

Steven Orla Kimbrough

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Education

- Ph.D., University of Wisconsin-Madison, 1982
 - Major: Department of Philosophy; Minor: Department of Genetics
- M.S., University of Wisconsin-Madison, 1981, Industrial Engineering
- B.A., University of Wisconsin-Madison, 1973, with Honors

Dissertation

- Title: “Circumventing the Problems of Induction: A Theory of Rational Hypothesis Choice”
- Advisor: Fred I. Dretske

Research Interests

Dr. Kimbrough is a Professor at The Wharton School, University of Pennsylvania. His main research interests are in the fields of electronic commerce (and formal languages for business communication), knowledge and information management, and computational rationality. His active research areas include: computational approaches to belief revision and nonmonotonic reasoning, formal languages for business communication, evolutionary computation (including genetic algorithms and genetic programming), and information discovery in unstructured and semi-structured data bases (e.g., text). He was principal investigator for the U. S. Coast Guard’s KSS (knowledge-based decision support systems) project, and co-principal investigator on the Logistics DSS project, which is part of DARPA’s Advanced Logistics Program. He was most recently Principal Investigator in the NSF-funded project “Working Memory and Adaptive Choice Behavior.”

Academic Positions

- Assistant Professor, University of Pennsylvania, Decision Sciences Department, August 1984–June 1990.
- Associate Professor (with tenure), University of Pennsylvania, Decision Sciences Department, July 1990–June 1998.
- William Davidson Visiting Professor of Computer and Information Systems, University of Michigan, School of Business Administration, January 1992–April 1993.
- Professor (with tenure), University of Pennsylvania, Department of Operations and Information Management, July 1998–present.
- Distinguished Visiting Research Fellow, Singapore Management University, School of Information Systems, 2009–2010.

Professional Service

- Editorial Board of *Information Systems Research*, 1990–2000
- Organizer of the logic modeling minitrack at the 20th and 21st (with Ronald M. Lee), 22nd, and 23rd and 24th (with Hemant Bhargava) Hawaii International Conference on Systems Sciences (1987-91); 30th and 31st with Donald Nute (1997–1998)
- Reviewer for *Decision Support Systems*
- Reviewer for *The ORSA Journal on Computing*
- Reviewer for *Management Science*
- Reviewer for *MIS Quarterly*
- Reviewer for *Office: Technology and People*
- Reviewer for *Systematic Zoology*
- Program committee for the 1989 International Conference on Information Systems
- Reviewer for the National Science Foundation
- Reviewer for *Expert Systems with Applications: An International Journal*
- Panelist for evaluation of proposals under the special initiative by the National Science Foundation on coordination theory, June 25-6, 1990.
- Editorial Board of *The ORSA Journal on Computing*, 1990-1992
- Program committee member for the Seventh IEEE Conference on Artificial Intelligence Applications, February 24-28, 1991.

- Program committee member for COSCIS '91, Collaborative Work, Social Communications and Information Systems, August 27-29, 1991.
- Organizer with Arvind Rangaswamy, SEI Center workshop, "Frontiers in Electronic Commerce: Experimental Systems for Communication, Coordination, and Negotiation," Steinberg Conference Center, Philadelphia, PA, February 13, 1992.
- Editorial board of *Data Base*, 1992–1998.
- Reviewer for *Journal of Logic and Computation*
- Reviewer for the Hawaii International Conference on System Sciences
- Reviewer for *Journal of Organizational Computing*
- Outside evaluator for the Ph.D. proposal of the Artificial Intelligence Programs of the University of Georgia, October 15–17, 1993.
- Program committee member for the 1995 ISDSS conference, Hong Kong.
- Organizer (with Hemant Bhargava) of the 1995 mini-track on logic modeling, Hawaii International Conference on System Sciences.
- Organizer (with Hemant Bhargava) of the 1996 mini-track on logic modeling, Hawaii International Conference on System Sciences.
- Organizer (with Ronald M. Lee) of the first mini-track on electronic commerce, Hawaii International Conference on System Sciences, 1996.
- Program committee for INFORMS, spring 1996, IS papers.
- Editorial board of the *Journal of Electronic Commerce*, 1995–present.
- Program committee for GP-96 (Genetic Programming Conference).
- Program committee for WITS (Workshop on Information Technology and Systems), 1996–present.
- Program committee for conference on Artificial Intelligence and Industrial Engineering Applications, fall 1996.
- Organizer (with Donald Nute) of the logic modeling mini-track, Hawaii International Conference on System Sciences, January 1998.
- Organizer (with Ronald M. Lee) of the formal aspects of digital commerce mini-track, Hawaii International Conference on System Sciences, January 1998.
- Program committee for GP-98 (Genetic Programming Conference).
- Program committee for CIST (Conference on Information Systems and Technologies), spring 1998.
- Organizer (with Ronald M. Lee) of the formal aspects of digital commerce mini-track, Hawaii International Conference on System Sciences, January 1999.

