Marco Valtorta

1. Personal History

OFFICE ADDRESS

Swearingen Room 3A55
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BIOGRAPHICAL DATA

Born on May 7, 1956, Milan, Italy
Italian citizen by birth. Naturalized U.S. citizen since September 17, 2005.
Married to a U.S. citizen since 1982. One daughter and one son.

RESEARCH INTERESTS

Main interests: Artificial Intelligence, especially probabilistic reasoning, expert systems, problem representation and search, heuristics. Other interests: complexity theory, design of efficient programs, logic programming, VLSI algorithmics.

EDUCATION

Ph.D., Computer Science, Duke University, April 1987.

Dissertation: "Automating Rule Strengths in Expert Systems."
Supervisor: D.W. Loveland.

M.A., Computer Science, Duke University, April 1983.

Project: "The Graduate Course Adviser."
Supervisor: D.W. Loveland.

Laurea in Ingegneria Elettronica (cum laude--highest honor awarded), Politecnico di Milano, July 1980.

Thesis: "Un contributo alla Teoria della Risoluzione dei Problemi: Rappresentazione Semantica, Proprieta Algebriche e Algoritmi di Ricerca."
Supervisor: Marco Somalvico.

LANGUAGES

Italian (first language), English (very fluent), French, German (some), Latin, Attic Greek of the 4th century B.C. (studied).

2. Non-Academic Experience

October 1985-August 1988

Project Officer in ESPRIT, a program of the European Economic Community. Duties included supervision of sponsored projects, negotiation of shortlisted proposals, participation in the evaluation of proposals and in the development of the yearly work program. I supervised an average of nine projects in the field of knowledge engineering, with an average of 4 to 5 participating organizations per project. I independently negotiated five proposals into projects and participated in the negotiation process for several more.

3. Academic Professional Experience

June 2008-present

Professor at the Department of Computer Science and Engineering, University of South Carolina.

June 1994-June 2008

Associate Professor at the Department of Computer Science and Engineering[1], University of South Carolina.

October 1999, March 2000, and May 2000

Visiting Researcher (on sabbatical leave from the University of South Carolina) at the Decision Support System Research Group, Department of Computer Science, University of Aalborg, Denmark.

June 1993-August 1999

Director of Undergraduate Studies at the Department of Computer Science, University of South Carolina.

August 1988-June 1994

Assistant Professor at the Department of Computer Science, University of South Carolina.

August 1980-August 1985

Instructional and Research Assistant for Professor D.W. Loveland at Duke University.

4. Publications in Refereed Journals

Marco Valtorta and Yimin Huang. "Identifiability in Causal Bayesian Networks: A Gentle Introduction." *Cybernetics and Systems,* 39, 4 (May 2008), 425-442, 2008.

Vaibhav Gowadia, Csilla Farkas, and Marco Valtorta. "PAID: A Probabilistic Agent-Based Intrusion Detection System." *Computer Security Journal,* 24, 7 (October 2005), 529-545, 2005.

Subramani Mani, Marco Valtorta, and Suzanne McDermott. "Building Bayesian Network Models in Medicine: the MENTOR Experience." *Applied Intelligence,* 22, 2 (March/April 2005), 93-108, 2005.

Bhaskara Reddy Moole and Marco Valtorta. "Sequential and Parallel Algorithms for Causal Explanation with Background Knowledge." *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems,* 12, Supplementary Issue 2 (October 2004), 101-122, 2004.

Young-Gyun Kim, Marco Valtorta, and Jiri Vomlel. "A Prototypical System for Soft Evidential Update." *Applied Intelligence,* 21, 1 (July-August 2004), 81-97, 2004.

Valtorta, Marco, Jiri Vomlel, and Young-Gyun Kim. "Soft Evidential Update for Multiagent Systems."

[1]Department of Computer Science until 2000.

International Journal of Approximate Reasoning, 29, 1 (January 2002), 71-106.

Valtorta, Marco and Michael H. Huhns. "Probability and Agents." *Internet Computing,* 6, 6 (November-December 2001), 77-79.

Mani, Subramani, Suzanne McDermott, and Marco Valtorta. "MENTOR: A Bayesian Model for Prediction of Mental Retardation in Newborns." *Research in Developmental Disabilities,* 18 (1997), 5, pp.303-318.

Ling, C.X.F. and M. Valtorta. "Refinement of Uncertain Rule Bases via Reduction." *International Journal of Approximate Reasoning,* 13, 2 (August 1995). 95-126.

Singh, M. and M. Valtorta. "Construction of Bayesian Belief Networks from Data: a Brief Survey and an Efficient Algorithm." *International Journal of Approximate Reasoning,* 12, 2 (February 1995), 111-131.

Valtorta, M. and M.I. Zahid. "Tie-Breaking Rules for 4 x n Warnsdorff's Tours." *Congressus Numerantium,* 95 (1993), 75-86.

Valtorta, M. and M.I. Zahid. "Warnsdorff's Tours of a Knight." *Journal of Recreational Mathematics,* 25 (1993), 2, 128-140.

Valtorta, M. and D.W. Loveland. "On the Complexity of Belief Network Synthesis and Refinement." *International Journal of Approximate Reasoning,* 7,3-4 (October-November 1992), 121-148.

Hansson, O., A. Mayer, and M. Valtorta. "A New Result on the Complexity of Heuristic Estimates for the A* Algorithm." *Artificial Intelligence,* 55, 1 (May 1992), 129-143.

Durham, S.D., J.S. Smolka, and M. Valtorta. "Statistical Consistency with Dempster's Rule on Diagnostic Trees Having Uncertain Performance Parameters." *International Journal of Approximate Reasoning,* 6,1 (January 1992), 67-81.

Valtorta, M. "Knowledge-Based Construction of Probabilistic and Decision Models" (AAAI-91 workshop report). *IEEE Expert,* 6,6 (December 1991), 69-71.

Valtorta, M. "Knowledge Base Refinement: A Bibliography." *Applied Intelligence,* 1,1 (July 1991), 87-94.

Valtorta, M. "Some Results on the Computational Complexity of Refining Confidence Factors." *International Journal of Approximate Reasoning,* 5,2 (March 1991), 123-148.

Virtanen, H., K. Johnson, R.A. O'Keefe, and M. Valtorta. "Fuzzy Prolog." *Newsletter of the Association for Logic Programming,* 4, 1 (February 1991), 11-12.

Valtorta, M. "A Result on the Computational Complexity of Heuristic Estimates for the A* Algorithm." *Information Sciences,* vol 34 (1984), 47-59.

5. Invited Surveys/Tutorials/ Papers Published in Conference Proceedings/Books

Published Book Chapter

Loveland, D.W. and M. Valtorta. "Detecting Ambiguity: An Example in Knowledge Evaluation." In: Gupta, U. (ed.). *Validating and Verifying Knowledge-Based Systems.* Los Alamitos, CA: IEEE Computer Society Press, 391-395, 1991.

6. Contributed Surveys/Tutorials/ Papers Published in Conference Proceedings[2]/Books

Scott Langevin and Marco Valtorta. "Performance Evaluation of Algorithms for Soft Evidential Update in Bayesian Networks: First Results." *Proceedings of the Second International Conference on Scalable Uncertainty* Management (SUM-08), Naples, Italy, October 1-3, 2008, pp. 284-297. (Proceedings edited by Sergio Greco and Thomas Lukasiewicz and published as Lecture Notes in Artificial Intelligence vol. 5291 (LNAI 5291), Springer, ISBN-13 978-30540-87992-3, 2008) (27/42 = 64% acceptance rate) (*)

Michael Huhns and Marco Valtorta. "Ontological Support for Bayesian Evidence Management." *Proceedings of the Second International Ontology for the Intelligence Community Conference (OIC-2007),* Columbia, MD, November 28-29, 2007, pp. 47-52 (available online at http://CEUR-WS.org/Vol-299/, ISSN 1613-0073) (14/33 = 42% acceptance rate) (*)

Marco Valtorta, John Byrnes, and Michael Huhns. "Logical and Probabilistic Reasoning to Support Information Analysis in Uncertain Domains." *Working Notes of the Third Workshop on Combining Probability and Logic (Progic-07),* Canterbury, England, September 5-7, 2007.

