CoCo 2018 Participant: **CSI\textasciitilde ho 0.3.2**

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\texttt{CSI\textasciitilde ho} is a tool for automatically proving confluence of higher-order rewrite systems, specifically pattern rewrite systems (PRSs) as introduced by Nipkow \cite{N91, M03}. \texttt{CSI\textasciitilde ho} focuses on patterns in order to ensure decidability of unification for computing critical pairs. To this end \texttt{CSI\textasciitilde ho} implements a version of Nipkow’s algorithm for higher-order pattern unification \cite{N93}. \texttt{CSI\textasciitilde ho} is an extension of \texttt{CSI}, a powerful confluence prover for first-order term rewrite systems. The tool and a web interface are available at

\url{http://cl-informatik.uibk.ac.at/software/csi/ho}

Below we briefly describe the criteria implemented by \texttt{CSI\textasciitilde ho}, a more detailed description of both \texttt{CSI\textasciitilde ho} and \texttt{CSI} can be found in \cite{N17, NM17}.

For terminating PRSs \texttt{CSI\textasciitilde ho} decides confluence by checking joinability of critical pairs \cite{N91}. As termination criteria \texttt{CSI\textasciitilde ho} 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 \cite{K12} as an oracle. For potentially non-terminating systems \texttt{CSI\textasciitilde ho} supports weak orthogonality \cite{vO94} and van Oostrom’s result on development closed critical pairs \cite{vO97}. As a divide-and-conquer technique \texttt{CSI\textasciitilde ho} 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 \cite{AS10}. Moreover \texttt{CSI\textasciitilde ho} uses the simple technique of adding and removing redundant rules \cite{NFM15}, adapted for PRSs. New in version 0.3.2 is improved support for showing non-confluence.

\begin{thebibliography}{10}
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