Proceedings of the

13th International Workshop on Confluence

July 9, 2024

Tallinn, Estonia

Foreword

The 13th International Workshop on Con uence (IWC 2024) is held on July 9, 2024, in Tallinn, Estonia, a liated with the 9th International Conference on Formal Structures for Computation and Deduction (FSCD 2024).

Con uence, as a general notion of determinism, is an essential property of rewrite systems and has emerged as a crucial concept for many applications. However, the con uence property is also relevant to various further areas of rewriting, such as completion, commutation, termination, modularity, and complexity. The International Workshop on Con uence was created as a forum to discuss all these aspects, as well as related topics, implementation issues, and new applications.

IWC 2024 continues this tradition. The present report comprises nine regular submissions and the abstract of an invited talk, as well as descriptions of tools participating in the 13th Con uence Competition (CoCo 2024). In the invited talk, Aart Middeldorp highlights con uence of Logically Constrained Term Rewrite Systems, which has been attracting attention recently, and for which a new category of CoCo has started this year. The contributions in these proceedings re ect the wide scope of current research on con uence, ranging from new con uence criteria and novel con uence-related properties over formalization of con uence results to implementation aspects and applications. At the same time, the spectrum of rewrite formalisms (rst- as well as higher-order, conditional rewriting, rewriting under strategies) used to model problems from di erent application areas underlines the importance of con uence for various domains.

The renewed interest in con uence research in the last decade resulted in a variety of novel approaches, which were also implemented in powerful tools that compete in the annual con uence competition. The second part of this report devoted to CoCo 2024 provides a general overview as well as system descriptions of all competition entrants.

IWC 2024 was made possible by the commitment of many people who contributed to the submissions, the preparation and the program of the workshop, as well as the con uence competition. These include authors of papers and tools, committee members, external reviewers, and the organizers of CoCo, the organizers of FSCD, as well as the local organizers. Their hard work is very much appreciated.

Cyrille Chenavier and Naoki Nishida — Limoges and Nagoya, 26 June 2024

Organization

IWC Steering Committee

- Mauricio Ayala-Rincon, Brasilia University, Brasil
- Sarah Winkler, Free University of Bozen-Bolzano, Italy

IWC Program Committee

- Sandra Alves, Universidade do Porto, Portugal
- Cyrille Chenavier, Universite de Limoges, France (co-chair)
- Nao Hirokawa, JAIST, Japan
- Dohan Kim, University of Innsbruck, Austria
- Maja Hanne Kirkeby, Roskilde University, Denmark
- Salvador Lucas, Universitat Politecnica de Valencia, Spain
- Naoki Nishida, Nagoya University, Japan (co-chair)
- Femke van Raamsdonk, Vrije Universiteit Amsterdam, Netherlands

Additional Reviewers

- Jörg Endrullis, Vrije Universiteit Amsterdam, Netherlands
- Jan Willem Klop, Vrije Universiteit Amsterdam, Netherlands
- Johannes Niederhauser, University of Innsbruck, Austria
- Rene Thiemann, University of Innsbruck, Austria

CoCo Steering Committee

- Raul Gutierrez, Universidad Politecnica de Madrid, Spain
- Aart Middeldorp, University of Innsbruck, Austria
- Naoki Nishida, Nagoya University, Japan
- Teppei Saito, JAIST, Japan
- Rene Thiemann, University of Innsbruck, Austria

Contents

[2] M. Kojima and N. Nishida. Reducing non-occurrence of specified runtime errors to all-path reachability problems of constrained rewriting. Journal of Logical and Algebraic Methods in Programming, 135:1–19, 2023.

[3] C. Kop. Termination of LCTRSs. In Proceedings of the 13th International Workshop on Termination, pages 1–5, 2013.

[4] C. Kop and N. Nishida. Term rewriting with logical constraints. In P. Fontaine, C. Ringeissen, and R. A. Schmidt, editors, Proceedings of the 9th International Symposium on Frontiers of Combining Systems, volume 8152 of Lecture Notes in Artificial Intelligence, pages 343–358, Springer, 2013.

[5] A. Matsumi, N. Nishida, M. Kojima, and D. Shin. On singleton self-loop removal for termination of LCTRSs with bit-vector arithmetic. In A. Yamada, editor, Proceedings of the 19th International Workshop on Termination, pages 1–6, 2023.

[6] J. Schöpf and A. Middeldorp. Confluence criteria for logically constrained rewrite systems. In B. Pientka and C. Tinelli, editors, Proceedings of the 29th International Conference on Automated Deduction, volume 14132 of Lecture Notes in Computer Science, pages 474–490, Springer, 2023.