- Organizer (with Donald Nute) of the logic modeling mini-track, Hawaii International Conference on System Sciences, January 1999.
- Area Editor for Decision Technology, *Operations Research*, July 1998–December 1999.
- Reviewer for Twelfth International Bled Electronic Commerce Conference (June 1999).
- Editorial Board member for *EM – Electronic Markets*, June 1999–2007.
- Program Committee for ICAIL-2001, -2003, -2005.
- Co-organized (with DJ Wu) FMEC-2000, Philadelphia, June 2000.
- Co-organized FMEC-2001 (with Andrew Jones), Oslo, Norway, June 2001.
- Co-edited (with DJ Wu) a special issue of *Group Decision and Negotiation* on FMEC, Formal Modeling in Electronic Commerce, 2006.
- Organized FMEC-2007, co-located with ICAIL-2007.
- Served on NSF’s Decision, Risk & Management Sciences 2007 Fall Panel and 2008 Spring Panel.

Funded Research

- Junior Faculty Research Award, The Wharton School, 1985
- Knowledge-Based Decision Support Systems project, U. S. Coast Guard, \$1,458,000, 1985-92
- University Research Foundation Award, The Wharton School, 1991, \$5000 for benchmark problems in formalizing business communications
- Knowledge-Based Decision Support Systems project, U. S. Coast Guard, \$497,000, 1992-5
- University Research Foundation Award, University of Pennsylvania, 1994, “Investigations in Computational Rationality: Adaptive Heuristic Processes in Coalition Bargaining,” (Steven O. Kimbrough and James D. Laing) \$14,000
- U.S. Army AI Center, 1995, “Automating Post-Evaluation Analysis with Genetic Search,” (Hemant K. Bhargava and Steven O. Kimbrough) \$100,000
- U.S. Army Research Office, 1996. “Building Integrated Scenario/Solution Databases Using Genetic Search,” \$72,297.
- U.S. Army AI Center, 1996. “Exploiting Decision and Policy Models More Effectively through Intelligent Search, Data Mining, and Visualization,” \$86,400.
- Defense Advanced Research Project Agency (DARPA), 1997, “Advanced Logistics Program,” (Steven O. Kimbrough and Ramayya Krishnan): \$200,000 FY 1997, \$195,000 FY 1998. \$380,000 FY99. Contract awarded September 1997.

- \$20,000. Partial funding of electronic commerce proposal, “Wharton Initiative on Business-to-Business Electronic Commerce,” (Steven O. Kimbrough, James D. Laing, and Yao-Hua Tan), June 27, 1998. File: big-pro-agents.PDF.
- Participated in “KDI: Executing Genetic Algorithms Using DNA Genetic Materials,” NSF 9980092, 1999.
- “Working Memory and Adaptive Choice Behavior.” October 2001–September 2004. Principal Investigator. NSF award number 9709548.
- “Explorations in Computational Modeling: Agent-Based Modeling and the Deliberation Problem.” Supported by the Wharton-SMU Research Center for collaborative work in Singapore.

Honors and Awards

- Atlantic Richfield Foundation Term Chair in Decision Sciences, 1984-9, University of Pennsylvania, Department of Decision Sciences
- Best paper in the Decision Support Systems Track of HICSS-22: “On Semantically-Accessible Messaging in an Office Environment,” (Steven O. Kimbrough and Michael J. Thornburg) *Proceedings of the Twenty-Second Hawaii International Conference on Systems Sciences* (1989).
- First place in the First International Competition for Outstanding DSS Applications and Achievements: “An Overview of the Coast Guard’s KSS Project: DSS Concepts and Technology,” (Steven O. Kimbrough, Clark W. Pritchett, Michael P. Bieber, Hemant K. Bhargava), *Transactions of DSS-90, Tenth International Conference on Decision Support Systems*, Boston, Massachusetts, May 1990.
- “On Post-Evaluation Analysis: Candle Lighting and Surrogate Models,” (Steven O. Kimbrough, James Oliver, Clark Pritchett), *Interfaces*, 1993. Revised version of “On DSS Support for Candle Lighting Analysis,” (Steven O. Kimbrough, Scott A. Moore, Clark W. Pritchett, and Cynthia A. Sherman), DSS prize paper in *Transactions of DSS ‘92*, Chicago, IL, June 8-10, 1992, 118-135.
- Fellow of the Artificial Intelligence Center at the University of Georgia. November 10, 1994–2004.
- Best paper in the Decision Support and Knowledge-Based Systems Track of HICSS-28: “On Automated Discovery of Models Using Genetic Programming in Game-Theoretic Contexts,” (Garett Dworman, Steven O. Kimbrough, and James D. Laing) in *Proceedings of the Twenty-Eighth Annual Hawaii International Conference on System Sciences, Volume III: Information Systems: Decision Support and Knowledge-Based Systems*, Jay F. Nunamaker, Jr., and Ralph H. Sprague, Jr., eds., IEEE Computer Society Press, Los Alamitos, CA, January 1995, pp. 428–438.
- Invited keynote speaker at the SOBU Symposium on Electronic Commerce, Tilburg University, Tilburg, The Netherlands, September 24, 1997. This symposium inaugurated a new industry/university research program called SPECIE (“Safe Protocols in Interorganizational Entrepreneurship”).

