

Preface

Answer set programming (ASP) is a form of logic programming that originated at the end of the 1980s and the beginning of the 1990s. It is especially tailored towards solving hard search problems, which it allows to encode concisely. In the past two decades it has known great success and has – among others – been applied to planning problems, musical composition, biological modeling and decision support systems for the space shuttle. Unfortunately, ASP is not very well equipped for modeling problems in continuous domains. In this book we attempt to augment ASP with the capability of expressing continuous problems by creating an answer set programming framework based on fuzzy logic. The resulting language is called fuzzy answer set programming (FASP). After two introductory chapters, also introducing the necessary technical background, we study FASP and its extensions in Chapters 3 and 4. Then we focus on the question of whether the many extensions of FASP can be compiled to a core language in Chapter 5 and succeedingly study an implementation method for a subset of FASP in Chapter 6. As such, we focus both on theoretical aspects of the language as on more practical aspects such as implementation.

This book originated from the doctoral thesis of the first author, which was successfully defended in June 2011. Encouraged by the enthusiastic reports of the committee members, we have decided to publish this book, and make the obtained results available to a larger audience. We are grateful to the external members of the doctoral jury, Umberto Straccia and Wolfgang Faber, for their useful suggestions and remarks on the first version of this thesis. Our special thanks go to Da Ruan, the former editor of the Atlantis Computational Intelligence Systems book series, who initiated the publication process of this book shortly before he passed away very unexpectedly in the Summer of 2011. For us, this book will always be associated with dear memories of Da's friendship and his enthusiasm and help to publish our work. We would also like to thank the new series editors Jie Lu and Javier Montero for their valued contributions in continuing Da Ruan's work, and for guiding

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Fuzzy Logic Approach

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