

William E. Walsh
CombineNet, Inc.
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Research Interests

Electronic commerce, electronic auctions, computational markets, artificial intelligence, optimization.

Education

- 1997-2001 **University of Michigan**, Ann Arbor, MI
Ph.D., Computer Science and Engineering – Intelligent Systems
Dissertation: *Market Protocols for Decentralized Supply Chain Formation*
Advisor: Prof. Michael P. Wellman
- 1995-1997 **University of Michigan**, Ann Arbor, MI
M.S.E., Computer Science and Engineering – Intelligent Systems
- 1991-1995 **University of Michigan**, Ann Arbor, MI
B.S.E., Summa Cum Laude, Computer Engineering

Research and Teaching Positions

- July 2005 to present **Senior Research Scientist, CombineNet, Inc**
Pittsburgh, PA
- Developed an automated system for optimizing expressive advertising auctions
 - Developed and fielded an automated system for computing auction reserve prices
- September 2001 to June 2005 **Research Staff Member, IBM T.J. Watson Research Center**
Hawthorne, NY
- Developed a prototype electronic market for distributed computing resources
 - Performed research on supply chain auctions and computational game theory
- May 1999 to August 1999 **Research Intern, NASA Jet Propulsion Laboratory**
Pasadena, CA
- January 1996 to August 1998 **Graduate Student Research Assistant, University of Michigan**
Ann Arbor, MI
- September 1995 to December 1995 **Graduate Student Instructor, University of Michigan**,
Ann Arbor, MI
Class: Introduction to Artificial Intelligence

Honors and Awards

- NASA/Jet Propulsion Laboratory Graduate Student Researcher Fellowship, 1998 - 2000
- University of Michigan Distinguished Achievement Award in Computer Science and Engineering, 1998
- NSF Graduate Research Fellowship Honorable Mention, 1995

Personal Data: U.S. Citizen

Publications

Many available at: <http://wewalsh.com/papers.html>

Refereed Journals

1. Incentive-compatible, budget-balanced, yet highly efficient auctions for supply chain formation (M. Babaioff and W.E. Walsh). *Decision Support Systems*, 39(1):123-149, 2005.
2. 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.
3. On market-inspired approaches to propositional satisfiability (W.E. Walsh, M. Yokoo, K. Hirayama, M.P. Wellman). *Artificial Intelligence*, 144(1-2):125-156, 2003.
4. Auction protocols for decentralized scheduling (M.P. Wellman, W.E. Walsh, P.R. Wurman, and J.K. MacKie-Mason). *Games and Economic Behavior*, 35:271-303, 2001.
5. 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.
6. Designing the market game for a trading agent competition (M.P. Wellman, P.R. Wurman, K. O'Malley, R. Banger, S. Lin, D. Reeves, W. Walsh). *IEEE Internet Computing*, 43-51, March-April 2000.
7. 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.

Refereed Conferences and Workshops

1. Automated channel abstraction for advertising auctions (W.E. Walsh, C. Boutilier, T. Sandholm, R. Shields, G. Nemhauser, D.C. Parkes). *Fifth Workshop on Ad Auctions*, 2009.
2. Expressive banner ad auctions and model-based online optimization for clearing (C. Boutilier, D.C. Parkes, T. Sandholm, W.E. Walsh). *Twenty-third AAAI Conference on Artificial Intelligence*, 30-37, 2008.
3. New approaches to optimization and utility elicitation in autonomic computing (R. Patrascu, C. Boutilier, R. Das, J.O. Kephart, G. Tesauero, W. E. Walsh). *Twentieth National Conference on Artificial Intelligence*, 140-145, 2005.
4. A multi-agent systems approach to autonomic computing (G. Tesauero, D.M. Chess, W.E. Walsh, R. Das, A. Segal, I. Whalley, J.O. Kephart, and S. White). *Third International Joint Conference on Autonomous Agents and Multi Agent Systems*, 464-471, 2004.
5. Utility functions in autonomic systems (W.E. Walsh, G. Tesauero, J.O. Kephart, and R. Das). *International Conference on Autonomic Computing*, 70-77, 2004.

6. Incentive-compatible, budget-balanced, yet highly efficient auctions for supply chain formation (M. Babaioff and W.E. Walsh). *Fourth ACM Conference on Electronic Commerce*, 64-75, 2003.
7. Cooperative negotiation in autonomic systems using incremental utility elicitation (C. Boutilier, R. Das, J.O. Kephart, G. Tesauro, and W.E. Walsh). *Nineteenth Conference on Uncertainty in Artificial Intelligence*, 89-97, 2003.
8. On market-inspired approaches to propositional satisfiability (W.E. Walsh, M. Yokoo, K. Hirayama, M.P. Wellman). *Seventeenth International Joint Conference on Artificial Intelligence*, 2001.
9. Combinatorial auctions for supply chain formation. (W.E. Walsh, M.P. Wellman, and F. Ygge). *Second ACM Conference on Electronic Commerce*, 260-269, 2000.
10. MarketSAT: An extremely decentralized (but really slow) algorithm for propositional satisfiability (W.E. Walsh and M.P. Wellman). *Seventeenth National Conference on Artificial Intelligence*, 303-309, 2000.
11. Distributed quiescence detection in multiagent negotiation. (M.P. Wellman and W.E. Walsh.) *Fourth International Conference on Multi-Agent Systems*, 317-324, 2000.
12. Efficiency and equilibrium in task allocation economies with hierarchical dependencies (W.E. Walsh and M.P. Wellman). *Sixteenth International Joint Conference on Artificial Intelligence*, 520-526, 1999.
13. A control architecture for flexible internet auction servers (P.R. Wurman, M.P. Wellman, W.E. Walsh, and K.A. O'Malley). *First IAC Workshop on Internet Based Negotiation Technologies*, March, 1999.
14. Some economics of market-based distributed scheduling (W.E. Walsh, M.P. Wellman, P.R. Wurman, and J.K. MacKie-Mason). *Eighteenth International Conference on Distributed Computing Systems*, 612-621, 1998.
15. A market protocol for decentralized task allocation (W.E. Walsh and M.P. Wellman). *Third International Conference on Multi-Agent Systems*, 325-332, 1998.
16. The Michigan Internet AuctionBot: A configurable auction server for human and software agents. (P.R. Wurman, M.P. Wellman, and W.E. Walsh). *Second International Conference on Autonomous Agents*, 301-308, 1998.

