

# CoCo 2019 Participant: CSI 1.2.3\*

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CSI is a strong automatic tool for (dis)proving confluence of first-order term rewrite systems (TRSs). It has been in development since 2010. Its name is derived from the Confluence of the rivers Sill and Inn in Innsbruck. The tool is available from

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

under a LGPLv3 license. A detailed description of CSI can be found in [2]. Compared to last year's version, CSI 1.2.3 contains an implementation of the (inefficient) decision procedure for UNC of shallow rewrite systems by Radcliffe, Moraes and Verma [3]. In addition, CSI 1.2.3 contains an implementation of right-reducibility (no right-hand side of a rewrite rule is a normal form) [1] as a sufficient condition for NFP (and UNC and UNR by implication).

CSI participated in the categories CPF-TRS, NFP, SRS TRS, UNC, and UNR of CoCo 2019. It won the NFP and UNR categories, and in connection with CeTA, the CPF-TRS category. Somewhat surprisingly, CSI also won the new SRS category. CSI came in second behind ACP in the TRS and UNC categories.

## References

- [1] T. Aoto and Y. Toyama. Automated proofs of unique normal forms w.r.t. conversion for term rewriting systems. In *CoRR*, abs/1807.00940, 2018. <http://arxiv.org/abs/1807.00940>.
- [2] J. Nagele, B. Felgenhauer, and A. Middeldorp. CSI: New evidence – A progress report. In *Proc. 26th International Conference on Automated Deduction*, volume 10395 of *Lecture Notes in Artificial Intelligence*, pages 385–397, 2017. doi: [10.1007/978-3-319-63046-5\\_24](https://doi.org/10.1007/978-3-319-63046-5_24).
- [3] N.R. Radcliffe, L.F.T. Moraes, and R.M. Verma. Uniqueness of normal forms for shallow term rewrite systems. *ACM Transactions on Computational Logic*, 18(2):17:1–17:20, 2017. doi: [10.1145/3060144](https://doi.org/10.1145/3060144).

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