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Enhancing linear algebraic computation of logic programs using sparse representation.

(English) [Zbl 07455718](#)

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Summary: Algebraic characterization of logic programs has received increasing attention in recent years. Researchers attempt to exploit connections between linear algebraic computation and symbolic computation in order to perform logical inference in large scale knowledge bases. This paper proposes further improvement by using sparse matrices to embed logic programs in vector spaces. We show its great power of computation in reaching the fixpoint of the immediate consequence operator from the initial vector. In particular, performance for computing the least models of definite programs is dramatically improved in this way. We also apply the method to the computation of stable models of normal programs, in which the guesses are associated with initial matrices, and verify its effect when there are small numbers of negation. These results show good enhancement in terms of performance for computing consequences of programs and depict the potential power of tensorized logic programs.

For the entire collection see [\[Zbl 1466.68027\]](#).

MSC:

68N17 Logic programming

Software:

[Eigen](#); [Clingo](#); [KONECT](#); [TensorLog](#)

Full Text: [arXiv Link](#)

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