

## Curriculum Vitae

### Edmund H. Durfee

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#### Address:

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#### Research Interests:

Artificial Intelligence, Multiagent Systems, Distributed Computing, Cooperative Distributed Problem Solving, Distributed Planning and Coordination, Organizational Design, Intelligent Communication, Real-Time Intelligent Control.

#### Current Position:

Professor, [Computer Science and Engineering, College of Engineering, University of Michigan](#), 2000-.

Professor, [School of Information, University of Michigan](#), 2000-.

Director, [Masters of Engineering Program in Robotics and Autonomous Vehicles](#), 2010-.

#### Education:

- Ph.D. [Computer and Information Science, Univ. of Massachusetts](#), Sept. 1987.  
Dissertation: *A Unified Approach to Dynamic Coordination: Planning actions and interactions in a distributed problem solving network.*  
Advisor: [Victor R. Lesser](#)
- M.S.E.C.E. Electrical and Computer Engineering, Univ. of Massachusetts, Sept. 1984.
- A.B. Chemistry and Physics *cum laude*, Harvard University, June 1980.

#### Honors and Awards:

- Outstanding Achievement in Research Award, U. of Massachusetts CS Dept, 2012.
- Int. Foundation for Autonomous Agents and MultiAgent Systems Influential Paper Award, 2010.
- Int. Foundation for Autonomous Agents and MultiAgent Systems Influential Paper Award, 2008.
- Best Paper, 4<sup>th</sup> Int. Joint Conf. on Autonomous Agents and MultiAgent Systems
- Fellow, Institute of Electrical and Electronics Engineers (IEEE), 2004.
- Univ. of Michigan College of Engineering Service Excellence Award, 2002.
- Fellow, American Association of Artificial Intelligence (AAAI), 2001.
- Univ. of Michigan EECS Department Outstanding Achievement Award, 2001.
- Univ. of Michigan EECS Department Research Excellence Award, 1996.
- Plenary speaker, First International Conference on Multiagent Systems, 1995.
- Invited speaker, National Conference on Artificial Intelligence (AAAI-92), 1992.
- NSF Presidential Young Investigator, 1991.
- IBM Graduate Fellowship, 1986--1987 academic year.
- University Fellowship, University of Massachusetts, 1985--1986 academic year.

## **Previous Positions:**

Visiting Professor, Department of Computer Science, University of Fort Hare, South Africa, and Adjunct Visiting Professor, Department of Computer Science, Rhodes University, South Africa, February-March, 2002.

Associate Professor, Department of Electrical Engineering and Computer Science, College of Engineering, and in the School of Information, University of Michigan, 1994-2000.

Visiting Researcher, Institute of Computer Science, Hebrew University, Jerusalem Israel, January-April, 1995.

Assistant Professor, Department of Electrical Engineering and Computer Science, University of Michigan, 1988-1994.

Post-doctoral Research Computer Scientist, Department of Computer and Information Science, University of Massachusetts, 1987-1988.

Research Assistant under the direction of Victor R. Lesser, in the Distributed Problem Solving Laboratory, University of Massachusetts, 1983-1987.

Teaching Assistant in the Department of Electrical and Computer Engineering, University of Massachusetts, 1982-1983.

Associate Staff Chemist, General Electric Corporate Research and Development Center, Schenectady, NY, 1980-1982.

Summer Research Trainee, General Foods Research and Development Center, Tarrytown, NY, summers of 1978 and 1979.

## **Research Activities**

### **Papers in Journals and Refereed Magazines:**

1. Edmund H. Durfee, James C. Boerkoel Jr., and Jason Sleight. "Using hybrid scheduling for the semi-autonomous formation of expert teams," *Future Generation Computer Systems*, 31:200-212, 2014.
2. James C. Boerkoel Jr. and Edmund H. Durfee. "Distributed Reasoning for Multiagent Simple Temporal Problems," *Journal of Artificial Intelligence Research (JAIR)*, volume 47, pages 95-156, 2013.
3. Jianhui Wu and Edmund H. Durfee. "[Resource-Driven Mission-Phasing Techniques for Constrained Agents in Stochastic Environments](#)," *Journal of Artificial Intelligence Research (JAIR)*, volume 38, pages 415-473, July 2010.
4. Jeffrey S. Cox and Edmund H. Durfee. "[Efficient and Distributable Methods for Solving the Multiagent Plan Coordination Problem](#)," *Multiagent and Grid Systems* 5(4): 373-408, 2009. (Special Issue on Coordinating Agents' Plans and Schedules.)
5. Keith Purrington and Edmund H. Durfee. "[Agreeing on Social Outcomes Using Individual CP-Nets](#)," *Multiagent and Grid Systems* 5(4): 409-425, 2009. (Special Issue on Coordinating Agents' Plans and Schedules.)
6. Stefan J. Witwicki and Edmund H. Durfee. "[Commitment-Based Service Coordination](#)," *International Journal on Agent Oriented Software Engineering*, Special Issue on Service-Oriented Computing: Agents, Semantics, and Engineering. 3(1):59-87, 2009.
7. Bradley J. Clement, Edmund H. Durfee, and Anthony C. Barrett. "[Abstract Reasoning for Planning and Coordination](#)," *Journal of Artificial Intelligence Research (JAIR)*, volume 28, pages 453-515, April 2007.
8. Dmitri A. Dolgov and Edmund H. Durfee. "[Resource Allocation Among Agents with MDP-Induced Preferences](#)," *Journal of Artificial Intelligence Research (JAIR)*, volume 27, pages 505-549, September 2006.
9. Dmitri A. Dolgov and Edmund H. Durfee. "[Symmetric Approximate Linear Programming for Factored MDPs with Application to Constrained Problems](#)," *Annals of Mathematics and Artificial Intelligence*, 47(3-4):273-293, August 2006.
10. Michael N. Huhns, Munindar P. Singh, Mark Burstein, Keith Decker, Edmund Durfee, Tim Finin, Les Gasser, Hrishikesh Goradia, Nick Jennings, Kiran Lakkaraju, Hideyuki Nakashima, H. Van Dyke Parunak, Jeffrey S. Rosenschein, Alicia Ruvinsky, Gita Sukthankar, Samarth Swarup, Katia Sycara, Milind Tambe, Tom Wagner, and Laura Zavala, "[Research Directions for Service-Oriented Multiagent Systems](#)," *IEEE Internet Computing*, vol. 9, no. 6, pp. 65-70, November/December 2005.
11. Sunju Park, Edmund H. Durfee, and William P. Birmingham. "[Use of Markov Chains to Design an Agent Bidding Strategy for Continuous Double Auctions](#)," *Journal of Artificial Intelligence Research (JAIR)*, volume 22, pages 175-214, November 2004.

12. Christopher H. Brooks and Edmund H. Durfee. "[Congregation Formation in MultiAgent Systems.](#)" *Autonomous Agents and Multi-Agent Systems Journal*, 7(1-2):145-170, July/September 2003.
13. José M. Vidal and Edmund H. Durfee. "[Predicting the expected behavior of agents that learn about agents: The CLRI framework.](#)" *Autonomous Agents and Multi-Agent Systems Journal*, 6(1):77-107, January 2003.
14. Edmund H. Durfee, Sarit Kraus, Hideyuki Nakashima, and Milind Tambe. "Editorial: Special Issue on the International Conference on MultiAgent Systems 2000." *Artificial Intelligence* 142:95-97, December 2002.
15. Christopher H. Brooks, Robert S. Gazzale, Rajarshi Das, Jeffrey O. Kephart, Jeffrey K. MacKie-Mason, and Edmund H. Durfee. "Model Selection in an Information Economy: Choosing what to Learn." *Computational Intelligence*, 18(4):566-582 2002.
16. David N. Allsopp, Patrick Beautement, Jeffrey M. Bradshaw, Edmund H. Durfee, Michael Kirton, Craig A. Knoblock, Niranjani Suri, Austin Tate, and Craig W. Thompson. "[Coalition Agents Experiment: Multiagent Cooperation in International Coalitions.](#)" *IEEE Intelligent Systems*, 17(3):26-35, May/June 2002.
17. Piotr J. Gmytrasiewicz and Edmund H. Durfee. "[Rational Communication in Multi-Agent Systems.](#)" *Autonomous Agents and Multi-Agent Systems Journal*, 4(3):233-272, September 2001.
18. Edmund H. Durfee. "[Scaling Up Agent Coordination Strategies.](#)" *IEEE Computer* 34(7):39-46, July 2001.
19. Ella M. Atkins, Tarek F. Abdelzaher, Kang G. Shin, and Edmund H. Durfee. "[Planning and Resource Allocation for Hard Real-Time, Fault-Tolerant Plan Execution.](#)" *Autonomous Agents and Multi-Agent Systems Journal* ("Best of Agents'99" special issue), 4(1-2):57-78, March/June 2001.
20. Piotr J. Gmytrasiewicz and Edmund H. Durfee. "[Rational Coordination in Multi-Agent Systems.](#)" *Autonomous Agents and Multi-Agent Systems Journal*, 3(4):319-350, December 2000.
21. Sunju Park, Edmund H. Durfee, and William P. Birmingham. "[Emergent Properties of a Market-based Digital Library with Strategic Agents.](#)" *Autonomous Agents and Multi-Agent Systems Journal* ("Best of ICMAS'98" special issue), 3(1):33-51, March 2000.
22. Edmund H. Durfee. "Distributed Continual Planning for Unmanned Ground Vehicle Teams." *AI Magazine* 20(4):55-61 (Special section on Distributed Continual Planning), Winter, 1999.
23. Marie E. desJardins, Edmund H. Durfee, Charles L. Ortiz, Jr., and Michael J. Wolverton. "[A Survey of Research in Distributed, Continual Planning.](#)" *AI Magazine* 20(4):13-22 (Special section on Distributed Continual Planning), Winter, 1999.
24. Edmund H. Durfee. "[Practically Coordinating.](#)" *AI Magazine* 20(1):99-116, Spring 1999.