- Invited keynote speaker: The Sixth International Workshop on the Language-Action Perspective on Communication Modelling LAP 2001, 21-22 July 2001, Montreal, Canada.
- Invited keynote speaker: Third International Conference on Trust Management, INRIA, Rocquencourt, France, 23–26 May 2005. “Foraging for Trust: Exploring Rationality and the Stag Hunt Game” [Kim05b] <http://www-rocq.inria.fr/arles/events/iTrust2005/>.
- Secondary appointment, Professor of Philosophy, University of Pennsylvania, July 1, 2007–present.

Papers in Refereed Journals

1. “On Simplicity as a Guide to Truth,” *Kinesis* **9** no. 2 (Spring 1979), 55-72.
2. “On the Reduction of Genetics to Molecular Biology,” *Philosophy of Science* **46** no. 3 (September 1979), 389-406.
3. “The Concepts of Fitness and Selection in Evolutionary Biology,” *Journal of Social and Biological Structures* **3** (1980), 149-170.
4. “A Cost–Effectiveness Analysis of Screening for Carcinoma of the Prostate by Digital Examination,” (Richard R. Love, Dennis G. Fryback, and Steven R. [sic] Kimbrough), *Medical Decision Making*, **5**, no. 3, (1985), 263–278.
5. “A Graph Representation for Management of Logic Models,” *Decision Support Systems* **2** (March 1986) 27-37.
6. “Why Nonmonotonic Logic?” (Steven O. Kimbrough and Fred Adams) *Decision Support Systems* **4**, (1988), 111-127. (Revision of: “Why Nonmonotonic Logic?,” (Steven O. Kimbrough and Fred Adams) *Proceedings of the Twentieth Hawaii International Conference on Systems Sciences* (1987).)
7. “Logic Modeling: A Tool for Management Science,” (Steven O. Kimbrough and Ronald M. Lee) *Decision Support Systems*, **4**, (1988), 3-16. (Revision of: “Logic Modeling: A Tool for Management Science,” (Steven O. Kimbrough and Ronald M. Lee) *Proceedings of the Twentieth Hawaii International Conference on Systems Sciences* (1987).)
8. “Lowering the Cost of Interactions: The Great Lakes Higher Education Corporation,” (Steven O. Kimbrough), *Office: Technology and People*, **5**, no. 4,(1989) 257-273. (Revision of: “Lowering the Cost of Interactions: The Great Lakes Higher Education Corporation,” (Steven O. Kimbrough), in *Proceedings of the Twenty–Second Hawaii International Conference on Systems Sciences* (1989).)
9. “On Representation Schemes for Promising Electronically,” (Steven O. Kimbrough), *Decision Support Systems*, **6**, no. 2 (1990), pp. 99–122. (Revision of: “On Representation Schemes for Electronic Promising,” (Steven O. Kimbrough), *Proceedings of the Twenty-First Annual Hawaii International Conference on System Sciences*, IEEE Computer Society Press, Washington, D.C., (1988), 486-495.)
10. “On Generalizing the Concept of Hypertext,” (Michael P. Bieber and Steven O. Kimbrough), *MIS Quarterly*, **16**, no. 1, (March 1992), 77-93. File: BieberKim-MISQ-final-3.

