Marco Valtorta

Contact Information

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Biographical Information

Born in Milan, Italy, May 7, 1956.
Naturalized citizen of the U.S.A. since September 17, 2005
Married, two children.

Languages

Italian (native), English (very fluent), French (basic working proficiency), German (basic), Latin (working proficiency), Ancient Greek (studied)

Professional Experience

Professor 08/2008 - present
Department of Computer Science and Engineering
University of South Carolina, Columbia, SC

Chair of the Faculty Senate 08/2017 - 08/2019
University of South Carolina

Associate Professor 08/1994 - 08/2008
Department of Computer Science and Engineering[1]
University of South Carolina

Assistant Professor 08/1988 - 08/1994
Department of Computer Science
University of South Carolina

Temporary Agent 10/1985 - 08/1988
Commission of the European Communities
Brussels, Belgium
Project Officer in ESPRIT, a program of the European Economic Community. Duties included supervision of sponsored projects, negotiation of shortlisted proposals, evaluation of proposals and development of the yearly work program.

Teaching and Reseach Assistant 08/1980 - 08/1985
Department of Computer Science
Duke University

Education

Duke University, Durham, N.C.
Ph.D., Computer Science, 1987

Duke University
M.A., Computer Science, 1984

Politecnico di Milano, Milan, Italy
Laurea (with highest honors), Electrical Engineering, 1980

Liceo Classico dell'Istituto Gonzaga, Milan, Italy
Maturità Classica (with highest honors), 1975

[1] Department of Computer Science until 2000

Research Interests

Uncertainty in Artificial Intelligence: foundations and applications of Bayesian networks, influence diagrams, and other probabilistic graphical models; learning of Bayesian networks and chain graphs; parameter identifiability in causal Bayesian networks and Markov networks; integration of logic and probabilistic reasoning; use of soft (uncertain) evidence in Bayesian networks and influence diagrams.
Problem Solving Methods in Artificial Intelligence: Properties of heuristics derived from simplified models in the state-space approach to problem solving.

Brief Professional Biography

Marco Valtorta (Ph.D., Duke University, 1987) is a professor of Computer Science and Engineering in the College of Engineering and Computing at the University of South Carolina. He received a laurea degree with highest honors in electrical engineering from the Politecnico di Milano, Milan, Italy, where he studied with Marco Somalvico, in 1980. After his graduate work in Computer Science at Duke University with Donald W. Loveland, he joined the Commission of the European Communities in Brussels, Belgium, where he worked as a project officer for ESPRIT (the European Strategic Programme in Information Technologies) from 1985 to 1988. In August 1988 he joined the faculty at USC in what was then the Department of Computer Science. He spent much of his sabbatical year (1999–2000) in the Decision Support Systems group of the Department of Computer Science of Aalborg University in Denmark. His research interests are in Artificial Intelligence. His first research result, known as "Valtorta's theorem" and obtained in 1980, was recently (2011) described as "seminal" and "an important theoretical limit of usefulness" for heuristics computed by search in an abstracted problem space. Most of his later research has been in the area of uncertainty in artificial intelligence. His theoretical and methodological contributions include results on the complexity of theory revision, algorithms for learning Bayesian networks from large data sets, algorithms for the identification of conflicts in Bayesian networks, algorithms for probability update in the presence of uncertain information, theoretical results on the identifiability of parameters in causal Bayesian networks, and related results on more expressive probabilistic graphical models, such as chain graphs and directed hypergraphs. His applied work includes the construction of Bayesian networks and influence diagrams in medicine, agriculture, computer security, and information analysis. Valtorta's work was funded by ONR, DARPA, ARDA, and IARPA, among other sources. He has around 70 peer reviewed publications in journals and highly selective conferences such as *Artificial Intelligence*, *International Journal of Approximate Reasoning*, *ACM Journal of Data and Information Quality*, *IEEE Transactions on Instrumentation and Measurement*, International Joint Conference on Artificial Intelligence, and Conference on Uncertainty in Artificial Intelligence. His students have been best paper award winners at the Conference on Uncertainty in Artificial Intelligence (1993, 2006) and the International Conference on Information Quality (2006). He was a Lilly teaching fellow in 1993–94 and undergraduate director for the Department of Computer Science from 1993 to 1999. He is particularly interested in advising and mentoring undergraduate students. He was awarded the College of Science and Mathematics Outstanding Advisor Award in 1997. In addition to his teaching and research activity, he has served in numerous capacities at the departmental (e.g., chair of the tenure and promotion committee and of the colloquium committee), college (e.g., College of Engineering and Computing scholarship committee), and university level (e.g., faculty senator, committee on curricula and courses, committee on instructional development, university committee on tenure and promotion). He was elected chair of the university faculty senate in April 2016 and became chair in August 2017 for a two-year term. He was an associate editor of the *International Journal of Approximate Reasoning* from 1993 to 2008 and has been involved in the organization and review of many conferences and workshops.