25. Peter Weinstein, William P. Birmingham, and Edmund H. Durfee. "[Agent-Based Digital Libraries: Decentralization and Coordination.](#)" *IEEE Communications Magazine*, 37(1):110-115, January 1999.
26. José M. Vidal and Edmund H. Durfee. "[Learning Nested Agent Models in an Information Economy.](#)" *Journal of Experimental and Theoretical Artificial Intelligence* (special issue on learning in distributed artificial intelligence systems), 10(3):291-308, 1998.
27. Sandip Sen and Edmund H. Durfee. "[A Formal Study of Distributed Meeting Scheduling.](#)" *Group Decision and Negotiation*, 7:265-289, 1998.
28. Makoto Yokoo, Edmund H. Durfee, Toru Ishida, and Kazuhiro Kuwabara. "[Distributed Constraint Satisfaction Problem: Formalization and Algorithms.](#)" *IEEE Transactions on Knowledge and Data Engineering*, TKDE10(5):673-685, September 1998. (Winner of the IFAAMAS Influential Paper Award in 2010.)
29. Edmund H. Durfee, Patrick G. Kenny, and Karl C. Kluge. "[Integrated Permission Planning and Execution for Unmanned Ground Vehicles.](#)" *Autonomous Robots*, 5:1-14, 1998. (Reprinted in *Autonomous Agents* (G. Bekey, editor), pages 97-110, Kluwer Academic Publishers, 1999.)
30. Edmund H. Durfee, Daniel L. Kiskis, and William P. Birmingham. "The Agent Architecture of the University of Michigan Digital Library." *IEE/British Computer Society Proceedings on Software Engineering* (Special Issue on Intelligent Agents), 144(1):61-71, February 1997. Also published in *Readings in Agents* (M. N. Huhns and M. P. Singh, editors), Morgan Kaufmann 1998.
31. Innes A. Ferguson and Edmund H. Durfee. "Artificial intelligence in digital libraries: moving from chaos to (more) order." Introductory editorial in the *International Journal on Digital Libraries*, 2(1):1-2, 1998.
32. Young-pa So and Edmund H. Durfee. "[Designing Tree-Structured Organizations for Computational Agents.](#)" *Computational and Mathematical Organization Theory*, 2(3):219-246, Fall 1996.
33. Sandip Sen and Edmund H. Durfee. "[A Contracting Model for Flexible Distributed Scheduling.](#)" *Annals of Operations Research* (Special issue on integration of AI and OR and decision analysis), volume 65 pages 195-222, 1996.
34. Michael P. Wellman, Edmund H. Durfee, and William P. Birmingham. "[The Digital Library as a Community of Information Agents.](#)" *IEEE Expert*. 11(3):10-11, June 1996.
35. Daniel E. Atkins III, William P. Birmingham, Edmund H. Durfee, Eric Glover, Tracy Mullen, Elke A. Rundensteiner, Elliot Soloway, José M. Vidal, Raven Wallace, and Michael P. Wellman. "Toward inquiry-based education through interacting software agents." *IEEE Computer* (Special issue on building large-scale digital libraries), 29(5):69-76, May 1996.
36. David J. Musliner, Edmund H. Durfee, and Kang G. Shin. "[World Modeling for the Dynamic Construction of Real-Time Control Plans.](#)" *Artificial Intelligence* volume 74, pp 83-127, 1995.

37. David J. Musliner, James A. Hendler, Ashok K. Agrawala, Edmund H. Durfee, Jay K. Strosnider, and C. J. Paul. "[The Challenge of Real-Time Artificial Intelligence.](#)" *IEEE Computer* 28(1):58-66, January 1995.
38. Sandip Sen and Edmund H. Durfee. "[The Role of Commitment in Cooperative Negotiation.](#)" *International Journal of Intelligent and Cooperative Information Systems*, 3(1):67-81, 1994.
39. Piotr J. Gmytrasiewicz and Edmund H. Durfee. "[Toward a Theory of Honesty and Trust Among Communicating Autonomous Agents.](#)" *Group Decision and Negotiation* 2:237-258 (Special issue on Distributed Artificial Intelligence), 1993.
40. Thomas A. Montgomery and Edmund H. Durfee. "[Search Reduction in Hierarchical Distributed Problem Solving.](#)" *Group Decision and Negotiation* 2:301-317 (Special issue on Distributed Artificial Intelligence), 1993.
41. David J. Musliner, Edmund H. Durfee, and Kang G. Shin. "[CIRCA: A Cooperative Intelligent Real-Time Control Architecture.](#)" *IEEE Transactions on Systems, Man, and Cybernetics* (Special Issue on Planning, Scheduling, and Control) SMC-23(6):1561-1574, 1993.
42. Edmund H. Durfee. "[Organisations, Plans, and Schedules: An Interdisciplinary Perspective on Coordinating AI Systems.](#)" *Journal of Intelligent Systems*, Special Issue on the Social Context of Intelligent Systems, 3(2-4):157-187, 1993.
43. Young-pa So and Edmund H. Durfee. "A Distributed Problem-Solving Infrastructure for Computer Network Management." *International Journal of Intelligent and Cooperative Information Systems*, 1(2):363-392, 1992.
44. Makoto Yokoo, Edmund H. Durfee, Toru Ishida, and Kazuhiro Kuwabara. "Distributed Constraint Satisfaction for Formalizing Distributed Problem Solving and its Algorithms." *The Transactions of the Institute of Electronics, Information, and Communication Engineers*, J-75,D-I(8):704-713, 1992. (In Japanese.)
45. Mark Adler, Edmund Durfee, Michael Huhns, William Punch, and Evangelos Simoudis. "AAAI Workshop on Cooperation Among Heterogeneous Intelligent Systems." *AI Magazine* 13(2):39-42, Summer 1992.
46. Edmund H. Durfee and Thomas A. Montgomery. "Coordination as Distributed Search in a Hierarchical Behavior Space." *IEEE Transactions on Systems, Man, and Cybernetics*, Special Issue on Distributed Artificial Intelligence, SMC-21(6):1363-1378, November 1991.
47. Edmund H. Durfee. "[The Distributed Artificial Intelligence Melting Pot.](#)" *IEEE Transactions on Systems, Man, and Cybernetics*, Special Issue on Distributed Artificial Intelligence, SMC-21(6):1301-1306, November 1991.
48. Edmund H. Durfee and Victor R. Lesser. "Partial Global Planning: A Coordination Framework for Distributed Hypothesis Formation." *IEEE Transactions on Systems, Man, and Cybernetics*, Special Issue on Distributed Sensor Networks, SMC-21(5):1167-1183, September 1991. (Winner of the IFAAMAS Influential Paper Award in 2008.)

49. Edmund H. Durfee, Victor R. Lesser, and Daniel D. Corkill. "[Trends in Cooperative Distributed Problem Solving](#)." *IEEE Transactions on Knowledge and Data Engineering*, KDE-1(1):63-83, March 1989.
50. Edmund H. Durfee and Victor R. Lesser. "Incremental Planning to Control a Time-Constrained, Blackboard-Based Problem Solver." *IEEE Transactions on Aerospace and Electronic Systems*, special issue on space telerobotics, 24(5):647-662, September 1988.
51. Victor R. Lesser, Jasmina Pavlin, and Edmund H. Durfee. "Approximate Processing in Real-Time Problem Solving." *AI Magazine*, Vol. 9, No. 1, pages 49--61, Spring 1988.
52. Edmund H. Durfee, Victor R. Lesser, and Daniel D. Corkill. "Coherent Cooperation Among Communicating Problem Solvers." *IEEE Transactions on Computers*, C36(11):1275--1291, November 1987. (Also published in *Readings in Distributed Artificial Intelligence*, pp. 268-284, A. Bond and L. Gasser (eds.), Morgan Kaufmann Publishers, California, 1988.)

### **Papers in Highly Refereed Proceedings:**

1. Jason Sleight and Edmund H. Durfee. "Multiagent Metareasoning Through Organizational Design." In *Proceedings of the Twenty-Eighth Conference on Artificial Intelligence (AAAI-14)*, July 2014.
2. Robert Cohn, Satinder Singh, and Edmund Durfee. "[Characterizing EVOI-Sufficient k-Response Query Sets in Decision Problems](#)." In *Proceedings of the Seventeenth International Conference on Artificial Intelligence and Statistics (AISTATS-14)*, April 2014.
3. James C. Boerkoel, Jr. and Edmund H. Durfee. "[Decoupling the Multiagent Disjunctive Temporal Problem](#)." In *Proceedings of the Twenty-Seventh Conference on Artificial Intelligence (AAAI-13)*, pages 123-129, July 2013.
4. Jason Sleight and Edmund H. Durfee. "[Organizational Design Principles and Techniques for Decision-Theoretic Agents](#)." In *Proceedings of the Twelfth International Conference on Autonomous Agents and Multiagent Systems (AAMAS-13)*, pages 463-470, May 2013.
5. James C. Boerkoel, Jr. and Edmund H. Durfee. "[A Distributed Approach to Summarizing Spaces of Multiagent Schedules](#)." In *Proceedings of the Twenty-Sixth Conference on Artificial Intelligence (AAAI-12)*, pages 1742-1748, July 2012.
6. Jason Sleight and Edmund H. Durfee. "A Decision-Theoretic Characterization of Organizational Influences." In *Proceedings of the Eleventh International Conference on Autonomous Agents and Multiagent Systems (AAMAS-12)*, pages 323-330, June 2012.
7. Robert Cohn, Edmund H. Durfee, and Satinder Singh. "Comparing Action-Query Strategies in Semi-Autonomous Agents." In *Proceedings of the Twenty-Fifth Conference on Artificial Intelligence (AAAI-11)*, pages 1102-1107, 2011.
8. Stefan J. Witwicki and Edmund H. Durfee. "[Towards a Unifying Characterization for Quantifying Weak Coupling in Dec-POMDPs](#)." In *Proceedings of the Tenth International Conference on Autonomous Agents and Multiagent Systems (AAMAS-11)*, pages 29-36, May 2011. (One of three nominees for the Best Student Paper Award.)

9. James C. Boerkoel Jr. and Edmund H. Durfee. "[Distributed Algorithms for Solving the Multiagent Temporal Decoupling Problem.](#)" In *Proceedings of the Tenth International Conference on Autonomous Agents and Multiagent Systems (AAMAS-11)*, pages 141-148, May 2011.
10. James C. Boerkoel Jr. and Edmund H. Durfee. "[A Comparison of Algorithms for Solving the Multiagent Simple Temporal Problem.](#)" In *Proceedings of the 2010 International Conference on Automated Planning and Scheduling (ICAPS-10)*, pages 26-33, May 2010.
11. Stefan J. Witwicki and Edmund H. Durfee. "[Influence-Based Policy Abstraction for Weakly-Coupled Dec-POMDPs.](#)" In *Proceedings of the 2010 International Conference on Automated Planning and Scheduling (ICAPS-10)*, pages 185-192, May 2010.
12. James C. Boerkoel Jr. and Edmund H. Durfee, and Keith Purrington. "[Generalized Solution Techniques for Preference-Based Constrained Optimization with CP-nets.](#)" In *Proceedings of the Ninth International Conference on Autonomous Agents and Multiagent Systems (AAMAS-10)*, pages 291-298, May 2010.
13. James C. Boerkoel Jr. and Edmund H. Durfee. "[Evaluating Hybrid Constraint Tightening for Scheduling Agents.](#)" In *Proceedings of Eighth International Conference on Autonomous Agents and MultiAgent Systems (AAMAS-09)*, pages 673-680, May 2009.
14. James C. Boerkoel Jr. and Edmund H. Durfee. "[Hybrid Constraint Tightening for Solving Hybrid Scheduling Problems.](#)" In *Proceedings of 23<sup>rd</sup> AAAI Conference on Artificial Intelligence (AAAI-08)*, pages 1446-1449, July 2008.
15. Jianhui Wu and Edmund H. Durfee. "[Sequential Resource Allocation in Multi-agent Systems with Uncertainties.](#)" In *Proceedings of the Sixth International Conference on Autonomous Agents and MultiAgent Systems (AAMAS-07)*, pages 760-767, May 2007.
16. Jianhui Wu and Edmund H. Durfee. "[Solving Large TÆMS Problems Efficiently by Selective Exploration and Decomposition.](#)" In *Proceedings of the Sixth International Conference on Autonomous Agents and MultiAgent Systems (AAMAS-07)*, pages 291-298, May 2007.
17. Stefan Witwicki and Edmund H. Durfee. "[Commitment-Driven Distributed Joint Policy Search.](#)" In *Proceedings of the Sixth International Conference on Autonomous Agents and MultiAgent Systems (AAMAS-07)*, pages 480-487, May 2007.
18. Dmitri A. Dolgov and Edmund H. Durfee. "[Resource Allocation Among Agents with Preferences Induced by Factored MDPs.](#)" In *Proceedings of the Fifth International Conference on Autonomous Agents and MultiAgent Systems (AAMAS-06)*, pages 297-304, May 2006.
19. Jianhui Wu and Edmund H. Durfee. "[Mathematical Programming for Deliberation Scheduling in Time-limited Domains.](#)" In *Proceedings of the Fifth International Joint Conference on Autonomous Agents and MultiAgent Systems (AAMAS-06)*, pages 874-881, May 2006.
20. Dmitri A. Dolgov and Edmund H. Durfee. "[Stationary Deterministic Policies for Constrained MDPs with Multiple Rewards, Costs, and Discount Factors.](#)" In *Proceedings of the*



