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Over-Constrained Systems

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Preface

Constraint-based systems are becoming more and more widespread because they allow many different problems to be expressed in a natural way and to be solved efficiently. However, most real-world systems contain inconsistencies and contradictory information. In this situation, many current techniques for constraints give no help to programmers and users. A number of research groups around the world are working to improve matters, using a variety of techniques at different levels of automation. In September 1995 a Workshop on Over-Constrained Systems was held as part of CP'95, the First International Conference on Principles and Practice of Constraint Programming, at Cassis near Marseilles. The aim of the workshop was to bring together researchers using all of these various techniques, and we especially encouraged cross-fertilisation between Constraint Logic Programming, Constraint Satisfaction, and other AI and logic-based techniques.

In addition to a selection of papers from the workshop, we have included some important background papers which have already been published elsewhere. The two theories represented by these papers, Hierarchical Constraint Logic Programming (HCLP) and Partial Constraint Satisfaction Problems (PCSP), are at the heart of most of the rest of the papers in this volume. We also commissioned a paper combining two existing general frameworks within which HCLP, PCSP, and other methods for relaxing constraints can be compared. We hope that the inclusion of these three papers, and also a bibliographic overview of the field, will make this book a very useful resource for all researchers and practitioners in the field of hierarchical, partial, and over-constrained systems.

Out of 24 papers submitted to the workshop, the programme committee selected 15 for full presentation and 6 as posters. Eleven of the 15 have been selected for inclusion in this volume. After the overview and three background papers, the eleven workshop papers are grouped into the following areas: CLP, CSP, and Alternative Paradigms.

Namur, May 1996

Michael Jampel
Workshop Chair

Programme Committee

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The following two articles appear in the 'Background Papers' section of this book. They are reprinted with permission.

Constraint Hierarchies by Borning, Freeman-Benson, and Wilson originally appeared in the journal *Lisp and Symbolic Computation*, 5:223–270, 1992, and has since been reprinted elsewhere.

Partial Constraint Satisfaction by Freuder and Wallace originally appeared in *Artificial Intelligence*, 58:21–70, 1992, and has also been reprinted elsewhere.

Semiring-Based CSPs and Valued CSPs: Basic Properties and Comparison is printed here for the first time. However, it contains most of the following two papers from *IJCAI'95*:

S. Bistarelli, U. Montanari, and F. Rossi (1995). "Constraint Solving over Semirings." In Proceedings of the 14th International Joint Conference in Artificial Intelligence. Pages 624–630.

T. Schiex, H. Fargier, and G. Verfaillie (1995). "Valued Constraint Satisfaction Problems: Hard and Easy Problems" In Proceedings of the 14th International Joint Conference in Artificial Intelligence. Pages 631–637.

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