Re: Jan Kofroň, Doctoral Thesis – Advisor's Reference

The submitted PhD thesis focuses on formal description of behavior of software components and verification their communication compatibility. The work has been done as a contribution to the SOFA/DCUP and Fractal projects, which aim at providing an infrastructure to support hierarchical component applications.

The thesis analyzes the original approach to behavior specification and verification in the SOFA component model (Behavior Protocols), articulates the problem statement (the insufficient expressive power, insufficient performance of the tool used for verification), and proposes solutions addressing the problem.

The thesis starts with a brief introduction of basic concepts related to software components and behavior specification (Chapter 1). In Chapter 2, an overview of the most important component models, languages and tools used for behavior modeling and verification is presented. Chapter 3 proposes a new specification language – Extended Behavior Protocols – addressing the insufficient expressive power of Behavior Protocols, while in Chapter 4, an efficient way of verification of absence of communication errors via translating the proposed specification language into the Promela language is described. Chapter 5 evaluates the benefits of the proposed language in the context of the CoCoME project by comparison with the original Behavior Protocols as well as with some other approaches to behavior specification. Chapter 6 concludes the thesis and proposes directions of future work.

This work has been partially published in the International Journal of Computer and Information Science (published by ACIS), at the FACS 2005 conference (electronic proceedings by Elsevier B.V.), and at the SAC 2007 conference (proceedings published by ACM). Besides conference papers, some of the results have been presented at the Fractal Workshop 2006 (part of the ECOOP 2006 conference). With respect to all these facts, I strongly recommend the thesis for defense and to grant the Doctor degree to Jan Kofroň.

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