11. "Unique Names Violations: A Problem for Model Integration or You Say Tomato, I Say Tomahto," (Hemant Bhargava, Steven O. Kimbrough, Ramayya Krishnan), *ORSA Journal on Computing*, **3**, no. 2, (Spring 1991), pp. 107-120. File: tomato-tomahto.
12. "The Coast Guard's KSS Project," (Steven O. Kimbrough, Clark W. Pritchett, Michael P. Bieber, Hemant K. Bhargava), *Interfaces*, **20**, no. 6 (November-December 1990), pp. 5-16. (Shortened version of: "An Overview of the Coast Guard's KSS Project: DSS Concepts and Technology," (Steven O. Kimbrough, Clark W. Pritchett, Michael P. Bieber, Hemant K. Bhargava), *Transactions of DSS-90, Tenth International Conference on Decision Support Systems*, Linda Volonino, ed., Boston, Massachusetts, May 21-23, 1990, pp. 63-77.)
13. "Model Management: An Embedded Languages Approach," (Hemant K. Bhargava and Steven O. Kimbrough), *Decision Support Systems*, **10**, (1993), pp. 277-299. File: BharKimDSSDolk-final-fini. (Expanded version of: "On Embedded Languages for Model Management," (Hemant K. Bhargava and Steven O. Kimbrough), *Proceedings of the Twenty-Third Hawaii International Conference on Systems Sciences*, IEEE Computer Society Press, Washington, D.C., (1990), 443-452.)
14. "On Nonmonotonic Reasoning with the Method of Sweeping Presumptions," (Steven O. Kimbrough and Hua Hua), *Minds and Machines*, **1**, no. 4, (November 1991), pp.393-416. File: Sweeping-presump-M&M-final.
15. "On the Logic of Generalized Hypertext," (Michael P. Bieber and Steven O. Kimbrough), *Decision Support Systems*, **11** (1994), pp. 241-257. File: Logic-Mod-GHT-DSS.
16. "Message Management Systems: Concepts, Motivations and Strategic Effects," (Steven O. Kimbrough and Scott A. Moore), *Journal of Management Information Systems*, **9**, no. 2, (Fall 1992), pp. 29-52. File: JMIS-92-MMS-to-pub.
17. "An Empirical Comparison of Utility Assessment Programs," (Steven O. Kimbrough and Martin Weber), *European Journal of Operational Research*, **75** (1994), pp. 617-633.
18. "On Post-Evaluation Analysis: Candle Lighting and Surrogate Models," (Steven O. Kimbrough, James Oliver, Clark Pritchett), *Interfaces*, **23**, no. 3 (May-June 1993) pp. 17-28.
19. "Message Management Systems at Work: A System for Office Communications," (Scott A. Moore and Steven O. Kimbrough), *Journal of Organizational Computing*, **5**, no. 2, (1995), pp. 83-100. File: OrgComp93-1.2.
20. "On Automated Discovery of Models Using Genetic Programming: Bargaining in a Three-Agent Coalitions Game," (Garett O. Dworman, Steven O. Kimbrough, James D. Laing), *Journal of Management Information Systems*, **12**, no. 3 (Winter 1995-96), pp. 97-125.
21. "On Automated Message Processing in Electronic Commerce and Work Support Systems: Speech Act Theory and Expressive Felicity," (Steven O. Kimbrough and Scott A. Moore), *ACM Transactions on Information Systems*, **15**, no. 4 (October 1997), pp. 321-367, , [KM97].
22. "Formal Aspects of Electronic Commerce: Research Issues and Challenges," (Steven O. Kimbrough and Ronald M. Lee), *International Journal of Electronic Commerce*, **1**, no. 4, Summer 1997, pp. 11-30.
23. "On Hypermedia-Based Argumentation Decision Support Systems," (Gary Hua and Steven O. Kimbrough), 1998, *Decision Support Systems*, [HK98].