*Nineteenth International Joint Conference on Artificial Intelligence (IJCAI-05)*, pages 1326-1331, August 2005.

21. Dmitri A. Dolgov and Edmund H. Durfee. "[Computationally-Efficient Combinatorial Auctions for Resource Allocation in Weakly-Coupled MDPs.](#)" In *Proceedings of the Fourth International Joint Conference on Autonomous Agents and MultiAgent Systems (AAMAS-05)*, pages 657-664, July 2005.
22. Jianhui Wu and Edmund H. Durfee. "[Automated Resource-Driven Mission Phasing Techniques for Constrained Agents.](#)" In *Proceedings of the Fourth International Joint Conference on Autonomous Agents and MultiAgent Systems (AAMAS-05)*, pages 331-338, July 2005.
23. Jeffrey S. Cox, Edmund H. Durfee, and Thomas Bartold. "[A Distributed Framework for Solving the Multiagent Plan Coordination Problem.](#)" In *Proceedings of the Fourth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-05)*, pages 821-827, July 2005. (Named "Best Paper" of 130 accepted, 530 submitted.)
24. Jeffrey S. Cox and Edmund H. Durfee. "[Efficient Algorithms for Multiagent Plan Coordination.](#)" In *Proceedings of the Fourth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-05)*, pages 828-835, July 2005. (Winner of Best Paper Award.)
25. Dmitri A. Dolgov and Edmund H. Durfee. "[Graphical Models in Local, Asymmetric Multi-Agent Markov Decision Processes.](#)" In *Proceedings of the Third International Conference on Autonomous Agents and MultiAgent Systems (AAMAS-04)*, pages 956-963, July 2004.
26. Jianhui Wu and Edmund H. Durfee. "[The Impact of Communication Costs and Limitations on Price Wars.](#)" In *Proceedings of the Third International Joint Conference on Autonomous Agents and MultiAgent Systems (AAMAS-04)*, pages 1205-1212, July 2004. (One of three finalists for the Best Student Paper Award.)
27. Dmitri A. Dolgov and Edmund H. Durfee. "[Resource Allocation and Policy Formulation for Multiple Resource-Limited Agents Under Uncertainty.](#)" In *Proceedings of the International Conference on Automated Planning and Scheduling*, pages 315-324, June 2004.
28. Dmitri A. Dolgov and Edmund H. Durfee. "[Approximating Optimal Policies for Agents with Limited Execution Resources.](#)" In *Proceedings of the Eighteenth International Joint Conference on Artificial Intelligence (IJCAI-03)*, pages 1107-1112, August 2003.
29. Jeffrey S. Cox and Edmund H. Durfee. "[Discovering and Exploiting Synergy between Hierarchical Planning Agents.](#)" In *Proceedings of the Second International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 281-288, July 2003.
30. Haksun Li, Edmund H. Durfee, and Kang G. Shin. "[Multiagent Planning for Agents with Internal Execution Resource Constraints.](#)" In *Proceedings of the Second International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 560-567, July 2003.
31. Thomas Bartold and Edmund H. Durfee. "[Limiting Disruption in Multiagent Replanning.](#)" In *Proceedings of the Second International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 49-56, July 2003.

32. Christopher H. Brooks and Edmund H. Durfee. "Congregating and Market Formation." In *Proceedings of the First International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 96-103, July, 2002.
33. Dmitri Dolgov and Edmund H. Durfee. "[Satisficing Strategies for Resource-Limited Policy Search in Dynamic Environments.](#)" In *Proceedings of the First International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 1325-1332, July, 2002.
34. Jeffrey O. Kephart, Christopher H. Brooks, Rajarshi Das, Jeffrey K. MacKie-Mason, Robert Gazzale, and Edmund H. Durfee. "[Pricing Information Bundles in a Dynamic Environment.](#)" In *Proceedings of the ACM Conference on Electronic Commerce 2001 (EC-01)*, pages 180-190, October 2001.
35. Bradley J. Clement, Anthony C. Barrett, Gregg R. Rabideau, and Edmund H. Durfee. "[Using Abstraction in Planning and Scheduling.](#)" In *Proceedings of the Sixth European Conference on Planning (ECP-01)*, pages 145-156, September 2001.
36. Christopher H. Brooks, Edmund H. Durfee and Rajarshi Das. "[Price Wars and Niche Discovery in an Information Economy.](#)" In *Proceedings of the ACM Conference on Electronic Commerce 2000 (EC-00)*, pages 95-106, October 2000.
37. Christopher H. Brooks, Edmund H. Durfee and Aaron Armstrong. "[An Introduction to Congregating in Multiagent Systems.](#)" In *Proceedings of the Fourth International Conference on MultiAgent Systems (ICMAS-2000)*, pages 79-86, July 2000.
38. Christopher H. Brooks, Scott Fay, Rajarshi Das, Jeffrey K. MacKie-Mason, Jeffrey O. Kephart and Edmund H. Durfee. "[Automated Strategy Searches in an Electronic Goods Market: Learning and Complex Price Schedules.](#)" In *Proceedings of the ACM Conference on Electronic Commerce (EC-99)*, pages 31-40, November, 1999.
39. Bradley J. Clement and Edmund H. Durfee. "[Theory for Coordinating Concurrent Hierarchical Planning Agents Using Summary Information.](#)" In *Proceedings of the National Conference on Artificial Intelligence (AAAI-99)*, pages 495-502, July 1999.
40. Ella M. Atkins, Tarek F. Abdelzaher, Kang G. Shin, and Edmund H. Durfee. "[Planning and Resource Allocation for Hard Real-time Fault-Tolerant Plan Execution.](#)" In *Proceedings of the Third International Conference on Autonomous Agents*, pages 244-251, May 1999.
41. Bradley J. Clement and Edmund H. Durfee. "[Top-Down Search for Coordinating the Hierarchical Plans of Multiple Agents.](#)" In *Proceedings of the Third International Conference on Autonomous Agents*, pages 252-259, May 1999.
42. Sunju Park, Edmund H. Durfee, and William P. Birmingham. "[An Adaptive Agent Bidding Strategy based on Stochastic Modeling.](#)" In *Proceedings of the Third International Conference on Autonomous Agents*, pages 147-153, May 1999.
43. José M. Vidal and Edmund H. Durfee. "[The Moving Target Function Problem in Multi-Agent Learning.](#)" In *Proceedings of the Third International Conference on Multi-Agent Systems (ICMAS98)*, pages 317-324, July 1998.

44. Aaron Armstrong and Edmund H. Durfee. "Mixing and Memory: Emergent Cooperation in an Information Marketplace." In *Proceedings of the Third International Conference on Multi-Agent Systems (ICMAS98)*, pages 34-41, July 1998.
45. Sunju Park, Edmund H. Durfee, and William P. Birmingham. "[Emergent Properties of a Market-Based Digital Library with Strategic Agents](#)." In *Proceedings of the Third International Conference on Multi-Agent Systems (ICMAS98)*, pages 230-237, July 1998.
46. Bradley Clement and Edmund H. Durfee. "Scheduling High-Level Tasks Among Cooperative Agents." In *Proceedings of the Third International Conference on Multi-Agent Systems (ICMAS98)*, pages 96-103, July 1998.
47. Edmund H. Durfee and Young-pa So. "[The Effects of Runtime Coordination Strategies Within Static Organizations](#)." In *Proceedings of the Fifteenth International Joint Conference on Artificial Intelligence (IJCAI97)*, pages 612-618, August 1997.
48. Chip McVey, Edmund H. Durfee, Ella Atkins, and Kang G. Shin. "[Development of Iterative Real-time Scheduler to Planner Feedback](#)." In *Proceedings of the Fifteenth International Joint Conference on Artificial Intelligence (IJCAI97)*, pages 1267-1272, August 1997.
49. Aaron Armstrong and Edmund H. Durfee. "[Dynamic Prioritization of Complex Agents in Distributed Constraint Satisfaction Problems](#)." In *Proceedings of the Fifteenth International Joint Conference on Artificial Intelligence (IJCAI97)*, pages 620-625, August 1997.
50. Ella M. Atkins, Edmund H. Durfee, and Kang G. Shin. "[Detecting and Reacting to Unplanned-for World States](#)." In *Proceedings of the Fourteenth National Conference on Artificial Intelligence (AAAI97)*, pages 571-577, July 1997.
51. Edmund H. Durfee, Marcus J. Huber, Michael Kurnow, and Jaeho Lee. "[TAIPE: Tactical Assistants for Interaction Planning and Execution](#)." In *Proceedings of the First International Conference on Autonomous Agents*, pages 443-450, February 1997.
52. Edmund H. Durfee, Patrick G. Kenny, and Karl C. Kluge. "[Integrated Permission Planning and Execution for Unmanned Ground Vehicles](#)." In *Proceedings of the First International Conference on Autonomous Agents*, pages 348-354, February 1997.
53. José M. Vidal and Edmund H. Durfee. "[The Impact of Nested Agent Models in an Information Economy](#)." In *Proceedings of the Second International Conference on Multi-Agent Systems (ICMAS96)*, pages 377-384, December 1996.
54. Sunju Park, Edmund H. Durfee, and William P. Birmingham. "[Advantages of Strategic Thinking in Multiagent Contracts \(A Mechanism and Analysis\)](#)." In *Proceedings of the Second International Conference on Multi-Agent Systems (ICMAS96)*, pages 259-266, December 1996.
55. Marcus J. Huber and Edmund H. Durfee. "An Initial Assessment of Plan-Recognition-Based Coordination for Multi-Agent Teams." In *Proceedings of the Second International Conference on Multi-Agent Systems (ICMAS96)*, pages 126-133, December 1996.

