

## Problem #58

*Originator: Michio Oyamaguchi*

*Date: June 1993*

*Summary: Is any “strongly” non-overlapping right-linear term-rewriting system confluent?*

Is any “strongly” non-overlapping right-linear term-rewriting system confluent? (“Strong” in the sense that left-hand sides are non-overlapping even when the occurrences of variables have been renamed apart [Che81].) On the one hand, strongly non-overlapping systems need not be confluent [Hue80]; on the other hand, strongly non-overlapping right-ground systems are [OO93].

### Remark

A partial positive solution is given in [OOTar][TO94], namely, any strongly non-overlapping right-linear term-rewriting system is confluent if it satisfies the condition that for any rewrite rule, no variables occurring more than once in the left-hand-side occur in the right-hand-side.

# Bibliography

- [Che81] Paul Chew. Unique normal forms in term rewriting systems with repeated variables. In *Proceedings of the Thirteenth Annual Symposium on Theory of Computing*, pages 7–18. ACM, 1981.
- [Hue80] Gérard Huet. Confluent reductions: Abstract properties and applications to term rewriting systems. *J. of the Association for Computing Machinery*, 27(4):797–821, October 1980.
- [OO93] Michio Oyamaguchi and Yoshikatsu Ohta. On the confluent property of right-ground term rewriting systems. *Trans. IEICE*, J76-D-I:39–45, 1993.
- [OOTar] Yoshikatsu Ohta, Michio Oyamaguchi, and Yoshihito Toyama. On the Church-Rosser property of simple-right-linear term rewriting systems. *Trans. IEICE*, to appear.
- [TO94] Yoshihito Toyama and Michio Oyamaguchi. Church-Rosser property and unique normal form property of non-duplicating term rewriting systems. In Nachum Dershowitz and N. Lindenstrauss, editors, *Proceedings of the Fourth International Workshop on Conditional Rewriting Systems*, Jerusalem, Israel, July 1994. Springer-Verlag.