24. “Formal Language for Business Communication: Sketch of a Basic Theory,” (Steven O. Kimbrough) *International Journal of Electronic Commerce*, **3**, no. 2 (Winter 1998–99), pp. 23–44. <http://grace.wharton.upenn.edu/~sok/sokpapers/1998-9/ijec-si/dumb.dvi>, [Kim99].
25. “MOTC: An Interactive Aid for Multidimensional Hypothesis Generation,” (K. Balachandran, J. Buzydlowski, G. Dworman, S.O. Kimbrough, T. Shafer, and W. Vachula), *Journal of Management Information Systems*, **16**, no. 1 (Summer 1999), pp. 17–36. File: motcjmis5.pdf.
26. “On Pattern-Directed Search of Archives and Collections,” (Garett O. Dworman, Steven O. Kimbrough, and Chuck Patch), **51**, no. 1 (2000) *J. American Association for Information Science*. File: mw99-jasis-19990514.doc, [DKP00].
27. “On Lean Messaging with Unfolding and Unwrapping for Electronic Commerce,” (Steven O. Kimbrough and Yao-Hua Tan), 2000 *International Journal of Electronic Commerce*. File: lean000212.pdf/tex.
28. “MOTC with Examples: An Interactive Aid for Multidimensional Hypothesis Generation,” K. Balachandran, J. Buzydlowski, G. Dworman, S. Kimbrough, T. Shafer, and W. Vachula, *Communications of the Association for Information Systems*, **4**, no. 5 (December 2000), pp. 1–65. At <http://cais.isworld.org/contents.asp>. File: motccaisBill.rtf.
29. “Computers Play the Beer Game: Can Artificial Agents Manage Supply Chains” (S.O. Kimbrough, D.J. Wu, and F. Zhong), *Decision Support Systems* vol. 33, no. 3, pp. 323–333, 2002.
30. “On the Existence and Significance of Data Preprocessing Biases in Web Usage Mining” (Zheng, Z., Padmanabhan, B., and Kimbrough, S.), *INFORMS Journal on Computing*, [ZPK03].
31. “On Adaptive Emergence of Trust Behavior in the Game of Stag Hunt” (Christina Fang, Steven O. Kimbrough, Stefano Pace, Annapurna Valluri and Zhiqiang Zheng), *Group Decision and Negotiation* vol. 11, no. 6, pp. 449–467, 2002, [FKP⁺02].
32. “Cooperative Agent Systems: Artificial Agents Play the Ultimatum Game” (F. Zhong, Steven O. Kimbrough, and D.J. Wu), *Group Decision and Negotiation* vol. 11, no. 6, pp. 433–447, 2002, [ZKW02].
33. “Exemplary Documents: A Foundation for Information Retrieval Design” (David C. Blair and Steven O. Kimbrough) *Information Processing and Management* vol. 38, no. 3, pp. 363–379, 2002.
34. “Simple Reinforcement Learning Agents: Pareto Beats Nash in an Algorithmic Game Theory Study,” (Steven O. Kimbrough and Ming Lu), *Information Systems and e-Business*, [KL05].
35. “A study of the Philadelphia knowledge economy,” (Steven O. Kimbrough and Frederic H. Murphy), *Interfaces*, [KM05].
36. “An Empirical Analysis of the Value of Complete Information for eCRM Models,” (Balaji Padmanabhan, Z. Zheng and Steven Kimbrough) *MIS Quarterly* [PZK06].
37. “On a Feasible–Infeasible Two–Population (FI-2Pop) genetic algorithm for constrained optimization: Distance tracing and no free lunch,” (Steven Orla Kimbrough and Gary J.

- Koehler and Ming Lu and David Harlan Wood), *European Journal of Operational Research*, [KKLW08], 2008.
38. “The Normative Aspect of Signalling and the Distinction between Performative and Constantive,” (Andrew J.I. Jones and Steven O. Kimbrough), *Journal of Applied Logic*, 2008. [JK08].
 39. “Introducing the Fair and Logical Trade Project,” (S. O. Kimbrough and A. S. Abrahams and A. J.I. Jones and D. M. Eyers and J. M. Bacon), forthcoming *International Journal of Business Process Integration and Management* [KAJ⁺09].
 40. “Learning to Collude Tacitly on Production Levels by Oligopolistic Agents” (Steven O. Kimbrough and Frederic H. Murphy), *Computational Economics*, 2009. [KM09]

Books

- *Formal Modelling in Electronic Commerce*, Steven O. Kimbrough and D.J. Wu, eds., 2004, [KW05].

Papers in Significantly-Refereed Conference Proceedings¹

1. “On the Use of Likelihood as a Guide to Truth,” *PSA 1980* vol. I, P. D. Asquith and R. N. Giere, eds. (1980), 117-128.
2. “Performative, Informative, and Emotive Systems: The First Piece of the PIE,” (Steven O. Kimbrough, Ronald M. Lee, and David Ness) *Proceedings of the Fifth International Conference on Information Systems*, Leslie Maggie et al., eds., Tucson, AZ (November 28-30, 1984) 141-148.
3. “Alternatives to Non-Monotonic Logics,” (Steven O. Kimbrough and Fred Adams) *Proceedings of the Nineteenth Hawaii International Conference on Systems Sciences* vol. IA, Yoahan Chu et al., eds., (1986) 589-594.
4. “On Illocutionary Logic as a Telecommunications Language,” (Steven O. Kimbrough and Ronald M. Lee) *Proceedings of the Seventh International Conference on Information Systems*, Leslie Maggi et al., eds., San Diego, CA, (December 15-17, 1986) 15-26.
5. “Information Systems, Telecommunications, and Their Effects on Industrial Organization,” (Eric K. Clemons and Steven O. Kimbrough) *Proceedings of the Seventh International Conference on Information Systems*, Leslie Maggi et al., eds., San Diego, CA, (December 15-17, 1986) 99-108.