Valerie Sessions and Marco Valtorta. "The Effects of Data Quality on Machine Learning Algorithms." *Proceedings of the 11th International Conference on Information Quality (ICIQ-06),* Cambridge, MA, November 10-12, 2006, pp.485-498 (acceptance rate not disclosed by conference policy, but general chair stated that "it may be around 30-50%---less for academic papers. Our goal has been encouraging the dialog between academics and industry practitioners, but at the same time using the Madnick Best ICIQ Paper Award and beginning this year fast-track to the ACM Journal of Data and Information [Quality] to attrack top-tier journal articles."; 30% contribution) (This paper won the Madnick Best Academic Paper Award.) (*)

Yimin Huang and Marco Valtorta. "Pearl's Calculus of Intervention is Complete." *Proceedings of the 22nd Conference on Uncertainty in Artificial Intelligence (UAI-06),* Cambridge, MA, July 13-16, 2006, pp. 437-444 (68/213 = 32% acceptance rate, 30% contribution). (This paper won the Best Student Paper Award, shared with "Identification of Conditional Interventional Distributions," by Ilya Shpitser and Judea Pearl.) (*)

Yimin Huang and Marco Valtorta. "Identifiability on Causal Bayesian Networks: A Sound and Complete Algorithm." *Proceedings of the Twenty-First National Conference on Artificial Intelligence (AAAI-06),* Boston, MA, July 16-20, 2006, pp. 1149-1154 (one of 171 paper chosen for oral presentation out of 236 accepted papers out of 774 submitted papers, for a 30% acceptance rate; 30% contribution). (*)

Stephen Cole, Matthew Royal, Michael Huhns, Marco Valtorta, and John Bowles. "A Lightweight Tool for Automatically Extracting Causal Relationships from Text." *IEEE Southeastcon 2006* (CD-ROM),

[2]Some of the papers are published in "working notes," as indicated. Working notes are often available only to participants of a workshop or conference. Refereed papers published in proceedings are marked with an asterisk (*). Note that some of the papers published in working notes are refereed, even though none are marked with an asterisk.

Nashville, TN, March 20-April 1, 2006, 5 pages (43% acceptance rate, 25% contribution). (*)

Marco Valtorta (corresponding and presenting author), Jiangbo Dang, Hrishikesh Goradia, Jingshan Huang, and Michael Huhns. "Extending Heuer's Analysis of Competing Hypotheses Method to Support Complex Decison Analysis." *Proceedings of the 2005 International Conference on Intelligence Analysis (IA-05)* (CD-ROM), Washington, D.C., May 2-4, 2005, 2 pages (43% acceptance rate, 50% contribution) (*)

Marco Valtorta (corresponding author), John Cheng, Ray Emami, Larry Kerschberg, Eugene Santos, Jr., Qunhua Zhao, Nien Nguyen, Hua Wang, Michael Huhns, Jiangbo Dang, Hrishikesh Goradia, Jingshan Huang, and Sharon Xi. "OmniSeer: A Cognitive Framework for User Modeling, Reuse of Prior and Tacit Knowledge, and Collaborative Knowledge Services." *Proceedings of the 38th Hawaii International Conference on System Sciences (HICSS38)* (CD-ROM), Big Island, Hawaii, January 3-6, 2005, 10 pages (*).

Moole, Bhaskara Reddy and Marco Valtorta. "Causal Explanation with Background Knowledge." *Proceedings of the First Indian International Conference on Artificial Intelligence,* Hyderabad, India, December 18-20, 2003, pp.843-856. (acceptance rate 150/700 = 21%, contribution 40%) (*)

Gowadia, Vaibhav, Csilla Farkas, and M. Valtorta. "Agent Based Intrusion Detection with Soft Evidence." *Proceedings of the 14th Information Resources Association (IRMA) International Conference,* Philadelphia, PA, May 18, 2003, pp. 140-143. (*)

Farkas, Csilla, M. Valtorta, and Stephen Fenner. "Medical Privacy versus Data Mining." *Proceedings of the Fifth World Multiconference on Systemics, Cybernetics and Informatics,* July 2001, pp.194-200. (*)

Buell, Duncan A., Csilla Farkas, Michael N. Huhns, John R. Rose, and M. Valtorta. "Information Reputation in an Environment of Ubiquitous Computing." *Proceedings of the Phoenix Conference on Information Warfare,* Colorado Springs, Colorado, 5-7 September 2001.

Ghosh, Jayanta K. and M. Valtorta. "Building a Bayesian Network Model of Heart Disease (Extended Abstract)." *Proceedings of the 38th Annual ACM Southeastern Conference,* Clemson, South Carolina, April 7-8, 2000, pp.239-240.

Bloemeke, Mark and M. Valtorta. "A Hybrid Algorithm to Compute Marginal and Joint Beliefs in Bayesian Networks and Its Complexity." In: G.F. Cooper and S. Moral (eds.), *Uncertainty in Artificial Intelligence: Proceedings of the Fourteenth Conference.* San Francisco, CA: Morgan-Kaufmann, 1998, 16-23, (acceptance rate 62/137 = 45%; 45% contribution) (*)

Kim, Young-Gyun and M. Valtorta. "On the Detection of Conflicts in Diagnostic Bayesian Networks Using Abstraction." In: Ph. Besnard and S. Hanks (eds.), *Uncertainty in Artificial Intelligence: Proceedings of the Eleventh Conference.* San Francisco, CA: Morgan-Kaufmann, 1995, 362-367. (acceptance rate 67/121 = 55%, contribution 50%) (*)

Subramani, Mani, M. Valtorta, and S. McDermott. "MENTOR: A Bayesian Model for Prediction and Intervention in Mental Retardation." *Working Notes of the Fifth International Workshop on Artificial Intelligence and Statistics (AIS-95),* 366-371, Ft. Lauderdale, FL, January 1995.

Mechling, Randy and M. Valtorta. "A Parallel Constructor of Markov Networks." Pages 255-262 in: Cheeseman, Peter and Wayne Oldford (eds.): *Selecting Models from Data: Artificial Intelligence and Statistics IV.* Volume 89 of Lecture Notes in Statistics. New York: Springer-Verlag, 1994 (ISBN 0-387-94281-5).

Bordetski, Alexander and M. Valtorta. "Learning Empirical Constraints to Complement Diagnostic Models." In: C.H. Dagli, L.I. Burke, B.R. Fernandez, J. Ghosh (eds.), *Intelligent Engineering Systems through Artificial Neural Networks, Vol.3 (Proceedings of the Third International Conference on Artificial Neural* Networks *in Engineering (ANNIE-93)),* 97-102, New York, NY: ASME Press, 1993. (*)

Childress, Rita L. and M. Valtorta. "Polynomial-Time Model-Based Diagnosis with the Critical Set Algorithm." *Working Notes of the Fourth International Workshop on Principles of Diagnosis (DX-93),* 166-177, Aberystwyth, Wales, September 1993.

Singh, Moninder and M. Valtorta. "An Algorithm for the Construction of Bayesian Network Structures from Data." In: D. Heckerman and E.H. Mamdani (eds.), *Uncertainty in Artificial Intelligence: Proceedings of the Eighth Conference.* San Mateo, CA: Morgan-Kauffman, 1993, 259-265 (winner of Best Student Paper award). (*)

Mechling, Randy, and Marco Valtorta. "PaCCIN: A Parallel Constructor of Markov Networks." *Working Notes of the Fourth International Workshop on Artificial Intelligence and Statistics (AIS-93),* 405-410, Ft. Lauderdale, FL, January 1993.

Childress, Rita L., M. Valtorta, and Giorgio Tornielli. "The Complexity of Diagnosing Continuous Processes with ODS-PI." *Working Notes of the AAAI Workshop on Approximations and Abstractions of Computational Theories,* 39-46, San Jose, CA, July 1992.

Wang, Shijie and M. Valtorta. "On The Exponential Growth Rate of Dempster-Shafer Belief Functions." *Proceedings of the SPIE Conference on Applications of Artificial Intelligence X:* Knowledge-Based Systems, 15-24, Orlando, FL, April 1992. (*)

Wang, S. and M. Valtorta. "On the Conversion of Rule Bases into Belief Networks." *Proceedings of the 1992 ACM/SIGAPP Symposium on Applied Computing,* 363-368, Kansas City, MO, March 1992. (*)

Childress, R.L. and M. Valtorta. "EVA and the Verification of Expert Systems Written in OPS-5." *Working Notes of the AAAI-91 Workshop on Knowledge-based Systems Verification, Validation, and Testing,* Anaheim, CA, July 1991, 72-83.

Valtorta, M. "Complexity of Knowledge Base Refinement (Research Summary)." *Working Notes of the AAAI-91 Workshop on Knowledge-Based Construction of Probabilistic and Decision Models,* Anaheim, CA, July 1991, 145-148.

Ling, Xiaofeng (Charles) and M. Valtorta. "Revision of Reduced Theories." In Birnbaum, L. and G. Collins (eds.) *Machine Learning: Proceedings of the Eighth International Workshop (IWML-91).* San Mateo, CA: Morgan Kaufmann, 1991, 519-523. (*)

Valtorta, M. and M.I. Zahid. "Some Heuristics Cannot be Derived from Simplified Models (abstract)." *Proceedings of the ACM 1991 Computer Science Conference,* San Antonio, TX, March 5-8, 1991, p.698.

Durham, S.D., J.S. Smolka, and M. Valtorta. "Conditions for the Statistical Consistency of Dempster's Rule." *Working notes of the Third International Workshop on Artificial Intelligence and Statistics,* Ft. Lauderdale, Florida, January 1991, 7.1-7.4.

