Problem #60 (Solved !)

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Summary: Does termination of a many-sorted rewrite system reduce to the one-sorted case in case all variables are of the same sort?

Let R be a many-sorted term-rewriting system and R' the one-sorted system consisting of the same rules, but in which all operation symbols are considered to be of the same sort. Any rewrite in R is also a rewrite in R'. The converse does not hold, since terms and rewrite steps in R' are allowed that are not well-typed in R. In [Zan94] it was shown that termination of R is in general not equivalent to termination of R', but it is if R does not contain both collapsing and duplicating rules. Are termination of R and of R' equivalent in the case where all variables occurring in R are of the same sort? If this statement holds, it would follow that simulating operation symbols of arity n greater than 2 by $n-1$ binary symbols in a straightforward way does not affect termination behavior.

Remark

This has been solved positively by Takahito Aoto [Aot01].

Bibliography

[Aot01] Takahito Aoto. Solution to the problem of Zantema on a persistent property of term rewriting systems. *Journal of Functional and Logic Programming*, 2001(11), December 2001.

[Zan94] Hans Zantema. Termination of term rewriting: interpretation and type elimination. *Journal of Symbolic Computation*, 17:23–50, 1994.

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