Michael P. Wellman
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RESEARCH INTERESTS

Artificial intelligence, strategic reasoning, computational finance, electronic commerce.

EDUCATION

1985-1988	**Massachusetts Institute of Technology**, Cambridge, MA. Ph.D., Artificial Intelligence. Dissertation: *Formulation of Tradeoffs in Planning under Uncertainty*. Supervisor: P. Szolovits
1983-1985	**Massachusetts Institute of Technology**, Cambridge, MA. S.M., Computer Science. Thesis: *Reasoning about Preference Models*.
1979-1983	**Massachusetts Institute of Technology**, Cambridge, MA. S.B., Computer Science; S.B., Management Science.

PROFESSIONAL EMPLOYMENT

September, 2001 to present	**PROFESSOR, UNIVERSITY OF MICHIGAN.** Lynn A. Conway Collegiate Professor (2015–). Chair, Computer Science & Engineering (2020–). Assoc. Dean Academic Affairs, College of Engineering (2016–2020). Associate Chair, Computer Science & Engineering (2007–2009). Director, Artificial Intelligence Laboratory (2001–2005).
September, 1996 to August, 2001	**ASSOCIATE PROFESSOR, UNIVERSITY OF MICHIGAN.** Division of Computer Science & Engineering.
September, 1998 to January, 2000	**CHIEF MARKET TECHNOLOGIST, TRADINGDYNAMICS, INC.** E-Commerce startup company.
September, 1992 to August, 1996	**ASSISTANT PROFESSOR, UNIVERSITY OF MICHIGAN.** Division of Computer Science & Engineering.
August, 1988 to July, 1992	**RESEARCH SCIENTIST, USAF WRIGHT LABORATORY.** Avionics Directorate. Also Adjunct Asst. Prof., Air Force Institute of Technology. Active-duty Air Force, rank: Captain.

AWARDS

ACM/SIGAI Autonomous Agents Research Award, 2014.
Influential Paper Prize, *Int'l Foundation Autonomous Agents and Multiagent Systems*, 2012.
Outstanding Achievement Award, EECS Department, 2009–10.
Fellow, Association for Computing Machinery, 2005.
Faculty Recognition Award, University of Michigan, 2002–03.
Fellow, Association for the Advancement of Artificial Intelligence, 2001.
Teaching Excellence Award, EECS Department, 1996–97.
NSF National Young Investigator, 1994.
Outstanding Paper, *Qualitative Reasoning & Decision Technologies*, 1993.

PERSONAL DATA

Born 27 March 1961, Brooklyn, NY. US citizen.

Publications

Refereed Journals

1. Strategic knowledge transfer (M. O. Smith, T. Anthony, and M. P. Wellman). *Journal of Machine Learning Research* **24**(233):1–96, 2023.

2. Learning to play against any mixture of opponents (M. O. Smith, T. Anthony, and M. P. Wellman). *Frontiers in Artificial Intelligence* **6**, 2023.

3. Spoofing the limit order book: A strategic agent-based analysis (X. Wang, C. Hoang, Y. Vorobeychik, and M. P. Wellman). *Games* **12**(2):46, 2021.

4. Economic reasoning from simulation-based game models. *Œconomia* **10**(2): 257–278, 2020.

5. Machine behaviour (I. Rahwan, M. Cebrian, *20 others*, M. Wellman). *Nature* **568**:477–486, 2019.

6. Multistage attack graph security games: Heuristic strategies, with empirical game-theoretic analysis (T. H. Nguyen, M. Wright, M. P. Wellman, and S. Singh). *Security and Communication Networks*, Article ID 2864873, 28 pages, 2018.

7. Welfare effects of market making in continuous double auctions (E. Wah, M. Wright, and M. P. Wellman). *Journal of Artificial Intelligence Research* **59**:613–650, 2017.

8. Self-confirming price-prediction strategies for simultaneous one-shot auctions (with E. Sodomka and A. Greenwald). *Games and Economic Behavior* **102**:339–372, 2017.

9. Ethical issues for autonomous trading agents (with U. Rajan). *Minds and Machines*, **27**:609–624, 2017.

10. Strategic agent-based modeling of financial markets (with E. Wah). *RSF: Russell Sage Foundation Journal of the Social Sciences* **3**(1):104–119, 2017.

11. Latency arbitrage in fragmented markets: A strategic agent-based analysis (E. Wah and M. P. Wellman). *Algorithmic Finance* **5**:69–93, 2016.

12. Putting the agent in agent-based modeling. *Autonomous Agents and Multiagent Systems* **30**:1175–1189, 2016.

13. Economic reasoning and artificial intelligence (D. C. Parkes and M. P. Wellman). *Science* **349**(6245):267–272, 2015.

14. Strategic formation of credit networks (P. Dandekar, A. Goel, M. P. Wellman, and B. Wiedenbeck). *ACM Transactions on Internet Technology* **15**(1):3:1–41, 2015.

15. Asset pricing under ambiguous information: An empirical game-theoretic analysis (B.-A. Cassell and M. P. Wellman). *Computational and Mathematical Organization Theory* **18**:445–462, 2012.

16. Constrained automated mechanism design for infinite games of incomplete information (Y. Vorobeychik, D. M. Reeves, and M. P. Wellman). *Autonomous Agents and Multiagent Systems* **25**:313–351, 2012.

17. Strategic modeling of information sharing among data privacy attackers (Q. Duong, K. LeFevre, and M. P. Wellman). *Informatica* **34**:151–158, 2010.

18. Multiattribute auctions based on generalized additive independence (Y. Engel and M. P. Wellman). *Journal of Artificial Intelligence Research* **37**:479–525, 2010.

19. Forecasting market prices in a supply chain game (C. Kiekintveld, J. Miller, P. R. Jordan, L. F. Callender, and M. P. Wellman). *Electronic Commerce Research and Applications* **8**:63–77, 2009.

20. Bidding strategies for simultaneous ascending auctions (with A. Osepayshvili, J. K. MacKie-Mason, and D. M. Reeves). *B. E. Journal of Theoretical Economics (Topics)* **8**(1), 2008.

21. CUI networks: A graphical representation for conditional utility independence (Y. Engel and M. P. Wellman). *Journal of Artificial Intelligence Research* **31**:83–112, 2008.

22. Market-based allocation with indivisible bids (L. J. Schvartzman and M. P. Wellman). *Production and Operations Management* **16**:495–509, 2007.

23. Learning payoff functions in infinite games (Y. Vorobeychik, M. P. Wellman, and S. Singh). *Machine Learning* **67**:145–168, 2007.

24. Graphical models for groups: Belief aggregation and risk sharing (D. M. Pennock and M. P. Wellman). *Decision Analysis* **2**:148–164, 2005.

25. Strategic interactions in a supply chain game (with J. Estelle, S. Singh, Y. Vorobeychik, C. Kiekintveld, and V. Soni). *Computational Intelligence* **21**:1–26, 2005.

26. Walverine: A Walrasian trading agent (S.-F. Cheng, E. Leung, K. M. Lochner, K. O'Malley, D. M. Reeves, L. J. Schvartzman, and M. P. Wellman). *Decision Support Systems* **39**:169–184, 2005.

27. Betting Boolean-style: A framework for trading in securities based on logical formulas (L. Fortnow, J. Kilian, D. M. Pennock, and M. P. Wellman). *Decision Support Systems* **39**:87–104, 2005.

28. Exploring bidding strategies for market-based scheduling (D. M. Reeves, M. P. Wellman, J. K. MacKie-Mason, and A. Osepayshvili). *Decision Support Systems* **39**:67–85, 2005.

29. Bounding probabilistic relationships in Bayesian networks using qualitative influences: Methods and applications (C.-L. Liu and M. P. Wellman). *International Journal of Approximate Reasoning* **36**:31–73, 2004.

30. Price prediction in a trading agent competition (with D. M. Reeves, K. M. Lochner, and Y. Vorobeychik). *Journal of Artificial Intelligence Research* **21**:19–36, 2004.

31. Trading agents competing: Performance, progress, and market effectiveness (with S.-F. Cheng, D. M. Reeves, and K. M. Lochner). *IEEE Intelligent Systems* **18**(6):48–53, 2003.

32. Nash Q-learning for general-sum stochastic games (J. Hu and M. P. Wellman). *Journal of Machine Learning Research* **4**:1039–1069, 2003.

33. Decentralized supply chain formation: A market protocol and competitive equilibrium analysis (W. E. Walsh and M. P. Wellman). *Journal of Artificial Intelligence Research* **19**:513–567, 2003.

34. The 2001 trading agent competition (with A. Greenwald, P. Stone, and P. R. Wurman). *Electronic Markets* **13**:4-12, 2003.

35. On market-inspired approaches to propositional satisfiability (W. E. Walsh, M. Yokoo, K. Hirayama, and M. P. Wellman). *Artificial Intelligence* **144**:125-156, 2003.

36. Automated negotiation from declarative contract descriptions (D. M. Reeves, M. P. Wellman, and B. N. Grosof). *Computational Intelligence* **18**:482-500, 2002.

37. Evaluation of Bayesian networks with flexible state-space abstraction methods (C.-L. Liu and M. P. Wellman). *International Journal of Approximate Reasoning* **30**:1–39, 2002.

38. Learning about other agents in a dynamic multiagent system (J. Hu and M. P. Wellman). *Cognitive Systems Research* **2**:67–79, 2001.

