

CONTENTS

ix Introduction

Katia P. Sycara, Conference Chair
Michael Wooldridge, Program Co-Chair

x Conference Organization/Sponsors

xi Program Committee

PAPER SESSION 1: AGENTS AT THE INTERFACE

Monday, May 11

10:30 am - 12:30 pm

1 Using Explicit Requirements and Metrics for Interface Agent User Model Correction

Scott M. Brown, *Air Force Institute of Technology*
Eugene Santos Jr., *University of Connecticut*
Sheila B. Banks, *Air Force Institute of Technology*
Mark E. Oxley, *Air Force Institute of Technology*

8 Animated Autonomous Personal Representatives

Timothy W. Bickmore, *FX Palo Alto Laboratory*
Linda K. Cook, *ISAI*
Elizabeth F. Churchill, *FX Palo Alto Laboratory*
Joseph W. Sullivan, *FX Palo Alto Laboratory*

16 Real-Time Decision Making in Multimodal Face-to-Face Communication

Kristinn R. Thórisson, *Massachusetts Institute of Technology*

24 Do the Thing Right: An Architecture for Action-Expression

Phoebe Sengers, *Carnegie Mellon University*

PAPER SESSION 2: ROBOTICS

Monday, May 11

10:30 am - 12:30 pm

32 From Theory to Practice: The UTEP Robot in the AAI 96 and AAI 97 Robot Contests

C. Baral, *University of Texas at El Paso*
L. Floriano, *University of Texas at El Paso*
A. Hardesty, *University of Texas at El Paso*
D. Morales, *University of Texas at El Paso*
M. Nogueira, *University of Texas at El Paso*
T. C. Son, *University of Texas at El Paso*

39 Multi-Robot Path-Planning Based on Implicit Cooperation in a Robotic Swarm

Guillaume Beslon, *INSA/IF - PRISMa*
Frédérique Biennier, *INSA/IF - PRISMa*
Béat Hirsbrunner, *IIUF-PAI*

47 Frontier-Based Exploration Using Multiple Robots

Brian Yamauchi, *Naval Research Laboratory*

54 Reconfigurable Physical Agents

Masahiro Fujita, *Sony Corporation*
Hiroaki Kitano, *Sony Computer Science Laboratory*
Koji Kageyama, *Sony Corporation*

PAPER SESSION 3: COORDINATION & COOPERATION

Monday, May 11

10:30 am - 12:30 pm

62 Coordinating with Obligations

Mihai Barbuceanu, *University of Toronto*
Tom Gray, *Mitel Corporation*
Serge Mankovski, *Mitel Corporation*

70 Markov Tracking for Agent Coordination

Richard Washington, *Caelum Research, NASA Ames Research Center*

78 The CMUnited-97 Robotic Soccer Team: Perception and Multiagent Control

Manuela Veloso, *Carnegie Mellon University*
Peter Stone, *Carnegie Mellon University*
Kwun Han, *Carnegie Mellon University*

86 Using Decision Tree Confidence Factors for Multi-Agent Control

Peter Stone, *Carnegie Mellon University*
Manuela Veloso, *Carnegie Mellon University*

PAPER SESSION 4: ENGINEERING AGENT SYSTEMS I

Monday, May 11

2:00 pm - 3:30 pm

92 Patterns of Intelligent and Mobile Agents

Elizabeth A. Kendall, *Royal Melbourne Institute of Technology*
P. V. Murali Krishna, *Royal Melbourne Institute of Technology*
Chirag V. Pathak, *Royal Melbourne Institute of Technology*
C. B. Suresh, *Royal Melbourne Institute of Technology*

100 JAFMAS: A Multiagent Application Development System

Deepika Chauhan, *University of Cincinnati*
Albert D. Baker, *University of Cincinnati*

108 Agent Design Patterns: Elements of Agent Application Design

Yariv Aridor, *IBM Tokyo Research Laboratory*
Danny B. Lange, *General Magic Inc.*

