

UNIFICATION IN COLLAPSING EQUATIONAL THEORIES

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For equational theories of terms, an axiom is called a collapse axiom iff it is of the form $t = x$, where t is a term and x a variable occurring in t . Examples for collapse axioms are $f(x,x) = x$ (idempotency) and $f(x,g(x,y)) = x$ (absorption).

We present an unification algorithm for collapsing equational theories having collapse axioms. We show the completeness of the algorithm. Examples demonstrating why the algorithm is not minimal are discussed, suggesting the conjecture that the algorithm could be made minimal by going through an elaborate case analysis.

UNIFICATION ALGORITHMS FOR WEAKLY ASSOCIATIVE FUNCTIONS

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A function f is simply power associative (PA) iff $f(x,f(x,x)) = f(f(x,x),x)$, and f is power associative of degree n (PAn) iff $f(x,f(x, \dots, (f(x,x)) \dots)) = f(f(x,x), f(x, f(x, \dots, f(x,x) \dots))) = \dots$ (f nested n times).

We present a complete unification algorithm for terms involving functions that are power associative for arbitrary finite degrees. It is shown that the number of independent unifiers for such degrees is always finite. If the degree goes to infinity in the limit, the number of independent unifiers becomes infinite.