Valtorta, M. and M.I. Zahid. "Some Heuristics Cannot be Derived from Simplified Models." *Working Notes of the AAAI-90 Workshop on the Automatic Generation of Approximations and Abstractions,* Boston, Massachusetts, July 1990.

Wang, S. and M. Valtorta. "A Prototype Belief Network-based Expert System Shell," *Proceedings of the Third International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems (IEA/AIE-90),* Charleston, South Carolina, July 1990, 509-518. (*)

Valtorta, M. "More Results on the Complexity of Knowledge Base Refinement: Belief Networks," *Proceedings of the Seventh International Conference on Machine Learning (ICML-90),* Austin, Texas, June 1990, 419-426. (*)

Childress, R. and M. Valtorta. "Verification and Validation of Expert Systems." *Proceedings of the Sixth Annual USC-CS Symposium: Intelligent Systems,* Columbia, South Carolina, March 1990, 55-68.

Valtorta, M. and M.I. Zahid. "On a Conjecture by Judea Pearl: First Results." *Proceedings of the Sixth Annual USC-CS Symposium: Intelligent Systems,* Columbia, South Carolina, March 1990, 45-54.

Valtorta, M. "KADS vs. KEATS." *Proceedings of the IJCAI-89 Workshop on Knowledge Acquisition: Practical Tools and Techniques,* August 1989.

Valtorta, M. "Some Results on the Complexity of Knowledge-Base Refinement." *Proceedings of the Sixth International Workshop on Machine Learning (IWML-89),* Ithaca, New York, June 1989, 326-331. (*)

Valtorta, M. "Automating Rule Strengths in Expert Systems." *Proceedings of the 8th European Conference on Artificial Intelligence (ECAI-88),* Munich, Germany, August 1988, 369-371. (*)

Valtorta, M., B.T. Smith, and D.W. Loveland. "The Graduate Course Advisor: A Multi-Phase Rule-Based Expert Systems." *Proceedings of the IEEE Workshop on Principles of Knowledge-Based systems,* Denver, Colorado, December 1984, 53-57. (*)

Valtorta, M. "Knowledge Refinement in Rule Bases for Expert Systems: An Application-Driven Approach." *Proceedings of the First International Workshop on Expert Database Systems,* Kiawah Island, South Carolina, October 1984.

M. Valtorta. "A Result on the Computational Complexity of Heuristic Estimates for the A* Algorithm." *Proceedings of the 8th International Joint Conference on Artificial Intelligence (IJCAI-83),* Karlsruhe, Germany, August 1983, 777-779. (*)

Loveland, D.W. and M. Valtorta. "Detecting Ambiguity: An Example in Knowledge Evaluation." *Proceedings of the 8th International Joint Conference on Artificial Intelligence (IJCAI-83),* Karlsruhe, Germany, August 1983, 182-184. (*)

Valtorta, M. "A Result on the Computational Complexity of Heuristic Estimates for the A* Algorithm (Extended Abstract)." *Proceedings of the 21st Southeast Region ACM Conference,* Durham, North Carolina, April 1983.

Guida, G., M. Somalvico, and M. Valtorta. "Problemi Ausiliari ed Algoritmi di Ricerca: Un Contributo alla Teoria dei Problemi." *Atti del Congresso Annuale AICA-80.* Bologna, Italy: Tecnoprint, 1980. (*)

7. Contract Technical Reports

Valtorta, Marco, Young-Gyun Kim, and Jiri Vomlel. "Soft Evidential Update for Communication in Multiagent Systems and the Big Clique Algorithm." October 31, 2000.

Childress, Rita L. and Marco Valtorta. "Deliverable Report D6: Final Report." Sixth report of project "A Study of the complexity of Abstraction in Qualitative Diagnosis." June 30, 1994. Four pages and a 3.5" diskette in tar format.

Childress, Rita L. and Marco Valtorta. "Deliverable Report D5: Progress on New Diagnostic Diagnostic Algorithms and Programs." Fifth report of project "A Study of the Complexity of Abstraction in Qualitative Diagnosis." June 7, 1993, 62 pages not including appendices.

Childress, Rita L. and Marco Valtorta. "Deliverable Report D4: Progress on New Diagnostic Problems." Fourth report of project "A Study of the Complexity of Abstraction in Qualitative Diagnosis." November 19, 1992, 48 pages.

Matthews, M.M., A. Sengupta, and M. Valtorta. "Sentencing Information Retrieval and Criminal Offense Coding: Final Report." August 1992, 55 pages.

Childress, Rita L. and Marco Valtorta. "Deliverable Report D3: New Diagnostic Problems." Third report of project "A Study of the Complexity of Abstraction in Qualitative Diagnosis." July 9, 1992, 68 pages not including appendices.

Childress, Rita L. and Marco Valtorta. "Deliverable Report D2: Complexity of ODS-PI and Related Issues." Second report of project "A Study of the Complexity of Abstraction in Qualitative Diagnosis." October 3, 1991, 41 pages not including appendices.

Childress, Rita L. and Marco Valtorta. "Deliverable Report D1: Survey of the State of the Art and Problem Formalization in Qualitative Diagnostic Reasoning and Complexity Theory." First report of project "A Study of the Complexity of Abstraction in Qualitative Diagnosis." May 31, 1991, 88 pages not including appendices.

8. Non-Contract Technical Reports

Bloemeke, Mark and Marco Valtorta. "Agent-Encapsulated Bayesian Networks and The Rumor Problem." Technical Report TR2002-006, Department of Computer Science and Engineering, June 10, 2002, updated December 20, 2002.

Valtorta, M., Young-Gyun Kim, and Jiri Vomlel. "Soft Evidential Update for Probabilistic Multi-Agent Systems." Technical Report TR0001, Department of Computer Science and Engineering, University of South Carolina, 2000.

Ghosh, Jayanta and M. Valtorta "Probabilistic Bayesian Network Model Building of Heart Disease." Technical Report TR9911, Department of Computer Science, University of South Carolina, 1999.

Smith, Wayne, Mark Bloemeke, and M. Valtorta. "Messages for Agent-Encapsulated Bayesian Networks and How to Update Beliefs with Them." Technical Report TR9907, Department of Computer Science, University of South Carolina, 1999.

Subramani Mani, M. Valtorta, and Suzanne W. McDermott. "MENTOR: A Study in Building Bayesian Models in Medicine." Technical Report TR9601, Department of Computer Science, University of South Carolina, 1996.

Subramani Mani, M. Valtorta, and Suzanne W. McDermott. "Bayesian Model Building from a Large Medical Dataset: A Practical Study." Technical Report TR9502, Department of Computer Science,

University of South Carolina, 1995.

Kim, Young-Gyun and M. Valtorta. "On the Detection of Conflict in Bayesian Networks Using Abstraction." Technical Report TR9501, Department of Computer Science, University of South Carolina, 1995.

Bordetski, Alexander and M. Valtorta. "Learning Empirical Constraints to Complement Diagnostic Models." Technical Report TR9303, Department of Computer Science, University of South Carolina, 1993.

Childress, Rita L. and M. Valtorta. ‘‘Polynomial-Time Model-Based Diagnosis with the Critical Set Algorithm.’’ Technical Report TR9302, Department of Computer Science, University of South Carolina, 1993.

Singh, Moninder and M. Valtorta. "An Algorithm for the Construction of Bayesian Network Structures from Data." Technical Report TR9301, Department of Computer Science, University of South Carolina, 1993.

Valtorta, M. and M.I. Zahid. "Some Heuristics Cannot be Derived from Relaxed Models." Technical Report TR9204, Department of Computer Science, University of South Carolina, 1992. (This report supercedes TR90007.)

Childress, R.L., M. Valtorta, and G. Tornielli. "On the Complexity of Diagnosing Continuous Processes with ODS-PI." Technical Report TR9201, Department of Computer Science, University of South Carolina, 1992.

Wang, S. and M. Valtorta. "On the Exponential Growth Rate of Dempster-Shafer Belief Functions." Technical Report TR9109, Department of Computer Science, University of South Carolina, 1991.

Childress, R.L., M. Valtorta, and G. Tornielli. "On the Complexity of Diagnosing Continuous Processes." Technical Report TR9107, Department of Computer Science, University of South Carolina, 1991.

Yu, E.K. and M. Valtorta. "Computer-assisted Knowledge Engineering: A Survey of KADS and KEATS." Technical Report TR9104, Department of Computer Science, University of South Carolina, 1991.

Hansson, O., A. Mayer, and M. Valtorta. "A New Result on the Complexity of Heuristic Estimates for the A* Algorithm." Technical Report TR9102, Department of Computer Science, University of South Carolina, 1991.

Ling, X.C. and M. Valtorta. "A Theory of Rule Base Refinement via Theory Reduction." Technical Report TR9101, Department of Computer Science, University of South Carolina, 1991.

