

Problem #98

Originator: Dan Dougherty (Talk at RTA 2000)

Date: July 2000

Summary: Is unification modulo the theory of allegories decidable?

Let ALL be the equational theory of Allegories. Is unification modulo ALL decidable?

Background:

The notion of "Allegory" has defined by Peter Freyd and Andre Scedrov in their monograph [FS90]. Allegories are to binary relations between sets as categories are to functions between sets. By ALL we refer to the untyped version of the theory (see page 195 of [FS90]).

Validity in this equational theory is decidable (Gutiérrez' dissertation, Wesleyan University 1999, also see [DG00]). The universal-existential theory over these axioms is undecidable (reduction from the universal-existential theory of free semigroups with constants).

Bibliography

- [DG00] Dan Dougherty and Claudio Gutiérrez. Normal forms and reduction for theories of binary relations. In Leo Bachmair, editor, *Rewriting Techniques and Applications*, volume 1833 of *Lecture Notes in Computer Science*, pages 95–109, Norwich, UK, July 2000. Springer-Verlag.
- [FS90] Peter Freyd and Andre Scedrov. *Categories and Allegories*, volume 39 of *North Holland Mathematical Library*. North-Holland, 1990.