CSI'ho is a tool for automatically (dis)proving confluence of higher-order rewrite systems, specifically pattern rewrite systems (PRSs) as introduced by Nipkow [3, 7]. CSI'ho focuses on patterns in order to ensure decidability of unification for computing critical pairs. To this end CSI'ho implements a version of Nipkow’s algorithm for higher-order pattern unification [8]. 

CSI'ho is an extension of CSI, a confluence prover for first-order rewrite systems. The tool is available at

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

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

For terminating PRSs CSI'ho decides confluence by checking joinability of critical pairs [7]. As termination criteria CSI'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 [2] as an oracle. For potentially non-terminating systems CSI'ho supports weak orthogonality [10] and van Oostrom’s result on development closed critical pairs [9]. As a divide-and-conquer technique CSI'ho implements modularity for left-linear PRSs—note that confluence of PRSs is not modular in general [1]. Moreover CSI'ho uses the simple technique of adding and removing redundant rules [4], adapted for PRSs.

No new features were added to CSI'ho since CoCo 2018. It ran unopposed in the HRS category of CoCo 2019.

References