Durham, S.D., J.S. Smolka, and M. Valtorta. "Conditions for the Consistency of Dempster's Rule in Diagnostic Trees." Technical Report TR90008, Department of Computer Science, University of South Carolina, 1990.

M. Valtorta and M.I. Zahid. "Some Heuristics Cannot be Derived from Simplified Models." Technical Report TR90007, Department of Computer Science, University of South Carolina, 1990.

Wang, S. and M. Valtorta. "A Prototype Belief-Network Based Expert System Shell." Technical Report TR90006, Department of Computer Science, University of South Carolina, 1990.

Childress, R.L. and M. Valtorta. "Preliminary Report on the Verification of Expert Systems Written in OPS5." Technical Report TR90005, Department of Computer Science, University of South Carolina, 1990.

M. Valtorta and D.W. Loveland. "On the Complexity of Belief Network Synthesis and Refinement." Technical Report TR89011, Department of Computer Science, University of South Carolina, 1989 (updated June 1991).

M. Valtorta. "KADS vs. KEATS." Technical Report TR89009, Department of Computer Science, University of South Carolina, 1989.

M. Valtorta "On the Complexity of Belief Network Refinement and Validation." Technical Report TR89008, Department of Computer Science, University of South Carolina, 1989.

M. Valtorta. "The Synthesis of Initial Probability Assignments in Belief Nets is NP-Hard." Technical Report TR89007, Department of Computer Science, University of South Carolina, 1989.

M. Valtorta. "Knowledge-base Refinement: A Bibliography." Technical Report TR89006, Department of Computer Science, University of South Carolina, 1989.

M. Valtorta. "Some Results on Knowledge Base Refinement with an Oracle." Technical Report TR89005, Department of Computer Science, University of South Carolina, 1989.

M. Valtorta. "Some Results on the Complexity of Knowledge Base Refinement." Technical Report TR89004, Department of Computer Science, University of South Carolina, 1989.

Wagner, R.A., C. Wright, and M. Valtorta. "Detection of Unintentional Connections in VLSI Circuits." Technical Report CS-1984-19, Department of Computer Science, Duke University, 1984.

"The Linear Placement Problem." In: "Course Projects in VLSI Algorithmics," Technical Report CS-1982-17, Department of Computer Science, Duke University, 1982.

9. Research Proposals

Funded

Title: "Combining Facts and Expert Opinion in Analytical Models via Logical and Probabilistic Reasoning."
Agency: Air Force Research Laboratory (AFRL).
Amount: $1,922,442 (total including options and subcontract to HNC Software LLC), USC share approximately $1,000,000.
Period: 1 June 2006-30 September 2010
Role: PI with co-PI Michael Huhns at USC, John Byrnes and Richard Rohwer at HNC.

Title: "Collaboration between Digital Support Systems, Inc. and the University of South Carolina."
Company: Digital Support Systems, Inc.
Role: PI.
Amount: $11,600.
Period: January-May 2006.

Title: "Case-Based Reasoning for Knowledge Discovery and Bayesian Reasoning."
Agency: Advanced Research and Development Agency (ARDA),
Role: PI, with Michael Huhns as co-PI, $125,000 share.
Amount: $250,000 (USC part).
Period: August 2004-April 2006.
Note: USC is a subcontractor of Georgia Tech Research Institute.

Title: "OmniSeer: Novel Information from Massive Data."
Agency: Advanced Research and Development Agency (ARDA).
Role: co-PI (PI, Dr. Michael Huhns; USC is subcontractor).
Amount: $250,000 (USC part).
Period: December 2002-July 2004.

Title: Critical Infrastructure Protection Center Initiative: Infrastructure and Bayesian Network Models. .br Agency: SPAWAR Systems Center Charleston.
Amount: $100,000.
Period: April 15, 2004, September 30, 2004.
Role: Consultant. USC Technical POC for this effort is Dr. Joseph E. Johnson (Physics Department).
Note: The grant supported support two CSE graduate students from May 15 to September 30. Total amount coming to the students and me is approximately $20,000

Title: "Fingerprinting Seeds."
Agency: USC.
Role: Co-Principal Investigator (Dr. Gail Wagner, PI).
Amount: $4,500.
Period: Summer 2002.

Title: "Normative Decision Analysis Research Incentive Proposal."
Agency: USC.
Role: Co-Principal Investigator (with Drs. John Rose and Juan Vargas).
Amount: $50,000.
Period: Calendar year 2001.

Title: "Resource Allocation in Dynamic Uncertain Domains."
Agency: U.S. Department of Defense, DARPA.
Role: PI with Juan Vargas and Jose Vidal; Michael Huhns is Project Director.
Amount: $779,000.
Period: May 15, 1999 to May 15, 2002.

Title: "Dynamic Decision Support for Command, Control, and Communication in the Context of Tactical Defense."
Agency: U.S. Department of Defense.
Role: Co-Principal Investigator, with John R. Rose, Suresh Singh, and Abhijit Sengupta.
Amount: $410,399.
Period: June 1, 1997 to June 29, 2000 (sic!).
Note: This project is part of a larger proposal submitted by the College of Science and Mathematics on February 17, 1997.

Title: "Survivable and Reconfigurable Optical/Wireless Tactical Networks."
Agency: U.S. Department of Defense.
Role: Co-Principal Investigator, with John R. Rose, Suresh Singh, and Abhijit Sengupta.
Note: This approximately $400,000 project is part of a larger proposal submitted by the College of Science and Mathematics on February 17, 1997.

Period: June 1, 1997 to June 29, 2000 (sic!).

Title: "Expert System for Agricultural Loans: Collaboration with S.C. State University."
Agency: U.S. Department of Agriculture.
Period: May 16, 1994-August 31, 1997.
Amount: $16,289 (subcontract to USC)
Role: Principal Investigator.
Note: Total amount for the 36-month project, entitled "Analysis of Agricultural Loan Defaults: Development of Credit/Loan Analysis Models," and to last 36 months, is $296,301. A no-cost extension to 48 months was negotiated in 1996.

"Teaching Evaluation, Critiquing, and Curriculum Change." Funded under the Lilly Teaching Fellows Program. I was a Junior Teaching Fellow in 1993-94 in the proposed project, which is joint with Caroline Eastman, who is a Senior Teaching Fellow in the proposed project. The total monetary value of the award is estimated to $8,500.

"A Study of the Complexity of Abstraction in Qualitative Diagnosis," supported by CISE SpA, January 1, 1991-December 31, 1993 (with no-cost extension to June 30, 1994), for $49,500.

"Studies in Sentencing Information Retrieval and Criminal Offense Coding," supported by the South Carolina Law Enforcement Division, May 4, 1992-August 17, 1992 (with Manton M. Matthews and Abhijit Sengupta), for $48,000.

"Development of a Computer Network for Quality Assurance and Statistical Process Control, Phase 2," Summer 1993, General Electric Medical Systems. My part in the project was compensated with approximately $4,000. Total funding for the project is approximately $109,000. Juan E. Vargas was principal investigator.

Approved

Submitted

CASE CIFT (Causal Information From Text), Advanced Research and Development Agency (ARDA), $2,582,000 (total including options and subcontract to Sarnoff Corporation, PI with co-PI Michael Huhns at USC and Hua Li at Sarnoff, $500,000 share. Proposal submitted on March 3, 2006. Not funded.

Collaborative Foraging and Modeling, Advanced Research and Development Agency (ARDA), $5,458,000 (total including options; USC is a subcontractor to Georgia Tech Research Institute), 1 June 2006-30 September 2010, PI with co-PI Michael Huhns at USC, Robert Simpson and Elizabeth Whitaker at GTRI, $500,000 share. Pre-proposal submitted on December 6, 2005. Not funded.

Integrating Measurement and Simulation for the Management of Power Systems with Limited Capability, NSF, amount unknown, September 2005-September 2008, CoPI with Antonello Monti (USC), Ferdinanda Ponci (USC), Giuseppe DAntona (Politecnico di Milano). Proposal submitted June 1, 2005. Not funded.

ELOISE (Example Learning Over Integrated Swarming Elements), DARPA, total amount unknown, January 2006-January 2010, co-PI with Michael Huhns for USC subcontract to Altarum Institute, submitted on September 15, 2005. Not funded.

Title: "Embedding Bayesian Reasoners for Dynamic and Uncertain Domains"
Agency: DARPA
Role: Co-PI (with Drs. Juan Vargas, PI, and Csilla Farkas).
Amount Requested: $925,000.
Note: Submitted on September 3, 2003. Not funded.

Title: A Virtual Test Bed for Adaptable Tactical Behavior in Unmanned Ground Vehicles.
Agency: US Army Research Laboratory.
Role: co-PI, with Roger Dougal, Antonello Monti, David Rocheleau, and Lijun Gao.
Note: White Paper submitted on August 20, 2003 to the Robotics Program Office of the Aberdeen US Army Research Laboratory. Not funded.