56. Ella M. Atkins, Edmund H. Durfee, and Kang G. Shin. "[Plan Development Using Local Probabilistic Models.](#)" In *Proceedings of the Conference on Uncertainty in Artificial Intelligence*, pages 49-56, July 1996.
57. Piotr J. Gmytrasiewicz and Edmund H. Durfee. "[A Rigorous, Operational Formalization of Recursive Modeling.](#)" In *Proceedings of the First International Conference on Multi-Agent Systems (ICMAS)*, pages 125-132, June 1995.
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### **Books:**

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3. Dmitri A. Dolgov and Edmund H. Durfee. "[The Effects of Locality and Asymmetry in Large-Scale MDPs.](#)" In *Challenges in the Coordination of Large-Scale Multiagent Systems* (Scerri, ed.), pages 3-25, Springer-Verlag, 2006.
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26. Edmund H. Durfee, Victor R. Lesser, and Daniel D. Corkill. "Cooperation Through Communication in a Distributed Problem Solving Network," Chapter 2 in M. Huhns (ed.) *Distributed Artificial Intelligence*, Pitman 1987. (Also appeared as chapter 7 in S. Robertson and W. Zachary (eds.), *Cognition, Computing, and Cooperation*, Ablex 1990.)

### **Major Invited Presentations:**

1. "Commitments and Responsibilities in Multiagent Systems," University of Massachusetts Computer Science Department Distinguished Lecture Series, Amherst, MA, November 14, 2012.
2. "Planning for Coordination and Coordination for Planning," keynote address presented at the *2008 IEEE/WIC/ACM International Conferences on Web Intelligence and Intelligent Agent Technology*, Sydney Australia, December 10, 2008.
3. "Multiagent Coordination, Planning, and Control," plenary address presented at the *International Workshop on Intelligent Information Management Systems and Technology*, Shanghai University of Finance and Economics Agent Systems School, Shanghai, China, March 2005.

4. "Multiagent Plan Coordination: Challenges, Solutions, and Opportunities," keynote speech at the Ninth Taiwan Conference on Artificial Intelligence and Applications (TAAI-2004), Taipei, Taiwan, November 2004.
5. "Cooperative Real-Time Control Plans for Resource-Limited Agents," plenary presentation at the *International Conference of Korea Intelligent Information Systems Society* and the *Pacific Rim International Workshop on Multi-Agents (PRIMA-03)*, Seoul, South Korea, November 2003.
6. "Exploiting Hierarchical Representations for Efficient and Flexible Coordination in Multi-Agent Systems," keynote presentation at the *Second United Kingdom workshop on Multi-Agent Systems (UKMAS-99)*, Bristol, UK, December 1999.
7. "Strategic Reasoning and Adaptation in an Information Economy," keynote presentation at the *Second IberoAmerican Workshop on Distributed AI and MultiAgent Systems*, Toledo, Spain, October 1998.
8. "Blissful Ignorance: Knowing Just Enough to Coordinate Well," invited plenary presentation at the *First International Conference on Multi-Agent Systems*, San Francisco, CA, June 1995.
9. "Distributed Problem Solving and Multiagent Systems: Commonalities, Differences, and Examples," keynote presentation at the *Zentrum fur interdisziplinare Forschung Conference on Solving Complex Problems With Agent Systems*, University of Bielefeld, Germany, February 1994.
10. "Robots Agree to Disagree," radio interview on the National Science *Foundation Radio Newslines*, April 1993.
11. "Coordination as Distributed Search," keynote presentation at the *Workshop on Modeling Autonomous Agents in Multi-Agent Worlds*, Viterbo, Italy, July 1992.
12. "What Your Computer Really Needs to Know, You Learned in Kindergarten," invited presentation at the *Tenth National Conference on Artificial Intelligence*, San Jose, CA, July 1992.

#### **Selected Other Presentations:**

1. "Negotiated Commitments," invited presentation at the 2014 AAMAS Workshop on Agent-based Complex Automated Negotiations (ACAN), May 6, 2014.
2. "Reasoning About Predictability in Cooperative and Adversarial Environments," invited presentation at Army Research Office Workshop on Planning and Learning in Multiagent Adversarial Environments, April 26, 2012.
3. "Selective Communication to Reduce Uncertainty in Multiagent Coordination," invited presentation at the AAI Fall Symposium on Multiagent Coordination Under Uncertainty, Nov 2011.

4. "Don't Always Ask, Don't always Tell: Judicious Mutual Modeling in Cooperative Multiagent Systems," Carnegie-Mellon University Robotics Institute Seminar, February 2011.
5. "MultiAgent Sequential Decision Making in Resource-Limited Systems," keynote talk at the AAMAS-09 Workshop on Multiagent Sequential Decision Making, May 2009.
6. "A MultiAgent Systems Perspective on MultiAgent Planning," invited talk at the Dagstuhl Seminar on Planning in Multiagent Systems, November 10, 2008.
7. "Distributed Constraint Reasoning for Cooperative Distributed Problem Solving," keynote talk at the AAMAS-08 Workshop on Distributed Constraint Reasoning, May 13, 2008.
8. "Applying MDP-based Planning in Time-Constrained, Dynamic, Stochastic Domains," Distinguished Lecture Series at *Intelligent Automation Incorporated*, Rockville, MD, November 8, 2007.
9. "Scalable Techniques for Coordinating Agents' Plans," Workshop on Large-Scale Multi-Agent Architectures, DoD Laboratory for Telecommunications Sciences, March 21, 2007.
10. "A Spectrum of Strategies for Multiagent Plan Coordination," invited talk at the Workshop on Distributed Planning and Scheduling at the 15th International Conference on Automated Planning & Scheduling (ICAPS 2005), Monterey, CA, June 6, 2005.
11. "Strategies for Discovering Coordination Needs," presented at the *University of Michigan/Sante Fe Institute Workshop on Emergence and Engineering in Complex Systems*, Ann Arbor MI, November 14, 2003.
12. "Some Research Directions in Distributed AI and MultiAgent Systems," presented at the *DARPA-IPTO Program Development Workshop on COORDINATORS – Cognitive Assistants for Activity Coordination*, Chicago IL, August 21, 2003.
13. "Autonomy, Delegation, and Control: Some (Semi-Random) Scientific Questions and Open Problems," presented at the *AAMAS-03 Workshop on Autonomy*, Melbourne, Australia, July 14, 2003.
14. "Strategic Research Directions in AI: Distributed AI and Agent Systems," presented at the *AFRL/AFOSR Research on Strategic Research Directions in AI*, Ithaca NY, June 26-7, 2003.
15. "Load Balancing and Load Reduction for Multiple Resource-Bounded Real-Time Agents," presented at the Workshop on High-Performance, Fault-Adaptive, Large-Scale Real-Time Systems (FALSE), Vanderbilt University, November 2002.
16. "Strategies for Discovering Coordination Needs," presented at NTT Research Labs, Japan, August 2002.
17. "Automated Agents that Learn Consumer Preferences in an Information Economy," presented at the European Network of Excellence for Agent-Based Computing (Agentlink) joint ALAD/AMEC special interest group meeting, July 2002.

18. "Scaling Up Agent Coordination Strategies," presented at the AAMAS Workshop on Multiagent Problem Spaces and Architectures, July 2002.
19. "Concepts and Strategies for Multiagent Coordination," presented at Rhodes University, Grahamstown, South Africa, March 2002.
20. "Strategies for Discovering Coordination Needs," presented at the Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland, October 2001.
21. "Strategies for Discovering Coordination Needs," inaugural seminar in the agents@usc seminar series, University of Southern California, Los Angeles, September 2001.
22. "The Dynamics of the UMDL Service Markets Society," invited presentation at the *Second International Workshop on Cooperative Information Agents*, July 1998.
23. "Endogenous System-Level Learning in a Distributed Intelligent Agent Network," presented at the NSF-CONACyT Third US-Mexico Workshop on Computing, Puebla Mexico, June 1998.
24. "Satisfactory Coordination," invited presentation at the AAAI-98 Spring Symposium on Satisficing Models, March 1998.
25. "Agent Models and Model Agents," invited keynote presentation at the AAAI96 Workshop on Agent Modeling, July 1996.
26. "Agent Models for Practical Coordination," presented at Bar Ilan University (Tel Aviv), Hebrew University (Jerusalem), and Technion (Haifa) in March/April 1995.
27. "Planning for Interagent Communication: A DAI Perspective" presented at AAAI94 Workshop on Planning for Interagent Communication, July 1994.
28. "Intelligent Agent Infrastructures" presented at Intel, Portland OR, 6/13/94.
29. "Intelligent Agent Infrastructures for Supporting Collaborative Work," invited presentation at the *Scientific Computing and Automation Conference*, Washington DC, October 1993.
30. "Distributed Search Using Abstractions," colloquium at the *Deutsches Forschungszentrum fur Kunstliche Intelligenz*, Saarbrueken, Germany, August 1993.
31. "Distributed Artificial Intelligence Tools," tutorial (with Katia Sycara) presented at the *National Conference on Artificial Intelligence*, July 1992 (San Jose) and July 1993 (Washington DC).
32. "Coordination as Distributed Search," presented at the *NSF Coordination Theory and Collaboration Technology Workshop*, Washington, DC, July 1993.
33. "Coordination and Communication among Driving Machines," presented at the *IEEE Robotics and Automation Conference*, Workshop on Needs for Research in Cooperative Robotics, Atlanta, GA, May 1993.



34. "Underlying Issues and Practical Considerations in Real-Time Planning and Control," presented at the *DARPA Workshop on Real-Time Planning*, Washington, DC, February 1993.
35. "Any-Dimension Algorithms and Intelligent Real-Time Control," presented at *the NSF Artificial Intelligence in Real Time Workshop*, College Park, MD, February 1993.
36. "Distributed Resource Allocation and Scheduling Problems," presented at *the NASA Space Station Freedom Scheduling Workshop*, Huntsville, AL, December 1992.
37. "Coordination as Distributed Search," presented at *the NSF Coordination Theory and Collaboration Technology Workshop*, Washington, DC, June 1992.
38. "Coordination Among, and Through, Intelligent Computer Systems," presented at the *Workshop on Enabling Technologies for Concurrent Engineering*, Morgantown, WV, April 1992.
39. "Cooperative Distributed Problem Solving Between (and Within) Intelligent Agents," presented at the *US-Mexico Symposium on Natural and Artificial Intelligence*, Xalapa, Mexico, December 1991.
40. "Strategies for Combining Real-Time Systems and Intelligent Systems," presented at the *AAAI Workshop on Design Principles for Real-Time, Knowledge-Based Control Systems*, Anaheim, California, July 1991.
41. "A Hierarchical Negotiation Protocol Using Multi-Dimensional Behavior Specifications," presented at the *NSF Coordination Theory and Collaboration Technology Workshop*, Washington, DC, June 1991.
42. "Coordinating Robots Performing Time-Constrained Reconnaissance," presented at the *DARPA UGV Demo-II Workshop*, Pittsburgh, PA, May 1991.
43. "Intelligent Coordination in Distributed Computing," presented during an invited panel on distributed artificial intelligence at the *Eleventh International Conference on Distributed Computing Systems*, Arlington, Texas, May 1991.
44. "Coordination in Distributed, Real-Time AI Applications," presented at the University of Chicago *Frontiers in Artificial Intelligence Series*, Chicago, IL, May 1990.
45. "Towards Intelligent Real-Time Cooperative Systems," presented at the *AAAI Spring Symposium on Planning in Uncertain, Unpredictable, or Changing Environments*, Stanford University, March 1990.
46. "Flexible Coordination in Manufacturing," presented at the *IJCAI Workshop on Integrated Architectures for Manufacturing*, Detroit, MI, August 1989.
47. "The Partial Global Planning Approach to Coordinating Distributed Problem Solvers," presented at: the University of Pittsburgh, May 1988; the University of Michigan, April 1988; the University of Wisconsin, March 1988; Carnegie-Mellon University, March 1988; the Massachusetts Institute of Technology, March 1988; Yale University, March 1988; Harvard University, February 1988; the University of Pennsylvania, January 1988.