Honors and Awards

Joseph M. Biedenbach Distinguished Service Award 2020
College of Engineering and Computing, University of South Carolina

Elevation to AAAI Senior Member Grade 2018

SEC Academic Leadership Development Program Fellowship 2016-17

Outstanding Achievement Award 2016
Department of Computer Science and Engineering, University of South Carolina

Two Thumbs Up Award 2013-14
University of South Carolina

Elevation to ACM Senior Member Grade 2007

(Inaugural) Madnick Best Information Quality Paper Award 2006
(with Valerie Sessions)

UAI Best Student Paper Award 1993 and 2006
(with Moninder Singh in 1993 and Yimin Huang in 2006)

Elevation to IEEE Senior Member Grade 2005

Lilly Teaching Fellow 1993-94
Eli Lilly Endowment, Indianapolis, IN

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

Journal Publications

[1] Mohammad Ali Javidian and Marco Valtorta. "A Decomposition-Based Algorithm for Learning the Structure of Multivariate Regression Graph." *International Journal of Approximate Reasoning*, 136 (September 2021), 66-85, DOI: https://doi.org/10.1016/j.ijar.2021.05.005, 2021.

[2] Mohammad Ali Javidian, Marco Valtorta, and Pooyan Jamshidi. "AMP Chain Graphs: Minimal Separators and Structure Learning Algorithms." *Journal of Artificial Intelligence Research*, 69 (2020) 419-480, DOI: https://doi.org/10.1613/jair.1.12101, 2020.

[3] Mohammad Ali Javidian, Zhiyu Wang, Linyuan Lu, and Marco Valtorta. "On a Hypergraph Probabilistic Graphical Model." *Annals of Mathematics and Artificial Intelligence*, (2020), DOI: https://doi.org/10.1007/s10472-020-09701-7, available at https://rdcu.be/b5R2a. (ArXiv preprint of earlier version available at https://arxiv.org/abs/1811.08372)

[4] Emad Alsuwat, Hatim Alsuwat, Marco Valtorta, and Csilla Farkas. "Adversarial Data Poisoning Attacks against the PC Learning Algorithm." *International Journal of General Systems*, 49:1, 3-31, DOI: 10.1080/03081079.2019.1630401, 2020.

[5] Elizabeth S. Allman, John A. Rhodes, Elena Stanghellini, and Marco Valtorta. "Parameter Identifiability of Discrete Bayesian Networks with Hidden Variables." *Journal of Causal Inference*, 3, 2, 189-206, 2015.

[6] Jingsong Wang, John Byrnes, Marco Valtorta, and Michael Huhns. "On the Combination of Logical and Probabilistic Models for Information Analysis." *Applied Intelligence*, 36, 2, 472-497, 2012.

[7] Antonello Monti, Ferdinanda Ponci, and Marco Valtorta. "Extending Polynomial Chaos to Include Interval Analysis." *IEEE Transactions on Instrumentation and Measurement*, 59, 1, 48-55, 2010.

[8] Valerie Sessions and Marco Valtorta. "Towards a Method for Data Accuracy Assessment Utilizing a Bayesian Network Learning Algorithm." *Journal of Data and Information Quality*, 1, 3 (December 2009), Article 14 (34 pages), 2009.

