CoCo 2024 Participant: CSI 1.2.7

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CSI is an automatic tool for (dis)proving confluence and related properties 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 [3]. Some of the implemented techniques are described in [1,2,4]. CSI can also produce certificates for confluence results, which are checked by CeTA.

CSI participates in the following CoCo 2024 categories: NFP, SRS, TRS, UNC and UNR. Additionally, it participates together with CeTA in the SRS and TRS categories, providing certified YES/NO answers. In 2023 CSI won the NFP, TRS and SRS categories and came second in the UNC and UNR categories.

CSI uses the conversion tool[1] to transform ARI problems into COPS problems.

References

[1] Bertram Felgenhauer. Confluence for Term Rewriting: Theory and Automation. PhD thesis, University of Innsbruck, 2015.

[2] Julian Nagele. Mechanizing Confluence: Automated and Certified Analysis of First- and Higher-Order Rewrite Systems. PhD thesis, University of Innsbruck, 2017.

[3] Julian Nagele, Bertram Felgenhauer, and Aart 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.

[4] Harald Zankl. Challenges in Automation of Rewriting. Habilitation thesis, University of Innsbruck, 2014.

[1] https://project-coco.uibk.ac.at/ARI/#conversion