Title: "ITR---DAVID (Digital Advanced Virtual Design)."
Agency: National Science Foundation.
Role: Co-PI (with several others, Dr. Antonello Monti, PI).
Amount Requested: $3,843,938.
Period Requested: 5 years.
Note: submitted on February 12, 2003. Not funded.

Title: "Biological-Political-Environmental-Societal-Electrodynamic Interactions in Hydroelectric Power Production: A New Multi-Domain Simulation Approach Focusing on the Lake Murray Case Study."
Agency: National Science Foundation.
Role: Co-PI (with several others, Dr. Antonello Monti, PI).
Amount Requested: $616,275.
Period Requested: 2 years.
Note: submitted on February 3, 2003. Not funded.

Title: "Autonomous Unmanned Vehicle Integrated Fight Through Capability: Intelligent System Management, Mission Awareness, Control, Fault Detection, and Reconfiguration."
Agency: Office of Naval Research.
Role: Co-PI (with several others, Dr. David Carter at Florida State University, PI). Amount Requested: $693,744 for the USC subcontract.
Period Requested: 3 years.
Note: submitted in September 2002. Not funded.

Title: "Normative Decision Support System for Forest Management."
Agency: International Paper Foundation.
Role: Principal Investigator.
Amount Requested: $8,000.
Note: Proposal submitted on October 31, 2003. Not funded.

Title: "Information Credibility via Reputation Endorsements in Ubiquitous Computing Environments."
Agency: SC Legislative Support.
Role: Co-PI (with Drs. Michael Huhns, Duncan Buell, and Larry Stephens).
Amount Requested: $3,000,000.
Note: Proposal submitted on October 11, 2001. Not funded.

Title: "A Normative Probabilistic Approach to Integrated Sensing and Processing."
Agency: DARPA.
Role: Co-PI (with Drs. John Rose, Juan Vargas, and Zoltan Der of ENSCO, Inc.)
Amount Requested: $600,000.
Note: Proposal (white paper) submitted on August 10, 2001. Not funded.

Title: "Information Fusion in Agent Encapsulated Bayesian Networks."
Agency: US Air Force.
Role: Principal Investigator.
Amount Requested: $200,000.
Note: Proposal (white paper) submitted on July 13, 2001. Not funded.

Title: "Distributed Normative Reasoning for Mobile Sensor Networks."
Agency: Department of Energy (Office of Science and Technology).
Role: Co-Principal Investigator (with Drs. John Rose, Michael Huhns, and Toshiro Kubota).
Amount: Not available.
Note: Pre-proposal submitted on January 2, 2001. We were not invited to submit a full proposal.

Title: "ITR/SI: Distributed Normative Reasoning for Interaction Networks."
Agency: National Science Foundation.
Role: Co-Principal Investigator (with Drs. John Rose, Michael Huhns, and Larry Stephens).
Amount: Not available.
Note: Submitted on October 26, 2000; not funded.

Title: "Normative Support System for Forest Management."
Agency: International Paper Foundation.
Role: Sole Investigator.
Amount: Not available.
Note: Submitted on October 26, 2000; not funded.

Title: "An Agent-Oriented Normative Reasoning System for Rover Planning and Plan Execution."
Agency: NASA (Epscor Program).
Role: Co-Principal Investigator (with Drs. John Rose, Michael Huhns, and Toshiro Kubota).
Amount: Not available.
Note: Submitted on September 22, 2000. Not funded.

Title: "An Intervention Model of Nutrition and Environment on the Health of the Rural Elderly."
Agency: U.S. Department of Agriculture (Capacity Building Grants Program; Joint project with S.C. State University).
Role: Co-Principal Investigator (with Dr. Kailash Mathur at S.C. State University).
Amount Requested: $299,250 ($185,567 for USC) for three years.
Note: Submitted on January 23, 1998; rejected.

Title: "1998 Summer Institute for Teachers of Computer Science AP Courses."
Agency: South Carolina Department of Education.
Role: Co-Principal Investigator (with Carter Bays).
Note: Rejected.

Title: "An Intervention Model of Nutrition and Environment on the Health of the Rural Elderly."
Agency: U.S. Department of Agriculture (Fund for Rural America Program).
Role: Co-Principal Investigator (with Drs. Kailash Mathur at S.C. State and Dr. Jayanta K. Ghosh at Vorhees College).
Amount Requested: $453,910 ($146,089 for USC) for three years.
Note: Submitted on April 21, 1997; rejected.

Title: "1997 Summer Institute for Teachers of Computer Science AP Courses."
Agency: South Carolina Department of Education.
Role: Co-Principal Investigator (with Carter Bays).
Note: Rejected.

Title: "Combining Bayesian Networks and Case-Based Reasoning for Diagnosis of Carcinomas."
Agency: Center for Cancer Treatment and Research.
Role: Other Investigator.
Note: Submitted in November 1994, with Juan E. Vargas. While I participated in the preparation of this submission and was listed as an investigator, I requested no funding. This proposal was not accepted.

Title: Computer-Assisted Scientific and Legal Decision Making in the Coastal Development Process.
Agency: NSF/EPSCoR.
Role: Co-Principal Investigator ("Target Faculty")
Note: Other faculty involved in this pre-proposal, submitted in June 1994, were James C. Evans and David S. Wethey (as "mentor faculty"); Terry Huntsberger, Manton Matthews, and Stephen A. Spitz (as "target faculty"). This proposal was not accepted.

"A High Performance Framework for ATD/R based on Wavelets and Topological Matching." Submitted (in January 1993) to DARPA. I am a senior researcher in the proposed project. The principal investigators are Bjorn Jawerth and Terry Huntsberger. This proposal was not accepted.

I submitted (in the fall of 1990) a proposal for a small project involving one graduate student to a large South Carolina manufacturing company. The company, which had been encouraging at first, eventually decided not to support university work in the field of diagnostic expert systems. Some details of this submission are confidential, but I am available to discuss it further on a personal basis.

I submitted a proposal abstract with S.D. Durham (Statistics Department) to DARPA in the spring of 1990, in answer to DARPA/ISTO Broad Agency Announcement 90-12 on Knowledge-Based Planning and Scheduling. We were recommended not to submit a full proposal.

I submitted a pre-proposal with S.D. Durham (Statistics Department) to International Chip Corporation in the Spring of 1990. The proposal had to be cut so substantially for budgetary reasons that we decided to withdraw it.

I submitted (in the fall of 1989) an application for a grant entitled "A Formal Analysis of KADS" to the USC Committee on Research and Productive Scholarship. The proposal was not accepted.

I sent a draft proposal in June 1989 for a collaborative NATO grant to a colleague in Scotland who had expressed interest in cooperating. I received a positive reply from him in January 1990, but I am not following up at this time.

10. Academic Seminars/Colloquia

Two presentations in the Bayesian networks seminar co-organized with Dr. Juan Vargas, Fall 2003.

Several presentations in the Influence Diagrams seminar organized by Dr. J. Lynch, Statistics Department, Spring 2003.

"Soft Evidential Update for Probabilistic Multiagent Systems." NASA Jet Propulsion Lab, Pasadena, CA, June 14, 2001.

Several presentations in the seminar on Genetics and Statistics organized with Drs. J. Lynch, Statistics Department, and R. Best, School of Medicine, Academic Year 2001-2002.

"Soft Evidential Update for Probabilistic Multiagent Systems." Department of Computer Science and Engineering, University of South Carolina, Columbia, S.C., November 9, 2000.

"The Rumor Problem in Agent-Encapsulated Bayesian Networks" (informal talk). Decision Support Systems Group, Department of Computer Science, Aalborg University, Aalbork, Denmark, May 31, 2000.

"Soft Evidential Update for Multiagent Systems" (informal talk). Decision Support Systems Group, Department of Computer Science, Aalborg University, Aalbork, Denmark, March 30, 2000.

"Some Techniques of Data Mining in Biology." Decision Support Systems Group, Department of Computer Science, Aalborg University, Aalbork, Denmark, March 9, 16, and 23, 2000 (three lectures). (Some of this material was used for talks at the Bioinformatics Journal Club organized by Dr. Austin Hughes at the University of South Carolina. The first such talk was given on April 17, 2000.)

"Lessons from the Aalborg Trip" (informal talk). Decision Analysis Group, Department of Computer Science and Engineering, University of South Carolina, Columbia, S.C., November 8, 1999.

"Building a Bayesian Network to Assess the Risk of Mental Retardation in Infants: the MENTOR System." Decision Support Systems Group, Department of Computer Science, Aalborg University, Aalbork, Denmark, October 29, 1999.

"Agent-Encapsulated Bayesian Networks." Decision Support Systems Group, Department of Computer Science, Aalborg University, Aalbork, Denmark, October 15, 1999.

"Value of Information in Multiagent Environments" (informal talk). Decision Support Systems Group, Department of Computer Science, Aalborg University, Aalbork, Denmark, October 13, 1999.