48. "Using Partial Global Plans to Coordinate Distributed Problem Solvers." *The 1987 Northeast AI Consortium Fall Meeting*, Potsdam, NY, October 1987.
49. "Using Partial Global Plans to Coordinate Distributed Problem Solvers." *The Sixth Annual International Phoenix Conference on Computers and Communications*, Phoenix, AZ, February 1987.
50. Edmund H. Durfee, Victor R. Lesser and Daniel D. Corkill. "Large-Grained Parallelism in a Distributed Problem Solving Network." *The 1986 Workshop on Large-Grained Parallelism*, Providence, RI, October 1986.
51. "Planning for Cooperation in a Distributed Problem Solving Network." *The 1986 Northeast AI Consortium Spring Meeting*, Amherst, MA, March 1986.

### **Selected Reports and Invited Papers:**

1. Jason Sleight and Edmund H. Durfee. "Multiagent Metareasoning Through Organizational Design." In *Working Notes of the AAMAS-14 Workshop on Multiagent Sequential Decision Making (MSDM)*, May 2014.
2. Edmund H. Durfee. "On Agent-Based Scheduling to Improve Self-Management by Adolescents with Disabilities (Position Paper)." In *Working Notes of the AAMAS-14 Workshop on Multiagent Systems for Healthcare (MASH)*, May 2014.
3. James C. Boerkoel, Jr. and Edmund H. Durfee. "Decoupling the Multiagent Disjunctive Temporal Problem." In *Working Notes of the ICAPS-13 Workshop on Constraint Satisfaction Techniques for Planning and Scheduling Problems*, pages 24-27, June 2013.
4. Jason Sleight and Edmund H. Durfee. "Organizational Design Principles and Techniques for Decision-Theoretic Agents." In *Working Notes of the AAMAS-13 Workshop on Multiagent Sequential Decision Making*, pages 16-23, May 2013. (Also appeared in the AAMAS-13 main conference.)
5. Jason Sleight and Edmund H. Durfee. "Selectively Injecting Organizational Influences into Decision-Theoretic Agents." In *Working Notes of the AAMAS-12 Workshop on Coordination, Organizations, Institutions, and Norms*, pages 181-195, June 2012.
6. Daniel D. Corkill, Edmund H. Durfee, Victor R. Lesser, Huzaifa Zafar, and Chongjie Zhang. "[Organizationally Adept Agents](#)." In *Working Notes of the AAMAS-11 Workshop on Coordination, Organizations, Institutions, and Norms in Multiagent Systems (COIN)*, May 2011.
7. Inn-Tung Chen, Edmund Durfee, Satinder Singh, and Stefan Witwicki. "[Influence-Based Multiagent Planning under Reward Uncertainty](#)." In *Working Notes of the AAMAS-11 Workshop of Multiagent Sequential Decision Making*, May 2011.
8. Stefan J. Witwicki and Edmund H. Durfee. "Influence-Based Policy Abstraction for Weakly-Coupled Dec-POMDPs." In *Working Notes of the AAMAS-10 Workshop of Multiagent Sequential Decision Making*, May 2010. (Extended version of paper that appeared in ICAPS10.)

9. Keith M. Purrington, James C. Boerkoel, Jr. and Edmund H. Durfee. "[Solving Decoupled Constraint Optimization Problems for Online Cognitive Orthotic Scheduling Agents.](#)" *Working Notes of the IJCAI 2009 Workshop on Intelligent Systems for Assisted Cognition*, July 2009.
10. Christopher Portway and Edmund H. Durfee. "The Multi Variable Multi Constrained Distributed Constraint Optimization Framework." *Working Notes of the IJCAI 2009 Workshop on Distributed Constraint Reasoning*, pages 102-116, July 2009.
11. Stefan J. Witwicki and Edmund H. Durfee. "Flexible Approximation of Structured Interactions in Decentralized Markov Decision Processes." *Working notes of the AAMAS-09 Workshop on Multiagent Sequential Decision Making*, May 2009.
12. Robert P. Goldman, David J. Musliner, Edmund H. Durfee, and Mark S. Boddy. "Coordinating Highly Contingent Plans: Biasing Distributed MDPs Towards Cooperative Behavior." In *Working Notes of the ICAPS08 Multiagent Planning Workshop (MASPLAN08)*, September 2008.
13. David J. Musliner, Michael J. S. Pelican, Robert P. Goldman, Kurt D. Krebsbach, and Edmund H. Durfee. "The Evolution of CIRCA, a Theory-Based AI Architecture with Real-Time Performance Guarantees." *Working Notes of the AAAI Spring Symposium on Architectures for Intelligent Theory-Based Agents*, March 2008.
14. Wei Chen, Vikram Manikonda, and Edmund Durfee. "A Flexible Human Agent Collaboration (HAC) Framework for Human-Human Activity Coordination (H2AC)." In *Working Notes of the AAAI Fall Symposium on Regarding the "Intelligence" in Distributed Intelligent Systems*, AAAI Technical Report FS-07-06, pages 38-41, November 2007.
15. David J. Musliner, Jim Carciofini, Robert P. Goldman, Edmund H. Durfee, Jianhui Wu, and Mark S. Boddy. "Flexibly Integrating Deliberation and Execution in Decision-Theoretic Agents." In *Working Notes of the ICAPS-07 Workshop on Planning and Plan Execution for Real-World Systems*, September 2007.
16. Keith Purrington and Edmund H. Durfee. "Joint Goal-Setting for Self-Interested Agents Using CP-nets." In *Working Notes of the AAMAS-07 Workshop on Coordinating Agents' Plans and Schedules*, pages 9-16, May 2007.
17. George Alexander, Anita Raja, Ed Durfee and David Musliner. "Design Paradigms for Meta-Control in Multi-Agent Systems." In *Working Notes of the AAMAS 2007 Workshop on Metareasoning in Agent-based Systems*, pp 92-103, May 2007.
18. Youngpa So and Edmund H. Durfee. "Organizational Structuring and Runtime Coordination." In *Working Notes of the AAMAS 2007 Workshop on Coordination and Control in Massively Multi-Agent Systems*, May 2007.
19. Robert P. Goldman, David J. Musliner, Mark S. Boddy, Edmund H. Durfee, and Jianhui Wu. "'Unrolling' Complex Task Models into MDPs." In *Working Notes of the AAAI Spring Symposium on Game-theoretic and Decision-Theoretic Agents*, March 2007.

20. David J. Musliner, Edmund H. Durfee, Jianhui Wu, Dmitri A. Dolgov, Robert P. Goldman, and Mark S. Boddy. "Coordinated Plan Management Using MultiAgent MDPs." In *Working Notes of the AAAI Spring Symposium on Distributed Plan and Schedule Management*, AAAI Technical Report SS-06-04, pages 73-80, March 2006. (Also appeared in *AAMAS-06 Workshop on Distributed Sequential Decision Making*.)
21. Jianhui Wu and Edmund H. Durfee. "Mixed-integer Linear Programming for Transition-independent Decentralized MDPs." In *AAMAS-06 Workshop on Distributed Sequential Decision Making*, May 2006.
22. Jeffrey S. Cox and Edmund H. Durfee. "Exploiting Synergy While Maintaining Agent Autonomy." In *AAMAS-03 Workshop on Autonomy, Delegation, and Control*, July 2003.
23. Christopher H. Brooks, Robert S. Gazzale, Jeffrey K. MacKie-Mason, and Edmund H. Durfee. "Improving Learning Performance by Applying Economic Knowledge." In *AAMAS-03 Workshop on Agent Mediated Electronic Commerce V*, July 2003.
24. Jeffrey S. Cox and Edmund H. Durfee. "Discovering and Exploiting Synergy Between Hierarchical Planning Agents." In *Proceedings of the AAAI 2002 Workshop on Planning With and For MultiAgent Systems*, July, 2002.
25. Haksun Li, Edmund H. Durfee, and Kang G. Shin "Multiagent planning with internal resource constraints." In *Proceedings of the AAAI 2002 Workshop on Planning With and For MultiAgent Systems*, July, 2002.
26. Dmitri A. Dolgov and Edmund H. Durfee. "Constructing Optimal Policies for Agents with Constrained Architectures." University of Michigan Computer Science and Engineering Technical Report CSE-TR-476-03, April 2003.
27. Christopher H. Brooks and Edmund H. Durfee. "Congregating and Market Formation." *Proceedings of the AAAI 2002 Spring Symposium on Collaborative Learning Agents*. March, 2002.
28. Haksun Li, Ella Atkins, Edmund H. Durfee and Kang Shin. "Practical State Probability Approximation for a Resource-Limited Real-Time Agent." Working Notes of the *IJCAI-01 Workshop on Planning with Resources*, pages 34-42, August 2001.
29. Christopher H. Brooks, Rajarshi Das, Jeffrey O. Kephart, Jeffrey K. MacKie-Mason, Robert S. Gazzale, and Edmund H. Durfee. "Information bundling in a dynamic environment." *IJCAI Workshop on Economic Agents, Models, and Mechanisms*, pages 52-61, August 2001.
30. Christopher H. Brooks and Edmund H. Durfee. "Decision-theoretic Learning of Agent Models in an Information Economy." *Proceedings of the Spring 2001 AAAI Spring Symposium on Game Theoretic and Decision Theoretic Agents*, pages 144-146, March 2001.
31. Christopher H. Brooks and Edmund H. Durfee. "Toward Automated Pricing and Bundling of Information Goods." *AAAI Workshop on Knowledge-based Electronic Markets*, pages 8-13, August, 2000.
32. Bradley J. Clement and Edmund H. Durfee. "Exploiting Domain Knowledge with a Concurrent Hierarchical Planner." *AI and Planning Systems (AIPS-2000) Workshop on*