¹The proceedings of the International Conference on Information Systems typically have an acceptance rate of 15-20%. The proceedings of the Hawaii International Conference on System Sciences has a much higher acceptance rate, but there is a high degree of self selection in the direction of quality due in part to the cost of attending the conference. Very many of the conference’s papers are later republished in refereed journals.

6. Oona, Max, and the WYWWYWI Principle: Hypertext and Model Management in a Symbolic Programming Environment,” (Hement Bhargava, Michael Bieber, and Steven O. Kimbrough) in *Proceedings of the Ninth International Conference on Information Systems*, Minneapolis, MN, (December 1988), 179–191.
7. “On Semantically–Accessible Messaging in an Office Environment,” (Steven O. Kimbrough and Michael J. Thornburg) *Proceedings of the Twenty–Second Hawaii International Conference on Systems Sciences* (January 1989), 566–574.
8. “On Embedded Languages for Model Management,” (Hemant Bhargava and Steven O. Kimbrough), *Proceedings of the Twenty–Third Hawaii International Conference on Systems Sciences*, IEEE Computer Society Press, Washington, D.C., (1990), 443–452.
9. “Towards a Logic Model of Generalized Hypertext,” (Michael Bieber and Steven O. Kimbrough), *Proceedings of the Twenty–Third Hawaii International Conference on Systems Sciences*, IEEE Computer Society Press, Washington, D.C., (1990), 506–515.
10. “An Introduction to the Method of Sweeping Presumptions for Modeling Nonmonotonic Reasoning,” (Steven O. Kimbrough), *Proceedings of the Twenty–Fourth Annual Hawaii International Conference on System Sciences, Vol. III, DSS and Knowledge–Based Systems and Collaboration Technology Tracks*, Jay F. Nunamaker, Jr., ed., IEEE Computer Society Press, Los Alamitos, CA, 1991, pp. 339–348.
11. “University Students, Ladies and Tigers: Defeasible Reasoning and Insufficient Information,” (Steven O. Kimbrough and Stephen F. Roehrig), in Jay F. Nunamaker, Jr., ed., *Proceedings of the Twenty–Fifth Annual Hawaii International Conference on System Sciences, Volume III: Information Systems, Decision Support and Knowledge–Based Systems*, IEEE Computer Society Press, Los Alamitos, California, January 1992, pp. 395–406.
12. “Message Management Systems: Concepts and Prospects,” (Steven O. Kimbrough and Scott A. Moore), in Jay F. Nunamaker, Jr., and Ralph H. Sprague, Jr., eds., *Proceedings of the Twenty–Fifth Annual Hawaii International Conference on System Sciences, Volume IV: Information Systems, Collaboration Technology, Organizational Systems and Technology*, IEEE Computer Society Press, Los Alamitos, California, January 1992, pp. 654–665.
13. “A Simple Speech–Act–Theoretic Indexing Scheme for Documents,” (Steven O. Kimbrough), in A.M. Tjoa and I. Ramos, eds., *Database and Expert Systems Applications: Proceedings of the International Conference in Valencia, Spain, 1992*, (DEXA 92, September 2–4, 1992), pp. 84–9. File: ICTframeworkintro. (According to the editors of the proceedings, “A Total of nearly 200 papers submitted from all over the world were sent to DEXA 92. Only 90 could be accepted.”)
14. “Message Management Systems at Work: A System for Office Communications,” (Scott A. Moore and Steven O. Kimbrough), *Proceedings of WITS 1992, Workshop on Information Technologies & Systems*, Dallas, Texas, December 12–13, 1992, 83–100. (Of 51 papers submitted, 27 were accepted.)
15. “Candle Lighting Analysis: Concepts, Examples, and Implementation,” (Jim Oliver and Steven O. Kimbrough), *Proceedings of WITS 1992, Workshop on Information Technologies & Systems*, Dallas, Texas, December 12–13, 1992, 55–63. File: Oliver-sok-WITS94-r2. (Of 51 papers submitted, 27 were accepted.)

