. Despite the area of testing has been long studied, it still offers a lot of challenges stemming from new approaches to developing computer systems, new technologies used, new requirements laid on the computer systems, and so on. This is reflected in the area considered by Luděk Dolíhal too, and hence the topic considered by him is up-to-date from the viewpoint of the present level of knowledge.

The concrete problems solved by Luděk Dolíhal in his thesis are the following: (1) automation of porting of the C library for a particular processor, (2) selection of tests to be performed over the tools generated for a particular processor, (3) acceleration of the testing process, and (4) automation of the process of deriving jobs for continuous integration. My main problem with the contribution of Luděk Dolíhal in all the mentioned areas is that they seem to be of a rather specialized, engineering nature and lack a broader scientific contribution to the area. Not to be mistaken, by a scientific contribution, I do not mean usage of formal approaches. What I mean is that the thesis should target *principles* rather than narrow, specific engineering problems of one company. Unfortunately, Luděk Dolíhal presents his results in the way that he works for a certain company, he encountered certain problems, and he solved them in a certain way. While this is fine for a diploma thesis, I do not find such an approach sufficient for a Ph.D. thesis—even if multiple such problems are solved.

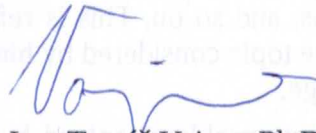
Moreover, I find some of the proposed solutions quite immediate. This is the most extreme for the proposed solution of accelerating the testing process by not continuing in the process if one of its crucial phases fails (which is my understanding of the solution that was proposed in the thesis). Indeed, why would any reasonable testing environment proceed in a different way? Likewise, the proposed system of the  $\times$  files for controlling the selection of the tests to be performed seems to be a rather natural engineering solution. The solutions proposed for automation of the porting of the C library and for automation of the continuous integration are a little more involved, but, in my experience, similar tasks are commonly solved by testing engineers in many companies. Moreover, the description of these solutions in the thesis is not very clear—I doubt they would allow an interested reader to reproduce the results.

The results of the thesis were published in the proceedings of several international conferences and in one journal publication. The number of the publications is more than sufficient for a Ph.D. thesis. However, none of the publication venues seems to be truly competitive.

The thesis is written in English of a reasonable though not perfect level. Moreover, I do not like the fact that the author does not use the author's "we". Likewise the typesetting could be improved (e.g., from the point of view of the last/first lines of a paragraph on a separate page, spaces in front of citations, inappropriate sizes of some of the figures, etc.).

In summary, I do not think that the Ph.D. thesis of Luděk Dolíhal has proved that he is a person with a sufficient research erudition. Hence, unless Luděk Dolíhal manages to defend his results during the defense, explaining mainly where the *scientific* contribution of his results lies, I do not recommend the thesis to be accepted.

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