*Analysing and Exploiting Domain Knowledge for Efficient Planning, Working Notes, 57-62, April 2000.*

33. Haksun Li, Ella Atkins, Edmund H. Durfee and Kang Shin. "Practical State Probability Approximation for a Resource-Limited Real-Time Agent." Working Notes of the AAAI 2000 Spring Symposium on *Real-Time Autonomous Systems*, pages 47-55, March 2000.
34. Christopher H. Brooks and Edmund H. Durfee. "Congregation Formation in Information Economies." In *AAAI Workshop on Artificial Intelligence in Electronic Commerce*, pages 62-68, July, 1999.
35. Bradley J. Clement and Edmund H. Durfee. "Identifying and Resolving Conflicts among Agents with Hierarchical Plans." In *AAAI Workshop on Negotiation: Settling Conflicts and Identifying Opportunities*, AAAI Technical Report WS-99-12, 6-11, 1999.
36. Ella M. Atkins, Edmund H. Durfee, and Kang G. Shin. "Autonomous Flight with CIRCA-II." In *Autonomous Agents '99 Workshop on Autonomy Control Software*, May 1999.
37. Edmund H. Durfee, Yves Demazeau, and Nicholas R. Jennings. "Third International Conference on Multi-Agent Systems (ICMAS)." In *Newsletter of AgentLink: The European Network of Excellence for Agent-Based Computing*, Mike Wooldridge (editor), Issue 1, page 20, November 1998.
38. Eric Glover, Sunju Park, Anil Arora, Daniel Kiskis, and Edmund Durfee. "A case study on the evolution of software tool selections and development in a large-scale multi-agent system." In *AAAI-98 Workshop on Software Tools for Developing Agents*, Madison, WI, July 1998.
39. Aaron Armstrong and Edmund H. Durfee. "Dynamic Prioritization of Complex Agents in Distributed Constraint Satisfaction Problems." In *AAAI-97 Workshop on Constraints and Agents*, pages 8-13, Providence, RI July 1997.
40. Ella Atkins, Edmund H. Durfee, and Kang G. Shin. "Buying Time for Resource-Bounded Reasoning." In *AAAI-97 Workshop on Building Resource Bounded Reasoning Systems*, Providence, RI July 1997.
41. José M. Vidal and Edmund H. Durfee. "Agents learning about agents: A framework and analysis." In Working notes of *AAAI-97 Workshop on Multiagent Learning*, pages 71—76, Providence, RI July 1997.
42. Ella Atkins, Edmund H. Durfee, and Kang G. Shin. "Achieving Fully-Automated Aircraft Flight with Limited Resources." In *AAAI Fall Symposium on Flexible Computation in Intelligent Systems*, pages 7-14, Cambridge, MA November 1996.
43. Ella Atkins, Edmund H. Durfee, and Kang G. Shin. "Building a Plan with Real-Time Execution Guarantees." In *AAAI-96 Workshop on Structural Issues in Planning and Temporal Reasoning*, pages 1-6, Portland, OR July 1996.
44. Ella Atkins, Edmund H. Durfee, and Kang G. Shin. "Detecting and Reacting to Unplanned-for States." In *AAAI-96 Workshop on Action, Planning, and Control*, pages 7-14, Portland, OR July 1996.

45. José M. Vidal and Edmund H. Durfee. "Building Agent Models in Economic Societies of Agents." In *AAAI-96 Workshop on Agent Modeling*, Portland, OR July 1996.
46. Sunju Park and Edmund H. Durfee. "An Optimal Contracting Strategy in a Digital Library." In *AAAI-96 Workshop on Agent Modeling*, Portland, OR July 1996.
47. José M. Vidal and Edmund H. Durfee. "Task Planning Agents in the UMDL." In *Proceedings of the 1995 CIKM Intelligent Information Agents Workshop*, Dec. 1995.
48. Edmund H. Durfee. "Rational Agents, Limited Knowledge, and Nash Equilibria (Extended Abstract)." *AAAI Fall Symposium on Rational Agency*, Cambridge, MA, AAAI Press, November 1995.
49. Piotr J. Gmytrasiewicz, Edmund H. Durfee, and Jeffrey S. Rosenschein. "Toward Rational Communicative Behavior." *AAAI Fall Symposium on Embodied Language*, Cambridge, MA, AAAI Press, November 1995.
50. Jaeho Lee and Edmund H. Durfee. "A Microeconomic Approach to Intelligent Resource Sharing in Multiagent Systems." (full paper) Technical Report CSE-TR-234-95, Department of Electrical Engineering and Computer Science, U. of Michigan, May 1995
51. William P. Birmingham, Edmund H. Durfee, Tracy Mullen, and Michael Wellman. "The distributed agent architecture of the University of Michigan Digital Library." *AAAI Spring Symposium on Information Gathering from Heterogeneous, Distributed*
52. *Environments*, Stanford, CA, AAAI Press, March 1995.
53. *Environments*, Stanford, CA, AAAI Press, March 1995.
54. Marcus J. Huber and Edmund H. Durfee. "On Acting Together: Without Communication." In *AAAI Spring Symposium on Representing Mental States and Mechanisms*, pages 60-71, Stanford, CA, AAAI Press, March 1995.
55. Edmund H. Durfee, Piotr J. Gmytrasiewicz, and Jeffrey S. Rosenschein. "The Utility of Embedded Communications: Toward the Emergence of Protocols." In *Proceedings of the Thirteenth International Distributed Artificial Intelligence Workshop*, pages 85-93, July 1994.
56. Edmund H. Durfee and Jeffrey S. Rosenschein. "Distributed Problem Solving and Multi-Agent Systems: Comparisons and Examples." In *Proceedings of the Thirteenth International Distributed Artificial Intelligence Workshop*, pages 94-104, July 1994.
57. Marcus J. Huber, Edmund H. Durfee, and Michael P. Wellman. "The Automated Mapping of Plans for Plan Recognition." In *Proceedings of the Thirteenth International Distributed Artificial Intelligence Workshop*, pages 137-152, July 1994.
58. Sandip Sen and Edmund H. Durfee. "Adaptive Surrogate Agents." In *Proceedings of the Thirteenth International Distributed Artificial Intelligence Workshop*, pages 320-334, July 1994.
59. José Vidal and Edmund H. Durfee. "RMM's Solution Concept and the Equilibrium Point Solution." In *Proceedings of the Thirteenth International Distributed Artificial Intelligence Workshop*, pages 363-377, July 1994.

60. Daniel Damouth and Edmund H. Durfee. "Local Search in the Coordination of Intelligent Agents." (Abstract) In *Proceedings of the Twelfth National Conference on Artificial Intelligence*, page 1437, July 1994.
61. Marcus J. Huber, Edmund H. Durfee, and Michael P. Wellman. "The Automated Mapping of Plans for Plan Recognition." (Abstract) In *Proceedings of the Twelfth National Conference on Artificial Intelligence*, page 1460, July 1994.
62. José M. Vidal and Edmund H. Durfee. "Agent Modeling Methods Using Limited Rationality." (Abstract) In *Proceedings of the Twelfth National Conference on Artificial Intelligence*, page 1437, July 1994.
63. Young-pa So and Edmund H. Durfee. "Modeling and Designing Computational Organizations." In *Working Notes of the AAAI Spring Symposium on Computational Organization Design*, March 1994.
64. William P. Birmingham, Joseph G. D'Ambrosio, Tim Darr, and Edmund H. Durfee. "Coordinating Decision Making in Large Organizations." In *Working Notes of the AAAI Spring Symposium on Computational Organization Design*, March 1994.
65. Sandip Sen and Edmund H. Durfee. "Avoiding and Resolving Conflicts Among Cooperative Scheduling Agents." In *Working Notes of the IJCAI-93 Workshop on Computational Models of Conflict Management in Cooperative Problem Solving*, August 1993.
66. Marcus Huber and Edmund H. Durfee. "Observational Uncertainty in Plan Recognition Among Interacting Robots." In *Working Notes of the IJCAI-93 Workshop on Dynamically Interacting Robots*, August 1993.
67. Young-pa So and Edmund H. Durfee. "An Organizational Self-Design Model for Organizational Change." In *Working Notes of the AAAI-93 Workshop on AI and Theories of Groups and Organizations*, July 1993.
68. William P. Birmingham, Timothy Darr, Edmund H. Durfee, Allen Ward, and Michael Wellman. "Supporting Mechatronic Design Via a Distributed Network of Intelligent Agents." In *Working Notes of the AAAI-93 Workshop on Collaborative Design*, July 1993.
69. Sandip Sen and Edmund H. Durfee. "Dependent Subtask Processing in a Contract-Net for Manufacturing." In *Working Notes of the AAAI-93 SIGMAN Workshop on Intelligent Manufacturing Technology*, July 1993.
70. David J. Musliner, Edmund H. Durfee, and Kang G. Shin. "Integrating Intelligence and Real-Time Control into Manufacturing Systems." In *Working Notes of the AAAI-93 SIGMAN Workshop on Intelligent Manufacturing Technology*, July 1993.
71. Piotr J. Gmytrasiewicz and Edmund H. Durfee. "Rational Coordination and Communication Among Autonomous Agents." In *Bar-Ilan Symposium on the Foundations of Artificial Intelligence*, June 1993.

72. Edmund H. Durfee, Jaeho Lee and Piotr J. Gmytrasiewicz. "Overeager Reciprocal Rationality and Mixed Strategy Equilibria." In *Proceedings of The Twelfth International Workshop on Distributed Artificial Intelligence*, May 1993. Also appeared in AAAI-93.
73. Piotr J. Gmytrasiewicz and Edmund H. Durfee. "Reasoning about Other Agents: Philosophy, Theory, and Implementation." In *Proceedings of The Twelfth International Workshop on Distributed Artificial Intelligence*, May 1993. Also appeared in the preproceedings of the workshop on *Modeling Autonomous Agents in Multiagent Worlds*, August 1993.
74. Sandip Sen and Edmund H. Durfee. "The Effects of Search Bias on Flexibility in Distributed Scheduling." In *Proceedings of The Twelfth International Workshop on Distributed Artificial Intelligence*, May 1993.
75. Marcus J. Huber and Edmund H. Durfee. "Plan Recognition for Real-World Autonomous Robots: Work in Progress." In *AAAI Fall Symposium on Autonomous Mobile Robots*, Cambridge, MA, November 1992.
76. Edmund H. Durfee, Daniel Damouth, Marcus Huber, Thomas A. Montgomery, and Sandip Sen. "The Search for Coordination: Knowledge-Guided Abstraction and Search in a Hierarchical Behavior Space." In *Modeling Autonomous Agents in Multiagent Worlds*, Viterbo, Italy, July 1992.
77. Piotr J. Gmytrasiewicz and Edmund H. Durfee. "A Game-Theoretic Perspective on the Concepts of Interaction, Coordination, and Cooperation." In *Proceedings of AAAI Workshop on Cooperation Among Heterogeneous Intelligent Systems*, July 1992.
78. Sandip Sen and Edmund H. Durfee. "Automated Meeting Scheduling Among Heterogeneous Agents." In *Proceedings of AAAI Workshop on Cooperation Among Heterogeneous Intelligent Systems*, July 1992.
79. David J. Musliner, Edmund H. Durfee, and Kang G. Shin. "Any-Dimension Algorithms."
80. In *Real-Time Operating System Symposium*, Pittsburgh, PA, May 1992.
81. Thomas A. Montgomery and Edmund H. Durfee. "Search Reduction in Hierarchical Distributed Problem Solving." In *Proceedings of the Eleventh International Workshop on*
82. *Distributed Artificial Intelligence*, February 1992.
83. Piotr J. Gmytrasiewicz and Edmund H. Durfee. "Decision-Theoretic Recursive Modeling and the Coordinated Attack Problem." In *Proceedings of the Eleventh International Workshop on Distributed Artificial Intelligence*, February 1992.
84. Piotr J. Gmytrasiewicz and Edmund H. Durfee. "Truth, Lies, Belief, and Disbelief in Communication Between Autonomous Agents." In *Proceedings of the Eleventh International Workshop on Distributed Artificial Intelligence*, February 1992.
85. Sandip Sen and Edmund H. Durfee. "A Formal Analysis of Communication and Commitment in Distributed Meeting Scheduling." In *Proceedings of the Eleventh International Workshop on Distributed Artificial Intelligence*, February 1992.
86. Makoto Yokoo and Edmund H. Durfee. "Distributed Search Formalisms for Distributed Problem Solving: Overview." In *Proceedings of the Eleventh International Workshop on*