16. "On Obligation, Time, and Defeasibility in Systems for Electronic Commerce," (Steven O. Kimbrough and Scott A. Moore), Jay F. Nunamaker, Jr. and Ralph H. Sprague, Jr., eds., *Proceedings of the Twenty-Sixth Annual Hawaii International Conference on System Sciences, Volume III, Information Systems: DSS/Knowledge-Based Systems*, IEEE Computer Society Press, Los Alamitos, California, January 1993, pp. 493–502. File: HICSS-93-final-1.2.
17. "On Hypermedia-Based Argumentation Decision Support Systems," (Hua Hua and Steven O. Kimbrough), Jay F. Nunamaker, Jr. and Ralph H. Sprague, Jr., eds., *Proceedings of the Twenty-Sixth Annual Hawaii International Conference on System Sciences, Volume III, Information Systems: DSS/Knowledge-Based Systems*, IEEE Computer Society Press, Los Alamitos, California, January 1993, pp. 401–410. File: HICSS93-Hua-sok-Arg-1.
18. "On Automating Candle Lighting Analysis: Insight from Search with Genetic Algorithms and Approximate Models," (Steven O. Kimbrough and Jim R. Oliver), in *Proceedings of the Twenty-Sixth Annual Hawaii International Conference on System Sciences, Volume III: Information Systems: Decision Support and Knowledge-Based Systems*, Jay F. Nunamaker, Jr., and Ralph H. Sprague, Jr., eds., IEEE Computer Society Press, Los Alamitos, CA, January 1994, pp. 536–544. File: Candle Lighting HICSS 7/20/93.
19. "Symbolic Representation of Securities Trade Settlement Messages: Applying the Principles of Formal Languages for Business Communication," (Mark Ginsburg, Steven O. Kimbrough, and Bruce W. Weber), in *Proceedings of the Twenty-Sixth Annual Hawaii International Conference on System Sciences, Volume III: Information Systems: Decision Support and Knowledge-Based Systems*, Jay F. Nunamaker, Jr., and Ralph H. Sprague, Jr., eds., IEEE Computer Society Press, Los Alamitos, CA, January 1994, pp. 548–557.
20. "On Automated Discovery of Models Using Genetic Programming in Game-Theoretic Contexts," (Garett Dworman, Steven O. Kimbrough, and James D. Laing) in *Proceedings of the Twenty-Eighth Annual Hawaii International Conference on System Sciences, Volume III: Information Systems: Decision Support and Knowledge-Based Systems*, Jay F. Nunamaker, Jr., and Ralph H. Sprague, Jr., eds., IEEE Computer Society Press, Los Alamitos, CA, January 1995, pp. 428–438.
21. "On Relevance and Two Aspects of the Corporate Memory Problem," (Jim R. Oliver and Steven O. Kimbrough), in Pradubbha De and Carson Woo, eds., *Proceedings of the Fourth Annual Workshop on Information Technologies and Systems*, December 1994, pp. 302–311. (Of 137 papers submitted, 33 were accepted.)
22. "Bargaining in a Three-Agent Coalitions Game: An Application of Genetic Programming," (Garett O. Dworman, Steven O. Kimbrough, and James D. Laing,) *Working Notes: AAAI-95 Fall Symposium Series, Genetic Programming*, Boston, MA, November 10-12, 1995, pp. 9–16. File: gpconf08.doc.
23. "On Formal Aspects of Electronic (or Digital) Commerce: Examples of Research Issues and Challenges," (Steven O. Kimbrough and Ronald M. Lee) *Proceedings of the Twenty-Ninth Hawaii International Conference on System Sciences, Volume IV, Organizational Systems*, Jay F. Nunamaker, Jr. and Ralph H. Sprague, Jr., eds., IEEE Computer Press, January 1996, pp. 319–328. File: KimLee.w6.sok.26sep95.
24. "A Propædeutic on Logic for Object-Oriented Systems Analysis and Design," (Steven O. Kimbrough and William J. Vachula) *Proceedings of the Twenty-Ninth Hawaii International*

Conference on System Sciences, Volume II, Decision Support and Knowledge-Based Systems, Jay F. Nunamaker, Jr. and Ralph H. Sprague, Jr., eds., IEEE Computer Press, January 1996, pp. 20-29. File: Vachula Kimbrough HICSS96.

