

# CO3 (Version 1.3)

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CO3, a converter for proving confluence of conditional TRSs, is a tool for proving confluence of conditional term rewriting systems (CTRS) by using a transformational approach. The tool is based on the result in [6, 1, 4]: the tool first transforms a given *weakly-left-linear (WLL) and ultra-WLL 3-DCTRS* into an unconditional term rewriting system (TRS) by using the *SR transformation*  $\mathbb{S}\mathbb{R}$  [8, 9, 3] or the *unraveling*  $\mathbb{U}$  [2, 7], and then verify confluence of the transformed TRS. This tool is basically a converter of CTRSs to TRSs. The main expected use of this tool is the collaboration with other tools for proving confluence of TRSs, and thus this tool has very simple and lightweight functions to verify properties such as confluence and termination of TRSs. The tool is available from <http://www.trs.cm.is.nagoya-u.ac.jp/co3/>.

The main technique for proving confluence of CTRSs is based on the following theorem: a weakly left-linear normal 1-CTRS  $\mathcal{R}$  is confluent if one of  $\mathbb{S}\mathbb{R}(\mathcal{R})$  and  $\mathbb{U}(\mathcal{R})$  is confluent [6]. The other important features can be seen in a system description of the previous version [5].

The new feature is to adapt the main technique to WLL and ultra-WLL 3-DCTRSs. More precisely, the implementation of the SR transformation and the unraveling are adapted to 3-DCTRSs [3, 1], and the following theorems are introduced: a WLL 3-DCTRS  $\mathcal{R}$  is confluent if  $\mathbb{U}(\mathcal{R})$  is confluent [1]; a WLL and ultra-WLL 3-DCTRS  $\mathcal{R}$  is confluent if  $\mathbb{S}\mathbb{R}(\mathcal{R})$  is confluent [4].

## References

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