CoCo 2016 Participant: ConCon*

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ConCon is a fully automatic confluence checker for *oriented* first-order conditional term rewrite systems (CTRSs). The tool implements three known confluence criteria:

(A) A quasi-decreasing strongly irreducible deterministic 3-CTRS $\mathcal{R}$ is confluent if and only if all critical pairs are joinable [1].

(B) Almost orthogonal extended properly oriented right-stable 3-CTRSs are confluent [6].

(C) A weakly left-linear deterministic CTRS $\mathcal{R}$ is confluent if $\mathbb{U}(\mathcal{R})$ is confluent [2].

We refer to [4] for a more detailed description of the above results. ConCon is written in Scala 2.11 and available under the LGPL license. It can be downloaded from:

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

A web interface can also be found there. For some of the methods ConCon issues calls to the external unconditional confluence and termination checkers CSI and T$_{\text{T}}$T$_2$ as well as the theorem prover Waldmeister.

To make criteria (A) and (B) more useful, we implemented a variety of methods to check for infeasibility of conditional critical pairs, ranging from a simple technique based on the tcap function, via tree automata completion, to equational reasoning. These are described in [5]. ConCon can generate certifiable output for method (C),[1] which is made possible due the formalization efforts described in [7] as well as certifiable output for method (B) along with most of the infeasibility methods due to the formalization described in [3]. We are currently working on certifiable output for method (A).

References

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