25. "Bargaining by Artificial Agents in Two Coalition Games: A Study in Genetic Programming for Electronic Commerce," (Garett O. Dworman, Steven O. Kimbrough, and James D. Laing,) in John R. Koza, David E. Goldberg, David B. Fogel, and Rick L. Riolo, eds., *Genetic Programming 1996: Proceedings of the First Annual Genetic Programming Conference, July 28-31, 1996, Stanford University*, The MIT Press, Cambridge, MA, 1996, pp. 54-62. File: GP96_k08.doc. (From the acceptance letter for the paper: "The 88 submitted GP papers were reviewed, in most cases, by 5 peer reviewers from the GP program committee consisting of 85 peer reviewers. The GP reviewers spent considerable effort in judging the papers and produced almost 500 review documents. The collective decision of each paper's reviewers appear to be of excellent quality and were the basis for selecting the papers for publication and presentation at the conference. The 30 papers receiving the highest rankings became the long papers." Ours was among these 30.) File: GP96_k05.doc.
26. "Towards a Logic Model for Object-Oriented Systems Analysis and Design," (Steven O. Kimbrough and William J. Vachula), *Proceedings of the Thirtieth Hawaii International Conference on System Sciences*, January 1997. Files: KVHICSSf.doc, kimbros8.ps.
27. "On Electronic Commerce, Subatomic Semantics and Cæsar's Stabbing," (Steven O. Kimbrough), *Proceedings of the Thirtieth Hawaii International Conference on System Sciences*, January 1997. File: hicss97-sok-subatomic-final.
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50. “Exploring the Evolutionary Details of a Feasible-Infeasible Two-Population GA,” Steven Orla Kimbrough, Ming Lu and David Harlan Wood, *PPSN-2004*, [KLW04a].
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69. "One Thing at a Time: Evaluating Profit and Legality, or On the Contributions of Losers: Exploring the Benefits of Retaining Infeasible Solutions During Search for a Constrained Optimum," presented at the Naval Postgraduate School, Monterey, August 2004 and at Georgia Institute of Technology Business School, October 2004.
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78. "Algorithmic Game Theory: Artificial Agents Play and Learn, Producing Surprising and Instructive Results" (Steven O. Kimbrough), Singapore Management University, School of Information Systems, 11 June 2008. <http://opim-sky.wharton.upenn.edu/sok/sokpapers/2009/SMU20080611/comprats-master-foils.pdf>
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80. “Algorithmic Game Theory: Artificial Agents Play and Learn, Producing Surprising and Instructive Results” (Steven O. Kimbrough, 23 January 2009, Carnegie Mellon University. <http://opimstar.wharton.upenn.edu/~sok/sokpapers/2009/carnegie-mellon-talk-2009-1-23.pdf>)
81. “Model-Based Decision Making: On Supporting Deliberation with Metaheuristics” (Steven O. Kimbrough), INFORMS O.R. Practice Conference, 2009.04.2–28. <http://opimstar.wharton.upenn.edu/~sok/sokpapers/2009/deliberation-COModel-master-beamer.pdf>

Ph.D. Students Advised

1. Hemant Bhargava; topic: model management; status: Ph.D. awarded, Decision Sciences, University of Pennsylvania, December 1990; first job: Assistant Professor, Naval Postgraduate School, September 1989. Promoted to Associate Professor with tenure, spring 1996, at the Naval Postgraduate School. Fall 2000: took up an appointment at Penn State, at the rank of full Professor.
2. Michael Bieber; topic: hypertext; status: Ph.D. awarded, Decision Sciences, University of Pennsylvania, December 1990; first job: Assistant Professor, Boston College, September 1989.
3. Fred Collopy; topic: forecasting, decision support systems; Ph.D. awarded, Decision Sciences, University of Pennsylvania, December 1990; first job: Assistant Professor, Case Western Reserve, September 1989. Promoted to Associate Professor with tenure, spring 1996, at Case Western Reserve.
4. Stephen F. Roehrig; topic: defeasible reasoning; Ph.D. awarded, Decision Sciences, University of Pennsylvania, May 1992; first job: Assistant Professor, Carnegie Mellon University, January 1992.
5. Peter Crosby Scott; title: “A Logical Approach to Requirements Analysis;” thesis defense: February 26, 1993, Systems Engineering Department, University of Pennsylvania; first job: at General Electric.
6. Scott Alan Moore; “Saying and Doing: Uses of Formal Languages in the Conduct of Business;” graduated, December 1993, Department of Operations and Information Management, University of Pennsylvania; first job: University of Michigan, School of Business Administration, Ann Arbor, Michigan, January 1994. Spring 2001: promoted with tenure to Associate Professor.
7. Hua Hua. Topic: defeasible reasoning. Thesis defense: August 1995. Graduated: December 1995, Department of Operations and Information Management, The Wharton School, University of Pennsylvania; first job: New Jersey Institute of Technology, September 1994.
8. James Robert Oliver. Topic: Bargaining by artificial agents in electronic commerce. Thesis defense: February 1996. Graduated: May 1996, The Wharton School, University of Pennsylvania. First job: Assistant to the CEO of Apple Computer.
9. Garrett Oliver Dworman. Topic: pattern-oriented information retrieval. Graduated December 1999, University of Pennsylvania. First job: Ejemoni, an Internet startup: <http://www.ejemoni.com/>.

Ph.D. Committee Service (starting 1997-8)

1. Hung Wing, *Managing Complex, Open, Web-deployable Trade Objects*, Department of Computer Science and Electrical Engineering, The University of Queensland, Brisbane, Australia.
2. J. Buzydlowski, information management, Drexel University, defended fall 2002.
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