39. Designing the market game for a trading agent competition (with P. R. Wurman, K. O'Malley, R. Bangera, S.-d. Lin, D. M. Reeves, and W. E. Walsh). *IEEE Internet Computing* **5**(2):43–51, 2001.

40. A parametrization of the auction design space (P. R. Wurman, M. P. Wellman, and W. E. Walsh). *Games and Economic Behavior* **35**:304–338, 2001.

41. Auction protocols for decentralized scheduling (with W. E. Walsh, P. R. Wurman, and J. K. MacKie-Mason). *Games and Economic Behavior* **35**:271–303, 2001.

42. Conjectural equilibrium in multiagent learning (with J. Hu). *Machine Learning* **33**:179–200, 1998.

43. Flexible double auctions for electronic commerce: Theory and implementation (P. R. Wurman, W. E. Walsh, and M. P. Wellman). *Decision Support Systems* **24**:17–27, 1998.

44. Market-aware agents for a multiagent world (with P. R. Wurman). *Robotics and Autonomous Systems* **24**:115-125, 1998.

45. The WALRAS algorithm: A convergent distributed implementation of general equilibrium outcomes (J. Q. Cheng and M. P. Wellman). *Computational Economics* **12**:1–24, 1998.

46. Generalized queries on probabilistic context-free grammars (D. V. Pynadath and M. P. Wellman). *IEEE Transactions on Pattern Analysis and Machine Intelligence* **20**:65–77, 1998.

47. Toward inquiry-based education through interacting software agents (10 co-authors). *IEEE Computer* **29**(5):69–76, May 1996.

48. The economic approach to artificial intelligence (position paper). *ACM Computing Surveys* **7**(3):360–362, 1995.

49. A computational market model for distributed configuration design. *Artificial Intelligence for Engineering Design, Analysis, and Manufacturing (AI EDAM)* **9**:125–133, 1995. Reprinted in Readings in Agents (M. N. Huhns and M. P. Singh, eds.), Morgan Kaufmann Publishers, 1998.

50. Inference in cognitive maps. *Mathematics and Computers in Simulation* **36**:137–148, 1994.

51. A market-oriented programming environment and its application to distributed multicommodity flow problems. *Journal of Artificial Intelligence Research* **1**:1–23, 1993.

52. Explaining "explaining away" (with M. Henrion) (correspondence). *IEEE Transactions on Pattern Analysis and Machine Intelligence* **15**:287–292, 1993.

53. From knowledge bases to decision models (with J. S. Breese and R. P. Goldman). *Knowledge Engineering Review* **7**:35–53, 1992.

54. Impediments to universal preference-based default theories (J. Doyle and M. P. Wellman). *Artificial Intelligence* **49**:97–128, 1991.

55. Graphical inference in qualitative probabilistic networks. *Networks* **20**:687–701, 1990.

56. Fundamental concepts of qualitative probabilistic networks. *Artificial Intelligence* **44**:257–303, 1990.

57. Automated critiquing of medical decision trees (with M. H. Eckman, C. Fleming, S. L. Marshall, F. A. Sonnenberg, and S. G. Pauker). *Medical Decision Making* **9**:272–284, 1989.

Books

1. Trading Agents. *Synthesis Lectures in Artificial Intelligence and Machine Learning*, Morgan & Claypool Publishers, 2011.

2. Autonomous Bidding Agents: Strategies and Lessons from the Trading Agent Competition (with A. Greenwald and P. Stone). MIT Press, 2007.

3. Planning and Control (T. L. Dean and M. P. Wellman). Morgan Kaufmann, 1991.

4. Formulation of Tradeoffs in Planning Under Uncertainty. *Research Notes in Artificial Intelligence*, Pitman Publishing and Morgan Kaufmann, 1990.

Refereed Conferences

1. Generalized response objectives for strategy exploration in empirical game-theoretic analysis (Y. Wang and M. P. Wellman). *23rd International Conference on Autonomous Agents and Multiagent Systems*, May 2024.

2. Learning to manipulate a financial benchmark (M. Shearer, G. Rauterberg, and M. P. Wellman). *4th International Conference on Artificial Intelligence in Finance*, pages 592–600, Nov 2023.

3. Empirical game-theoretic analysis for mean-field games (Y. Wang and M. P. Wellman). *22nd International Conference on Autonomous Agents and Multiagent Systems*, pages 1025–1033, May 2023.

4. Exploiting extensive-form structure in empirical game-theoretic analysis (C. Konicki, M. Chakraborty, and M. P. Wellman). *18th Conference on Web and Internet Economics*, pages 132–149, Dec 2022.

5. Evaluating strategy exploration in empirical game-theoretic analysis (Y. Wang, Q. Ma, and M. P. Wellman). *21st International Conference on Autonomous Agents and Multiagent Systems*, pages 1346–1354, May 2022.

6. Building action sets in a deep reinforcement learner (Y. Wang, A. Sinha, S. CH-Wang, and M. P. Wellman). *20th IEEE International Conference on Machine Learning and Applications*, pages 484–489, Dec 2021.

7. A strategic analysis of portfolio compression (K. Mayo and M. P. Wellman). *2nd International Conference on Artificial Intelligence in Finance*, Nov 2021.

8. An agent-based model of strategic adoption of real-time payments (K. Mayo, S. Fozdar, and M. P. Wellman). *2nd International Conference on Artificial Intelligence in Finance*, Nov 2021.

9. Stability effects of arbitrage in exchange-traded funds: An agent-based model (M. Shearer, D. Byrd, T. Balch, and M. P. Wellman). *2nd International Conference on Artificial Intelligence in Finance*, Nov 2021.

10. Designing a combinatorial financial options market (X. Wang, D. M. Pennock, N. R. Devanur, D. M. Rothschild, B. Tao, and M. P. Wellman). *22nd ACM Conference on Economics and Computation*, pages 864–883, July 2021.

11. Iterative empirical game solving via single policy best response (M. O. Smith, T. Anthony, and M. P. Wellman). *9th International Conference on Learning Representations*, May 2021.

12. Evolution strategies for approximate solution of Bayesian games (Z. Li and M. P. Wellman). *35th AAAI Conference on Artificial Intelligence*, pages 5531–5540, Feb 2021.

13. Learning-based trading strategies in the face of market manipulation (X. Wang, C. Hoang, and M. P. Wellman). *1st International Conference on Artificial Intelligence in Finance*, article #25, 8 pages, Oct 2020.

14. Market manipulation: An adversarial learning framework for detection and evasion (X. Wang and M. P. Wellman). *29th International Joint Conference on Artificial Intelligence*, pages 4626–4632, July 2020.

15. Generating realistic stock market order streams (J. Li, X. Wang, Y. Lin, A. Sinha, and M. P. Wellman). *34th AAAI Conference on Artificial Intelligence*, pages 727–734, Feb 2020.

16. Structure learning for approximate solution of many-player games (Z. Li and M. P. Wellman). *34th AAAI Conference on Artificial Intelligence*, pages 2119–2127, Feb 2020.

17. Cap-and-trade emissions regulation: A strategic analysis (F. Cheng, Y. Engel, and M. P. Wellman). *28th International Joint Conference on Artificial Intelligence*, pages 187–193, Aug 2019.

18. Iterated deep reinforcement learning in games: History-aware training for improved stability (M. Wright, Y. Wang, and M. P. Wellman). *20th ACM Conference on Economics and Computation*, pages 617–636, June 2019.

19. Incentivizing collaboration in a competition (A. Sinha and M. P. Wellman). *18th International Conference on Autonomous Agents and Multiagent Systems*, pages 556–564, May 2019.

20. Deception in finitely repeated security games (T. H. Nguyen, A. Sinha, Y. Wang, and M. P. Wellman). *33rd AAAI Conference on Artificial Intelligence*, pages 2133–2140, Jan 2019.

21. A cloaking mechanism to mitigate market manipulation (X. Wang, Y. Vorobeychik, and M. P. Wellman). *27th International Joint Conference on Artificial Intelligence*, pages 541–547, July 2018.

22. Evaluating the stability of non-adaptive trading in continuous double auctions (M. Wright and M. P. Wellman). *17th International Conference on Autonomous Agents and Multiagent Systems*, pages 614–622, July 2018.

23. SoK: Security and privacy in machine learning (N. Papernot, P. McDaniel, A. Sinha, and M. P. Wellman). *3rd IEEE European Symposium on Security and Privacy*, Apr 2018.

24. A regression approach for modeling games with many symmetric players (B. Wiedenbeck, F. Yang, and M. P. Wellman). *32nd AAAI Conference on Artificial Intelligence*, pages 1266–1273, Feb 2018.

25. A Stackelberg game model for botnet data exfiltration (T. H. Nguyen, M. P. Wellman, and S. Singh). *8th Conference on Decision and Game Theory for Security*, pages 151–170, Oct 2017.

26. Empirical mechanism design for optimizing clearing interval in frequent call markets (E. Brinkman and M. P. Wellman). *18th ACM Conference on Economics and Computation*, pages 205–221, June 2017.

27. Accounting for strategic response in an agent-based model of financial regulation (F. Cheng and M. P. Wellman). *18th ACM Conference on Economics and Computation*, pages 187–203, June 2017.

28. Spoofing the limit order book: An agent-based model (X. Wang and M. P. Wellman). *16th International Conference on Autonomous Agents and Multiagent Systems*, pages 651–659, May 2017.

29. Strategic payment routing in financial credit networks (F. Cheng, J. Liu, K. Amin, and M. P. Wellman). *17th ACM Conference on Economics and Computation*, pages 721–738, July 2016.