[9] Yimin Huang and Marco Valtorta. "On the Completeness of an Identifiability Algorithm for Semi-Markovian Models." *Annals of Mathematics and Artificial Intelligence*, 54, 4, 363-408, 2009.

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

[11] 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.

[12] 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.

[13] 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.

[14] 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.

[15] Marco Valtorta, Jiri Vomlel, and Young-Gyun Kim. "Soft Evidential Update for Multiagent Systems." *International Journal of Approximate Reasoning*, 29, 1 (January 2002), 71-106, 2002.

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

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

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

[19] Moninder Singh and Marco 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, 1995.

[20] Marco Valtorta and M.Ishaq Zahid. "Tie-Breaking Rules for 4 x n Warnsdorff's Tours." *Congressus Numerantium*, 95, 75-86, 1993.

[21] Marco Valtorta and M.Ishaq Zahid. "Warnsdorff's Tours of a Knight." *Journal of Recreational Mathematics*, 25, 2, 128-140, 1993.

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

[23] Othar Hansson, Andrew. Mayer, and Marco Valtorta. "A New Result on the Complexity of Heuristic Estimates for the A* Algorithm." *Artificial Intelligence*, 55, 1 (May 1992), 129-143, 1992.

[24] Stephen D. Durham, Jeffery S. Smolka, and Marco 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, 1992.

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

[26] Marco Valtorta. "Knowledge Base Refinement: A Bibliography." *Applied Intelligence*, 1,1 (July 1991), 87-94.1991.

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

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

[29] Marco Valtorta. "A Result on the Computational Complexity of Heuristic Estimates for the A* Algorithm." *Information Sciences*, vol 34, 47-59, 1984.

Book Chapters

[30] Huhns, Michael N., M. Valtorta, and Jingsong Wang. "Design Principles for Ontological Support of Bayesian Evidence Management." In: Obrst, L., T. Janssen, and W. Ceusters (eds.). *Ontologies and Semantic Technologies for Intelligence*. Volume 213 of Frontiers in Artificial Intelligence and Applications. Amsterdam, IOS Press pp.163-178 (Chapter 10), September 2010.

[31] 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.

Conference Publications

[32] Mohammad Ali Javidian, Marco Valtorta, and Pooyan Jamshidi. "An Order-Independent Algorithm for Learning Chain Graphs." *The International FLAIRS Conference Proceedings* 34 (April). https://doi.org/10.32473/flairs.v34i1.128365, 2021.

[33] Adem Coskun, Jason O'Kane, and Marco Valtorta. "Deadlock-Free Online Plan Repair in Multi-Robot Coordination With Disturbances". *The International FLAIRS Conference Proceedings* 34 (April). https://doi.org/10.32473/flairs.v34i1.12837, 2021.

[34] Mohammad Ali Javidian, Marco Valtorta, and Pooyan Jamshidi. "Learning LWF Chain Graphs: A Markov Blanket Discovery Approach." Proceedings of the 36th Conference on Uncertainty in Artificial Intelligence (UAI-20), Toronto, Canada, August 3-6, 2020.
(Paper available at `http://www.auai.org/uai2020/proceedings/446_main_paper.pdf`.)

[35] Mohammad Ali Javidian, Marco Valtorta, and Pooyan Jamshidi. "Order-Independent structure Learning of Multivariate Regression Chain Graphs." Proceedings of the 13th International Conference on Scalable Uncertainty Management (SUM 2019), pp. 324-338, Compiegne, France, December 16-18 2019. (Extended version available at https://arxiv.org/abs/1910.01067.)

[36] Hatim Alsuwat, Emad Alsuwat, Marco Valtorta, John Rose, and Csilla Farkas. "Modeling Concept Drift in the Context of Discrete Bayesian Networks." Proceedings of the 11th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management - Volume 1: KDIR, ISBN 978-989-758-382-7, pages 214-224. DOI: 10.5220/0008384702140224, Vienna, Austria, September 17-19, 2019.

