CoCo 2023 Participant: FORTify 2.0

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The first-order theory of rewriting is a decidable theory for linear variable-separated rewrite systems. The decision procedure goes back to Dauchet and Tison [1]. In this theory confluence-related properties on ground terms are easily expressible. An extension of the theory to multiple rewrite systems, as well as the decision procedure, has been formalized in Isabelle/HOL [2–4]. The code generation facilities of Isabelle then give rise to the certifier FORTify which checks certificate constructed by FORT-h [6]. FORTify takes as input an answer (YES/NO), a formula, a list of TRSs, and a certificate proving that the formula holds (does not hold) for the given TRSs. It then checks the integrity and validity of the certificate. A command-line version of the tool can be downloaded from

https://fortissimo.uibk.ac.at/fort(ify)/

We refer to the recent article [5] for a detailed description of FORTify.

This year FORTify participates, together with FORT-h, in the following CoCo 2023 categories: COM, GCR, NFP, TRS, UNC, and UNR.

References

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[3] Alexander Lochmann and Bertram Felgenhauer. First-Order Theory of Rewriting. *Archive of Formal Proofs*, 2022. https://isa-afp.org/entries/FO_Theory_Rewriting.html, Formal proof development.

[4] Alexander Lochmann, Bertram Felgenhauer, Christian Sternagel, René Thiemann, and Thomas Sternagel. Regular Tree Relations. *Archive of Formal Proofs*, 2021. https://www.isa-afp.org/entries/Regular_Tree_Relations.html, Formal proof development.

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[6] Fabian Mitterwallner and Aart Middeldorp. CoCo 2023 Participant: FORT-h 2.0. In *Proc. 12th International Workshop on Confluence*, 2023. This volume.