30. Gradient methods for Stackelberg security games (K. Amin, S. Singh, and M. P. Wellman). *32nd Conference on Uncertainty in Artificial Intelligence*, June 2016.

31. Strategic market choice: Frequent call markets vs. continuous double auctions for fast and slow traders (E. Wah, D. R. Hurd, and M. P. Wellman). *Third Conference on Auctions, Market Mechanisms, and their Applications*, Aug 2015.

32. Welfare effects of market making in continuous double auctions (E. Wah and M. P. Wellman). *14th International Conference on Autonomous Agents and Multiagent Systems*, pages 57–66, May 2015.

33. Empirical game-theoretic analysis of an adaptive cyber-defense scenario (preliminary report) (with A. Prakash). *5th Conference on Decision and Game Theory for Security*, pages 43–58, Nov 2014.

34. Characterizing strategic cascades on networks (T. Martin, G. Schoenebeck, and M. P. Wellman). *15th ACM Conference on Economics and Computation*, pages 113–130, June 2014.

35. Bootstrap statistics for empirical games (B. Wiedenbeck, B.-A. Cassell, and M. P. Wellman). *13th International Conference on Autonomous Agents and Multiagent Systems*, pages 597–604, May 2014.

36. Signal structure and strategic information acquisition: Deliberative auctions with interdependent values (E. Brinkman, M. P. Wellman, and S. Page). *13th International Conference on Autonomous Agents and Multiagent Systems*, pages 229–236, May 2014.

37. Accounting for price dependencies in simultaneous sealed-bid auctions (B. A. Mayer, E. Sodomka, A. Greenwald, and M. P. Wellman). *14th ACM Conference on Electronic Commerce*, pages 679–696, June 2013.

38. Latency arbitrage, market fragmentation, and efficiency: A two-market model (E. Wah and M. P. Wellman). *14th ACM Conference on Electronic Commerce*, pages 855–872, June 2013.

39. Analyzing incentives for protocol compliance in complex domains: A case study of introduction-based routing (with T. H. Kim and Q. Duong). *12th Workshop on the Economics of Information Security*, June 2013.

40. An empirical game-theoretic analysis of credit network formation (with B. Wiedenbeck). *50th Annual Allerton Conference on Communication, Control, and Computing*, October 2012.

41. Self-confirming price prediction strategies for simultaneous one-shot auctions (with E. Sodomka and A. Greenwald). *28th Conference on Uncertainty in Artificial Intelligence*, pages 893–902, August 2012.

42. Learning and predicting dynamic networked behavior with graphical multiagent models (Q. Duong, M. P. Wellman, S. Singh, and M. Kearns). *11th International Conference on Autonomous Agents and Multiagent Systems*, pages 441–448, June 2012.

43. Scaling simulation-based game analysis through deviation-preserving reduction (B. Wiedenbeck and M. P. Wellman). *11th International Conference on Autonomous Agents and Multiagent Systems*, pages 931–938, June 2012.

44. Strategic formation of credit networks (P. Dandekar, A. Goel, M. P. Wellman, and B. Wiedenbeck). *21st International WWW Conference*, pages 559-568, April 2012.

45. Modeling information diffusion in networks with unobserved links (Q. Duong, M. P. Wellman, and S. Singh). *Third IEEE International Conference on Social Computing*, pages 362–369, October 2011.

46. The structure of signals: Causal interdependence models for games of incomplete information (with L. Hong and S. E. Page). *27th Conference on Uncertainty in Artificial Intelligence*, pages 727–735, July 2011.

47. Incentivizing responsible networking via introduction-based routing (G. Frazier, Q. Duong, M. P. Wellman, and E. Petersen). *4th International Conference on Trust and Trustworthy Computing*, pages 279–293, June 2011.

48. Access point selection under emerging wireless technologies (B.-A. Cassell, T. Alperovich, M. P. Wellman, and B. Noble). *Workshop on the Economics of Networks, Systems, and Computation*, June 2011.

49. Agent-based analysis of asset pricing under ambiguous information (B.-A. Cassell and M. P. Wellman). *SpringSim Agent-Directed Simulation Symposium*, April 2011.

50. Algorithms for finding approximate formations in games (P. R. Jordan and M. P. Wellman). *24th AAAI Conference on Artificial Intelligence*, pages 798–804, July 2010.

51. Strategy and mechanism lessons from the first Ad Auctions Trading Agent Competition (P. R. Jordan, M. P. Wellman, and G. Balakrishnan). *11th ACM Conference on Electronic Commerce*, pages 287–296, June 2010.

52. A categorization of KR&R methods for requirement analysis of a query answering knowledge base (V. K. Chaudhri, B. Bredeweg, R. Fikes, S. McIlraith, and M. P. Wellman). *6th International Conference on Formal Ontology in Information Systems*, pages 158–171, May 2010.

53. History-dependent graphical multiagent models (Q. Duong, M. P. Wellman, S. Singh, and Y. Vorobeychik). *9th International Conference on Autonomous Agents and Multiagent Systems*, pages 1215–1222, May 2010.

54. Strategy exploration in empirical games (P. R. Jordan, L. J. Schvartzman, and M. P. Wellman). *9th International Conference on Autonomous Agents and Multiagent Systems*, pages 1131–1138, May 2010.

55. Weighted description logics preference formulas for multiattribute negotiation (A. Ragone, T. Di Noia, F. M. Donini, E. Di Sciascio, and M. P. Wellman). *Third International Conference on Scalable Uncertainty Management*, pages 193–205, September 2009.

56. Learning graphical game models (Q. Duong, S. Singh, Y. Vorobeychik, and M. P. Wellman). *21st International Joint Conference on Artificial Intelligence*, pages 116–121, July 2009.

57. Stronger CDA strategies through empirical game-theoretic analysis and reinforcement learning (L. J. Schvartzman and M. P. Wellman). *8th International Conference on Autonomous Agents and Multiagent Systems*, pages 249–256, May 2009.

58. Generalization risk minimization in empirical game models (P. R. Jordan and M. P. Wellman). *8th International Conference on Autonomous Agents and Multiagent Systems*, pages 553–560, May 2009.

59. Information feedback and efficiency in multiattribute double auctions (K. M. Lochner and M. P. Wellman). *First Conference on Auctions, Market Mechanisms, and their Applications*, pages 26–39, May 2009.

60. Knowledge combination in graphical multiagent models (Q. Duong, M. P. Wellman, and S. Singh). *24th Conference on Uncertainty in Artificial Intelligence*, pages 153–160, July 2008.

61. Searching for approximate equilibria in empirical games (P. R. Jordan, Y. Vorobeychik, and M. P. Wellman). *Seventh International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 1063–1070, May 2008.

62. Selecting strategies using empirical game models: An experimental analysis of meta-strategies (C. Kiekintveld and M. P. Wellman). *Seventh International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 1095–1102, May 2008.

63. Stochastic search methods for Nash equilibrium approximation in simulation-based games (Y. Vorobeychik and M. P. Wellman). *Seventh International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 1055–1062, May 2008.

64. Constrained automated mechanism design for infinite games of incomplete information (Y. Vorobeychik, D. M. Reeves, and M. P. Wellman). *Twenty-Third Conference on Uncertainty in Artificial Intelligence*, pages 400–407, July 2007.

65. Generalized value decomposition and structured multiattribute auctions (Y. Engel and M. P. Wellman). *Eighth ACM Conference on Electronic Commerce*, pages 227–236, June 2007.

66. Constraint satisfaction algorithms for graphical games (V. Soni, S. Singh, and M. P. Wellman). *Sixth International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 423–430, May 2007.

67. Empirical game-theoretic analysis of the TAC supply chain game (P. Jordan, C. Kiekintveld, and M. P. Wellman). *Sixth International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 1188–1195, May 2007.

68. Forecasting market prices in a supply chain game (C. Kiekintveld, J. Miller, P. Jordan, and M. P. Wellman). *Sixth International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 1318–1325, May 2007.

69. Iterated weaker-than-weak dominance (S.-F. Cheng and M. P. Wellman). *Twentieth International Joint Conference on Artificial Intelligence*, pages 1233–1238, January 2007.

70. CUI networks: A graphical representation for conditional utility independence (Y. Engel and M. P. Wellman). *Twenty-First National Conference on Artificial Intelligence*, pages 1137–1142, July 2006.

71. Bid expressiveness and clearing algorithms in multiattribute double auctions (Y. Engel, M. P. Wellman, and K. M. Lochner). *Seventh ACM Conference on Electronic Commerce*, pages 110–119, June 2006.

72. Controlling a supply chain agent using value-based decomposition (C. Kiekintveld, P. R. Jordan, J. Miller, and M. P. Wellman). *Seventh ACM Conference on Electronic Commerce*, pages 208–217, June 2006.

73. Empirical mechanism design: Methods, with application to a supply-chain scenario (Y. Vorobeychik, C. Kiekintveld, and M. P. Wellman). *Seventh ACM Conference on Electronic Commerce*, pages 306–315, June 2006.

74. Learning payoff functions in infinite games (Y. Vorobeychik, M. P. Wellman, and S. Singh). *Nineteenth International Joint Conference on Artificial Intelligence*, pages 977–982, August 2005.

75. Self-confirming price prediction for bidding in simultaneous ascending auctions (A. Osepayshvili, M. P. Wellman, D. M. Reeves, and J. K. MacKie-Mason). *Twenty-First Conference on Uncertainty in Artificial Intelligence*, pages 441–449, July 2005.