[37] Emad Alsuwat, Hatim Alsuwat, John Rose, Marco Valtorta, and Csilla Farkas. "Detecting Adversarial Attacks in the Context of Bayesian Networks." 33rd Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSec'19), Charleston, SC, USA - July 15-17, 2019

[38] Mohammad Ali Javidian, Pooyan Jamshidi, and Marco Valtorta. "Transfer Learning for Performance Modeling of Configurable Systems: A Causal Analysis." AAAI Spring 2019 Symposium: "Beyond Curve Fitting–Causation, Counterfactuals, and Imagination-Based AI" (WHY-19), Palo Alto, CA, March 2019, seven pages. (Locally published proceedings; available at https://why19.causalai.net/papers.html.)

[39] Zhiyu Wang, Mohammad Ali Javidian, Linyuan Lu, and Marco Valtorta. "The Causal Interpretation of Bayesian Hypergraphs." AAAI Spring 2019 Symposium: "Beyond Curve Fitting–Causation, Counterfactuals, and Imagination-Based AI" (WHY-19), Palo Alto, CA, March 2019, seven pages. (Locally published proceedings; available at https://why19.causalai.net/papers.html.)

[40] Mohammad Ali Javidian and Marco Valtorta. "Finding Minimal Separators in LWF Chain Graphs." Proceedings of Machine Learning Research Volume 72: International Conference on Probabilistic Graphical Models (PGM-18), pp. 193-200 (Václav Kratochvíl and Milan Studený, editors). Prague, Czech Republic, September 11-14, 2018.

[41] Mohammad Ali Javidian and Marco Valtorta. "On the Properties of MVR Chain Graphs." Workshop at the International Conference on Probabilistic Graphical Model (PGM-18), pp.13-24 (Václav Kratochvíl and Milan Studený, editors). Prague, Czech Republic, September 11-14, 2018. (Locally published proceedings; available at
http://pgm2018.utia.cz/data/workshopproceedings.pdf.)

[42] Emad Alsuwat, Hatim Alsuwat, Marco Valtorta, and Csilla Farkas. "Cyber Attacks against the PC Learning Algorithm." Second International Workshop on A.I. and Security at ECML-18, 16 pages. Dublin, September 10-14, 2018. (Locally published proceedings; available at
http://iwaise2018.it.nuigalway.ie/wp-content/uploads/2018/09/proceedings-second-international.pdf.)

[43] Mohammad Ali Javidian and Marco Valtorta. "Finding Minimal Separators in Ancestral Graphs." Seventh Causal Inference Workshop at the 34th Conference on Artifical Intelligence (UAI-18), 6 pages (Bryant Chen, Panos Toulis, and Alexander Volfovsky, editors), Monterey, CA, August 6-10. 2018. (Available at
https://sites.google.com/view/causaluai2018/papers.)

[44] Emad Alsuwat, Marco Valtorta, and Csilla Farkas. "How to Generate the Network You Want with the PC Learning Algorithm." Proceedings of the 11th Workshop on Uncertainty Processing (WUPES'18), 12 pages. (Václav Kratochvíl and Jirina Vejnarová, editors.) Třeboň, Czech Republic, June 6-9, 2018. (Available at http://wupes.utia.cas.cz/proceedings/proceedings.pdf.)

[45] Elizabeth S. Allman, John A. Rhodes, Elena Stanghellini, and Marco Valtorta. "On Identifiability of Causal Effects in Bayesian Networks" (abstract). UK Causal Inference Meeting. Cambridge, UK, April 2014.

[46] Elizabeth S. Allman, John A. Rhodes, Elena Stanghellini, and Marco Valtorta. "Identifiability of Binary Directed Graphical Models with Hidden Variables" (9 pages, refereed). Workshop on Approaches to Causal Learning at the 29th Conference on Uncertainty in Artificial Intelligence (UAI-2013), Bellevue, WA, July 2013.

[47] Elizabeth S. Allman, John A. Rhodes, Elena Stanghellini, and Marco Valtorta. "Identifiability of Discrete Graphical Models with Hidden Variables" (4 pages). 46th Annual Meeting of the Societa Italiana di Statistica (SIS-12), Rome, Italy, June 2012.

