

## Problem #12 (Solved !)

*Originator: Wayne Snyder*

*Date: April 1991*

*Summary: What is the complexity of the decision problem for the confluence of ground term-rewriting systems?*

What is the complexity of the decision problem for the confluence of ground (i.e., variable-free) term-rewriting systems? Decidability was shown in [DHLT90][Oya87]; see also [DT90].

### Remark

The problem is PTIME-complete, as has been shown independently by [CGN01] and [Tiw02].

# Bibliography

- [CGN01] Hubert Comon, Guillem Godoy, and Robert Nieuwenhuis. The confluence of ground term rewrite systems is decidable in polynomial time. In *Proceedings of the 42nd Annual IEEE Symposium on Foundations of Computer Science (FOCS)*, pages 298–307, Las Vegas, Nevada, USA, 2001.
- [DHLT90] Max Dauchet, Thierry Heuillard, Pierre Lescanne, and Sophie Tison. Decidability of the confluence of finite ground term rewriting systems and of other related term rewriting systems. *Information and Computation*, 88(2):187–201, October 1990.
- [DT90] Max Dauchet and Sophie Tison. The theory of ground rewrite systems is decidable. In John C. Mitchell, editor, *Fifth Symposium on Logic in Computer Science*, pages 242–248, Philadelphia, PA, June 1990. IEEE.
- [Oya87] Michio Oyamaguchi. The Church-Rosser property for ground term rewriting systems is decidable. *Theoretical Computer Science*, 49(1):43–79, 1987.
- [Tiw02] Ashish Tiwari. Deciding confluence of certain term rewriting systems in polynomial time. In Gordon Plotkin, editor, *IEEE Symposium on Logic in Computer Science, LICS 2002*, pages 447–456, Copenhagen, Denmark, July 2002. IEEE.