76. Approximate strategic reasoning through hierarchical reduction of large symmetric games (with D. M. Reeves, K. M. Lochner, S.-F. Cheng, and R. Suri). *Twentieth National Conference on Artificial Intelligence*, pages 502–508, July 2005.

77. Rule-based specification of auction mechanisms (K. M. Lochner and M. P. Wellman). In *Third International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 818–825, July 2004.

78. Computing best-response strategies in infinite games of incomplete information (D. M. Reeves and M. P. Wellman). In *Twentieth Conference on Uncertainty in Artificial Intelligence*, pages 470–478, July 2004.

79. Strategic interactions in the 2003 TAC supply chain tournament (J. Estelle, Y. Vorobeychik, M. P. Wellman, S. Singh, C. Kiekintveld, and V. Soni). In *Fourth International Conference on Computers and Games*, July 2004.

80. Price prediction strategies for market-based scheduling (J. K. MacKie-Mason, A. Osepayshvili, D. M. Reeves, and M. P. Wellman). In *Fourteenth International Conference on Automated Planning and Scheduling*, pages 244–252, June 2004.

81. Distributed feedback control for decision making on supply chains (C. Kiekintveld, M. P. Wellman, S. Singh, J. Estelle, Y. Vorobeychik, V. Soni, and M. Rudary). In *Fourteenth International Conference on Automated Planning and Scheduling*, pages 384–392, June 2004.

82. Computing approximate Bayes-Nash equilibria in tree-games of incomplete information (S. Singh, V. Soni, and M. P. Wellman). In *Fifth ACM Conference on Electronic Commerce*, pages 81–90, May 2004.

83. Walverine: A Walrasian trading agent (S.-F. Cheng, E. Leung, K. M. Lochner, K. O'Malley, D. M. Reeves, L. J. Schvartzman, and M. P. Wellman). In *Second International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 465–472, July 2003.

84. Exploring bidding strategies for market-based scheduling (with D. M. Reeves, J. K. MacKie-Mason, and S. Swaminathan). In *Fourth ACM Conference on Electronic Commerce*, pages 115–124, June 2003.

85. Betting Boolean-style: A framework for trading in securities based on logical formulas (L. Fortnow, J. Kilian, D. M. Pennock, and M. P. Wellman). In *Fourth ACM Conference on Electronic Commerce*, pages 144–155, June 2003.

86. The 2001 trading agent competition (with A. Greenwald, P. Stone, and P. R. Wurman). In *Fourteenth Conference on Innovative Applications of Artificial Intelligence*, pages 935-941, August 2002.

87. On market-inspired approaches to propositional satisfiability (W. E. Walsh, M. Yokoo, K. Hirayama, and M. P. Wellman). In *Seventeenth International Joint Conference on Artificial Intelligence*, pages 1152–1158, August 2001.

88. Automated negotiation from declarative contract descriptions (D. M. Reeves, M. P. Wellman, and B. N. Grosof). In *Fifth International Conference on Autonomous Agents*, pages 51–58, May 2001. (winner of *Best Student Paper Award* for Daniel Reeves)

89. A*k*BA: A progressive, anonymous-price combinatorial auction (P. R. Wurman and M. P. Wellman). In *Second ACM Conference on Electronic Commerce*, pages 21–29, October 2000.

90. Combinatorial auctions for supply chain formation (W. E. Walsh, M. P. Wellman, and F. Ygge). In *Second ACM Conference on Electronic Commerce*, pages 260–269, October 2000.

91. MarketSAT: An extremely decentralized (but really slow) algorithm for propositional satisfiability (W. E. Walsh and M. P. Wellman). In *Seventeenth National Conference on Artificial Intelligence*, pages 303–309, August 2000.

92. Distributed quiescence detection in multiagent negotiation (with W. E. Walsh). In *Fourth International Conference on Multiagent Systems*, pages 317–324, July 2000.

93. Compact securities markets for Pareto Optimal reallocation of risk (D. M. Pennock and M. P. Wellman). In *Sixteenth Conference on Uncertainty in Artificial Intelligence*, pages 481–488, July 2000.

94. Probabilistic state-dependent grammars for plan recognition (D. V. Pynadath and M. P. Wellman). In *Sixteenth Conference on Uncertainty in Artificial Intelligence*, pages 507–514, July 2000.

95. Experimental results on Q-learning for general-sum stochastic games (J. Hu and M. P. Wellman). In *Seventeenth International Conference on Machine Learning*, pages 407–414, June 2000.

96. Using stochastic dominance relationships for bounding travel time in stochastic networks (C.-L. Liu and M. P. Wellman). In *International Conference on Intelligent Transportation Systems*, pages 55–60, October 1999.

97. Efficiency and equilibrium in task allocation economies with hierarchical dependencies (W. E. Walsh and M. P. Wellman). In *Sixteenth International Joint Conference on Artificial Intelligence*, pages 520–526, August 1999.

98. Graphical representations of consensus belief (D. M. Pennock and M. P. Wellman). In *Fifteenth Conference on Uncertainty in Artificial Intelligence*, pages 531–540, July 1999.

99. The Auction Manager: Market middleware for large-scale electronic commerce (T. Mullen and M. P. Wellman). In *Third USENIX Workshop on Electronic Commerce*, pages 37–47, September 1998.

100. Multiagent reinforcement learning: Theoretical framework and an algorithm (J. Hu and M. P. Wellman). In *Fifteenth International Conference on Machine Learning*, pages 242–250, July 1998.

101. Incremental tradeoff resolution in qualitative probabilistic networks (C.-L. Liu and M. P. Wellman). In *Fourteenth Conference on Uncertainty in Artificial Intelligence*, pages 338–345, July 1998.

102. Using qualitative relationships for bounding probability distributions (C.-L. Liu and M. P. Wellman). In *Fourteenth Conference on Uncertainty in Artificial Intelligence*, pages 346–353, July 1998.

103. A market protocol for decentralized task allocation (W. E. Walsh and M. P. Wellman). In *Third International Conference on Multiagent Systems*, pages 325–332, July 1998.

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109. Self-fulfilling bias in multiagent learning (J. Hu and M. P. Wellman). In *Second International Conference on Multiagent Systems*, pages 118–125, December 1996.

110. Market-based negotiation for digital library services (T. Mullen and M. P. Wellman). In *Second USENIX Workshop on Electronic Commerce*, pages 259–269, November 1996.

111. Toward a market model for Bayesian inference (D. M. Pennock and M. P. Wellman). In *Twelfth Conference on Uncertainty in Artificial Intelligence*, pages 405–413, August 1996.

112. Optimal factory scheduling using stochastic dominance A* (P. R. Wurman and M. P. Wellman). In *Twelfth Conference on Uncertainty in Artificial Intelligence*, pages 554–563, August 1996.

113. Generalized queries on probabilistic context-free grammars (D. V. Pynadath and M. P. Wellman). In *National Conference on Artificial Intelligence,* pages 1285–1290, August 1996.

114. Accounting for context in plan recognition, with application to traffic monitoring (D. V. Pynadath and M. P. Wellman). In *Eleventh Conference on Uncertainty in Artificial Intelligence*, pages 472–481, August 1995.

115. Path planning under time-dependent uncertainty (with M. Ford and K. Larson). In *Eleventh Conference on Uncertainty in Artificial Intelligence*, pages 532–539, August 1995.

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118. State-space abstraction for anytime evaluation of probabilistic networks (with C.-L. Liu). In *Tenth Conference on Uncertainty in Artificial Intelligence*, pages 567–574, July 1994.

119. The automated mapping of plans for plan recognition (M. J. Huber, E. H. Durfee, and M. P. Wellman). In *Tenth Conference on Uncertainty in Artificial Intelligence*, pages 344–351, July 1994.

120. Some varieties of qualitative probability. In *Fifth International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems*, pages 437–442, July 1994.

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122. Inference in cognitive maps. In *IMACS International Workshop on Qualitative Reasoning and Decision Technologies*, pages 95–104, June 1993. *Awarded Best Paper prize* (2 of 75 papers selected).

123. A general-equilibrium approach to distributed transportation planning. In *National Conference on Artificial Intelligence,* pages 282–289, AAAI, July 1992.

124. Modular utility representation for decision-theoretic planning (with J. Doyle). In *First International Conference on AI Planning Systems,* pages 236–242, June 1992.

125. Preferential semantics for goals (with J. Doyle). In *National Conference on Artificial Intelligence,* pages 698–703, AAAI, July 1991.

126. Qualitative intercausal relations, or, Explaining "explaining away" (with M. Henrion). In *Second International Conference on Principles of Knowledge Representation and Reasoning*, pages 535–546, April 1991.

127. Qualitative simulation with multivariate constraints. In *Second International Conference on Principles of Knowledge Representation and Reasoning*, pages 547–557, April 1991.

128. Rational distributed reason maintenance for planning and replanning of large-scale activities: Preliminary report (J. Doyle and M. P. Wellman). In *DARPA Workshop on Innovative Approaches to Planning, Scheduling, and Control*, pages 28–36, Nov 1990.

129. The STRIPS assumption for planning under uncertainty. In *National Conference on Artificial Intelligence*, pages 198–203, AAAI, August 1990.

130. Exploiting functional dependencies in qualitative probabilistic reasoning. In *Sixth Conference on Uncertainty in Artificial Intelligence*, pages 2–9, July 1990.

