Lecture Notes in Computer Science   5719

Commenced Publication in 1973
Founding and Former Series Editors:
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SDL 2009:
Design for
Motes and Mobiles

14th International SDL Forum
Bochum, Germany, September 22-24, 2009
Proceedings

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Preface

This volume contains the papers presented at the 14th SDL Forum, Bochum, Germany entitled *Design for Motes and Mobiles*. The SDL Forum has been held every two years for the last three decades and is one of the most important open events in the calendar for anyone from academia or industry involved in System Design Languages and modelling technologies. It is a primary conference event for discussion of the evolution and use of these languages. The most recent innovations, trends, experiences, and concerns in the field are discussed and presented. The SDL Forum series addresses issues related to the modelling and analysis of reactive systems, distributed systems, and real-time and complex systems such as telecommunications, automotive, and aerospace applications. The intended audience of the series includes users of modelling techniques in industrial, research, and standardization contexts, as well as tool vendors and language researchers.

Of course, during the last three decades languages, associated methods, and tools have evolved and new ones have been developed. The application domain has changed almost beyond recognition. Three decades ago the mobile technology of today was science fiction, whereas now we find software systems embedded in inexpensive childrens' toys. More recently multi-core processors have become common technology for consumer computers, and are beginning to be applied in small devices. Even in small co-operating, independently powered remote devices (such as motes and mobile phones), there is enough memory and processing power to support quite sophisticated operating systems and applications. No longer do these need to be hand-coded in a machine-level language, and it is cost effective to apply the languages, tools, and methods that previously applied to systems for telephony routing or automated manufacture.

Many programming language support systems assume a single processor, or that distribution of processes over processors is handled by the operating system. System Design Languages such as the Unified Modeling Language or ITU-T Specification and Description Language allow engineers to defer the distribution until later in product engineering, and also to defer whether the distributed components of systems are loosely (or tightly) coupled. However, these issues still need to be tackled, and therefore a focus of SDL 2009 was on multi-processor and multi-core issues. The concern is what impact does development for this kind of system have on the model-driven approach, engineering languages, and operating system support. Papers in this volume address such issues or applications that use motes.

Based on experience with the previous SDL Forum, it was decided to not only call for papers based on well-advanced or established work, but also to invite short papers describing work-in-progress. One submitted paper that appears in this volume is very clearly in the category: "Towards Model-Based Development

of Managed Networked Embedded Systems." This work is at an early stage, but the topic is certainly an important one, as we can anticipate further development of MDD and increasing numbers of networked embedded systems with individual components that are even more powerful. The method for developing the management system is the focus of this work. It will be interesting to see the results.

Another paper applies aspect orientation to the User Requirements Notation (URN). This language has only recently reached the status of a standard, and illustrates that it is not just the applications that are changing in nature over the years: URN has extended the range of formal languages to the requirements area, and the proposal to add aspect orientation shows that it is a *living language* that is evolving to user needs. In a few years' time URN, supporting tools, and use of the language will have evolved. In that case URN may be considered the natural way to design products with state-based models being thought of as intermediate languages, in the same way that currently the ITU-T Specification and Description Language is considered as the design with transcompilation into C. All that we can really predict is that after another decade, at the 19th SDL Forum, it is likely that system design will be at a higher level, with more advanced languages, methods, and tools.

Thanks

As always, the event and this volume would not exist without the contributions of authors, who are thanked for their work.

The Programme Committee and Anders Olsen (Cinderella, Denmark) were reviewers of the papers, and are thanked for their work selecting the papers and the programme.

The organization of SDL 2009 was assisted by sponsorship and support from:

- IBM Rational
- Forschungsschwerpunkt "Ambient Systems"
- International Telecommunication Union

July 2009

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SDL Forum Society

The SDL Forum Society is a not-for-profit organization that in addition to running the SDL Forum series of events:

- Has usually run[1] the SAM (System Analysis and Modeling) workshop every two years between SDL Forum years.
- Is a body recognized by ITU-T as co-developing the Z.100 to Z.109 and Z.120 to Z.129 and other language standards.
- Promotes the ITU-T System Design Languages.

For more information on the SDL Forum Society, see `www.sdl-forum.org`.

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[1] In 2008 there was no SAM workshop, but instead a one-day workshop on System Design Languages was held in collaboration with ITU-T at ITU-T in Geneva.

Organization

Each SDL Forum is organized by the SDL Forum Society with the help of local organizers. The Organizing Committee consists of the Board of the SDL Forum Society plus the local organizers and others as needed depending on the actual event. For SDL 2009 the local organizers from Ruhr-Universität Bochum and hosting sponsor IBM Rational need to be thanked for their effort to ensure that everything was in place for the presentation of the papers in this volume.

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