[48] Jingsong Wang and Marco Valtorta. "Using Relative Classification Probability to Increase Accuracy of Restricted Structure Bayesian Network Classifiers" (refereed). *Proceedings of the IEEE 24th International Conference on Tools with Artificial Intelligence (ICTAI-2012)*, pp.105–113. Athens, Greece, November 7-9, 2012

[49] Elizabeth S. Allman, John A. Rhodes, Elena Stanghellini, and Marco Valtorta. "Discrete Graphical Models with One Hidden Variable" (abstract). SIAM Conference on Applied Algebraic Geometry, Raleigh, NC, October 6-9. 2011

[50] Marco Valtorta and Scott Langevin. "Causality in Communication: The Agent-Encapsulated Bayesian Network Model" (abstract). 14th International Conference on Applied Stochastic Models and Data Analysis, Rome, Italy, June 7-10, 2011.

[51] Jingsong Wang and Marco Valtorta. "Instantiation to Support the Integration of Logical and Probabilistic Knowledge" (13 pages, refereed). First Workshop on Grounding and Transformation for Theories with Variables (GTTV-2011), Vancouver, Canada, May 15, 2011.

[52] Scott Langevin, Marco Valtorta, and Mark Bloemeke. "Agent-encapsulated Bayesian Networks and the Rumor Problem." *Proceedings of the Ninth International Conference on Autonomous Agents and Multiagent Systems* (AAMAS-10), Volume 1, Toronto, Canada, May 10-14, 2010, pp. 1553-1555 (one of 136 short papers out of 299 papers selected out of 685 papers for a 44% acceptance rate; 30% contribution), 2010.

[53] 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), 2010.

[54] 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), 2007.

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

[56] Valerie Sessions and Marco Valtorta. "The Effects of Data Quality on Machine Learning Algorithms" (refereed). *Proceedings of the 11th International Conference on Information Quality* (ICIQ-06), Cambridge, MA, November 10-12, 2006, pp.485-498. (This paper won the Madnick Best Academic Paper Award.) 2006.

[57] 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.) 2006.

[58] 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). 2006.

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

[60] 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). 2005.

[61] 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" (10 pages, refereed) Proceedings of the 38th Hawaii International Conference on System Sciences (HICSS38) (CD-ROM), Big Island, Hawaii, January 3-6, 2005.

[62] Bhaskara Reddy Moole 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%). 2003.

[63] Vaibhav Gowadia, 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. 2003.

[64] Csilla Farkas, Marco 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. 2001.

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

[66] Jayanta K. Ghosh 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. 2000.

[67] Mark Bloemeke 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.) 1998.

[68] Young-Gyun Kim 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%.) 1995.

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

[70] Randy Mechling and Marco Valtorta. "A Parallel Constructor of Markov Networks" (refereed). 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).

[71] Alexander Bordetski and Marco Valtorta. "Learning Empirical Constraints to Complement Diagnostic Models" (refereed). 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.

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

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

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

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

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

[77] Shijie Wang and Marco Valtorta. "On the Conversion of Rule Bases into Belief Networks" (refereed) *Proceedings of the 1992 ACM/SIGAPP Symposium on Applied Computing*, pp.363–368, Kansas City, MO, March 1992.

[78] Rita L. Childress and Marco Valtorta. "EVA and the Verification of Expert Systems Written in OPS-5" (refereed). Working Notes of the AAAI-91 Workshop on Knowledge-based Systems Verification, Validation, and Testing, Anaheim, CA, July 1991, 72-83. 1991.

[79] Marco Valtorta. "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. 1991.

[80] Xiaofeng (Charles) Ling and Marco Valtorta. "Revision of Reduced Theories" (refereed). 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. 1991.

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

[82] Stephen D. Durham, Jeffery S. Smolka, and Marco 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. 1991.

[83] Marco Valtorta and M.Ishaq 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.

[84] Shijie Wang and Marco Valtorta. "A Prototype Belief Network-based Expert System Shell" (refereed). 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. 1990.

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

[86] Rita Childress and Marco Valtorta. "Verification and Validation of Expert Systems." Proceedings of the Sixth Annual USC-CS Symposium: Intelligent Systems, Columbia, South Carolina, March 1990, 55-68. 1990.