"On the Complexity of Bayesian Network Synthesis and Refinement." Decision Support Systems Group, Department of Computer Science, Aalborg University, Aalbork, Denmark, October 8, 1999.

Six presentations as co-organizer (with Dr. John Rose) of the Decision Analysis Group journal club (see http://www.cse.sc.edu/research/dag/journal_club.html) in Fall 1998, Spring 1999, and Fall 1999.

"A Short Introduction to Bayesian Networks." Department of Computer Science, University of South Carolina, Columbia, S.C., March 26, 1998.

"A Review of Existing Instruments for the Evaluation of Teaching at USC." Teaching Breakfast, October 8, 1996 (with Gail Wagner, Harriet Williams, and Steve Whisnant).

"An Introduction to Bayesian Networks." Department of Family Medicine, School of Medicine, University of South Carolina, Columbia, November 2, 1995.

One presentation (on Markov properties of undirected graphs and Hammersley and Clifford's factorization theorem) in the seminar on the Gibbs sampler organized by the Statistics Department at USC, March 21, 1995.

"Bayesian Belief Network: An Introduction and Some Computational Problems," Department of Physics, University of South Carolina, Columbia, S.C., March 24, 1994.

"Bayesian Belief Network: An Introduction and Some Computational Problems," Department of Statistics, University of South Carolina, Columbia, S.C., January 31, 1994.

"Bayesian Belief Network Refinement and its Complexity," Department of Computer Science, Clemson University, Clemson, S.C., January 26, 1993.

"Where Do Heuristics Come From?" United States Army Computer Science School, Ft. Gordon, GA, January 21, 1993.

"On the Complexity of Dempster-Shafer Belief Network Synthesis," Artificial Intelligence Seminar, School of Business, University of Kansas, Lawrence, KS, March 3, 1992.

One presentation (February 1992) at "Hack ’n Snack," an informal club meeting almost every week, and involving faculty from the Chemical Engineering, Computer Science, Electrical and Computer Engineering Departments, with occasional participation by members of other departments and industry representatives.

"Generation of Heuristics for A*: A Survey." Coastal Carolina College, Conway, S.C., October 25, 1991.

"Generation of Heuristics for A*: A Survey." Department of Computer Science, University of South Carolina, Columbia, S.C., September 26, 1991.

"Refinement of Reduced Rule Bases." Department of Electrical and Computer Engineering, University of South Carolina, Columbia, S.C., April 11, 1991.

As a participant in their visiting professor program, I visited the United States Army Computer Science School on January 29, 1991. I toured the school and gave two talks: "Rule-Based Refinement and its Complexity," and "Belief Network Refinement and its Complexity."

"On the Complexity of Belief Network Refinement," Department of Mathematics and Computer Science, the Citadel, Charleston, S.C., November 1, 1989.

"On the Complexity of Belief Network Refinement and Validation," Center for Machine Intelligence, University of South Carolina, Columbia, S.C., October 5, 1989.

Several presentations within the Joint Research Seminar on Evidential Reasoning and Inference Theory. (See below.)

"On the Computational Complexity of Heuristic Estimates for the A* Algorithm. (Or: Where Do Heuristics Come From?)" Joint EECE555/CSCI580 session, December 7, 1989.

"Research Policy of the European Commission and European Unity." International Law Association Meeting, USC Law School, Columbia, S.C., October 17, 1989.

I was co-organizer of the interdepartmental research seminar on evidential reasoning and inference theory (1989-1990, with Steve Durham, Department of Statistics).

I presented a colloquium based on my dissertation at nine Departments of Computer Science in U.S. Universities.

I was co-organizer of a semester-long seminar on extensions to the Graduate Course Adviser Expert System at the Computer Science Department of Duke University in the Spring 1984.

11. Industrial Seminars/Colloquia

"On the Complexity of Belief Network Refinement: Bayesian Networks," CISE, Milan, Italy, June 1990.

I gave an invited presentation at the local event preceding the First Transcontinental AI Symposium organized by Texas Instruments in 1986.

I gave a presentation on the Graduate Course Adviser Expert System at Computer Corporation of America in Cambridge, MA, in 1985.

I gave a long presentation during a one-day seminar on expert systems at Becton-Dickinson in Research Triangle Park, NC, in 1984.

12. Reviewer/Referee Activity

I acted as reviewer for NSERC (1991) NSF (1990 and 1986), and the Incentive Programme for Fundamental Research in Artificial Intelligence of the Kingdom of Belgium (1987).

I have refereed papers for *AI Communications, Annals of Mathematics and Artificial Intelligence, Applied Intelligence, Artificial Intelligence, IEEE Expert* (now *IEEE Intelligent Systems), IEEE Transactions on Fuzzy Systems, IEEE Transactions on Systems, Man, and Cybernetics, Information Fusion, International Journal of Applied Management and Technology, International Journal of Approximate Reasoning, International Journal of Cooperative Information Systems, International Journal of Expert Systems, International Journal of Uncertainty, Fuzziness, and Knowledge-Based Systems, Journal of Automated Reasoning, Journal of Artificial Intelligence Research, Journal of Experimental and Theoretical Artificial Intelligence, Journal of Logic Programming,* and *Machine Learning.*

I have served as referee for many conferences. Recent ones include the Twenty-first and Twenty-second AAAI Conference on Artificial Intelligence (AAAI-06 and AAAI-07), the Fifth and Seventh Conference in Symbolic and Quantitative Approaches to Reasoning with Uncertainty (ECSQARU-99 and ECSQARU-03), the Twelfth, Thirteenth, Fourteenth, Fifteenth, Seventeenth, and Twenty-second Annual Conferences on Uncertainty in Artificial Intelligence (UAI-96, UAI-97, UAI-98, UAI-99, UAI-01, and UAI-06), the First, Second, and Third Indian International Conference on Artificial Intelligence (IICAI-03, IICAI-05, IICAI-07), the 13th and 16th International Joint Conferences on Artificial Intelligence (IJCAI-93 and IJCAI-99), the 2000 and 2002 Symposium on Abstraction, Reformulation, and Approximation (SARA-00 and SARA-02), the Second, Third, Fourth, Fifth, Tenth, Eighteenth, Nineteenth, and Twentieth International Conferences on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems (IEA/AIE-89 IEA/AIE-90, IEA/AIE-91, IEA/AIE-92, IEA/AIE-97, IEA/AIE-05, IEA/AIE-06, IEA/AIE-07), the 34rd ACM Southeastern Conference (1996), the 8th and 11th European Conferences on Artificial Intelligence (ECAI-92 and ECAI-88), the 10th SPIE Applications of AI Conference, the 1992 Symposium on Applied Computing (SAC'92), the Third International Workshop on Artificial Intelligence and Statistics (AIS-91), the 23rd Southeastern Symposium on System Theory (SSST-91), the Fourth International Symposium on Methodologies for Intelligent Systems (ISMIS-89).

I have reviewed textbooks and monographs for Springer, W.H. Freeman, Benjamin-Cummings, Morgan-Kaufmann, Wiley (U.K.), Wiley (U.S.A.), and West, including:
two proposed textbook on Bayesian networks and decision networks for Springer (Fall 2006, Fall 2000[3])
a proposed textbook on Pattern Recognition for Wiley (Fall 1995[4])
a proposed textbook on Artificial Intelligence for W.H. Freeman and Morgan Kaufmann (February 1991

[3] I tested this manuscript in CSCE590, Fall 2000.

[4] I tested this manuscript in CSCI780, Spring 1995.

and Fall 1991[5]);
seven chapters of the second edition of an Artificial Intelligence textbook for Benjamin/Cummings, September 1991[6] and plans of the proposed third edition (September 1996)
a proposed textbook on Knowledge-Based Systems for Morgan Kaufmann (May 1991[7]);
a proposed textbook on Logic Programming for Morgan Kaufmann (September 1990);
the outline of a textbook on the construction of knowledge-based systems for Wiley (U.K.) (January 1990);
a proposed textbook/monograph on Automatic Theorem Proving Techniques for Wiley (U.K.) (December 1990-January 1990);
a proposed textbook on Artificial Intelligence for Wiley (U.S.A) (November 1989);
a proposed textbook on Knowledge Elicitation Techniques for Wiley (U.K) (June 1989);
a proposed textbook on Knowledge-Based Systems for West publishing company (December 1988-January 1989);
the outline of a proposed monograph on search in Artificial Intelligence for Wiley (U.K.) (November 1988).

I acted as external rapporteur for a PhD dissertation defended in December 1988 at the Department of Computer Science of the Universite de Paris-Sud.

I reviewed *Readings in Medical Artificial Intelligence,* by W.K. Clancey and E. Shortliffe (Addison-Wesley, 1984), for *ACM SIGART* (April 1985, Number 92, pp.13-14).