PAPER SESSION 5: WWW AGENTS I

Monday, May 11

2:00 pm - 3:30 pm

- 116 CiteSeer: An Autonomous Web Agent for Automatic Retrieval and Identification of Interesting Publications**
Kurt D. Bollacker, *University of Texas at Austin and NEC Research Institute*
Steve Lawrence, *NEC Research Institute*
C. Lee Giles, *NEC Research Institute and University of Maryland*
- 124 Query Restart Strategies for Web Agents**
Prasad Chalasani, *Carnegie Mellon University*
Somesh Jha, *Carnegie Mellon University*
Onn Shehory, *Carnegie Mellon University*
Katia Sycara, *Carnegie Mellon University*
- 132 WebMate: A Personal Agent for Browsing and Searching**
Liren Chen, *The Robotics Institute, Carnegie Mellon University*
Katia Sycara, *The Robotics Institute, Carnegie Mellon University*

PANEL SESSION

Monday, May 11

2:00 pm - 3:30 pm

Session Chair: Andrew Stern, *PF. Magic*

- 140 AUTONOMOUS AGENTS IN ENTERTAINMENT**
Joe Bates, *Carnegie Mellon University*
Bruce Blumberg, *MIT Media Lab*
Athomas Goldberg, *NYU Media Research Laboratory*
Barbara Hayes-Roth, *Stanford University*
Andrew Stern, *PF. Magic*

PAPER SESSION 6: AGENTS FOR INFORMATION MANAGEMENT I

Monday, May 11

4:00 pm - 5:30 pm

- 141 Concept Features in Re: Agent, an Intelligent Email Agent**
Gary Boone, *Georgia Institute of Technology*
- 149 Agents for Collecting Application Usage Data Over the Internet**
David M. Hilbert, *University of California, Irvine*
David F. Redmiles, *University of California, Irvine*
- 157 Adaptive Information Agents in Distributed Textual Environments**
Filippo Menczer, *University of California, San Diego*
Richard K. Belew, *University of California, San Diego*

PAPER SESSION 7: SYNTHETIC AGENTS

Monday, May 11

4:00 pm - 5:30 pm

- 165 A Social-Psychological Model for Synthetic Actors**
Daniel Rousseau, *Machina Sapiens*
Barbara Hayes-Roth, *Stanford University*
- 173 Agents in Annotated Worlds**
Patrick Doyle, *Stanford University*
Barbara Hayes-Roth, *Stanford University*
- 181 Story-morphing in the Affective Reasoning Paradigm: Generating Stories Semi-Automatically for Use with "Emotionally Intelligent" Multimedia Agents**
Clark Elliott, *DePaul University*
Jacek Brzezinski, *DePaul University*
Sanjay Sheth, *DePaul University*
Robert Salvatoriello, *DePaul University*

PANEL SESSION

Monday, May 11

4:00 pm - 5:30 pm

Session Chair: Hyacinth S. Nwana, *BT Labs*

- 189 AGENT-MEDIATED ELECTRONIC COMMERCE: ISSUES, CHALLENGES AND SOME VIEWPOINTS**
Hyacinth S. Nwana, *BT Labs*
Jeff Rosenschein, *Hebrew University*
Tuomas Sandholm, *Washington University*
Carles Sierra, *IIIA*
Pattie Maes, *MIT Media Laboratory*
Rob Guttman, *MIT Media Laboratory*

PAPER SESSION 8: MOBILE SOFTWARE AGENTS

Tuesday, May 12

10:30 am - 12:30 pm

- 197 Market-Based Resource Control for Mobile Agents**
Jonathan Brédin, *Dartmouth College*
David Kotz, *Dartmouth College*
Daniela Rus, *Dartmouth College*
- 205 Mobile Agents for Enabling Mobile User Aware Applications**
Akhil Sahai, *INRIA-IRISA*
Christine Morin, *INRIA-IRISA*
- 212 A Secure Marketplace for Mobile Java Agents**
Kay Neuenhofen, *Sun Microsystems*
Matthew Thompson, *Sun Microsystems*
- 219 Mobile Agents on the Digital Battlefield**
Martin O. Hofmann, *Lockheed Martin ATL*
Amy McGovern, *University of Massachusetts*
Kenneth R. Whitebread, *Lockheed Martin ATL*

