

Lecture Notes in Artificial Intelligence

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Non-Monotonic Extensions of Logic Programming

ICLP '94 Workshop
Santa Margherita Ligure, Italy, June 17, 1994
Selected Papers



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Preface

This book is the outcome of an original compilation of extended and revised versions of selected papers presented at the workshop on *Non-Monotonic Extensions of Logic Programming*, held in Santa Margherita Ligure, Italy, on June 17, 1994. It also includes additional papers solicited from the participants. As some workshop papers were published elsewhere, they do not appear in this volume.

The workshop on *Non-Monotonic Extensions to Logic Programming* was organized in conjunction with ICLP '94, the Eleventh International Conference on Logic Programming. It was the fourth in a series of workshops held jointly with logic programming conferences (NACLP'90, ILPS'91, and ILPS'93) and received financial support from the *ESPRIT Network of Excellence Compulog-Net* and the *University of Koblenz*.

The motivation for these workshops stems from the fact that during the last decade a significant body of knowledge has been accumulated providing us with a better understanding of the semantic issues in logic programming and the theory of deductive databases. In particular, the class of perfect models for (locally) stratified logic programs and two closely related extensions to normal, non-disjunctive, logic programs were introduced and extensively investigated: the *well-founded* models and the *stable* models.

Semantics of logic programs rely on a non-monotonic operator, often referred to as *negation-by-failure* or *negation-by-default*. The non-monotonicity of this operator allows us to view logic programs as special non-monotonic theories and thus makes it possible to draw from the extensive research in the area of non-monotonic reasoning and use it as a guidance in the search for a suitable semantics for logic programs.

Furthermore, the problem of extending the well-founded and the stable models approaches, by defining a suitable semantics for normal and disjunctive programs extended with a second type of negation, turned out to be a difficult one, as evidenced by a large number of papers devoted to the subject.

As a result, research work aimed at better understanding of the relationships existing between logic programming (LP) and a variety of nonmonotonic formalisms (NMF) has been mutually beneficial to both areas. NMFs help us to determine suitable semantics for logic programs and they help us as well to understand how they can be applied to express and solve various AI problems. Conversely, the NMFs can utilize the wide body of knowledge already gathered about LP and use logic programs as inference engines for query answering.

The 10 papers in this collection address the issues stemming from this outlook. Because new semantics often require new computational procedures, the papers can be naturally divided into two sections: **Semantics** (5 papers) and **Computation** (5 papers). We give more specific comments about the papers and their interrelationship in the Introduction (page 1).

All contributions were refereed by the Program Committee members, who are all to be thanked for their invaluable help and effort. Thanks are due as well to the external reviewers (see next page).

Last but not least, let us congratulate all the authors, whose high quality research and text formatting abilities made this book a reality. We are sure it will spur on further research into this exciting and open field.

March 1995

Jürgen Dix, Koblenz
Luís Moniz Pereira, Lisboa
Teodor C. Przymusinski, Riverside

Previous Workshops

1990	WS at NACLPS '90, U.S.A.	1991	WS at ILPS '91, U.S.A.
1993	WS at ILPS '93, U.S.A.	1994	WS at ICLP '94, Italy

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Additional Referees

J.J. Alferes, C.V. Damasio, L. Degerstedt, A. Provetti, and Carlos Uzcátegui.

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