13. Invited Talks at Professional Meetings

I gave a one-hour invited talk at the Southern Regional Committee and American Statistical Association 1997 Summer Conference in Gatlinburg, TN, on June 20, 1997. The talk was entitled "Bayesian Networks: An Introduction and Some Computational Problems."

I was an invited panelist at the 1995 ACM Computer Science Conference, Nashville, TN, february 28-March 2, 1995. My contribution was entitled "Industrial and Academic Misperceptions of AI." A report on the panel appeared as follows. Manaris, Bill, Robert Aiken, Cris Koutsougeras, Toshinori Munakata, and M. Valtorta. "Report on the ACM CSC-95 Panel: 'Artificial Intelligence: Finally in the Mainstream?'" *ACM SIGART Bulletin,* 6, 3 (July 1995), 7-11.

I was invited to give a presentation at the 1989 Annual Meeting of the South Carolina Academy of Science (20-21 April, 1989). Title of the presentation is "Evidential Reasoning for Knowledge-Based Systems."

14. Contributed Talks at Professional Meetings[8]

Shi, Jiang-Rong, M. Valtorta, Dawen Xie, and Roberd M. Bostick. "Predicting Risk of Prostate Cancer

[5]The manuscript was passed from one publisher to the other. I tested the manuscript in CSCI785, Fall 1991.

[6]Two chapters were tested in CSCI785, Fall 1991.

[7]I tested this manuscript in CSCI786, Spring 1991.

[8]Only presentations not listed in Section 6 are mentioned here.

with Bayesian Networks." Poster presented (by first author) at the ASPO (American Society of Preventive Oncology) annual meeting, New York, March 11-13, 2001.

McDermott, Suzanne, Subramani Mani, and M. Valtorta. "A Bayesian Model for the Prediction of Mental Retardation in Newborns." Abstract and Poster Presentation (given by S. McDermott) for Prevention-97: Science, Technology and Practice, The Fourteenth Annual National Preventive Medicine Meeting, Atlanta, GA, March 20--23, 1997.

M. Valtorta. "On the Detection of Conflicts in Diagnostic Bayesian Networks Using Abstraction." Symposium on Abstraction, Reformulation, and Approximation (SARA-95), Ville d'Esterel, Canada, August 16-18, 1995.

M. Valtorta. "A New Result on the Complexity of Heuristic Estimates for the A* Algorithm." The 1994 Workshop on Theory Reformulation and Abstraction, Jackson Hole, Wyoming, May 22-24, 1994.

M. Ishaq Zahid and I submitted abstracts to the 22nd and 23rd Southeastern International Conference on Combinatorics, Graph Theory, and Computing (Boca Raton, FL, February 3-7, 1992, and January 28, 1993). On the basis of the abstracts, entitled respectively "Warnsdorff's Tours of the Knight on a 3 x n board," and "Tie-Breaking Rules for 4 x n Warnsdorff's Tours," we were invited to give talks, but did not.

"On the Refinement and Validation of Belief Nets--Part I: Dempster-Shafer Networks," and "On the Refinement and Validation of Belief Nets--Part II; Bayesian Networks." Impromptu talks given at the Second Annual Workshop on Computational Learning Theory (COLT-89), Santa Cruz, CA, July 31-August 2, 1989.

15. Other Professional Meetings

Member of the program committee, Seventh European Conference on Symbolic and Quantitative Approaches to Reasoning Under Uncertainty (ECSQARU-2003), July 2-5, Aalborg, Denmark.

Member of the program committee, Seventeenth Annual Conference on Uncertainty in Artificial Intelligence (UAI-01), August 2-5, 2001, Seattle, Washington.

Member of the program committee, Fifteenth Annual Conference on Uncertainty in Artificial Intelligence (UAI-99), July 30-August 1, Stockholm, Sweden.

Member of the organizing committee, AAAI Spring Symposium "Predictive Toxicology of Chemicals: Experiences and Impact of AI Tools," Stanford University, March 22-24, 1999).

Member of the program committee, Fourteenth Annual Conference on Uncertainty in Artificial Intelligence (UAI-98), July 24-26, Madison, Wisconsin.

Member of the program committee, Thirteenth Annual Conference on Uncertainty in Artificial Intelligence (UAI-97), August 1-3, Providence, Rhode Island.

Member of the program committee and tutorial chair, Tenth International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems (IEA/AIE-97), Atlanta, Georgia, on June 10-13.

Member of the program committee, Twelfth Annual Conference on Uncertainty in Artificial Intelligence

(UAI-96), August 1-3, Portland, Oregon.

Member of the program committee, 1992 and 1993 ACM Symposia on Applied Computing (SAC'92 and SAC'93), March 1992, Kansas City, Missouri, and February 1993, Indianapolis, Indiana.

Member of the technical program committee, 23rd Southeastern Symposium on Systems Theory (SSST-91), March 1991, Columbia, South Carolina.

Discussant of paper "An Analysis of Two Probabilistic Model Induction Techniques," by S.L. Crawford and Robert M. Fung, at the Third International Workshop on Artificial Intelligence and Statistics (AIS-91), Ft. Lauderdale, FL, January 2-5, 1991 (in substitution of X.C. Ling, who could not come to the workshop).

Local chair and member of the program committee, Third International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems (IEA/AIE-90), July 1990, Charleston, South Carolina.

Member of the program committee, Sixth Annual USC-CS Symposium: Intelligent Systems, March 1990, Columbia, South Carolina.

Co-organizer and co-chair of the special session "ESPRIT--International Joint Collaborative AI," 10th International Joint Conference on Artificial Intelligence (IJCAI-87), August 1987, Milan, Italy.

16. Professional Societies

American Association for Artificial Intelligence (AAAI), ACM (senior member since July 18, 2007), ACM Special Interest Group in Artificial Intelligence (SIGART), ACM Special Interest Group in Applied Computing (SIGAPP), Institute of Electrical and Electronics Engineers (IEEE; senior member since September 24, 2005), IEEE Computer Society, South Carolina Academy of Science, Sigma Xi.

17. Other Professional Activities

Associate Editor, *International Journal of Approximate Reasoning,* since January 1993.

Member of the Editorial Board, *Applied Intelligence,* since January 1993.

Member of the Editorial Board, *International Journal of Applied Management and Technology,* since 2003.

I wrote a letter to the editor that appeared in *AI Magazine,* 16, 3 (Fall 1995), p.4.

I wrote a letter to the editor that appeared in the ACM *SIGART Bulletin,* 2,4 (August 1991), 4-5, as "Response to 'Explicit Solutions to the N-Queens Problem for all N.'"

I contributed answers to a survey on teaching Artificial Intelligence organized by *IEEE Expert* in November 1991. A report on the survey appeared in the April 1992 (vol.7, no.2) issue.

18. Supervised Graduate Student Theses and Dissertations

Valerie Sessions defended her Ph.D. dissertation successfully on October 27, 2006. The title of her dissertation is "Techniques for Incorporating Data Quality Assessments into Learning Algorithms for Bayesian Networks."

Yimin Huang defended his Ph.D. dissertation successfully on August 22, 2006. The title of his dissertation is "Identifiability in Causal Bayesian Networks."

Jincao Ye defended his M.S. (Computer Engineering) thesis successfully on April 18, 2003. The title of his thesis is "SQL Implementation of the Junction Tree Method for Probability Update in Bayesian Networks."

Bing Xia defended his M.S. (P) thesis successfully on April 5, 2002. The title of his thesis is: "An Algorithm to Learn Probabilistic Bayesian Network Structures from Data."

Young-Gyun Kim defended his Ph.D. dissertation successfully on December 7, 2000. The title of his dissertation is "Time-Critical Decision Making with Communicating Influence Diagrams."

Jayanta K. Ghosh defended his M.S. (P) thesis successfully on November 8, 1999. The title of his thesis is "A Probabilistic Model of Health and Nutrition of Elderly in South Carolina."

Chuong Duc Huyn defended his M.S. (P) thesis successfully on March 19, 1999. The title of his thesis is "Implementation of the Valuation-Based System for Bayesian Decision Analysis."

Mark Bloemeke defended his Ph.D. dissertation successfully on August 7, 1998, turned in the final copy to the Graduate School on October 30, 1998, and received his degree on December 14, 1998. The title of his dissertation is: "Agent Encapsulated Bayesian Networks."

Ashish Kuthiala defended his M.S. (R) thesis successfully on April 10, 1998. The title of his thesis is: "Object Modeling Technique and Object-Oriented Analysis Technique: A Comparison of the Analysis Phases and an Implementation."

Jian-Rong Shi defended his M.S. (P) thesis successfully on November 14, 1997. The title of his thesis is: "Sensitivity to Parameter and Evidence Values in Bayesian Networks."

Bhaskara R. Moole defended her M.S. (R) thesis successfully on September 24, 1997. The title of his thesis is "Parallel Construction of Bayesian Belief Networks."

