

# CONFident at the 2022 Confluence Competition\*

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## 1 Overview

CONFident is a tool for proving and disproving confluence of variants of rewrite systems: *term rewriting systems*, *conditional term rewriting systems* (using *join*, *oriented*, or *semi-equational* semantics [1]), and *context-sensitive (conditional) term rewriting systems* [5].

We use a unified logic-based approach and an extended notion of *conditional pair* [3] to homogeneously treat all aforementioned systems, see also [4].

We use a proof framework to generate proof trees by combining different techniques for proving confluence, including modular decompositions, checking joinability of (conditional) critical pairs, transformations, etc. [2].

We also use external tools for proving termination and operational termination (MU-TERM, <http://zenon.dsic.upv.es/muterm/>), feasibility (infChecker, <http://zenon.dsic.upv.es/infChecker/>), and deducibility (Prover9, <https://www.cs.unm.edu/~mccune/prover9/> and FORT, <http://cl-informatik.uibk.ac.at/software/FORT/>).

The tool is available here:

<http://zenon.dsic.upv.es/confident/>

## References

- [1] Raúl Gutiérrez, Salvador Lucas, and Miguel Vítóres. Confluence of Conditional Rewriting in Logic Form. In *Proc. of FSTTCS 2021*, LIPIcs 213:44:1–44:18, 2021.
- [2] Raúl Gutiérrez, Miguel Vítóres, and Salvador Lucas. Proving Confluence with CONFident. In *Proc. of LOPSTR 2022*, LNCS to appear, 2022.
- [3] Salvador Lucas. Local Confluence of (Context-Sensitive) Conditional Rewriting, *submitted*, 2022.
- [4] Salvador Lucas. On local confluence of conditional rewrite systems. In *Proc. of IWC 2022*, pages 7-12, 2022.
- [5] Salvador Lucas, Miguel Vítóres, and Raúl Gutiérrez. Proving and disproving confluence of context-sensitive rewriting. *Journal of Logical and Algebraic Methods in Programming*, 126, 100749, 2022.

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