PAPER SESSION 9: LEARNING AND ADAPTATION I

Tuesday, May 12

10:30 am - 12:30 pm

- 226 A Multiagent Perspective of Parallel and Distributed Machine Learning**
Gerhard Weiß, *Technische Universität München*
- 231 Learning Situation-Dependent Costs: Improving Planning from Probabilistic Robot Execution**
Karen Zita Haigh, *Carnegie Mellon University*
Manuela M. Veloso, *Carnegie Mellon University*
- 239 Online Learning about Other Agents in a Dynamic Multiagent System**
Junling Hu, *University of Michigan*
Michael P. Wellman, *University of Michigan*
- 247 Learning What Is Relevant to the Effects of Actions for a Mobile Robot**
Matthew D. Schmill, *University of Massachusetts*
Michael T. Rosenstein, *University of Massachusetts*
Paul R. Cohen, *University of Massachusetts*
Paul Utgoff, *University of Massachusetts*

PAPER SESSION 10: LIFELIKE AGENTS

Tuesday, May 12

10:30 am - 12:30 pm

- 254 Behavioural Self-Organization in Lifelike Agents**
Jiming Liu, *Hong Kong Baptist University*
Hong Qin, *Hong Kong Baptist University*
- 261 Integrating Reactive and Scripted Behaviors in a Life-Like Presentation Agent**
Elisabeth André, *German Research Center for Artificial Intelligence (DFKI)*
Thomas Rist, *German Research Center for Artificial Intelligence (DFKI)*
Jochen Müller, *German Research Center for Artificial Intelligence (DFKI)*
- 269 BodyChat: Autonomous Communicative Behaviors in Avatars**
Hannes Högni Vilhjálmsson, *MIT Media Laboratory*
Justine Cassell, *MIT Media Laboratory*
- 277 Actor-Based Computing: Vision Forestalled, Vision Fulfilled**
Arthur Allen, *Charis Software Systems*

PAPER SESSION 11: COMPUTATIONAL MARKET SYSTEMS

Tuesday, May 12

2:00 pm - 3:30 pm

- 285 A Market Architecture for Multi-Agent Contracting**
John Collins, *University of Minnesota*
Ben Youngdahl, *University of Minnesota*
Scott Jamison, *University of Minnesota*
Bamshad Mobasher, *University of Minnesota*
Maria Gini, *University of Minnesota*
- 293 Competitive Scenarios for Heterogeneous Trading Agents**
Juan A. Rodríguez-Aguilar, *IIIA, CSIC*
Francisco J. Martín, *IIIA, CSIC*
Pablo Noriega, *IIIA, CSIC*
Pere Garcia, *IIIA, CSIC*
Carles Sierra, *IIIA, CSIC*
- 301 The Michigan Internet AuctionBot: A Configurable Auction Server for Human and Software Agents**
Peter R. Wurman, *University of Michigan*
Michael P. Wellman, *University of Michigan*
William E. Walsh, *University of Michigan*

PAPER SESSION 12: AGENT CONTROL ARCHITECTURES I

Tuesday, May 12

2:00 pm - 3:30 pm

- 309 Increasing Agent Autonomy in Dynamic Environments**
Subrata Das, *Charles River Analytics*
Alper Caglayan, *Charles River Analytics*
Paul Gonsalves, *Charles River Analytics*
- 317 Movement Control Methods for Complex, Dynamically Simulated Agents: Adonis Dances the Macarena**
Maja J. Mataric, *University of Southern California*
Victor B. Zordan, *Georgia Institute of Technology*
Zachary Mason, *Brandeis University*
- 325 Integrating Active Perception with an Autonomous Robot Architecture**
Glenn Wasson, *University of Virginia*
David Kortenkamp, *Metrica, Inc., TRACLabs*
Eric Huber, *Metrica, Inc., TRACLabs*

VIDEO SESSION I

Tuesday, May 12

2:00 pm - 3:30 pm

- 332 STEVE: A Pedagogical Agent for Virtual Reality**
Jeff Rickel, *University of Southern California*
W. Lewis Johnson, *University of Southern California*
- 334 Virtual Petz: A Hybrid Approach to Creating Autonomous, Lifelike Dogz and Catz**
Andrew Stern, *PF. Magic*
Adam Frank, *PF. Magic*
Ben Resner, *PF. Magic*
- 336 The Use of Space Discretization for Autonomous Virtual Humans**
Srikanth Bandi, *Swiss Federal Institute of Technology*
Daniel Thalmann, *Swiss Federal Institute of Technology*