131. Temporal reasoning for airlift scheduling analysis (J. D. Clay, M. P. Wellman, and C. R. Bisbee). In *National Aerospace and Electronics Conference*, pages 1181–1185, May 1990.

132. Impediments to universal preference-based default theories (J. Doyle and M. P. Wellman). In *First International Conference on Principles of Knowledge Representation and Reasoning*, pages 94–102, May 1989.

133. On the value of goals (T. Dean and M. P. Wellman). In *Proceedings of the Rochester Planning Workshop*, Technical Report 284, University of Rochester Department of Computer Science, April 1989.

134. Mechanisms for reasoning about sets (with R. G. Simmons). In *National Conference on Artificial Intelligence*, pages 398–402, AAAI, August 1988.

135. Dominance and subsumption in constraint-posting planning. In *Tenth International Joint Conference on Artificial Intelligence*, pages 884–890, August 1987.

136. The role of calculi in uncertain reasoning (with D. E. Heckerman). In *Workshop on Uncertainty in Artificial Intelligence*, pages 321–331, July 1987.

137. Probabilistic semantics for qualitative influences. In *National Conference on Artificial Intelligence*, pages 660–664, AAAI, July 1987.

138. Representing health outcomes for automated decision formulation. In *Fifth Conference on Medical Informatics (MEDINFO)*, pages 789–793, October 1986.

139. Qualitative probabilistic networks for planning under uncertainty. In *Workshop on Uncertainty in Artificial* Intelligence, pages 311–318, August 1986.

Reviews, Commentary, Miscellany

1. Can slower financial traders find a haven in a world of high-speed algorithms? *The Conversation*, July 2016.

2. Head-to-head: Does US high-frequency trading need stricter regulatory oversight? (YES). *International Financial Law Review*, September 2013.

3. Trading faster than the speed of reality. *TechCrunch*, June 2013.

4. AI theory and practice: A discussion on hard challenges and opportunities (E. Horvitz, L. Getoor, C. Guestrin, J. A. Hendler, J. A. Konstan, D. Subramanian, M. P. Wellman, and H. A. Kautz). *AI Magazine* **31**(3):103-114, 2010.

5. Exceptional data quality using intelligent matching and retrieval (C. Bidlack and M. P. Wellman). *AI Magazine* **31**(1):65-73, 2010.

6. Simulation-based game theory (Tutorial) (Y. Vorobeychik and M. P. Wellman). *Winter Simulation Conference*, 2009.

7. Foundations of multi-agent learning (Introduction) (R. V. Vohra and M. P. Wellman). *Artificial Intelligence* **171**:363–364, 2007.

8. Markets blown to bits: Comments on Mirowski's "Markomata". *Journal of Economic Behavior and Organization* **63**:347-353, 2007.

9. Automated markets and trading agents (J. K. MacKie-Mason and M. P. Wellman). *Handbook of Computational Economics*, vol. 2: *Agent-Based Computational Economics* (L. Tesfatsion and K. L. Judd, eds.), North-Holland, 2006.

10. Online marketplaces. *Practical Handbook of Internet Computing* (M. Singh, ed.), CRC Press, 2004.

11. Specifying rules for electronic auctions (P. R. Wurman, M. P. Wellman, and W. E. Walsh). *AI Magazine* **23**(3):15–23, 2002.

12. JAIR at five: Half a decade of the Journal of Artificial Intelligence Research (S. Minton and M. P. Wellman). *AI Magazine* **20**(2):83–91, 1999.

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16. Economic principles of multi-agent systems (Editorial) (C. Boutilier, Y. Shoham, and M. P. Wellman). *Artificial Intelligence* **94**:1–6, 1997.

17. Comments on case-based pathfinding. *ITS Journal* **3**(3):254–256, 1996.

18. The digital library as a community of information agents (with E. H. Durfee and W. P. Birmingham). *IEEE Expert* **11**(3):10–11, 1996.

19. Real-world applications of uncertain reasoning (Introduction) (D. Heckerman, A. Mamdani, and M. P. Wellman). *International Journal of Human-Computer Studies* **42**(6):573–574, 1995.

20. Bayesian networks (tutorial) (D. Heckerman and M. P. Wellman). *Communications of the ACM* **38**(3):27–30, 1995.

21. Real-World applications of Bayesian networks (Introduction) (D. Heckerman, A. Mamdani, and M. P. Wellman). *Communications of the ACM* **38**(3):24–26, 1995.

22. Knowledge-based construction of probabilistic and decision models (Introduction) (J. S. Breese, R. P. Goldman, and M. P. Wellman). *IEEE Transactions on Systems, Man, and Cybernetics* **24**(11):1577–1579, 1994.

23. Kyburgian acceptance: A rejection, hedged. *Computational Intelligence* **10**:103–106, 1994.

24. Whither qualitative reasoning? A Response to Sacks and Doyle. *Computational Intelligence* **8**:277–280, 1992.

25. Review of Bernardo A. Huberman (ed.), *The Ecology of Computation*. *Artificial Intelligence* **52**:205-218, 1991. Reprinted in *Contemplating Minds* (W. J. Clancey, S. W. Smoliar, and M. J. Stefik, eds.), MIT Press, 1994.

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Articles in Books

1. Empirical game-theoretic analysis for adaptive cyber-defense (with T. H. Nguyen and M. Wright). In *Adversarial and Uncertain Reasoning for Adaptive Cyber Defense*, Springer, 2019.

2. EGTAOnline: An experiment manager for simulation-based game studies (B.-A. Cassell and M. P. Wellman). In *Multi-Agent-Based Simulation XIII*, Springer Verlag, 2013.

3. Learning improved entertainment trading strategies for the TAC Travel game (L. J. Schvartzman and M. P. Wellman). In E. David, E. Gerding, D. Sarne, and O. Shehory, editors, *Agent-Mediated Electronic Commerce: Designing Trading Strategies and Mechanisms for Electronic Markets*, Springer-Verlag, LNBIP 59, 2010.

4. Designing an ad auctions game for the trading agent competition (P. R. Jordan and M. P. Wellman). In E. David, E. Gerding, D. Sarne, and O. Shehory, editors, *Agent-Mediated Electronic Commerce: Designing Trading Strategies and Mechanisms for Electronic Markets*, Springer-Verlag, LNBIP 59, 2010.

5. Market-based allocation with indivisible bids (L. J. Schvartzman and M. P. Wellman). In H. La Poutré, N. Sadeh, and S. Janson, editors, *Agent-Mediated Electronic Commerce. Designing Trading Agents and Mechanisms*, Springer-Verlag, LNAI 3937, 2006.

6. Searching for Walverine 2005 (with D. M. Reeves, K. Lochner, and R. Suri). In H. La Poutré, N. Sadeh, and S. Janson, editors, *Agent-Mediated Electronic Commerce. Designing Trading Agents and Mechanisms*, Springer-Verlag, LNAI 3937, 2006.

7. Market-based resource allocation for information-collection scenarios (S.-F. Cheng, M. P. Wellman, and D. G. Perry). In K. Kurumatani, S.-H. Chen and A. Ohuchi, editors, *Multi-Agent for Mass User Support*, Springer-Verlag, LNAI 3012, 2004.

8. Market-based QoS control for incorporating community preferences (H. Yamaki, M. P. Wellman, and T. Ishida). In T. Ishida, editor, *Community Computing: Collaboration over Global Information Networks*, Wiley, 1998.

9. Some issues in the design of market-oriented agents (T. Mullen and M. P. Wellman). In M. Wooldridge, J. Mueller, and M. Tambe, editors, *Intelligent Agents: Theories, Architectures, and Languages*, Volume II, Springer-Verlag, 1996.

10. Market-oriented programming: Some early lessons. In S. H. Clearwater, editor, *Market-Based Control: A Paradigm for Distributed Resource Allocation*, World Scientific, 1996.

11. Some varieties of qualitative probability. In B. Bouchon-Meunier, R. R. Yager, and L. A. Zadeh, editors, *Advances in Intelligent Computing*, Springer Verlag, 1995.

12. A logic of relative desire (J. Doyle, Y. Shoham, and M. P. Wellman). In Z. W. Ras and M. Zemankova, editors, *Methodologies for Intelligent Systems* ***6***, Springer-Verlag, 1991.

13. Rational self-government and universal default logics (J. Doyle and M. P. Wellman). In P. Bourgine and B. Wallisen, editors, *Economics and Artificial Intelligence* (CECOIA-2), Pergamon Press, 1991.

14. Qualitative probabilistic networks for planning under uncertainty. In J. F. Lemmer and L. N. Kanal, editors, *Uncertainty in Artificial Intelligence* **2**, North-Holland, 1988. Revised version in *Readings in Uncertain Reasoning* (G. Shafer and J. Pearl, eds.), Morgan Kaufmann, 1990.

15. Reasoning about assumptions underlying mathematical models. In J. S. Kowalik, editor, *Coupling Symbolic and Numerical Computing in Expert Systems*, North-Holland, 1986.

Patents

US Patent 8,799,080, *Dynamic webpage generation including request-time auctioned web content* (B. D'Ambrosio and M. P. Wellman), issued 5 Aug 2014.

US Patent 8,112,320, *Multi-attribute web content auctions* (B. D'Ambrosio and M. P. Wellman), issued 7 Feb 2012.

US Patent 7,558,752, *Method and apparatus for a trading market design and deployment system* (E. Y. Ephrati, Y. Shoham, and M. P. Wellman), issued 7 Jul 2009.

