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Rogier M. van Eijk Marc-Philippe Huget  
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# Agent Communication

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Revised Selected and Invited Papers

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# Preface

In this book, we present a collection of papers around the topic of agent communication. The communication between agents has been one of the major topics of research in multiagent systems. The current work can therefore build on a number of previous Workshops of which the proceedings have been published in earlier volumes in this series. The basis of this collection is formed by the accepted submissions of the Workshop on Agent Communication held in conjunction with the AAMAS Conference in July 2004 in New York. The workshop received 26 submissions of which 14 were selected for publication in this volume. Besides the high-quality workshop papers we noticed that many papers on agent communication found their way to the main conference. We decided therefore to invite a number of authors to revise and extend their papers from this conference and to combine them with the workshop papers. We believe that the current collection comprises a very good and quite complete overview of the state of the art in this area of research and gives a good indication of the topics that are of major interest at the moment.

The papers can roughly be divided over the following five themes:

- social commitments
- multiparty communication
- content languages
- dialogues and conversations
- speech acts

Although these themes are of course not mutually exclusive they indicate some main directions of research. We therefore have arranged the papers in the book according to the topics indicated above.

The first three papers focus on the role of social commitments in agent communication. In the first paper, Nicoletta Fornara, Fransesco Viganò and Marco Colombetti explore the role of social commitments in defining the semantics of agent communication in the context of artificial institutions. *Roberto Flores, Philippe Pasquier and Brahim Chaib-draa* formalize the dynamics of social commitments, where they stress the role of commitment messages as coordination devices to advance the state of joint activities. In the subsequent contribution, *Ashok Mallya and Munindar Singh* use social commitments as a semantic underpinning of a formal framework to reason about the composition of interaction protocols.

The next two contributions involve communication between more than two agents. *Gery Gutnik and Gal Kaminka* address the representation of interaction protocols by means of Petri nets. In particular, the authors focus on protocols for overhearing in which more than two agents are involved. The theme of multiparty communication is further elaborated in the contribution of *Marc-Philippe Huget and Yves Demazeau*, where a communication server for multiparty dialogue is described.

The following two contributions focus on the role of vocabularies, ontologies and content languages in agent communication. *Jurriaan van Diggelen, Robbert-Jan Beun, Frank Dignum, Rogier van Eijk and John-Jules Meyer* study the characteristics and properties of communication vocabularies in multiagent systems with heterogeneous ontologies. *Mario Verdicchio and Marco Colombetti* deal with another aspect of content languages: the formal expression of temporal conditions.

The first paper of the section on dialogues and conversations is by *Jarred McGinnis and David Robertson* who define a general language for the expression of dynamic and flexible dialogue protocols. The flexibility of protocols is further elaborated in the contribution of *Lalana Kagal and Tim Finin* where conversation specifications and conversation policies are defined in terms of permissions and obligations. The authors introduce techniques to resolve conflicts within the specifications and policies and provide an engine that allows agents to reason about their conversations. In the next paper, *Joris Hulstijn, Mehdi Dastani and Frank Dignum* study the coherence of agent conversations. In particular, they show how constraints on the context of messages can be used to establish coherent dialogues. The importance of the context is also stressed in the contribution of *Matthias Nickles, Michael Rovatsos and Gerhard Weiss* who study the effects of social interaction structures on the semantics of messages. *Mirko Viroli and Alessandro Ricci* look at communication from the perspective of coordination. In their approach, agents coordinate their activities via artifacts that specify the successive actions of the interaction protocol.

The last four contributions of the volume are centered around the semantics of speech acts. *Karim Bouzouba, Jamal Bentahar and Bernard Moulin* develop a computation model to study the semantics of speech acts in dialogues between agents and humans. In the subsequent contribution, *Peter McBurney and Simon Parsons* propose a set of speech acts together with an interaction protocol for argumentation for which they provide an operational semantics. In the contribution of *Marcus Huber, Sanjeev Kumar and David McGee*, a repertoire of speech acts is provided, where the semantics of the acts is defined in terms of joint intentions. Finally, *Shakil Khan and Yves Lesperance* study the semantics of speech acts in terms of the agents' knowledge, intentions and commitments and show how this can be integrated into a planning framework.

To close, we would like to take this opportunity to thank the members of the Program Committee, the external reviewers and the authors of submitted papers for enabling us to edit this exciting volume on the *Developments in Agent Communication*.

Utrecht, November 2004

Rogier van Eijk  
Marc-Philippe Huget  
Frank Dignum

# Workshop Organization

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