CoLL-Saigawa: A Joint Confluence Tool*

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CoLL-Saigawa is a tool for automatically proving or disproving confluence of (ordinary) term rewrite systems (TRSs). The tool, written in OCaml, is freely available from:

http://www.jaist.ac.jp/project/saigawa/

The typical usage is: `collsaigawa <file>`. Here the input file is written in the standard WST format. The tool outputs `YES` if confluence of the input TRS is proved, `NO` if non-confluence is shown, and `MAYBE` if the tool does not reach any conclusion.

CoLL-Saigawa is a joint confluence tool of CoLL v1.1 [8] and Saigawa v1.8 [4]. If an input TRS is left-linear, CoLL proves confluence. Otherwise, Saigawa analyzes confluence. CoLL is a confluence tool specialized for left-linear TRSs. It proves confluence by using Hindley's commutation theorem [3] together with the three commutation criteria: Development closeness [2, 9], rule labeling with weight function [10, 1], and Church-Rosser modulo A/C [6]. Saigawa can deal with non-left-linear TRSs. The tool employs the four confluence criteria: The criteria based on critical pair systems [5, Theorem 3] and on extended critical pairs [7, Theorem 2], rule labeling [10], and Church-Rosser modulo AC [6]. Saigawa uses $\mathsf{T_TT_2}$ and MU-TERM to check (relative) termination.[1] A suitable rule labeling is searched by using MiniSmt.[2]

This version of CoLL-Saigawa is still at the experimental stage. Full integration of the two tools is planned for the next version.

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*Partly supported by JSPS KAKENHI Grant Number 17K00011 and the JSPS Core-to-Core Program.

[1] http://colo6-c703.uibk.ac.at/ttt2/ and http://zenon.dsic.upv.es/muterm/

[2] http://cl-informatik.uibk.ac.at/software/minismt/