US Patent 7,296,001, *Electronic multilateral negotiation system* (E. Y. Ephrati, Y. Shoham, and M. P. Wellman), issued 13 Nov 2007.

US Patent 7,133,841, *Method and computer system for conducting a progressive, price-driven combinatorial auction* (P. R. Wurman and M. P. Wellman), issued 7 Nov 2006.

US Patent 6,952,682, *System and method for matching multi-attribute auction bids*, issued 4 Oct 2005.

PhD Graduates

1. John Q. Cheng, *Essays on Designing Economic Mechanisms*, Jan 1998. (co-chair with Carl Simon)
2. Chao-Lin Liu, *State-Space Abstraction Methods for Approximate Evaluation of Bayesian Networks*, May 1998.
3. Tracy Mullen, *The Design of Computational Markets for Network Information Services*, Jan 1999.
4. David V. Pynadath, *Probabilistic Grammars for Plan Recognition*, Jan 1999.
5. Junling Hu, *Learning in Dynamic Noncooperative Multiagent Systems*, Jun 1999.
6. Peter R. Wurman, *Market Structure and Multidimensional Auction Design for Computational Economies*, Jul 1999.
7. David M. Pennock, *Aggregating Probabilistic Beliefs: Market Mechanisms and Graphical Representations*, Sep 1999.
8. William E. Walsh, *Market Protocols for Decentralized Supply Chain Formation*, May 2001.
9. Daniel Reeves, *Generating Trading Agent Strategies: Analytic and Empirical Methods for Infinite and Large Games*, Aug 2005.
10. Shih-Fen Cheng, *Game-Theoretic Approaches for Complex Systems Optimization*, Jul 2006. (co-chair with Robert Smith)
11. Kevin Lochner, *Multiattribute Call Markets*, Apr 2008.
12. Yevgeniy Vorobeychik, *Mechanism Design and Analysis Using Simulation-Based Game Models*, May 2008.
13. Christopher Kiekintveld, *Empirical Game-Theoretic Methods for Strategy Design and Analysis in Complex Games*, Jun 2008.
14. Yagil Engel, *Structured Preference Representation and Multiattribute Auctions*, Jun 2008.
15. L. Julian Schvartzman, *Stronger Bidding Strategies through Empirical Game-Theoretic Analysis and Reinforcement Learning*, Apr 2009.
16. Patrick R. Jordan, *Practical Strategic Reasoning, with Applications to Market Games*, Dec 2009.
17. Quang Duong, *Graphical Multiagent Models*, Jul 2012.
18. Ben-Alexander Cassell, *Scaling Empirical Game-Theoretic Analysis*, Jul 2014.
19. Bryce Wiedenbeck, *Approximate Analysis of Large Simulation-Based Games*, Jun 2015.
20. Elaine Wah, *Computational Models of Algorithmic Trading in Financial Markets*, Mar 2016.
21. Travis Martin, *Theoretical Tools for Network Analysis: Game Theory, Graph Centrality, and Statistical Inference*, Jun 2016. (co-chair with Mark Newman)

22. Erik Brinkman, *Understanding Financial Market Behavior through Empirical Game-Theoretic Analysis*, Mar 2018.
23. Mason Wright, *Stable Profiles in Simulation-Based Games via Reinforcement Learning and Statistics*, Dec 2018.
24. Frank Cheng, *Agent-Based Models for Analyzing Strategic Adaptations to Government Regulation*, Jan 2020.
25. Xintong Wang, *Computational Modeling and Design of Financial Markets: Towards Manipulation-Resistant and Expressive Markets*, Dec 2020.
26. Megan Shearer, *Modeling Trading Strategies in Financial Markets with Data, Simulation, and Deep Reinforcement Learning*, Jun 2022.
27. Max Olan Smith, *Efficient Game Solving through Transfer Learning*, Jul 2023.
28. Yongzhao Wang, *Multiagent Learning by Iterative Refinement of Game Models*, Aug 2023.
29. Zun Li, *Artificial Intelligence Algorithms for Large Economic and Computer Games*, Jan 2024.

Professional Activities

Boards and Offices

- 2024–present, Technical Advisory Committee, *Commodity Futures Trading Commission*
- 2020–present, Emerging Technology Technical Advisory Committee, *Bureau of Industry and Security* (US Dept of Commerce)
- 2017–2022, Market Surveillance Advisory Group, *Financial Industry Regulatory Authority (FINRA)*
- 2016–2019, Financial Research Advisory Committee, *Office of Financial Research* (US Dept of Treasury)
- 2014–2019, 2008–2011, Scientific Advisory Council, *Centrum Wiskunde & Informatica (CWI)* [Center for Mathematics & Computer Science, Amsterdam]
- 2013–2014, Advisory Board, *Dept. of Computer Science & Engineering, Chinese University of Hong Kong*
- 2011–2014, Scientific Advisory Board, *Technion-Microsoft Electronic Commerce Research Center*
- 2011–2014, International Advisory Board, *Ibn Sina School for Computer Science*.
- 2011–2012, Technical Advisory Board, Bitz LLC
- 2009–2015, Technical Adviser, Digital Scirocco, Inc.
- 2008–2014, Board of Directors, *International Foundation for Autonomous Agents and Multiagent Systems* (Chair Finance Committee, 2013–2014)
- 2006–present, Technical Advisory Board, ActivePrime, Inc.
- 2004–2015, Founder and Treasurer, 2004–2010, Chair, Board of Directors, *Assoc. Trading Agent Research*.
- 2006 Alternative Technical Advisory Board (ALT-TAB) for e-Commerce and Auctions, Microsoft Research
- 2006 Technical Advisory Board, Ripple Software

- 2004–2008, Board of Directors, *AI Access Foundation*
- 2003–2007 Chair, *ACM SIGecom* (Electronic Commerce SIG) (elected)
- 1999–2003, Steering Board, *ACM SIGecom*
- 1998–2001, Councilor, *American Association for Artificial Intelligence* (elected)
- 1993–1998, Board of Directors, *Association for Uncertainty in Artificial Intelligence*

Editorial

- 2019 Co-Editor, Special issue of *Artificial Intelligence*.
- 2016 Co-Editor, Special issue of *Autonomous Agents and Multiagent Systems*.
- 2011–2014 Associate Editor, *ACM Transactions on Economics and Computation.*
- 2010–2014 Associate Editor, *ACM Transactions on Internet Technology.*
- 2007 Co-Editor, Special issue of *Artificial Intelligence*.
- 2005–2010 Editorial Board, *International Journal of Electronic Commerce*.
- 2004 Co-Editor, Special issue of *International Journal of Electronic Commerce*.
- 2003–2009 Editorial Board, *Computational Intelligence.*
- 2002–2007 Advisory Board, *Journal of Artificial Intelligence Research.*
- 2002–2005 Book Review Editor, *AI Magazine*.
- 2000–2008 Editorial Board, *Journal of Autonomous Agents and Multiagent Systems.*
- 1997–2001 Executive Editor, *Journal of Artificial Intelligence Research.*
- 1997 Co-Editor, Special issue of *Artificial Intelligence*.
- 1996 Associate Editor, *Journal of Artificial Intelligence Research.*
- 1995 Co-Editor, Special issue of *International Journal of Human-Computer Systems*.
- 1995 Co-Editor, Special issue of *Communications of the ACM*.
- 1994 Co-Editor, Special section of *IEEE Transactions on Systems, Man, and Cybernetics*.
- 1993–1995 Editorial Board, *Journal of Artificial Intelligence Research.*
- 1992–1997 Editorial Board, *Knowledge Engineering Review.*

Conference Committees

- 2025 **Local Organizing Chair**, *Int'l Conf. on Autonomous Agents and Multiagent Systems*.
- 2024, 2004, 2000, 1998, 1992, 1991, 1990, 1988 Program Committee, 2023, 2019, 2018, 2017, 2015, 2014, 2013, 1997, 1996 Senior Program Committee; 2022, 2021 Senior Member Track, 2020, 2012, 2010 Area Chair; 2008 Nectar Track; *AAAI Conference on Artificial Intelligence*.
- 2023, 2021, 2017, 2014, 2010, 2008, 2007, 2000 Program Committee; 2020 Highlights Beyond EC Track; 2016, 2013, 2012, 2011, 2009 Senior Program Committee; *ACM Conference on Economics and Computation* (prior to 2014, called *ACM Conference on Electronic Commerce*).
- 2023, 2021, 2020 Reviewer, *Neural Information Processing Systems*
- 2022 Blue Sky Track; 2019, 2018 Area Chair; 2017, 2014, 2013, 2011, 2010, 2005, 2003 Senior Program Committee; 2015, 2012, 2009, 2008, 2007, 2002 Program Committee, *Int'l Conf. on Autonomous Agents and Multiagent Systems*.
- 2022, 2021, 2020 Steering Committee, *ACM Int'l Conference on AI in Finance.*

