CoCo 2014 Participant: ConCon*

Thomas Sternagel and Aart Middeldorp

Institute of Computer Science, University of Innsbruck, Austria

{thomas.sternagel, aart.middeldorp}@uibk.ac.at

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 of $\mathcal{R}$ are joinable [1].

(B) Almost orthogonal properly oriented right-stable 3-CTRSs are confluent [5].

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

A simple technique based on the tcap function is used to check for infeasibility of conditional critical pairs, making criteria (A) and (B) more useful.

We refer to [4] for a more detailed description of the above results. ConCon is written in Scala 2.10 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 $\mathsf{T_TT_2}$.

In addition to the techniques described in [4], ConCon employs a new sufficient condition for infeasibility of conditional critical pairs based on tree automata [3, Definition 10] as well as very simple techniques to detect non-confluence.

Future extensions will include support for *join* and *semi-equational* CTRSs.

References

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