[87] Marco Valtorta and M.Ishaq 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. 1990.

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

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

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

[91] Marco Valtorta, Bruce T. Smith, and Donald W. Loveland. "The Graduate Course Advisor: A Multi-Phase Rule-Based Expert Systems" (refereed). *Proceedings of the IEEE Workshop on Principles of Knowledge-Based Systems*, Denver, Colorado, December 1984, 53-57. 1984.

[92] Marco Valtorta. "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.

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

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

[95] Marco Valtorta. "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.

[96] Giovanni Guida, Marco Somalvico, and Marco Valtorta. "Problemi Ausiliari ed Algoritmi di Ricerca: Un Contributo alla Teoria dei Problemi" (refereed). Atti del Congresso Annuale AICA-80. Bologna, Italy: Tecnoprint, 1980.

Funded Projects

Title: "Hypergraph-Based Causal Modeling."
Agency: Office of Naval Research (ONR).
Award Amoint: $100,000.
Period: September 1, 2017–August 31, 2018
Role: co-PI (with PI Linyuan Lu, Mathematics Department)

Title: "Co-Arg: Causal Argumentation System with Crowd Elicitation."
Agency: Intelligence Advanced Research Project Agency (IARPA); subaward through George Mason University (GMU).
Award Amount: $342,331 (subaward only).
Period: January 2017–June 2021. Project funded to September 2018 only for budgetary reasons.
Role: PI of the subward; Prime (GMU) PI: Gheorghe Tecuci.

Title: "Integrating and Extending Techniques for the Identification of Latent Variables in Graphical Models."
Agency: American Institute of Mathematics, Palo Alto, CA (through the SQuaRE program).
Award Amount: Travel and lodging for week-long meetings every year for three years for Elizabeth Allman, John Rhodes, Elena Stanghellini, and Marco Valtorta at the AIM facility in Palo Alto, CA.
Period: October 2011–October 2013.
Role: co-PI (with Allman, Rhodes, and Stanghellini).

Title: "Combining Facts and Expert Opinion in Analytical Models via Logical and Probabilistic Reasoning."
Agency: Air Force Research Laboratory (AFRL).
Award Amount: $1,922,442 (total including options and subcontract to HNC Software LLC), University of South Carolina share approximately $1,000,000. Project not funded to completion, due to budgetary constraints.
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.

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.
Note: the University of South Carolina was a subcontractor of Georgia Tech Research Institute.

Title: "Critical Infrastructure Protection Center Initiative: Infrastructure and Bayesian Network Models."
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 was approximately $20,000.

Title: "Fingerprinting Seeds."
Agency: University of South Carolina.
Role: Co-PI (Dr. Gail Wagner, PI).
Amount: $4,500.
Period: Summer 2002.

Title: "Normative Decision Analysis Research Incentive Proposal."
Agency: University of South Carolina.
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 was 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.

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.
Amount: $400,000.
Period: June 1, 1997 to June 29, 2000.

Title: "Expert System for Agricultural Loans: Collaboration with S.C. State University."
Agency: U.S. Department of Agriculture.
Amount: $16,289 (subcontract to USC).
Period: May 16, 1994–August 31, 1997.
Role: PI.
Note: Total amount for the project, entitled "Analysis of Agricultural Loan Defaults: Development of Credit/Loan Analysis Models," and to last 36 months, was $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 was joint with Caroline Eastman, Senior Teaching Fellow in the proposed project. The total monetary value of the award was estimated to $8,500.

Title: "A Study of the Complexity of Abstraction in Qualitative Diagnosis."
Sponsor: CISE SpA .
Amount: $49,500.
Period: January 1, 1991–December 31, 1993 (with no-cost extension to June 30, 1994).
Role: PI.

Title: "Studies in Sentencing Information Retrieval and Criminal Offense Coding."
Agency: South Carolina Law Enforcement Division
Amount: $48,000. Period: May 4, 1992-August 17, 1992
Role: co-PI with Manton M. Matthews and Abhijit Sengupta.

