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Agent-Mediated Electronic Commerce III

Current Issues in
Agent-Based Electronic Commerce Systems

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Preface

In this book we present a collection of papers around the topic of Agent-Mediated Electronic Commerce. Most of the papers originate from the third workshop on Agent–Mediated Electronic Commerce held in conjunction with the Autonomous Agents conference in June 2000. After two previous workshops, one during the Autonomous Agents conference in 1998 in Minneapolis and the second one in conjunction with the International Joint Conference On Artificial Intelligence in 1999, this workshop continued the tradition of the previous ones by setting the scene for the assessment of the challenges that Agent-Mediated Electronic Commerce faces as well as the opportunities it creates. By focusing on agent-mediated interactions, specialists from different disciplines were brought together who contribute theoretical and application perspectives in the narrowly focused topic that nevertheless involves wide ranging concerns such as: agent architectures, institutionalization, economic theory, modeling, legal frameworks and policy guidelines. The main topics for the workshop were:

- Electronic negotiation models for agents
- Formal issues for agents that operate in electronic market places
- Virtual trading institutions and platforms
- Trading strategies for interrelated transactions (respectively auctions)

The workshop received 12 submissions of which 7 were selected for publication in this volume. Although the number of submissions was less then expected for an important area like agent-mediated electronic commerce there is no reason to worry that this area does not get enough attention from the agent community. In fact, we noticed that many papers on agent-mediated electronic commerce 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 combine them with the workshop papers. Finally, we decided to include a paper that discusses the results of the Fishmarket tournament that was held during the workshop. The result is that this volume contains 12 high quality papers that really can be called representative of the field at this moment.

We have arranged the papers in the book according to the topics indicated above. The first section containing three papers is focused on negotiation models. This section starts with a more theoretical paper on a bilateral negotiation model for agent-mediated electronic commerce from *G. de Paula, F. Ramos and G. Ramalho*. In this paper they describe a model for bilateral negotiation, which offers support for, e.g., alternative product suggestion and ultimatum generation. It is therefore a generalization of the models used in current e-commerce systems such as Kasbah and MAGMA.

The second paper in this section (from *M. Barbuceanu and W. Lo*) discusses simultaneous negotiation over several attributes of a product. It uses constraint optimization as a model to concurrently satisfy several objectives as well as possible.

The same type of techniques are used in the paper of *R. Kowalczyk and V. Bui*, which uses constraint-based reasoning to support the negotiation process of agents in a car-trading system.

The second section of the book contains three papers with a more formal, logical flavor. The first two papers both discuss issues related to the communication between agents in an e-commerce setting. The first paper of *A. Artikis, F. Guerin and J. Pitt* shows how conversations between more than two parties can be formally modeled and given a clear semantics. The theory is used to model some frequently occurring auction protocols.

The second paper (*M. Wooldridge and S. Parsons*) discusses some issues for the design of negotiation protocols for agent communication languages that are based on logic. It indicates that a seemingly simple question as to whether agreement between the parties has been reached is difficult to answer formally (based on the protocol and the messages exchanged). It sets forth to indicate a number of progressively more complex negotiation languages and considers the complexity of these languages.

The last paper of this section, from *M. Pradella and M. Colombetti*, gives a formal description of a practical agent for e-commerce. The formal model makes it possible to prove certain properties of the agent, which would otherwise be hard to discover.

The third section of this book is devoted to platforms and institutions for agent-mediated electronic commerce. *H. Cardoso and E. Oliveira* describe a platform that can be used for e-commerce between agents and which supports adaptive agents, i.e., agents that learn from past experiences. The platform also supports multi-lateral and multi-issue negotiation.

In the paper of *M. Schröder, J. McMann and D. Haynes* it is argued that in trading a universal ontology is often assumed for matching offers and demands. This ontology is often a bottleneck for the scalability of the system. The paper describes a system which circumvents the necessity of such a universal ontology by making the clients a bit more flexible, while the traders specify their products a bit less precisely.

The last paper in this session is from *M. Tsvetovat, K. Sycara, Y. Chen and J. Ying* and discusses the formation of customer coalitions on electronic markets. It discusses the possible formation processes with their advantages and risks and indicates which model is most likely to succeed.

The last section of the book contains four papers related to agent strategies for agents that operate on markets where multiple interrelated auctions are running. The first paper of *C. Preist, C. Bartolini and I. Phillips* discusses the design of an algorithm for an agent that participates in multiple simultaneous auctions. The algorithm is designed to divide the wanted number of products over the auctions in an optimal way.

The other paper of this section is from *J. Béjar and Cortés* and discusses strategies for agents that participate in the Fishmarket games using the Dutch Bidding Protocol. In these games the agent has to participate in a number of successive auctions, trying to buy an optimal amount of fish. The last paper by

J. Béjar and J. Rodríguez-Aguilar describes the exhibition tournament held for this workshop. It also discusses the reasons for the success or failure of some strategies and lessons that can be learned from the tournament.

We want to conclude this preface by extending our thanks to the members of the program committee of the AMEC workshop who were willing to review the papers in a very short time span and also of course to the authors who were willing to submit their papers to our workshop and the authors that revised their papers for this book.

December 2000

Frank Dignum
Ulises Cortés

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