CONFident at the 2024 Confluence Competition*

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1 Overview

CONFident 2.0 is a tool which is able to prove confluence of TRSs, CS-TRSs, CTRSs and CS-CTRSs. The tool is available here:

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

It is written in Haskell implementing the Confluence Framework:

- we consider two types of problems: *confluence problems* and *joinability problems*. Confluence problems encapsulate the different variants of rewrite systems. Joinability problems encapsulate any possible type of critical pair generated by rewrite systems.
- processors are partial functions that are applied to problems. Our processors encapsulate techniques for simplification, modular decomposition, problem transformation and direct confluence/joinability checks.

We implement these processors using the logical approach presented in [1, 3, 7] and mechanizing them by external tools like MU-TERM [3], infChecker [1], AGES [2], Prover9 and Mace4 [9] and Barcelogic[1].

Although CONFident 2.0 is the same as last year's, there were results submitted to conferences or journals before this publication and accepted afterwards. Latest description of the tool can be found now in [4]. Furthermore, a newly documented technique based on the notion of V-orthogonality is presented in [6]. V-orthogonal Generalized Term Rewriting Systems are confluent. For V-orthogonality, the usual left-linearity requirement for rules is relaxed. However, besides the absence of proper conditional critical pairs, the infeasibility of the conditional variable pairs introduced by conditional rules is also required.

References

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