- 2020 Area Chair; 2019, 2013, 2011, 2009 Senior Program Committee; 2018 Contours Track; 2005 Program Committee, *International Joint Conference on Artificial Intelligence*.
- 2020 Program Committee, *AAAI Spring Symposium on Challenges and Opportunities for Multi-Agent Reinforcement Learning*
- 2019 Organizing Committee, *ICML Workshop on AI in Finance*.
- 2018, 2017 Program Committee, *ACM Workshop on Moving Target Defense.*
- 2017, 2013 Program Committee, *Conference on Web and Internet Economics.*
- 2016 **Program Co-Chair**, *AAAI Conference on Artificial Intelligence*.
- 2016 Program Committee, *AAMAS Workshop on Security and Multiagent Systems.*
- 2015 Program Committee, *ACM SIGAI Career Network Conference.*
- 2014, 2013, 2012, 2011, 2010, 2009, 2008, 2007, 2006, 2005, 2003 Program Committee, *Workshop on Trading Agent Design and Analysis*.
- 2014 Program Committee, *AAAI Fall Symposium on Energy Market Prediction.*
- 2013, 2012, 2011, 2004, 2001, 2000 Senior Program Committee; 2010, 2008, 2007, 2005, 2003, 1998, 1997, 1996, 1995, 1994 Program Committee, *Conference on Uncertainty in Artificial Intelligence.*
- 2013, 2010, 2009, 2008, 2002 Program Committee, *Workshop on Agent-Mediated Electronic Commerce*.
- 2013 Program Committee, *Int'l Conference on Economic Computing.*
- 2012 Program Committee, *AAAI Fall Symposium on Machine Aggregation of Human Judgments.*
- 2011 Program Committee, *International Conference on Algorithmic Decision Theory*
- 2011 Program Committee, *Conference on Auctions, Market Mechanisms, and their Applications*
- 2010, 2001 Program Committee, *World-Wide Web Conference*.
- 2009 Program Committee, *SIGIR Workshop on Information Retrieval and Advertising*.
- 2009 Program Committee, *Workshop on Managing Insider Security Threats*.
- 2009 Program Committee, *IJCAI Workshop on Competitions in AI and Robotics*.
- 2008 Program Committee, *KDD Workshop on Data Mining and Audience Intelligence for Advertisement*.
- 2007 Senior Member Track Co-Chair, *AAAI National Conference on Artificial Intelligence*.
- 2006 **Conference Co-Chair**, *Int'l Joint Conf. on Autonomous Agents and Multiagent Systems*.
- 2005, 2004 Program Committee, *Workshop on Agent-Mediated Electronic Commerce*.
- 2005 Program Committee, *International Workshop on Incentive-Based Computing*.
- 2004 Program Committee, *Workshop on the Economics of Peer-to-Peer Systems*.
- 2004 Program Committee, *Int'l Conference on Automated Planning and Scheduling*.
- 2003 Vice-Chair, E-Commerce Track, *World-Wide Web Conference*.
- 2003 Program Committee, *IJCAI-03 Workshop on Multiagent for Mass User Support*.
- 2003 Program Committee, *AAMAS-03 Workshop on Evolutionary Game Theory for Learning in Multiagent Systems*.
- 2001 **Conference Chair**, *ACM Conference on Electronic Commerce.*
- 2001 Co-Organizer, *EC-01 Trading Agent Competition.*
- 2001 Tutorial Chair, *International Joint Conference on Artificial Intelligence*.
- 2001 Program Committee, *IJCAI-01 Workshop on Economic Agents, Models, & Mechanisms*.

- 2000 Co-Organizer, *ICMAS-00 Trading Agent Competition.*
- 2000, 1998 Program Committee, *Int'l Conference on Distributed Computing Systems*.
- 2000, 1998 1996 Program Committee, *Int'l Conference on Multiagent Systems*.
- 1999 **Program Chair**, *ACM Conference on Electronic Commerce*.
- 1999 Program Committee, *IBM/IAC Workshop on Internet-Based Negotiation Technologies*.
- 1999 Organizing Committee, *AAAI-99 Workshop on AI for Electronic Commerce*.
- 1998 Program Committee, *Int'l Conference on Information and Computational Economies*.
- 1998 Program Committee, *Agents-98 Workshop on Agent-Mediated Electronic Trading*.
- 1997 Organizing Committee, *AAAI Spring Symposium on Qualitative Preferences in Deliberation and Practical Reasoning*.
- 1996 Program Committee, *Theoretical Aspects of Rationality and Knowledge*.
- 1995 Program Committee, *IJCAI-95 Workshop on Agent Theories, Architectures, and Languages*.
- 1994 Organizing Committee, *AAAI Spring Symposium on Decision-Theoretic Planning*.
- 1994, 1992 Program Committee, *International Conference on Principles of Knowledge Representation and Reasoning*.
- 1993 **Conference Chair**, *Ninth Conference on Uncertainty in Artificial Intelligence.*
- 1992 **Program Co-Chair**, *Eighth Conference on Uncertainty in Artificial Intelligence.*
- 1992 Program Committee, *International Workshop on Principles of Diagnosis.*
- 1992 Program Committee, *IEEE Conference on Artificial Intelligence for Applications.*
- 1991 Organizing Committee (chair), *AAAI-91 Workshop on Knowledge-Based Construction of Probabilistic and Decision Models*.
- 1989 Program Committee, co-chair for Intelligent Systems, *Workshop on Space Operations Automation and Robotics* (SOAR-89).

Other Committees

- 2014–2015 ACM SIGecom Doctoral Dissertation Award Committee (Chair, 2015)
- 2010–2012 AAAI Fellows Selection Committee
- 2006–2009 DARPA Information Science and Technology (ISAT) Study Group. (Co-chaired study in 2008.)
- 2005 ACM SGB Task Force on the Impact of Increasing Conference Submissions
- 2000–2005 ACM Doctoral Dissertation Award Committee
- 1999 DARPA ISAT study participant
- 1997–1998 Joint US-European (NSF-ERCIM) Working Group on Intellectual Property and Economic Issues in Digital Libraries (US co-chair)
- 1996 AI Working Group, *ACM Workshop on Strategic Directions in Computing Research*

Lectures

- University lectures at Air Force Institute of Technology, Bowling Green State University, Brown University, Carnegie Mellon University, Dartmouth, Duke University, George Mason University, Georgia Institute of Technology, Harvard University, Kyoto University, Lund University, Massachusetts Institute of Technology, Michigan State University, National Chengchi University (Taiwan), New Mexico State University, North Carolina State University, Northwestern University, Pennsylvania State University, Princeton University, Purdue University, Singapore Management University, Stanford University, Texas A&M University at Texarkana, University of Alberta, University of Amsterdam, University of Arizona, University of California at Berkeley, University of California at Los Angeles, University of California at San Diego, University of Cambridge, University of Cincinnati, University of Dayton, University of Delaware, University of Illinois, University of Liverpool, University of Maryland, University of Michigan, University of Michigan—Dearborn, University of Mississippi, University of Notre Dame, University of Oxford, University of Pennsylvania, University of Pittsburgh, University of Rochester, University of Southern California, University of Texas, University of Toronto, University of Washington, University of Waterloo, University of Wisconsin at Milwaukee, University of Zurich, Washington University, Wayne State University, Western Michigan University, and Yale University.

- Lectures to industry and government: Academia Sinica, Ariba, AT&T Bell Laboratories, BBN, Centrum Wiskunde & Informatica (CWI), Chicago Federal Reserve Bank, Citadel, Commodity Futures Trading Commission, Financial Industry Regulatory Authority (FINRA), Ford Research Laboratories, Google, Google DeepMind (London, Paris), Hewlett-Packard Laboratories, IBM Watson Research Center, Jet Propulsion Laboratory, Machine Intelligence Research Institute, Microsoft Research, MITRE Corp, NASA/Ames Research Center, NEC Research Institute, Nokia Research Center, NTT Communication Science Laboratories, Office of Financial Research (US Treasury), RAND Corporation, Rockwell Science Center, SAIC, Santa Fe Institute, Siemens Corporate Research, SRI International, Telcordia Technologies, USC Information Sciences Institute, USAF Wright Laboratory, and Yahoo! Research.

- Lectures to professional organizations: Bay Area Forum on Uncertainty (Stanford, CA) and Dayton SIGART.

- Invited talks at conferences and workshops:
  - *Market-oriented programming*, at Twelfth Brazilian Symposium on Artificial Intelligence (SBIA-95), October 1995.
  - *Market-aware agents for a multiagent world*, at Eighth European Workshop on Modelling Autonomous Agents in a Multi-Agent World (MAAMAW-97), May 1997.
  - *Market-oriented programming*, at Fourteenth National Conference on Artificial Intelligence (AAAI-97), July 1997.

