

# Preface

The publication of the seminal issue on nonmonotonic logics by the Artificial Intelligence Journal in 1980 resulted in a new area of research in knowledge representation and changed the mainstream paradigm of logic that originated in antiquity. It established an important area of mathematical logic and led to discoveries of connections between logic, knowledge representation and computation which attracted not only computer scientists but also logicians, mathematicians and philosophers. Importantly, it also changed the perspective on applications of logic.

Nonmonotonic reasoning concerns situations when information is incomplete or uncertain. Thus, conclusions drawn lack iron-clad certainty that comes with classical logic reasoning. New information, even if the original one is retained, may change conclusions. Formal ways to capture mechanisms involved in nonmonotonic reasoning, and to exploit them for computation as in the answer set programming paradigm are at the heart of this research area.

To sum up the experience of the first 30 years of nonmonotonic logics and to map paths into the future we organized the conference NonMon@30 - Thirty Years of Nonmonotonic Reasoning (Lexington, KY, USA, October 22-25, 2010). Encouraged by the success of the conference, we also felt it was time for another special track on nonmonotonic reasoning giving an up-to-date picture of current work in the field. We are grateful to JAIR's editors-in-chief for giving us the opportunity to turn this plan into reality.

The response to our call for papers was way beyond our expectations with 25 papers submitted. The six papers we accepted for the special track clearly illustrate that the field remains vibrant and relevant to the long-term goals of artificial intelligence. The special track consists of the following papers:

1. Mario Alviano, Francesco Calimeri, Wolfgang Faber, Nicola Leone and Simona Perri. *Unfounded Sets and Well-Founded Semantics of Answer Set Programs with Aggregates*
2. Piero Bonatti, Marco Faella and Luigi Sauro. *Defeasible Inclusions in Low-Complexity Description Logics*
3. Richard Booth, Thomas Meyer, Ivan Varzinczak and Renata Wassermann. *Basic Horn Contraction*
4. Wolfgang Dvorak and Stefan Woltran. *On the Intertranslatability of Argumentation Semantics*
5. Dov Gabbay, David Pearce and Agustin Valverde. *Interpolable Formulas in Equilibrium Logic and Answer Set Programming*
6. Joohyung Lee and Yunsong Meng. *General Theory of Stable Models and First-Order Loop Formulas*

Three of these papers (1, 5 and 6) contribute to the foundations of logic programming under the answer set (stable model) semantics. This reflects an

important and highly successful current trend in nonmonotonic reasoning towards computationally feasible methods. Paper 2 investigates nonmonotonic extensions of description logics with a special focus on logics which trade expressiveness for low complexity. Paper 3 investigates a problem of belief change — how to avoid undesired conclusions — again in a restricted setting, namely that of Horn clauses. Paper 4 stems from another vibrant subarea of nonmonotonic reasoning, namely argumentation. It shows how different semantics developed for Dung-style argumentation frameworks can mutually model each other using adequate modifications of the argumentation frameworks.

We would like to dedicate this special track to the memory of John McCarthy, one of the founders of the field. John passed away just a few weeks ago on October 24, 2011. His influence on all of us was tremendous and is to be felt in almost every paper of this special track.

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