# CoCo 2017 Participant: FORT 1.0*

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FORT is a decision and synthesis tool for the first-order theory of rewriting for finite left-linear right-ground rewrite systems. It implements the decision procedure for this theory, which uses tree automata techniques and goes back to Dauchet and Tison [1]. In this theory confluence-related properties on ground terms are easily expressible. The basic functionality of FORT is described in [2] and in [3] we report on an extension to deal with non-ground terms.

FORT 1.0 was implemented 2016 in Java, for which the JAR file can be downloaded from

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

The tool participates in the categories UNC, NFP, UNR and GCR at CoCo 2017. The latter is about ground-confluence of *many-sorted* rewrite systems. Since the set of well-typed terms according to a many-sorted type discipline is accepted by a tree automaton, the modifications required in FORT were straightforward.

The most significant change in FORT 1.0 is the support for parallelism, using the multi-threading capabilities of Java. This greatly speeds up the synthesis of rewrite systems satisfying certain properties expressible in the first-order theory of rewriting. Furthermore, we exploit this functionality for deciding properties.

## 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.

[2] 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.

[3] F. Rapp and A. Middeldorp. Confluence properties on open terms in the first-order theory of rewriting. In *Proc. 5th International Workshop on Confluence*, pages 26–30, 2016.