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Intelligent Agents for Telecommunication Applications

Second International Workshop, IATA'98
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Preface

The first international workshop on Intelligent Agents for Telecommunications Applications (IATA) was held in July 1996 at Budapest during the XII European Conference on Artificial Intelligence ECAI 96. The workshop program consisted of technical presentations, which addressed agent based solutions in areas such as network architecture, network management, and telematic services. The presentations gave rise to a lively debate on the advantages and difficulties associated with incorporating agent technology in telecommunication applications. The proceedings were published by IOS Press providing introductory papers on agent technology as well as telecom applications and services and also papers about appropriate languages and development tools.

Agent technology is a very promising approach to address the challenges of modern day telecommunications. The existing world of telecommunications – which is deeply influenced by monopolistic public network operators (PNOs) – is currently changing at a rapid pace. This change is taking place in the technological as well as the regulatory arena. Additionally, market forces on an unprecedented scale are at work. Given these circumstances it will no longer be sufficient for PNOs to solely provide network infrastructure. The challenge for PNOs consists in evolving to full-service providers. This implies that on the one hand increasingly complex telecommunications infrastructure needs to be managed more efficiently and, on the other hand, that new types of telecommunications services need to be developed and provided. It is in particular such future services that need to satisfy a diverse range of requirements, e.g. personalization, support for user mobility, on-demand combination of different services, offline/online service usage, etc.

Agent technology addresses these requirements particularly well as opposed to other technologies, e.g. client-server. A stationary agent can reside on agent platforms "in the net", providing various types of services. Besides being potentially decentralized and cooperative, these stationary service provider agents possess capabilities for such issues as security, accounting and billing, etc. On the client side, agent-based services will be requested by means of small, mobile agents which may enable both offline and online service usage. Agent technology is very well supported by the language Java and corresponding Java APIs.

IATA'98 will take place in Paris in the framework of Agents' World, which bring together the principal scientific and technical events on agent technology such as the International Conference on Multi-Agent Systems (ICMAS'98), RoboCup'98 devoted to international competition between soccer-playing robot teams, and six international workshops. Each workshop focuses on specific aspects of agent technology like Databases and information discovery in INTERNET (CIA'98), Collective Robotics (CRW'98), Simulation (MABS'98), Agent Theories, Architectures and Languages (ATAL'98), Communityware (ACW'98), and Telecommunications Applications (IATA'98)

The aim of IATA'98 is to provide a state-of-the-art forum for presenting innovative agent based telecommunications applications, and for discussing new approaches, new models and technology trends in both telecom and agent related fields.

This volume contains revised versions of the papers selected by the program committee for presentation and discussion in IATA'98.

The book comprises a collection of seventeen papers organized into five groups. Contributions in the first group present new models of *Network Architecture* using different approaches such as hierarchies of agents, genetic algorithms, and co-operative mobile agents.

The second group deals with new approaches for *Network configuration and planning*. Three models are described. The first model is based on a distributed cognitive agent control architecture, the second model uses a reactive architecture based on ant-like agents, and the third proposes mobile agents.

Two papers in the third group address *Network Optimization* issues and dynamic resource allocation. The first contribution proposes several methods for dynamic resource allocation using the plug and play approach. The second paper describes an architecture based on the interaction of self-interested agents.

The fourth group on *Network Management* contains three papers two of which describe different models of multi-mobile-agent architecture for fault location. The first is based on a cognitive architecture for solving software problems in telecommunication networks, while the second describes a reactive architecture inspired by the foraging activities of ants, where chemical interaction is the principal mechanism for agent communication. The third paper addresses the monitoring and control of network and system components using both stationary and intelligent mobile agents.

The last group contains six papers addressing *Agent based architecture for service applications*. The first paper focuses on the use of agent metaphors for analyzing problematic cases of global inconsistency in distributed information systems. The second describes a multi-agent testbed for seamless messaging and intelligent network management. The next two papers present two different frameworks for negotiating agents. The first is for supporting personal mobility, and the second is for intelligent user interface for cooperative work services. In both cases, the agents negotiate on behalf of the user the best conditions relating to computing and communications resources in terms of quality of service and costs. The fifth paper reports on experimentation and evaluation, of several agent platforms, mixing both the intelligence and the middleware aspects.The last paper describes a Java based agent architecture for building applications concerned with electronic commerce and telecommunication services.

Acknowledgments

We would like to express our sincere gratitude to all the people who helped to bring about the production of this book. The Agents' World chairman Yves Demazeau gave the idea for this second IATA workshop, providing continuous support for both workshop organization and paper publication. His role is gratefully acknowledged.

Nothing would have been possible without the initiative and dedication of the DAI-Lab team at the Technical University of Berlin.

We owe particular gratitude to the members of the program committee for their professionalism and dedication in selecting the best papers for the workshop. We especially thank all contributing authors for choosing IATA'98 to present their

research results, and for their diligence and their cooperation in the preparation of this volume.

Hans Schlenker of the DAI-Lab has organized the review process, keeping in touch with the authors and monitoring the submitted contributions and the accepted papers. He did a great job.

We would like to thank Telefónica I+D for providing the environment and the technical facilities to prepare the book. Thanks also to Susana Suarez who handled the book formatting according to Springer guidelines, and Jose Maria Matias for his help in solving word processing and text editing troubles.

Finally, we would like to express our appreciation of the workshop sponsors:

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Paris, July 1998

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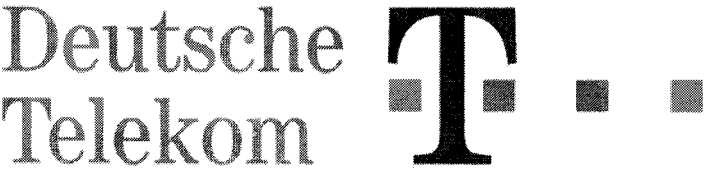

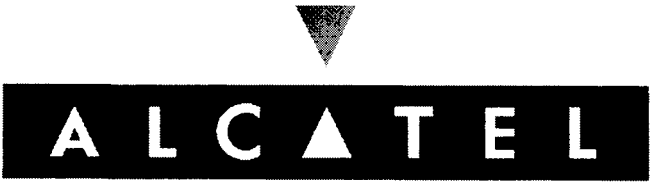

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