PAPER SESSION 13: AGENTS FOR INFORMATION MANAGEMENT II

Tuesday, May 12

4:00 pm - 5:00 pm

- 338 The ATL Postmaster: A System for Agent Collaboration and Information Dissemination**
Jennifer Kay, *Lockheed Martin Advanced Technology Laboratories*
Julius Ettl, *Lockheed Martin Advanced Technology Laboratories*
Goutham Rao, *Lockheed Martin Advanced Technology Laboratories*
Jon Thies, *Lockheed Martin Advanced Technology Laboratories*
- 343 Understanding Jokes: A Neural Approach to Content-Based Information Retrieval**
Stephane Zrehen, *USC Brain Project*
Michael A. Arbib, *USC Brain Project*

VIDEO SESSION II

Tuesday, May 12

4:00 pm - 5:00 pm

- 350 The RETSINA Multiagent System: Towards Integrating Planning, Execution and Information Gathering**
Katia Sycara, *Carnegie Mellon University*
Anandeeep S. Pannu, *Carnegie Mellon University*
- 352 Domain-Adaptive Information Systems (DAIS)**
Kenneth R. Whitebread, *Lockheed Martin Advanced Technology Laboratories*
Harley J. Stein, *Lockheed Martin Advanced Technology Laboratories*

PAPER SESSION 14: AGENT CONTROL ARCHITECTURES II

Wednesday, May 13

10:30 am - 12:00 pm

- 354 Action Selection in an Autonomous Agent with a Hierarchical Distributed Reactive Planning Architecture**
Vincent Decugis, *Groupe d'Etudes Sous-Marine de l'Atlantique*
Jacques Ferber, *Robotique et Microélectronique de Montpellier*
- 362 Issues in Temporal Reasoning for Autonomous Control Systems**
Nicola Muscettola, *Recom Technologies, NASA Ames Research Center*
Paul Morris, *Caelum Research, NASA Ames Research Center*
Barney Pell, *Riacs, NASA Ames Research Center*
Ben Smith, *Jet Propulsion Laboratory, California Institute of Technology*
- 369 A Hybrid Procedural/Deductive Executive for Autonomous Spacecraft**
Barney Pell, *Riacs, NASA Ames Research Center*
Edward B. Gamble, *Jet Propulsion Laboratory/California Institute of Technology*
Erann Gat, *Jet Propulsion Laboratory/California Institute of Technology*
Ron Keesing, *Caelum Research, NASA Ames Research Center*
James Kurien, *Caelum Research, NASA Ames Research Center*
William Millar, *Caelum Research, NASA Ames Research Center*
P. Pandurang Nayak, *Riacs, Nasa Ames Research Center*
Christian Plaunt, *Caelum Research, NASA Ames Research Center*
Brian C. Williams, *NASA Ames Research Center*

PAPER SESSION 15: ENGINEERING AGENT SYSTEMS II

Wednesday, May 13

10:30 am - 12:00 pm

- 377 Personal Security Agent: KQML-Based PKI**
Qi He, *Carnegie Mellon University*
Katia P. Sycara, *Carnegie Mellon University*
Timothy W. Finin, *University of Maryland Baltimore County*
- 385 Pitfalls of Agent-Oriented Development**
Michael Wooldridge, *Queen Mary & Westfield College, University of London*
Nicholas R. Jennings, *Queen Mary & Westfield College, University of London*
- 392 Liability for Autonomous Agent Design**
Carey Heckman, *Stanford Law School*
Jacob O. Wobbrock, *Stanford Symbolic Systems Program*

PAPER SESSION 16: WWW AGENTS II

Wednesday, May 13

10:30 am - 12:00 pm

- 400 A Web-based Information System that Reasons with Structured Collections of Text**
William W. Cohen, *AT&T Labs-Research*
- 408 WebACE: A Web Agent for Document Categorization and Exploration**
Eui-Hong (Sam) Han, *University of Minnesota*
Daniel Boley, *University of Minnesota*
Maria Gini, *University of Minnesota*
Robert Gross, *University of Minnesota*
Kyle Hastings, *University of Minnesota*
George Karypis, *University of Minnesota*
Vipin Kumar, *University of Minnesota*
Bamshad Mobasher, *University of Minnesota*
Jerome Moore, *University of Minnesota*
- 416 SHOPPER'S EYE: Using Location-based Filtering for a Shopping Agent in the Physical World**
Andrew E. Fano, *Andersen Consulting*

