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Abstract:

We study orderings on reductions in the style of Levy reflecting the growth of information w.r.t. (super)stable sets S of 'values' (such as head-normal forms or Bohm-trees). We show that sets of co-initial reductions ordered by such orderings form finitary w -algebraic complete lattices, i.e., form computation and Scott domains. As a consequence, we obtain a relativized version of computational semantics as proposed by Boudol for term rewriting systems.

Furthermore, we give a pure domain-theoretic characterization of the orderings in the spirit of Kahn and Plotkin's concrete domains. These constructions are carried out in the framework of Stable Deterministic Residual Structures, which are abstract reduction systems with an axiomatized residual relations on redexes, and model all orthogonal (or conflict-free) reduction systems as well as many other interesting computation structures.

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