87. *Distributed Artificial Intelligence*, February 1992.
88. Thomas A. Montgomery, Jaeho Lee, David J. Musliner, Edmund H. Durfee, Daniel Damouth, and Young-pa So. "MICE User's Guide." Technical Report CSE-TR-64-90, Dept. of EE and CS, University of Michigan, January 1992.
89. Makoto Yokoo and Edmund H. Durfee. "Distributed Constraint Optimization as a Formal Model of Partially Adversarial Cooperation." Technical Report CSE-TR-101-91, Computer Science and Engineering, University of Michigan, 1991.
90. Edmund H. Durfee and Thomas A. Montgomery. "A Hierarchical Protocol for Coordinating Multiagent Behaviors: An Update." In *Proceedings of the Tenth International Workshop on Distributed Artificial Intelligence*, October 1990.
91. Edmund H. Durfee. "Towards Intelligent Real-Time Cooperative Systems." In *AAAI Spring Symposium on Planning in Uncertain, Unpredictable, or Changing Environments*, pages 29--33, Stanford, CA, March 1990.
92. Edmund H. Durfee and Thomas A. Montgomery. "MICE: A flexible testbed for intelligent coordination experiments." In *Proceedings of the Ninth Workshop on Distributed Artificial Intelligence*, pages 25--40, Eastsound, WA, September 1989.
93. Edmund H. Durfee. "Incremental Planning for Blackboard Control." In *Proceedings of the Third Annual Workshop on Blackboard Systems*, pages 9--20, Detroit, MI, August 1989.
94. Edmund H. Durfee. "Planning for Problem Solving: Experiments in acquiring and sharing knowledge to improve decision making." In *Proceedings of the Workshop on Knowledge, Perception, and Planning*, Detroit, MI, August 1989.
95. Victor R. Lesser, Daniel D. Corkill, and Edmund H. Durfee. "An Update on the Distributed Vehicle Monitoring Testbed." COINS Technical Report 87-111, October 1987, Department of Computer and Information Science, University of Massachusetts, Amherst, MA 01003.
96. Edmund H. Durfee. "A Unified Approach to Dynamic Coordination: Planning actions and interactions in a distributed problem solving network." COINS Technical Report 87-84, September 1987. (Doctoral Dissertation submitted to the Graduate School at the University of Massachusetts.)
97. Edmund H. Durfee and Victor R. Lesser. "Incremental Planning to Control a Blackboard-based Problem Solver." In *Proceedings of the NASA Space Telerobotics Workshop*, Volume 3, pages 91--99, Pasadena, CA, January 1987.
98. Edmund H. Durfee. "An Approach to Cooperation: Planning and Communication in a Distributed Problem Solving Network." COINS Technical Report 86-09, March 1986.
99. Edmund H. Durfee, Victor R. Lesser, and Daniel D. Corkill. "Making coherent communication decisions in a distributed problem solving network." *Proceedings of the Workshop on AI and Distributed Problem Solving*, National Academy of Sciences, pages 59--75, May 1985.

100. Edmund H. Durfee. "A Parallel Simulation of a Distributed Problem Solving Network." COINS Technical Report 84-19, September 1984. (Master's Thesis submitted to the Graduate School at the University of Massachusetts.)

### **Research Funding:**

#### Current:

Principal Investigator, NSF, "Creating Organizationally Adept Software Agents and their Organizations," \$400,000, 6/10-6-14.

#### Previous:

Principal Investigator, TACOM/TARDEC, "Adjustable Autonomy for Safe, Coordinated Control," \$375,000, 7/07-6/11.

Principal Investigator, DARPA (subcontract through Intelligent Automation, Inc.), "A Shared Intelligence Framework Targeting Flexible Human Agent Cooperative Tasks," \$150,000, 5/08-5/11.

Principal Investigator, AFOSR, "Temporal Planning for Automatic Service Composition," \$557,825, 8/07-11/10.

Principal Investigator (with M. Pollack, co-PI), NSF, "Multiagent Plan Management for Sociocognitive Orthotics," \$540,000, 11/05-4/10.

Principal Investigator, DARPA (Coordinators Program) - subcontracted through Honeywell, "Coordinators: Intelligent Coordination Support for Humans," 1 month summer, 10%AY, \$545,251, 2/05-5/08.

Principal Investigator, Honeywell International, "Methods for Resource-Limited Multiagent MDPs," \$20,000, 6/04-12/04.

Principal Investigator (with J. MacKie-Mason, co-PI), NSF-ITR, "Strategic Positioning in Information Product Space," \$150,000, 9/01-8/04.

Principal Investigator (with K. Shin, co-PI), DARPA (ANTs) - subcontracted through Honeywell, "Planning Real-Time Negotiation for Mission-Critical Applications," 1 month summer, \$504K, 1/00-7/03.

Principal Investigator, DARPA (CoABS), "Multilevel Coordination Mechanisms for Real-Time Autonomous Agents," 10% AY and 1 month summer, \$921,268, 4/98 - 4/03.

Co-Principal Investigator with W. Birmingham (PI), NSF, "Congregating Agents," 1 month summer, \$300,000, 9/98-8/02.

Principal Investigator (with K. Shin, co-PI), DARPA - subcontracted through Honeywell, "SA-CIRCA: Self-Adaptive Control for Mission-Critical Systems," 1 month summer, \$153K, 7/98-12/99.

Co-Principal Investigator with J. MacKie-Mason (PI) and M. Van Alstyne, IBM, "Competition in Product Space for a Multi-Agent Information Goods Economy," 1 month summer, \$70,000, 12/98-11/99.

Principal Investigator, Honeywell, Industrial Partners Grant for Real-Time Artificial Intelligence, \$20,000, 5/1/98.

Co-Principal Investigator with D. Atkins (PI) and others, NSF, "The University of Michigan Digital Library," 1 month summer, approx. \$4M, 9/94-8/98.

Co-Principal Investigator with K. Shin (PI), NSF, "CIRCA: A Cooperative, Intelligent Real-Time Control Architecture," 1 month summer, \$304,500, 4/1/93-3/31/98.

Principal Investigator, NSF Presidential Young Investigators Program, "Real-Time AI, Cooperative Problem Solving, and Intelligent Systems" awarded 1991.

Principal Investigator (through Orincon Corp. as prime), ARPA-MSTO, "Ship Systems Automation Support," 1 month summer, \$380,000, 1/95-12/97.

Principal Investigator, ARPA, "Coordinated Navigation for Time-Constrained, Multirobot Reconnaissance," 10% AY and 1.5 months summer, approx. \$1.5 M, 7/1/92--8/31/96.

Principal Investigator, University of Michigan International Partnerships Program, "Rational Communication and Cooperation in Self-Interested Computational Agents," \$4,555, 2/1/93.

Principal Investigator, NSF Initiative on Coordination Theory and Collaboration Technology, "A Hierarchical Negotiation Protocol Using Multi-Dimensional Behavior Specifications," 1 month summer, \$165,000, 9/1/90--8/31/93.

Principal Investigator, NSF Research Experiences for Undergraduates, "Metrics for Evaluating Coordination Among Artificial Intelligence Systems in a Pursuit Problem," \$5,000, 9/1/91--8/31/93.

Principal Investigator, NSF Research Initiation Award, "DIAL: A Distributed Intelligent Agent Laboratory," \$43,333, 9/1/90--2/28/93.

Principal Investigator, Bellcore, Industrial Partners Grant for Distributed Artificial Intelligence, \$7,500, 9/1/91.

Principal Investigator, Bellcore, Industrial Partners Grant for Distributed Artificial Intelligence, \$10,000, 9/1/90.

Principal Investigator, University of Michigan Artificial Intelligence Laboratory, Project Support for Hosting Visiting Researcher from NTT, \$10,000, 9/1/90.

Principal Investigator, University of Michigan Artificial Intelligence Laboratory, Project Support for Hosting Visiting Researcher from Mitsubishi, \$6,000, 9/1/90.

Principal Investigator, Rackham Graduate School at the University of Michigan, "Mechanisms for Coordination Among Distributed Intelligent Agents," \$10,000, 6/1/89--10/31/90.

## **Consulting**

Institute for Human and Machine Cognition, University of West Florida

Intelligent Automation, Inc., Rockville, MD.

Lockheed-Martin Orincon Corporation, San Diego, CA.