PAPER SESSION 17: LEARNING AND ADAPTATION II

Wednesday, May 13

1:30 pm - 2:30 pm

- 422 A History-Based Approach for Adaptive Robot Behavior in Dynamic Environments**
François Michaud, *Université de Sherbrooke*
Maja J. Mataric, *University of Southern California*
- 430 Effects of Misconception on Reciprocal Agents**
Sandip Sen, *The University of Tulsa*
Anish Biswas, *The University of Tulsa*

PAPER SESSION 18: APPLICATIONS

Wednesday, May 13

1:30 pm - 2:30 pm

- 436 SANI: A Seamless and Non-Intrusive Framework and Agent for Creating Intelligent Interactive Homes**
Sandeep Chatterjee, *Massachusetts Institute of Technology*
- 441 Reactive Agents for Adaptive Image Analysis**
Jiming Liu, *Hong Kong Baptist University*

POSTER SESSION

Wednesday, May 13

1:30 pm - 3:00 pm

- 449 Artificial Autonomous Agents with Artificial Emotions**
Luís Miguel Botelho, *ISCTE*
Helder Coelho, *University of Lisbon*
- 451 Mobility and Management Support for Mobile Agents**
Wen-Shyen E. Chen, *National Chung-Hsing University*
S. T. Su, *National Chung-Hsing University*
Yao-Nan Lien, *National Chengchi University*
H. T. Shu, *Institute for Information Industry*
Huilin Liu, *Institute for Information Industry*
- 453 Dynamic Software Agents for Business Intelligence Applications**
Qiming Chen, *HP Laboratories*
Parvathi Chundi, *HP Laboratories*
Umeshwar Dayal, *HP Laboratories*
Meichun Hsu, *HP Laboratories*
- 455 RoboTA: An Agent Colony Architecture for Supporting Education**
Kenneth D. Forbus, *Northwestern University*
Sven E. Kuehne, *Northwestern University*
- 457 A Formal Treatment of Distributed Matchmaking**
Somesh Jha, *Carnegie Mellon University*
Prasad Chalasani, *Carnegie Mellon University*
Onn Shehory, *Carnegie Mellon University*
Katia Sycara, *Carnegie Mellon University*
- 459 A Synergy of Agent Components: Social Comparison for Failure Detection**
Gal A. Kaminka, *USC/Information Sciences Institute*
Milind Tambe, *USC/Information Sciences Institute*
- 461 Subjective Avatars**
Michael Mateas, *Carnegie Mellon University*
- 463 Embodied Cultural Agents and Synthetic Sociology**
Simon Penny, *Carnegie Mellon University*
- 465 The Multi-Agent-Based Schedule Calculator (MASC) System**
Aruna Sankaranarayanan, *Fidelity Investments*
Maja Mataric, *University of Southern California*
- 467 ULTIMA RATIO – Should Hamlet Kill Claudius?**
Michael Schroeder, *University of Hannover*
Daniela A. Plewe, *Franz-Kunstler-Str*
Andreas Raab, *University of Magdeburg*

- 469 Combining Mediation and Bidding Mechanisms for Agent-Based Manufacturing Scheduling**
Weiming Shen, *The University of Calgary*
Douglas H. Norrie, *The University of Calgary*
- 471 Cognition and Affect: Architectures and Tools**
Aaron Sloman, *University of Birmingham*
Brian Logan, *University of Birmingham*
- 473 An Open Architecture for Emotion and Behavior Control of Autonomous Agents**
Juan D. Velásquez, *MIT Artificial Intelligence Laboratory*
Masahiro Fujita, *Sony Corporation*
Hiroaki Kitano, *Sony Computer Science Laboratory, Inc.*
- 475 The University of Michigan Digital Library Service Market Society**
José M. Vidal, *University of Michigan*
Tracy Mullen, *University of Michigan*
Peter Weinstein, *University of Michigan*
Edmund H. Durfee, *University of Michigan*
- 477 Author Index**