

Preface

This LNCS volume contains the selected papers together with invited papers and tutorials presented at the 11th International Workshop on Rewriting Logic and Its Applications (WRLA 2016), held during April 2–3, 2016, in Eindhoven, The Netherlands.

Rewriting is a natural model of computation and an expressive semantic framework for concurrency, parallelism, communication, and interaction. It can be used for specifying a wide range of systems and languages in various application domains. It also has good properties as a metalogical framework for representing logics. Several successful languages based on rewriting (ASF+SDF, CafeOBJ, ELAN, Maude) have been designed and implemented. The aim of WRLA is to bring together researchers with a common interest in rewriting and its applications, and to give them the opportunity to present their recent work, discuss future research directions, and exchange ideas. WRLA 2016 was a special edition by marking its 20th anniversary since the first edition was held in Asilomar, California, in 1996.

The topics of the workshop include, but are not limited to:

A. Foundations

- Foundations and models of rewriting and rewriting logic, including termination, confluence, coherence and complexity
- Unification, generalisation, narrowing, and partial evaluation
- Constrained rewriting and symbolic algebra
- Graph rewriting
- Tree automata
- Rewriting strategies
- Rewriting-based calculi and explicit substitutions

B. Rewriting as a Logical and Semantic Framework

- Uses of rewriting and rewriting logic as a logical framework, including deduction modulo
- Uses of rewriting as a semantic framework for programming language semantics
- Rewriting semantics of concurrency models, distributed systems, and network protocols
- Rewriting semantics of real-time, hybrid, and probabilistic systems
- Uses of rewriting for compilation and language transformation

C. Rewriting Languages

- Rewriting-based declarative languages
- Type systems for rewriting

- Implementation techniques
- Tools supporting rewriting languages

D. Verification Techniques

- Verification of confluence, termination, coherence, sufficient completeness, and related properties
- Temporal, modal, and reachability logics for verifying dynamic properties of rewrite theories
- Explicit-state and symbolic model-checking techniques for verification of rewrite theories
- Rewriting-based theorem proving, including (co)inductive theorem proving
- Rewriting-based constraint solving and satisfiability
- Rewriting-semantics-based verification and analysis of programs

E. Applications

- Applications to logic, mathematics, and physics
- Rewriting models of biology, chemistry, and membrane systems
- Security specification and verification
- Applications to distributed, network, mobile, and cloud computing
- Specification and verification of real-time, probabilistic, and cyber-physical systems
- Specifications and verification of critical systems
- Applications to model-based software engineering
- Applications to engineering and planning

Following the tradition of the last editions, WRLA 2016 was a satellite event of ETAPS 2016. The workshop programme included the accepted regular papers, two invited talks, and three tutorials. The regular papers were reviewed by at least three reviewers and intensively discussed in the electronic meeting of the Program Committee (PC) members. We sincerely thank all the authors of papers submitted to WRLA 2016; we were really pleased by the quality of the submissions.

These proceedings include the revised versions of the contributions accepted as regular papers, one invited paper, one invited tutorial, and the abstracts of the other invited talks and tutorials. We warmly thank the invited speakers – Hélène Kirchner and Nikolaj Björner – and the authors of tutorials – Carolyn Talcott, Salvador Lucas, and Grigore Roşu – for kindly accepting to contribute to WRLA 2016.

We would like to thank the members of the PC and all the referees for their excellent work in the review and selection process. All of this was possible also thanks to the valuable and detailed reports provided by the reviewers. We benefited from the invaluable assistance of the EasyChair system through all the phases of submission, evaluation, and production of the proceedings.

Last but not least, we would also like to thank the ETAPS 2016 Tutorials and Workshops organizers, led by Erik de Vink, for their efficient coordination of and assistance with all the activities leading to WRLA 2016.

Rewriting Logic and Its Applications

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