

CoCo 2020 Participant: CeTA 2.39*

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The tool CeTA [2] is a certifier for, among other properties, (non-)confluence of term rewrite systems with and without conditions. Its soundness is proven as part of the formal proof library IsaFoR, the Isabelle Formalization of Rewriting. For a complete reference of supported techniques we refer to the certification problem format (CPF) and the IsaFoR/CeTA website:

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

In the following, we describe what is new in version 2.39 of CeTA. Although there are no new techniques in CeTA that are specific for confluence proving, we like to mention two newly supported termination methods [3]. Both of these extensions have the potential to increase the power of confluence techniques that rely upon termination or relative termination.

The first extension consists of support for the weighted path order (WPO) [5], a term order that unifies and extends well-known path orders such as the Knuth–Bendix order and the lexicographic path order. In particular, confluence provers can now for the first time use NaTT [4] – which is specialized on WPO – as external termination prover in order to produce certifiable confluence proofs.

The second extension is the support for max-polynomial interpretations [1], i.e., polynomial interpretations that additionally allow the maximum operator. In CeTA these orders can be used stand-alone, but also in combination with WPO.

We would like to welcome all confluence tool developers to experiment with whether our two extensions are indeed helpful for confluence proving, and are looking forward to certify these new kinds of proofs via CeTA.

References

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