CoCo 2018 Participant: CSIˆho 0.3.2*

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CSIˆho is a tool for automatically proving confluence of higher-order rewrite systems, specifically pattern rewrite systems (PRSs) as introduced by Nipkow [3, 7]. CSIˆho focuses on patterns in order to ensure decidability of unification for computing critical pairs. To this end CSIˆho implements a version of Nipkow's algorithm for higher-order pattern unification [8]. CSIˆho is an extension of CSI, a powerful confluence prover for first-order term rewrite systems. The tool and a web interface are available at

http://cl-informatik.uibk.ac.at/software/csi/ho

Below we briefly describe the criteria implemented by CSIˆho, a more detailed description of both CSIˆho and CSI can be found in [5, 6].

For terminating PRSs CSIˆho decides confluence by checking joinability of critical pairs [7]. As termination criteria CSIˆho implements a basic higher-order recursive path ordering and static dependency pairs with dependency graph decomposition and the subterm criterion. Alternatively, one can also use an external termination tool like WANDA [2] as an oracle. For potentially non-terminating systems CSIˆho supports weak orthogonality [10] and van Oostrom's result on development closed critical pairs [9]. As a divide-and-conquer technique CSIˆho implements modularity, i.e., decomposing a PRS into parts with disjoint signatures, for left-linear PRSs—note that confluence of PRSs is not modular in general [1]. Moreover CSIˆho uses the simple technique of adding and removing redundant rules [4], adapted for PRSs. New in version 0.3.2 is improved support for showing non-confluence.

References

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