Title: "Development of a Computer Network for Quality Assurance and Statistical Process Control, Phase 2."
Sponsor: General Electric Medical System.
Amount: My part in the project was compensated with approximately $4,000. Total funding for the project was approximately $109,000.
Period: Summer 1993, General Electric Medical Systems.
Role: Senior Researcher. Juan E. Vargas was PI.

Supervised Graduate Students (Graduated)

1. Adem Coskun successfully defended his Ph.D. dissertation on April 7, 2021. The title of the dissertation is: "Multi-Robot Coordination with Environmental Disturbances."
2. Noah J. Geveke successfull defended his M.S. (Computer Engineering) thesis on July 13, 2020. The title of the thesis is: "On the Robustness of Bayesian Network Learning Algorithms against Malicious Attacks."

3. Mohammad Ali Javidian successfully defended his Ph.D. dissertation on October 22, 2019, The title of the dissertation is: "Properties, Learning Algorithms, and Applications of Chain Graphs and Bayesian Hypergraphs."

4. Hatim Alsuwat successfully defended his Ph.D. dissertation on October 7, 2019. The title of the dissertation is: "Cybersecurity Issues in the Context of Cryptographic Shuffling Algorithms and Concept Drift: Challenges and Solutions."

5. Emad Alsuwat successfully defended his Ph.D. dissertation on June 12, 2019. The title of his dissertation is "Challenges in Large-scale Machine Learning Systems: Security and Correctness."

6. Subhro Kar successfully defended his M.S. (Computer Science and Engineering) thesis on February 20, 2015. The title of his thesis is: "Planning a Virtual Lab for Analysis of Malware: A Study of Virtualization on an Intel Platform."

7. Mohamed Sharaf defended his Ph.D. dissertation successfully on April 7, 2014. The title of his dissertation is "Identifiability of Directed and Undirected Graphical Models with a Latent Variable."

8. Jingsong Wang defended his Ph.D. dissertation successfully on November 16, 2011. The title of his dissertation is "A Framework for Combining Logical and Probabilistic Models."

9. Scott Langevin defended his Ph.D. dissertation successfully on December 15, 2010. The title of his dissertation is "Knowledge Representation, Communication, and Update in Probability-based Miltuagent Systems."

10. 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."

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

12. 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."

13. 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."

14. 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."

15. 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."

16. 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."

17. Mark Bloemeke defended his Ph.D. dissertation successfully on August 7, 1998. The title of his dissertation is: "Agent Encapsulated Bayesian Networks."

18. 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."

19. 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."

20. 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."

21. 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."

22. 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."

23. 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."

24. 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)."

25. 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."

26. 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."

27. 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."

28. 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."

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

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

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

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

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

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

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

36. 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."

Other Supervision

Member of dissertation and thesis committees for multiple students at the Department of Computer Science and Engineering at the University of South Carolina

Member of dissertation committees for multiple students in the departments of Mathematics and Physics at the University of South Carolina

External member of dissertation committees for students in Computer Science at the Universite de Paris-Sud and at Aalborg University in Denmark

Director, co-director, or committee members for multiple undergraduate honors theses in Computer Science and Engineering at the University of South Carolina

Courses Taught

Professional Issues in Computer Science and Engineering (CSCE 390)
Latest Offering: Fall 2021

Topics in Information Technology: Functional Programming (CSCE 590)
Latest Offering: Fall 2021

Bayesian Networks and Decision Graphs (CSCE 582, cross-listed as STAT 582)
Latest Offering: Spring 2021

Compiler Construction (CSCE 531)
Latest Offering: Spring 2021

Computing in the Modern World (CSCE 190)
Latest Offering: Fall 2019

Advanced Topics in Probabilistic Graphical Models (CSCE 790)
Topics Course Offered in Spring 2019

Computer Systems Engineering (CSCE 317)
Latest Offering: Spring 2018

Programming Language Structures (CSCE 330)
Latest Offering: Fall 2017

Artificial Intelligence (CSCE 580)
Latest Offering: Spring 2017

Knowledge Systems (CSCE 781)
Latest Offering: Spring 2013

Digital Logic Design (CSCE 211)
Latest Offering: Spring 2009

Data Structures and Algorithms (CSCE 350)
Latest Offering: Spring 2005

Introduction to Algorithmic Programming II (CSCE 146)
Latest Offering: Spring 2001

