

CoCo 2020 Participant: FORT-h 0.9*

Fabian Mitterwallner, Aart Middeldorp, and Bertram Felgenhauer

Department of Computer Science, University of Innsbruck, Austria
fabian.mitterwallner@uibk.ac.at, aart.middeldorp@uibk.ac.at, int-e@gmx.de

The first-order theory of rewriting is a decidable theory for finite left-linear right-ground rewrite systems. The decision procedure goes back to Dauchet and Tison [1] and is implemented in FORT [3,4]. In this theory confluence-related properties on ground terms are easily expressible.

FORT-h implements a new variant, described in [2], of the decision procedure for the larger class of linear variable-separated rewrite systems. This variant supports a more expressive theory and is based on anchored ground tree transducers. FORT-h 0.9 is implemented in Haskell. A command-line version of the tool can be downloaded from

<http://cl-informatik.uibk.ac.at/software/FORT/>

FORT-h participates in the following CoCo 2020 categories: COM, GCR, NFP, UNC, and UNR. A future release of FORT-h will produce certificates for the YES/NO answers that will be checked by an independent certifier based on the Isabelle/HOL formalization described in [2].

References

- [1] M. Dauchet and S. Tison. The Theory of Ground Rewrite Systems is Decidable. In *Proc. 5th IEEE Symposium on Logic in Computer Science*, pages 242–248, 1990. doi: [10.1109/LICS.1990.113750](https://doi.org/10.1109/LICS.1990.113750).
- [2] B. Felgenhauer, A. Lochmann, A. Middeldorp, and F. Mitterwallner. Formalizing the First-Order Theory of Rewriting. Submitted for publication, 2020.
- [3] F. Rapp and A. Middeldorp. Automating the First-Order Theory of Left-Linear Right-Ground Term Rewrite Systems. In *Proc. 1st International Conference on Formal Structures for Computation and Deduction*, volume 52 of *Leibniz International Proceedings in Informatics*, pages 36:1–36:12, 2016. doi: [10.4230/LIPIcs.FSCD.2016.36](https://doi.org/10.4230/LIPIcs.FSCD.2016.36).
- [4] F. Rapp and A. Middeldorp. FORT 2.0. In *Proc. 9th International Joint Conference on Automated Reasoning*, volume 10900 of *LNCS (LNAI)*, pages 81–88, 2018. doi: [10.1007/978-3-319-94205-6_6](https://doi.org/10.1007/978-3-319-94205-6_6).

*Supported by FWF (Austrian Science Fund) project P30301.