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Preface

This volume contains revised papers presented at the International Workshop on Declarative Agent Languages and Technologies (DALT 2011). In addition to these technical contributions, this volume also revisits the most influential papers of past DALT editions, through a "retrospective" in which the authors themselves appraise the impact of the research in the field and how it led to future developments.

DALT 2011 was the ninth and most recent edition of the ongoing series of events aimed at promoting declarative approaches and technologies for software agents and multiagent systems. DALT 2011 took place in Taipei, Taiwan, on May 3, and was held as a satellite workshop of the 10th International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS 2011). Past editions were held in 2003 in Melbourne, Australia; in 2004 in New York, USA; in 2005 in Utrecht, The Netherlands; in 2006 in Hakodate, Japan; in 2007 in Honolulu, USA; in 2008 in Estoril, Portugal; in 2009 in Budapest, Hungary; and in 2010 in Toronto, Canada. The post-workshop proceedings for all these were published in the *Lecture Notes in Artificial Intelligence* series as volumes 2990, 3476, 3904, 4327, 4897, 5397, 5948, and 6619, respectively.

Business and pleasure activities increasingly benefit from computer networks to share information and processes. Software to support such activities thus need to be distributed (i.e., many independent pieces of hardware, communicating via message-passing), open (i.e., components may come and go) and heterogeneous (i.e., components have been developed independently by different parties using different technologies). Moreover, as solutions become more sophisticated, they need to become more *autonomous*, being able to function with little or no human interference. Software agents and multiagent systems help make this class of applications a reality.

Engineering such systems brings about exciting challenges for which declarative approaches offer much. Declarative formalisms (e.g., functions and logics), and their associated mechanisms, can be used to specify, verify, analyze and, in many cases, actually program software agents and multiagent systems. Declarative approaches, with their well-understood and robust mathematical foundations, provide abstractions with which to explore computational phenomena.

The series of international workshops on Declarative Agent Languages and Technologies (DALT) has been organized as a forum in which theoreticians and practitioners come together for scientific exchange on declarative approaches to specifying, verifying, programming, and running software agents and multiagent systems. A main theme of the DALT series is to advance the state of the art in declarative specification and verification techniques, to address large, expressive and realistic classes of software agents and multiagent systems.

We have included in this volume five papers presented at DALT 2011; the authors have revised their papers in light of the comments and suggestions they received from the reviewers and during the workshop. The papers are:

1. *A Formal Framework for Reasoning about Goal Interactions*, by Michael Winikoff
2. *Plan Indexing for State-Based Plans*, by Louise Dennis
3. *Probing Attacks on Multiagent Systems using Electronic Institutions*, by Shahriar Bijani, David Robertson, and David Aspinall
4. *Formalizing Commitments Using Action Languages*, by Tran Cao Son, Enrico Pontelli, and Chiaki Sakama
5. *Detecting Conflicts in Commitments*, by Akin Gunay and Pinar Yolum

In addition to these original contributions, we also have a retrospective of the best papers of the DALT series, by the respective authors themselves, explaining how the research developed and how it influenced and impacted the community, the state of the art and subsequent work. The best papers of the DALT series were selected based on their number of citations given by Google Scholar.[1] The papers are:

1. *Coo-BDI: Extending the BDI Model with Cooperativity*, by Davide Ancona and Viviana Mascardi (DALT 2003)
2. *Extending the Operational Semantics of a BDI Agent-Oriented Programming Language for Introducing Speech-Act Based Communication*, by Álvaro F. Moreira, Renata Vieira, and Rafael H. Bordini (DALT 2003)
3. *A Lightweight Coordination Calculus for Agent Systems*, by David S. Robertson (DALT 2004)
4. *A Distributed Architecture for Norm-Aware Agent Societies*, by Andrés García-Camino, Juan-Antonio Rodríguez-Aguilar, Carles Sierra, and Wamberto W. Vasconcelos (DALT 2005)
5. *Producing Compliant Interactions: Conformance, Coverage, and Interoperability*, by Amit K. Chopra and Munindar P. Singh (DALT 2006)
6. *Specifying and Enforcing Norms in Artificial Institutions*, by Nicoletta Fornara and Marco Colombetti (DALT 2008)
7. *Social Commitments in Time: Satisfied or Compensated*, by Paolo Torroni, Federico Chesani, Paola Mello, and Marco Montali (DALT 2009)

In 2011, there was also a DALT Spring School, held during April 10-15 in Bertinoro (Forl-Cesena), Italy. The school, organized by Paolo Torroni and Andrea Omicini, aimed at giving a comprehensive introduction to the DALT research topics and disseminating the results of research achieved in an 8-year-long workshop activity, with a perspective on the future. The 5-day school program included five courses:

– *Agent Reasoning: Knowledge, Plans and Flexible Control Cycles* by Francesca Toni

[1] `http://scholar.google.com/`

- *Agent Reasoning: Goals and Preferences*, by Birna van Riemsdijk
- *Agent Interaction: Languages, Dialogues and Protocols*, by Peter McBurney
- *Agent and Multi-Agent Software Engineering: Modelling, Programming, and Verification*, by Rafael Bordini
- *Organization, Coordination and Norms for Multi-Agent Systems*, by Wamberto Vasconcelos

There was also a student session, organized by Federico Chesani in two tracks: for junior and senior students. The initiative was a success, with more than 30 students attending, and it received very positive feedback. The DALT school was very conveniently co-located with the Third ALP/GULP International School on Computational Logic. Additional information and course materials are available for download at the website: `http://lia.deis.unibo.it/confs/dalt_school/`. The DALT school is represented in this volume by two invited contributions from DALT lecturers: a short course report by Rafael Bordini, and a technical article by Wamberto Vasconcelos and colleagues.[2]

We would like to take this opportunity to thank the authors for their contributions, the members of the Steering Committee for support and guidance, and the members of the Program Committee for timely and high-quality reviews. We would also like to thank Wiebe Van der Hoek (Department of Computer Science, University of Liverpool, UK), for his invited talk "Control and Delegation;" we are very happy to include in this volume an extended abstract for this talk.

August 2011

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Sebastian Sardina
Wamberto Vasconcelos
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[2] We thank Paolo Torroni for providing us with this summary text on the DALT 2011 Spring School for inclusion in this preface.

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