

Paramodulation with Non-Monotonic Orderings and Simplification

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Abstract Ordered paramodulation and Knuth-Bendix completion are known to remain complete when using non-monotonic orderings. However, these results do not imply the compatibility of the calculus with essential redundancy elimination techniques such as demodulation, i.e., simplification by rewriting, which constitute the primary mode of computation in most successful automated theorem provers. In this paper we present a complete ordered paramodulation calculus for non-monotonic orderings which is compatible with powerful redundancy notions including demodulation, hence strictly improving the previous results and making the calculus more likely to be used in practice. As a side effect, we obtain a Knuth-Bendix completion procedure compatible with simplification techniques, which can be used for finding, whenever it exists, a convergent term rewrite system for a given set of equations and a (possibly non-totalizable) reduction ordering.

Keywords Automated theorem proving · Equational reasoning · Ordered paramodulation · Knuth-Bendix completion

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