Quantum Leap Corporation, Newark, DE

## **Teaching Activities**

### **Graduate Students, Degrees and Dates:**

#### **Completed Doctorates and Positions:**

1. [James C. Boerkoel, Jr.](#), 2012, chair. Title: Distributed Approaches for Solving Constraint-based Multiagent Scheduling Problems. Most recently known position: Assistant Professor of Computer Science, Harvey Mudd College.
2. [Stefan J. Witwicki](#), 2011, chair. Title: Abstracting Influences for Efficient Multiagent Coordination Under Uncertainty. Most recently known position: Research scientist, Robotic Systems Laboratory, Ecole Polytechnique Federale de Lausanne, Switzerland.
3. Jianhui Wu, 2008, chair. Title: Mission-Phasing Techniques for Constrained Agents in Stochastic Environments. Most recently known position: Manager of Software Development, Amazon.
4. [Dmitri A. Dolgov](#), 2006, chair. Title: Integrated Resource Allocation and Planning in Stochastic Multiagent Environments. Most recently known position: Software Engineer, Google.
5. [Jeffrey S. Cox](#), 2005, chair. Title: Efficient Methods for Solving the Multiagent Plan Coordination Problem. Most recently known position: Software Engineering Manager, Google.
6. [Haksun Li](#), 2004, co-chair with K. G. Shin. Title: Execution Resource Allocation for Distributed Real-Time Controllers. Most recently known position: CEO of Numerical Methods, Inc., and Adjunct Associate Professor at Nanyang Technological University.
7. [Christopher H. Brooks](#), 2002, chair. Title: Niche Formation and Efficient Learning of Consumer Preferences in a Dynamic Information Economy. Most recently known position: Associate Professor and Chair of Computer Science, University of San Francisco.
8. [Bradley J. Clement](#), 2002, chair. Title: Abstract Reasoning for Multiagent Coordination and Planning. Most recently known position: Senior member of technical staff, NASA Jet Propulsion Laboratory.
9. [Pradeep M. Pappachan](#), 2002, chair. Title: Coordinating Plan Execution in Dynamic Multiagent Environments. Most recently known position: Research Scientist, Intel Labs.
10. [Ella M. Atkins](#), 1999, co-chair with K. G. Shin. Title: Plan Generation and Hard Real-Time Execution with Application to Safe, Autonomous Flight. Most recently known position: Associate Professor of Aerospace Engineering, University of Michigan.
11. [Sunju Park](#), 1999, co-chair with W. P. Birmingham. Title: The P-Strategy: An Adaptive Agent Bidding Strategy Based on Stochastic Modeling for Continuous Double Auctions. Most recently known position: Associate Professor of Business, Yonsei University.

12. [José M. Vidal](#), 1998, chair. Title: Computational Agents that Learn About Agents: Algorithms for Their Design and a Predictive Theory of Their Behavior. Most recently known position: Professor of Computer Science and Engineering, University of South Carolina.
13. Jaeho Lee, 1997, chair. Title: An Explicit Semantics for Coordinated Multiagent Plan Execution. Most recently known position: Professor of Electrical and Computer Engineering, University of Seoul, Korea.
14. [Marcus J. Huber](#), 1996, chair. Title: The Automated Construction and Use of Plan Recognition Networks for Multiagent Coordination. Most recently known position: Research Scientist at Soar Technology.
15. [David J. Musliner](#), 1993, co-chair with K. G. Shin. Title: CIRCA: A Cooperative Approach to Intelligent Real-Time Control Architecture. Most recently known position: Senior Principal Research Scientist, Smart Information Flow Technologies (SIFT).
16. [Sandip Sen](#), 1993, chair. Title: Predicting Tradeoffs in Contract-Based Distributed Scheduling. Most recently known position: Professor of Mathematics and Computer Science, University of Tulsa.
17. [Thomas A. Montgomery](#), 1993, chair. Title: The Use of Abstraction in Coordinating Artificially Intelligent Agents. Most recently known position: Technical Expert – Text Mining, Ford Motor Company Scientific Research Laboratory, Dearborn, MI.
18. [Piotr J. Gmytrasiewicz](#), 1992, co-chair with D. Wehe. Title: A Decision-Theoretic Model of Coordination and Communication in Autonomous Systems. Most recently known position: Associate Professor at the University of Illinois, Chicago.

#### External Doctoral Committee Memberships:

Prasanna Velegapudi 2012 (Carnegie Mellon University), Hyuckchul Jung 2003 (University of Southern California), Steven Willmott 2001 (EPFL), Jay Gowdy, 2000 (Carnegie Mellon University)

#### Current Students or Past Masters Students:

Johnathon Schultz (MS13), Anna Chen (MS11), Jason Sleight, Michael Maxim (MS09) David Karmol (MS09), James Boerkoel, Sussana Early (MS05), Jianhui Wu (MS 04), Young-Pa So (MS 91), Thomas Bartold (MS 04) , Aaron Armstrong (MS 99), Hock-Shan Wong (MS 99), Chip McVey (MS 97), Eric Miller (MS 95), Doug Treder (MS 94), Wade Schuette (MS 93), Jim Burmeister (MS 92), Daniel Damouth (MS 92), Hong Chew (MS 90), Tom Galloway (MS 89), Dale Thoms (MS 89).

#### **Courses Taught:**

EECS 183: Elementary Programming Concepts

EECS 280: Programming and Introductory Data Structures

EECS 380: Algorithms and Data Structures

EECS 492: Introduction to Artificial Intelligence

EECS 496: Major Design Experience - Professionalism

EECS 543: Knowledge-Based Systems

EECS 571: Principles of Real-Time Computing

EECS 592: Advanced Artificial Intelligence

EECS 598: Distributed Artificial Intelligence

EECS 692: Current Topics in Artificial Intelligence

## **Tutorials**

“Multiagent Coordination, Planning, and Control,” tutorial presented at the China Agent Systems School, Chongqing, China, December 2004.

“Multiagent Planning, Coordination, and Control,” tutorial presented at the Hyderabad Multi-Agent Systems School, Hyderabad, India, August 2004.

“Coordination in MultiAgent Systems” plenary tutorial presented at the Pacific Rim MultiAgent (PRIMA) Agent Summer School, Seoul Korea, November 2003.

“Coordination in MultiAgent Systems” plenary tutorial presented at the Pacific Rim MultiAgent (PRIMA) Agent Summer School, Tokyo Japan, August 2002.

“Coordination in MultiAgent Systems” presented at the European Agent Systems Summer School, Bologna Italy, July 2002.

“Coordination in MultiAgent Systems” presented at the America’s Agent School, Los Angeles, January 2002.

“Cooperative Problem Solving and Planning” presented at the ECCAI Advanced Course in AI (ACAI) and European Agent Systems Summer School (EASSS), Prague, July 2001.

“Distributed Artificial Intelligence Tools,” (with Katia Sycara) presented at the *National Conference on Artificial Intelligence*, July 1992 (San Jose) and July 1993 (Washington DC).

## **Service Activities**

### **Selected Professional Service:**

International Foundation for Autonomous Agents and Multiagent Systems (IFAAMAS): Past-President, 2011-2013; President 2009-2011, Treasurer 2002-2009; Charter Member, Board of Directors 1998-2012. Chair of Influential Paper Award selection committee 2013. Member V. Lesser Distinguished Dissertation Award selection committee 2014.

Associate editor, *Autonomous Agents and Multi-Agent Systems*, 1998-

Associate editor, MIT Press series on *Intelligent Robotics and Autonomous Agents*, 1997-

Editorial board member for Kluwer Academic Publishers series in *Multiagent Systems, Artificial Societies, and Simulated Organizations*, 1998-.

Editorial board member for *Journal of Human Computation*, 2013-.

Associate editor, *Journal of Artificial Intelligence Research*, 2006-2009.

Guest co-editor for a special joint issue of *Artificial Intelligence Journal* and *Journal of Autonomous Agents and Multi-Agent Systems*.

Conference Chair for the Sixth Int. Joint Conference on Autonomous Agents and MultiAgent Systems (AAMAS-07).

Conference Chair for the Fourth Int. Conference on Multi-Agent Systems (ICMAS-00).

Program co-chair for the Third Int. Conference on Multi-Agent Systems (ICMAS-98).

Co-Chair for the AAAI 2006 Spring Symposium on Distributed Plan and Schedule Management.

Senior Program Committee member for the *International Joint Conference on Autonomous Agents and MultiAgent Systems* AAMAS-02, AAMAS-03, AAMAS-05, AAMAS-08, AAMAS-09 (winner of best Senior Program Committee member award), AAMAS-11, AAMAS-12, AAMAS-14.

Program committee member for, among others, the *Conference of the Association for the Advancement of AI* (AAAI-91, AAAI-94, AAAI-96, AAAI-97, AAAI-06, AAAI-14), the *Conference on AI in Planning and Scheduling* (AIPS-02), the *International Conference on Automated Planning and Scheduling* (ICAPS-03, ICAPS-04, ICAPS-11, ICAPS-12), the *International Joint Conference on Autonomous Agents and MultiAgent Systems* (AAMAS-04, AAMAS-10, AAMAS-13), the *International Joint Conference on AI* (IJCAI-97); *International Conference on Practical Applications of Agents and Multiagent Systems* (PAAMS-09, PAAMS-10, PAAMS-11, PAAMS13).

Associate editor for *IEEE Transactions on Systems, Man, and Cybernetics*, 1991-98;

Guest editor for *IEEE Transactions on Systems, Man, and Cybernetics* special issue on Distributed Artificial Intelligence (1991);



Editorial Board member for the *Journal of Artificial Intelligence Research*, 1993-1996;

Area chair on program committee for *the Tenth National Conference on AI (AAAI-92)*;

Advisory and Program committee member for the *First International Workshop on Multi-Agent Systems (ICMAS-95)*; and for the *Second International Workshop on Multi-Agent Systems (ICMAS-96)* (publication co-chair);

Referee for *International Joint Conferences on Artificial Intelligence (IJCAI-05, IJCAI-03, IJCAI-01, IJCAI-95, IJCAI-91, and IJCAI-89)*;

Co-chair of the *Eleventh International Distributed Artificial Intelligence Workshop (2/92)*;

Program committee member for the Tenth (10/90), Twelfth (5/93), Thirteenth (7/94), and Fourteenth (10/97) Distributed AI Workshops.

### **Recent Institutional Service:**

Director, U. of Michigan College of Engineering InterPro Masters of Engineering Program in Robotics and Autonomous Vehicles, 9/10-.

Chief Program Advisor, Computer Science (LSA) Undergraduate Program, 1/08 –8/09, 9/10-.

Member, CSE Curriculum Committee, 1/08-8/09, 9/10-.

Member, College of Engineering Curriculum Committee, 9/10-8/13.

Chair, CSE Chair Search Advisory Committee, 9/07-6/08, Member 11/10-4/11.

Member, Computer Science and Engineering Executive Committee, 6/04-5/06, 6/13-.

Advisor, Computer Science Undergraduate Program, 9/02-6/04, 9/06-1/08.

Member, College of Engineering, Strategic Planning Implementation Education Committee, 11/03-1/06.

Member, Undergraduate Women in CSE Committee, 9/02-5/03.

Director, Artificial Intelligence Laboratory, University of Michigan, 7/99-6/01.

Chair, Computer Science and Engineering Curriculum Committee, University of Michigan, 9/98-5/01.

Chair, EECS Dept Ad Hoc Committee on Undergraduate Programs, U. of Michigan, 11/99-5/00.

Member, College of Engineering Curriculum-2000 Advisory Committee, 9/98-.

Chair, Computer Science Program Review Committee, U. of Michigan, 4/98-8/99.

Member, School of Information Doctoral Committee, U. of Michigan, 9/98-.

Member, School of Information Curriculum Committee, U. of Michigan, 9/96-9/98.

Member, Computer Science and Eng. Graduate Committee, U. of Michigan, 9/95-9/98.

**Professional Memberships:**

AAAI (Fellow), IEEE (Fellow), IEEE Computer Society, ACM, SIGART, ASEE.