- *Electronic commerce*, at Second Dartmouth Workshop on Transportable Agents, September 1997.
- *Wanderings in marketspace*, at Agents-98 Workshop on Artificial Societies and Computational Markets, May 1998.
- *Agents and electronic commerce: Mechanisms and protocols*, at Third International Workshop on Cooperating Information Agents, August 1999.
- *Trading Agents*, at Brookings Workshop on Multi-Agent Computation in Natural and Artificial Economies, October 2001.
- *Trading Agents*, at DIMACS Workshop on Computational Aspects of Game Theory and Mechanism Design, November 2001.
- *Collective Cognition in Market Protocols*, at Santa Fe Institute Workshop on Collective Cognition—The Mathematical Foundations of Distributed Intelligence, January 2002.
- *Exploring Strategies for Market-Based Scheduling*, at Dagstuhl Seminar on Electronic Market Design, June 2002.
- *Explorations in Trading Strategy Spaces*, at AAAI-02 Workshop on Multiagent Modeling and Simulation of Economic Systems, July 2002.
- *Market-Based Resource Allocation*, at IJCAI-03 Workshop on AI and Autonomic Computing, August 2003.
- *Exploring Trading Strategy Spaces*, at AAMAS-04 Workshop on Trading Agent Design and Analysis, July 2004.
- *Exploring Trading Strategy Spaces*, at Dagstuhl Seminar on Computing and Markets, January 2005.
- *Strategic Issues in Prediction Markets*, at DIMACS Workshop on Markets as Predictive Devices, February 2005.
- *Trading Agent Stories: Lessons from an International Trading Agent Competition*, at Pacific Rim International Workshop on Multi-Agents, September 2005.
- *Empirical Game-Theoretic Analysis for Practical Strategic Reasoning*, at LACSI Workshop on Models & Simulations for Large-Scale Socio-Technical Systems, October 2005.
- *Trading Agent Stories: Lessons from an International Trading Agent Competition*, at International Conference on Electronic Commerce, August 2006.
- *A Supply Chain Management Trading Agent Competition*. Seminar on Intelligent Agents in Supply Chain Management, The Logistics Institute—Asia Pacific and Singapore Management University, Aug 2007.
- *Methods for Empirical Game-Theoretic Analysis*. Fifth Conference on Economic Design, June 2008.
- *AI Meets Markets: Trading Agents and Strategic Reasoning*. Microsoft Research Faculty Summit, July 2008.
- *Software Agents and Empirical Game Analysis*, at NSF Workshop on Behavior, Computation, and Networks in Human Subject Experiments, July 2008.
- *Knowledge Combination in Graphical Multiagent Models*, at Graph Theory, Computational Intelligence, and Thought, Sep 2008.
- *An Ad Auction Trading Agent Competition*. Microsoft Beyond Search Workshop, June 2009.

- *Trading Agent Competition*. IJCAI-09 Workshop on Competitions in Artificial Intelligence and Robotics, July 2009.
- *Knowledge Combination in Graphical Multiagent Models*. From Game Theory to Game Engineering Workshop, Oxford-Man Institute, Sep 2009.
- *Empirical Game-Theoretic Analysis of Bidding Strategies*. Sixth Ad Auctions Workshop, June 2010.
- *Levels of Optimization in Multiagent Systems*. NSF Workshop on Self-Optimizing Systems, June 2010.
- *Empirical Game-Theoretic Analysis*. ARO Workshop on Reasoning in Adversarial and Non-cooperative Environments, Nov 2010.
- *Autonomy in Finance and Trading*. Autonomous Systems Workshop, The MITRE Corporation, May 2011.
- *Empirical Game-Theoretic Analysis and the Behavior of Software Agents*. Twenty-First International Conference on Automated Planning and Scheduling, June 2011.
- *Self-Confirming Price Prediction Strategies for Simultaneous One-Shot Auctions*. Decentralization Conference, Mar 2012.
- *Empirical Game-Theoretic Analysis of Bidding Strategies*. Technion Electronic Commerce Day, May 2012.
- *Empirical Game-Theoretic Analysis for Practical Strategic Reasoning*. Fifteenth Int'l Conference on Principles and Practice of Multi-Agent Systems, Sep 2012.
- *Computational Finance Models: Investigations of Credit Network Formation and Latency Arbitrage*. Symposium on Emerging Topics in Control and Modeling of Social and Economic Behavior, Coordinated Science Lab of the University of Illinois at Urbana-Champaign, Nov 2013.
- *Strategic Reasoning and Mechanism Design from Agent-Based Models*. Conference on Technologies and Applications of Artificial Intelligence, Dec 2013.
- *Empirical Game-Theoretic Analysis for Practical Strategic Reasoning*. AAMAS-14 Workshop on Health-Care Applications of Algorithmic Game Theory, May 2014.
- *Putting the Agent in Agent-Based Modeling*. International Conference on Autonomous Agents and Multiagent Systems, May 2014.
- *Artificial Intelligence and Real Economics*. Workshop on Information Technologies and Systems, Dec 2015.
- *Adverse Outcomes for Financial Markets: AI, Trading Systems, and Market Manipulation*. Origins Project Workshop on Envisioning and Addressing Adverse Outcomes of Artificial Intelligence, Feb 2017.
- *Artificial Intelligence and Real Economics*. Gruter Institute Conference on Interdisciplinary Insights into Innovation and Growth, May 2017.
- *Why is AI important now, and what should we, as a nation, be doing about it?* Comptroller General Forum on Artificial Intelligence, Jul 2017.
- *Collaborative Intelligent Radio Networks as a Multiagent System*. Wireless Innovation Forum Conference on Wireless Communications Technologies (WinnComm), Nov 2017.

- *Simulation-Based Game Reasoning for Autonomous Cyber-Defense*. ARO Invitational Workshop on Foundations of Autonomous Adaptive Cyber Systems, Feb 2018.
- *Accounting for Strategic Response in Financial Regulation*. OFR-Michigan Financial Stability Conference, Nov 2018.
- *Detecting Financial Market Manipulation using Machine Learning*. AWS:invent, Nov 2018.
- *When Algorithms Trade: Modeling AI in Financial Markets*. NeurIPS Workshop on Challenges and Opportunities for AI in Financial Services, Dec 2018.
- *Trend Following Trading Strategies and Financial Market Stability*. ICML Workshop on AI in Finance, Jun 2019.
- *Automated Cyber-Strategy Generation through Deep Reinforcement Learning and Game Theory*. Workshop on Autonomy and AI for Cybersecurity, Aug 2019.
- *Empirical Game-Theoretic Analysis of Algorithmic Trading Scenarios*. Workshop on the Digitization of Finance, Dec 2019.
- *Empirical Game-Theoretic Analysis of Algorithmic Trading Scenarios.* Market Simulation Workshop, Turing Institute and Oxford Man Institute, Sep 2020.
- *Generative Adversarial Networks for Amplifying and Extending Financial Market Data.* IEX Academic Research Conference, Nov 2020.
- *Thoughts on AI Trust and Transparency*. Data Gathering Workshop, National Academies Study on Testing, Evaluating, and Assessing Artificial Intelligence-Enabled Systems under Operational Conditions for the Department of the Air Force, Jun 2022.
- *Loopholes and Hyper-Rationality: AI Risk from Mechanism-Level Interactions.* NSF Workshop on Provably Safe and Beneficial AI, Oct 2022.
- *Lessons from a Trading Agent Competition.* ICAIF Workshop on Benchmarks for AI in Finance, Nov 2022.
- *A Meta-Game Evaluation Framework for Multiagent Training Algorithms*. DIMACS Workshop on Foundation Models, Large Language Models, and Game Theory, Oct 2023.
- *Understanding the Implications of AI on Financial Markets*. 4th Int'l Conference on AI in Finance, Nov 2023.
- *Understanding the Implications of AI on Financial Markets*. AAAI-24 Bridge Workshop on AI for Financial Services, Feb 2024.

Tutorials

- *Knowledge Representation*, European Conference on Artificial Intelligence in Medicine, Marseilles, France, 31 August 1987.
- *Introduction to AI and Knowledge-Based Systems*, USAF Aeronautical Systems Division Training Course, Dayton, OH, 5-8 December 1988.
- *Model-Based Diagnosis*, AF Systems Command AI Working Group Meeting, Kirtland AFB, NM, 16 March 1989.
- *Introduction to Artificial Intelligence*, AAAI-93 Workshop on AI in Intelligent Vehicle-Highway Systems, Washington, DC, 12 July 1993.

- *Abstraction in Probabilistic Reasoning*, Summer Institute on Probability in AI, Corvallis, OR, 26 July 1994.
- *Economic Foundations for Distributed Artificial Agents*, Artificial Intelligence for Multi-Agent Systems: Methodologies and Applications, Sesimbra, Portugal, September 1994.
- *Economic Foundations for Multiagent Systems*, First International Conference on Multiagent Systems, San Francisco, CA, June 1995.
- *Designing Computational Markets and Multiagent Organizations* (with T Hogg), Thirteenth National Conference on Artificial Intelligence, Portland, OR, July 1996.
- *Computational Markets*, First European Agent Systems Summer School, Utrecht, Netherlands, July 1999.
- *Automated Commerce: An Overview*, Workshop on E-commerce and Agent Technologies, National Tsing Hua University, Taiwan, December 2000.
- *Market-Based Systems and Applications*, First Americas School on Agents and Multiagent Systems, Marina del Rey, CA, January 2002.
- *Markets in Uncertainty: Risk, Gambling, and Information Aggregation* (with DM Pennock), Fourth ACM Conference on Electronic Commerce, San Diego, June 2003.
- *Uncertainty and Computational Markets*, Nineteenth Conference on Uncertainty in Artificial Intelligence, Acapulco, August 2003.
- *Market-Oriented Agents and Systems*, Second Americas School on Agents and Multiagent Systems, Acapulco, August 2003.
- *Trading Agent Design and Analysis*, Sixth ACM Conference on Electronic Commerce, Vancouver, June 2005.
- *Trading Agent Design and Analysis*, Twenty-First National Conference on Artificial Intelligence, Boston, July 2006.
- *Autonomous Bidding Agents* (with PR Stone), Sixth International Joint Conference on Autonomous Agents and Multiagent Systems, Honolulu, May 2007.
- *Autonomous Bidding Agents* (with PR Stone), Twenty-Second National Conference on Artificial Intelligence, Vancouver, July 2007.
- *Trading Agent Design and Analysis*, Dubai Agents and Multi-Agent Systems School, Dubai, January 2008.
- *Trading Agents* (with A Greenwald), Twenty-Sixth AAAI Conference on Artificial Intelligence, Toronto, July 2012.

Reviewing

Extensive reviewing for a variety of conferences, journals, publishers, and government agencies.