Foreword

Constraint Handling Rules (CHR) is a high-level programming language based on multi-headed, committed-choice, guarded multiset rewrite rules. The CHR language has been actively developed for over 20 years now and has become a major declarative specification and implementation language for constraint-based algorithms and applications.

Research in the CHR community has been fostered through numerous meetings throughout the past years, including seven workshops and a summer school specifically on CHR, as well as countless research visits.

Apart from increased international collaboration, new theoretical results and optimized implementations, this has led to many more CHR users and researchers. The recently published book on Constraint Handling Rules by Thom Frühwirth and this book complement each other: The former is a thorough introduction to all aspects of CHR, whereas this book presents recent research in implementation, extensions, and novel analyses of CHR.

In order to be self-contained, it starts with an introduction to CHR, which in the spirit of this book, is held concise and research-oriented. After that, carefully selected chapters from recent PhD theses provide detailed information on the topics compilation and optimization, execution strategies, and formal analysis of CHR. These chapters can be read individually based on the reader's interest.

The chapters have been edited by Thom Frühwirth and Frank Raiser to better suit the book's general theme. Additionally, the book has been reviewed by the individual authors of the chapters, the editors, and Florian Geiselhart and Johannes Langbein. The involved PhD theses range from 2005 up to the latest theses available at the time of writing, resulting in the following list of authors: Gregory J. Duck, Leslie De Koninck, Edmund S. L. Lam, Frank Raiser, Tom Schrijvers, and Jon Sneyers.

March 2011, Ulm   Thom Frühwirth and Frank Raiser