

**Gelfond, Michael; Lifschitz, Vladimir**

**Classical negation in logic programs and disjunctive databases.** (English) Zbl 0735.68012  
New Gener. Comput. 9, No. 3-4, 365-385 (1991).

The authors extend logic programs by including classical negation in addition to negation as failure. They can distinguish between a query which fails in the sense that it doesn't succeed and a query which fails in the stronger sense that its negation succeeds. The semantics of an extended program is based on the method of stable models. A "well-behaved" extended program has exactly one answer set, and this set is consistent. Moreover, an extended program can be viewed as a special case of default theories.

On the other hand, an extended program  $P$  can be reduced to a general program  $P'$  and under rather general conditions it is possible to use a query evaluation for  $P'$ .

The paper also discusses examples when the use of classical negation leads to more natural results than with negation-as-failure. Finally, extended disjunctive databases are studied. They contain non-classical disjunction in their rule heads. The paper overcomes an important limitation of traditional logic programming in comparison with classical logic in the sense of expressing incomplete information.

Reviewer: [J.Pokorny](#)

**MSC:**

[68N17](#) Logic programming  
[68T15](#) Theorem proving (deduction, resolution, etc.) (MSC2010)  
[68T30](#) Knowledge representation

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**Keywords:**

[nonmonotonic reasoning](#); [negation as failure](#); [stable models](#); [disjunctive databases](#); [incomplete information](#)