

# Rigorous Methods for Software Construction and Analysis

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## Abstract

We survey here the key objectives and the structure of the Dagstuhl Seminar 06191, which was organized as Festkolloquium on the occasion of Egon Börger's 60th birthday, in May 2006 in Schloss Dagstuhl, Germany.

Focusing on applied formal methods, the final seminar program covered a wide range of applied research spanning from theoretical and methodological foundations to practical applications of Abstract State Machines, B, and beyond, emphasizing universal methods and tools that, regardless of their application orientation, are still committed to the ideal of mathematical rigor.

Two overarching themes were the persistent demand to

- foster further cross-fertilization between academic research and industrial development in the quest for innovative methods and tools to critically evaluate their potential in the light of new challenges as posed by new technological developments and paradigms in software engineering, and the ever-present question of
- convergence of methods, clarifying their commonalities and differences to better understand how to combine related approaches for accomplishing the various tasks in modeling, simulation, and verification of complex hardware/software systems.

In total, 54 participants from 14 different countries and four different continents attended the seminar. In 12 sessions, comprising a total of 35 presentations, 34 technical ones and one about fellowships and awards of the Alexander von Humboldt Foundation, the following central topics, among other topics, were addressed:

- Methodological foundations of requirements specification and verification

- Characterization of specification languages and their logical foundations
- Advanced tool environments and systematic integration of tools
- Machine assisted validation and verification
- Distributed algorithms and concurrent protocols
- Novel applications in public safety, security and privacy
- Industrial case studies and experience reports
- The role of formal methods in computer science education

The technical talks were either 30, 45 or 60 minutes and often resulted in lively and fruitful discussions which were continued informally during the breaks. After-dinner sessions were the norm, even on Wednesday after returning from an afternoon excursion to the charming historic town of Trier.

Overall the program was fairly balanced. Roughly,

- one third of the talks were related to Abstract State Machines,
- one third of the talks were related to B, and
- one third to other formal methods and software engineering contexts.

Rather than a strict grouping of talks according to research communities, technical content, and other standard criteria, the organizers have deliberately chosen a mixed program with the intention to stimulate interactions across research communities and also between industry and academia. This strategy turned out to be successful, as was evident from the impressive attendance of basically all the sessions with only very few exceptions.

Over the course of the seminar, a number of spontaneous requests for additional talks were brought forward. While not all of them could be accommodated due to given schedule restrictions, such dynamics provided further evidence for the inspiring and open atmosphere that also helped forge new collaborations. Notably, there has been a concrete proposal for organizing a joint working conference on ASM, B and Z in London in 2008.

Last not least, the tremendous hospitality of Schloss Dagstuhl made the participants feel comfortable and helped creating a pleasant atmosphere that allowed to fully concentrate on research contributions for more than twelve hours a day. The organizers would like to express their sincere appreciation for all the support and specifically thank the terrific Dagstuhl staff for their role in making this seminar so successful.

For the dissemination of results, revised and refereed versions of major contributions to the seminar will be collected over the Summer 2006. Springer-Verlag kindly agreed to publish the proceedings as LNCS Festschrift.