A Connection between the Cantor-Bendixson Derivative and the Well-Founded Semantics of Finite Logic Programs

D. Cenzer, J.B. Remmel

Abstract

Results of Schlipf and Fitting show that the well-founded semantics of a finite predicate logic program can be quite complex. In this paper, we show that there is a close connection between the construction of the perfect kernel of a Π^0_1 class via the iteration of the Cantor-Bendixson derivative through the ordinals and the construction of the well-founded semantics for finite predicate logic programs via Van Gelder's alternating fixpoint construction. This connection allows us to transfer known complexity results for the perfect kernel of Π^0_1 classes to give new complexity results for various questions about the well-founded semantics $wfs(P)$ of a finite predicate logic program P.