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Type checking and typability in domain-free lambda calculi. (English) Zbl 1241.03011
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Summary: This paper shows (1) the undecidability of type checking and the typability problems in the domain-free lambda calculus with negation, product, and existential types, (2) the undecidability of the typability problem in the domain-free polymorphic lambda calculus, and (3) the undecidability of type checking and the typability problems in the domain-free lambda calculus with function and existential types. The first and the third results are proved by the second result and CPS translations that reduce those problems in the domain-free polymorphic lambda calculus to those in the domain-free lambda calculi with existential types. The key idea is the conservativity of the domain-free lambda calculi with existential types over the images of the translations.

MSC:

03B40 Combinatory logic and lambda calculus

Keywords:

existential type; type checking; typability; undecidability; CPS translation; domain-free type system

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