Donna L. Shaver defended her M.S. (P) thesis successfully on April 14, 1997. The title of her thesis is: "Office Automation Using a Database Application."

Gopalakrishnan Viswanath defended his M.S. (R) thesis successfully on November 25, 1996. The title of his thesis is: "A Survey and Comparison of Algorithms for the Compilation of Bayesian Networks."

Leszek Piatkiewicz defended his M.S. (R) thesis successfully on March 20, 1996. The title of his thesis is: "On the Construction of a Bayesian Network for Agricultural Loan Assessment."

Raghu Babu Korrapati defended his M.S. (R) thesis successfully on November 10, 1995. The title of his thesis is: "Model-Based Diagnosis for Continuous Systems Using CLP(R)."

Ming Wu defended his M.S. (P) thesis successfully on January 20, 1995. The title of his thesis is: "Design and Implementation of a Bayesian Belief Network with Graphical User Interface."

Young-Gyun Kim defended his M.S. (R) thesis successfully on November 2, 1994. The title of his thesis is: "Design and Construction of a New Straw Model in Bayesian Networks."

Subramani Mani defended his M.S. (P) thesis successfully on August 26, 1994. The title of his thesis is: "MENTOR: A Bayesian Model for Prediction and Intervention in Mental Retardation."

Edmund L. Maier defended his M.S. (R) thesis successfully on August 7, 1993. The title of his thesis is: "Expert System for High School Student Advisement."

Moninder Singh defended his M.S. (R) thesis successfully on May 28, 1993. The title of the thesis is: "Construction of Bayesian Network Structures from Data."

Randy Mechling defended his M.S. (R) thesis successfully on July 1, 1992. The title of the thesis is "PaCCIN: A Parallel Constructor of Causal Independence Networks."

David L. Hibler defended his Ph.D. dissertation successfully on January 24, 1992. The title of the dissertation is "The Thought Experiment Method: A New Approach to Qualitative Reasoning."

Edward K. Yu defended his M.S. (R) thesis successfully on November 26, 1991. The title of the thesis is "MODIC: A Program for Model-Based Diagnosis that uses Constraint Logic Programming."

Rita L. Childress defended her M.S. (R) thesis successfully on April 16, 1991. The title of the thesis is "Verification of Expert Systems Written in OPS5."

M. Ishaq Zahid defended his M.S. (R) thesis successfully on September 29, 1990. The title of the thesis is "Warnsdorff's Tours of a Knight."

Dahai Zang defended his M.S. (R) thesis successfully on July 6, 1990. The title of the thesis is "An Analysis of Rule-Strength Refinement Algorithms for Expert Systems."

Shijie Wang defended his M.S. (R) thesis successfully on November 30, 1989. The title of the thesis is "BELFUN--A Belief Function Expert System Shell."

19. Teaching: Activities, Courses

Spring 2003: CSCE330, CSCE580.

Fall 2002: CSCE330, CSCE582 (=STAT582)

Spring 2002: CSCE531, CSCE 580.

Fall 2001: CSCE330, CSCE 531.

Spring 2001: CSCE146 (Algorithmic Design II), CSCE768 (Pattern Recognition and Classification).

Fall 2000: CSCE330, CSCE590 (Topics in Information Technology: Foundations of Bayesian Networks).

On sabbatical leave during Fall 1999 and Spring 2000.

Spring 1999: CSCI330.

Fall 1998: CSCI220 and CSCI509 (Topics in Computer Science: Foundations of Bayesian Networks[9]).

Spring 1998: Knowledge-Based Systems (CSCI786).

Fall 1997: Introduction to Algorithmic Design II (CSCI146).

Spring 1997: CSCI330 and CSCI886 (Seminar in Artificial Intelligence: Decision-Theoretic Approaches to Intelligent Systems[10]).

Fall 1996: CSCI220

Spring 1996: CSCI750 and CSCI886 (Seminar in Artificial Intelligence: PAC Learning[11]).

Fall 1995: CSCI780.

Spring 1995: CSCI146 and CSCI886 (Seminar in Artificial Intelligence: Bayesian Belief Networks[12]).

Fall 1994: CSCI145.

Spring 1994: CSCI146 and CSCI886 (Seminar in Artificial Intelligence: Foundations of Bayesian Belief Networks[13]).

Fall 1993: CSCI785.

Spring 1993: CSCI330 and CSCI886 (Seminar in Artificial Intelligence: Model-Based Diagnosis).

Fall 1992: CSCI220, CSCI785, and CSCI886 (Seminar in Artificial Intelligence: Construction of Bayesian Belief Networks[14]).

Spring 1992: Knowledge-Based Systems (CSCI786) and Data Structures and Algorithms (CSCI220).

Fall 1991: Heuristic Techniques in Artificial Intelligence (CSCI785) and Algorithms and Data Structures (CSCI720).

Spring 1991: Knowledge-Based Systems (CSCI786) and Programming Language Structures (CSCI330).

Fall 1990: Heuristic Techniques in Artificial Intelligence (CSCI785) and Programming Language Structures (CSCI330).

Spring 1990: Knowledge-Based Systems (CSCI786 and CSCI786J). This was a TV course.

Fall 1989: Artificial Intelligence (CSCI580).

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[9] CSCI509 was taught as a voluntary overload.

[10] CSCI886 was taught as a voluntary overload.

[11] CSCI886 was taught as a voluntary overload.

[12] CSCI886 was taught as a voluntary overload.

[13] CSCI886 was taught as a voluntary overload.

[14] CSCI886 was taught as a voluntary overload.

Spring 1989: Knowledge-Based Systems (CSCI786).

Fall 1988: Heuristic Techniques in Artificial Intelligence (CSCI785).

Summer 1984: Data Structures (CPS152, Duke University).

Summer 1981: Introduction to Programming (CPS51, Duke University).

20. Service Activities

Director of Undergraduate Studies, Department of Computer Science, University of South Carolina, Columbia, June 1993-August 1999. This duty was compensated.

Faculty Senator, Fall 2007-present, Fall 2003-Summer 2006, Fall 2000-Summer 2001, Spring 1999 (acting).

Member, University Committee on Curricula and Courses, University of South Carolina, elected by Faculty Senate vote on March 5, 2008, for the term starting in the summer session 2008 and ending on August 15, 2011.

Member, College of Engineering and Computing Committee on Scholarships, Spring 2008-present.

Mentor, University First-Year Scholars Program (several times since Fall 1998).

Advisor of the Year, College of Science and Mathematics, University of South Carolina, Columbia, 1997.

Member, University Committee on Instructional Development, University of South Carolina (Fall1994-Spring 1997); chair of the Teaching Evaluation subcommittee, Fall 1994-Spring 1996.

Chair of the following departmental committees: assessment (CSAB preparation) (Fall 2002-Spring 2003, Fall 1992), colloquium (Fall 2001 until present, Spring 1997, Fall 1996, Spring 1996, Fall 1995, Spring 1995, Fall 1994, Spring 1994, Fall 1993, Spring 1993, Fall 1992, Spring 1991, Fall 1990), curriculum (Spring 1995, Fall 1994, Spring 1994, Fall 1993, Spring 1993, Fall 1992), graduate student admission (Spring 1992, Fall 1991), qualifying exam oversight (Spring 1998, Fall 1997), reading room (Spring 1998, Fall 1997), undergraduate (Spring 1999, Fall 1998, Spring 1998, Fall 1997, Spring 1997, Fall 1996, Spring 1996, Fall 1995, Spring 1995, Fall 1994, Spring 1994).

Member of the following departmental committees: chair search (Spring 1999, Fall 1998), colloquium (Spring 1992, Fall 1991), curriculum (Spring 1999, Fall 1999, Spring 1998, Fall 1998, Spring 1997, Fall 1996, Spring 1996, Fall 1995), ethics (Spring 1992, Fall 1991), full professor visitation (Spring 1992), graduate (Spring 1991, Fall 1990, Spring 1990, Fall 1989), graduate student admission (Spring 1993, Fall 1992, Spring 1991, Fall 1990, Spring 1990, Fall 1989, Spring 1989, Fall 1988), peer review and tenure and promotion of assistant professors (since Fall 1994) qualifying exam (Fall 1998, Spring 1999), self-study (Spring 1989), symposium (Spring 1990, Fall 1989, Spring 1989, Fall 1988), undergraduate (Fall 2003 until now, Fall 2000 to Spring 2002).

Moderator and Judge, Alpha Lambda Delta Freshman Honor Society's Seventh, Sixth, Fifth, Fourth, and Third Annual USC Challenge Quiz Bowl, Columbia, SC, 1997, 1996, 1995 and 1994.

Judge, 42nd, 41st, 40th, 39th, 38th and 37th Annual Region II Science Fair, Columbia, SC, 1998, 1997, 1996, 1995, 1994 and 1993.

Graduate student representative, Duke University, Department of Computer Science, 1984-85.

Graduate student representative on the chairman search committee for the Department of Computer Science, Duke University, 1984.