

CoLL 1.6.1: A Commutation Tool

Kiraku Shintani

JAIST, Japan
s1820017@jaist.ac.jp

CoLL (version 1.6.1) is a tool for automatically proving commutation of left-linear term rewrite systems (TRSs). The tool, written in OCaml, is freely available at:

<http://www.jaist.ac.jp/project/saigawa/coll/>

The typical usage is: `coll <file>`. Here the input file is written in the commutation problem format [4]. The tool outputs YES if commutation of the input TRSs is proved, NO if non-commutation is shown, and MAYBE if the tool does not reach any conclusion.

In this tool commutation of left-linear TRSs is shown by *Hindley's Commutation Theorem*:

Theorem 1 ([2, 7]). *ARSs $\mathcal{A} = \langle A, \{\rightarrow_\alpha\}_{\alpha \in I} \rangle$ and $\mathcal{B} = \langle A, \{\rightarrow_\beta\}_{\beta \in J} \rangle$ commute if \rightarrow_α and \rightarrow_β commute for all $\alpha \in I$ and $\beta \in J$.*

Here indexes are interpreted as subsystems of the input TRSs. For every pair of subsystems CoLL proves its commutation property, employing the following criteria: simultaneous closedness [5], parallel closedness [9], parallel upside closedness and outside closedness [6], rule labeling with weight function [10, 1], and Church–Rosser modulo A/C [3]. A detailed description of CoLL can be found in [8].

References

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