Book Articles

1. Choosing samples to compute heuristic-strategy Nash equilibrium (W.E. Walsh, D. Parkes, and R. Das). In *Agent-Mediated Electronic Commerce V*, volume 3048 of *Lecture Notes in Artificial Intelligence*. Springer-Verlag 2004.
2. Modeling supply chain formation in multiagent systems (W.E. Walsh and M.P. Wellman). In *Agent Mediated Electronic Commerce II*, volume 1788 of *Lecture Notes in Artificial Intelligence*. Springer-Verlag, 2000.

Miscellaneous

1. Computing reserve prices and identifying the value distribution in real-world auctions with market disruptions (W.E. Walsh, D.C. Parkes, T. Sandholm, C. Boutilier). Short paper in *Twenty-third AAAI Conference on Artificial Intelligence*, 1499-1502, 2008.

2. An artificial intelligence perspective on autonomic computing policies (J.O. Kephart and W.E. Walsh). *IEEE 5th International Workshop on Policies for Distributed Systems and Networks*, 3-12, 2004.
3. Analyzing complex strategic interactions in multi-agent games (W.E. Walsh, R. Das, G. Tesauro, and J.O. Kephart). *AAAI Workshop on Game Theoretic and Decision Theoretic Agents*, 109-118, 2002.
4. Specifying rules for electronic auctions (P. R. Wurman, M. P. Wellman, and W. E. Walsh). *AI Magazine*, 23 (3): 15-23, 2002.
5. Survivability through market-based adaptivity: The MARX Project (J.E. Eggleston, S. Jamin, T.P. Kelly, J.K. MacKie-Mason, W.E. Walsh, and M.P. Wellman). *DARPA Information Survivability Conference*, January 2000.

Edited Volumes

1. *Lecture Notes in Artificial Intelligence: Agent-Mediated Electronic Commerce V* (J.A. Rodriguez, P. Faratin, D. Parkes, W.E. Walsh, eds.), 3048, Springer-Verlag, 2004.
2. *Lecture Notes in Artificial Intelligence: Agent-Mediated Electronic Commerce IV: Designing Mechanisms and Systems* (J. Padget, D. Parkes, N. Sadeh, O. Shehory, and W. Walsh, eds.), 2531, Springer-Verlag, 2002.

Invited Talks

- 2008 Guest class lecture: *Real-world Expressive Auctions*. Yale University, New Haven CT.
- 2007 Guest class lecture: *Expressive Auction Technology*. Carnegie Mellon University, Pittsburgh, PA
- 2005, 2006 Guest class lecture: *A Bit of Auction Theory and Auctions at CombineNet*. Carnegie Mellon University, Pittsburgh, PA
- 2004 Talk: *Utility Functions in Autonomic Systems*. Center for Discrete Mathematics & Theoretical Computer Science (DIMACS), Piscataway, NJ.
- 2003 Panelist: *AAMAS-03 Panel on Electronic Commerce*.
- 2000 Talk: *Market Protocols for Decentralized Supply Chain Formation*. Ford Scientific Research Lab, Dearborn, MI.
- 2000 Talk: *Market Protocols for Decentralized Supply Chain Formation*. Honeywell Research, Minneapolis, MN.
- 1999 Panelist: *Theoretical Aspects of Agent-Mediated Electronic Commerce*. IJCAI-99 Workshop on Agent Mediated Electronic Commerce, 1999.
- 1999 Talk: *A Market Model for Distributed Mars Rover Scheduling*. NASA Jet Propulsion Laboratory, Pasadena, CA.
- 1998 Talk: *A Market Protocol for Decentralized Task Allocation and Scheduling*. NASA Jet Propulsion Laboratory, Pasadena, CA.

Professional Activities

Conference and Workshop Organization

- 2008 Co-organizer: *Workshop on Trading Agent Design and Analysis (TADA-08)*.

- 2005 Sponsorship Co-chair: *Fourth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-05)*.
- 2004–2005 Steering committee for *Workshop on Agent-Mediated Electronic Commerce* series.
- 2003 Co-organizer: *IJCAI-03 Workshop on AI and Autonomic Computing: Developing a Research Agenda for Self-Managing Computer Systems*.
- 2003 Co-organizer: *AAMAS-03 Workshop on Agent-Mediated Electronic Commerce V*.
- 2002 Co-organizer: *AAMAS-02 Workshop on Agent-Mediated Electronic Commerce IV: Designing Mechanisms and Systems*.

Reviewing

Frequent reviewing for major journals, including: *Artificial Intelligence*, *Journal of Artificial Intelligence Research*, *Journal of Autonomous Agents and Multiagent Systems*, *Management Science*, and *Decision Support Systems*.

Frequent reviewing for major conferences and workshops, including: *ACM Conference on Electronic Commerce*, *International Joint Conference on Artificial Intelligence (IJCAI)*, *International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, *AAAI Conference on Artificial Intelligence (AAAI)*, and *Workshop on Agent-Mediated Electronic Commerce*.

Memberships

- American Association for Artificial Intelligence
- Association for Computing Machinery