

RP-DeLP: A weighted defeasible argumentation framework based on a recursive semantics

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Resum

In this paper we propose a recursive semantics for warranted formulas in a general defeasible logic argumentation framework by formalizing a notion of collective (non-binary) conflict among arguments. The recursive semantics for warranted formulas is based on the intuitive grounds that if an argument is rejected, then further arguments built on top of it should also be rejected. The main characteristic of our recursive semantics is that an output (or extension) of a knowledge base is a pair consisting of a set of warranted and a set of blocked formulas. Arguments for both warranted and blocked formulas are recursively based on warranted formulas but, while warranted formulas do not generate any collective conflict, blocked conclusions do. Formulas that are neither warranted nor blocked correspond to rejected formulas. Then we extend the framework by attaching levels of preference to defeasible knowledge items and by providing a level-wise definition of warranted and blocked formulas. After we consider the warrant recursive semantics for the particular framework of Possibilistic Defeasible Logic Programming (RP-DeLP for short). Since RP-DeLP programs may have multiple outputs, we define the maximal ideal output of an RP-DeLP program as the set of conclusions which are ultimately warranted, and we present an algorithm for computing it in polynomial space and with an upper bound on complexity equal to $P \wedge NP$. Finally, we propose an efficient and scalable implementation of this algorithm using SAT encodings, and we provide an experimental evaluation when solving test sets of instances with single and multiple preference levels for defeasible knowledge.

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