Pattern Recognition and Classification (CSCE 768)
Latest Offering: Spring 2001

Introduction to Algorithmic Programming I (CSCI 145)
Latest Offering: Fall 1994

Also taught various topics courses at the senior, beginning graduate student, and advanced graduate student levels, on model-based reasoning, various aspects of graphical probabilistic models, and PAC-learning. Also taught other courses on programming, data structures, and algorithms at various levels.

Professional Service

Journal Editorial Service

- Associate Editor *International Journal of Approximate Reasoning*, January 1993–2008.
- Member of the Editorial Board, *Applied Intelligence*, January 1993–present.
- Member of the Editorial Board, *International Journal of Applied Management and Technology*, 2003–present.

Journal Referee Service

- *AI Communications*
- *Annals of Mathematics and Artificial Intelligence*
- *Applied Intelligence*
- *Artificial Intelligence*
- *Artificial Intelligence in Medicine*
- *IEEE Expert* (now *IEEE Intelligent Systems*)
- *IEEE Transactions on Fuzzy Systems*
- *IEEE Transactions on Systems, Man, and Cybernetics*
- *Information Fusion*
- *Information Sciences*
- *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 Data and Information Quality*
- *Journal of Experimental and Theoretical Artificial Intelligence*
- *Journal of Intelligent Information Systems*
- *Journal of Logic Programming*
- *Kibernetica*
- *Machine Learning*

Review and Program Committee Service for Major Conferences

- National Conference on Artificial Intelligence (AAAI), multiple times
- International Conference on Artificial Intelligence and Statistics (AISTATS; known as AIS in early years), multiple times.
- European Conference on Artificial Intelligence (ECAI), multiple times
- European Conference on Symbolic and Quantitative Approaches to Reasoning and Uncertainty (ECSQUARU), multiple times
- International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems (IEA-AIE), multiple times

- Indian International Conference on Artificial Intelligence (IICAI), multiple times
- International Joint Conference on Artificial Intelligence (IJCAI), multiple times
- European Workshop on Probabilistic Graphical Models (PGM), multiple times
- Conference on Uncertainty in Artificial Intelligence (UAI), multiple times (senior PC Member, 2021)

Other Professional Service

- Local Arrangements Chair, IEA-AIE 1989
- Reviewer for many textbooks

PROFESSIONAL MEMBERSHIPS

AAAI (senior member since 2018), ACM (senior member since 2007), IEEE (senior member since 2005; life senior member since 2022).

DEPARTMENT SERVICE

Director of Graduate Studies, Department of Computer Science and Engineering, University of South Carolina, Columbia, Fall 2021–present.

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

Chair of the Tenure and Promotion Committee, Fall 2010–Fall 2016

Chair of the Colloquium Committee, Fall 1990–Spring 1997, Fall 2001–Fall 2016

Chair of the following additional committees, at some time between Fall 1988 and now: assessment (CSAB preparation), curriculum, qualifying exam oversight, reading room, undergraduate.

Member of the following additional committees, at some time between Fall 1988 and now: chair search, ethics, full professor teaching visitation, graduate, graduate student admission, qualifying exam, self-study, symposium.

COLLEGE SERVICE

Member, College of Engineering and Computing Committee on Scholarships, Spring 2008–Spring 2013.

Member, Dean Search Committee, Fall 2009–Spring 2010.

UNIVERSITY SERVICE

Chair, Faculty Senate, 2016-2020 (elected by vote of faculty senators; chair-elect, 2016-2017; chair, 2017-2019; past-chair, 2019-2020); includes membership or chairmanship of the following faculty committees: Faculty Advisory, Faculty-Board of Trustees Liaison, Faculty Budget, Senate Steering.

Member, Faculty Welfare Committee, 2020–present; co-chair of committee, 2020-2021.

Member, Faculty Budget Committee, 2020–present.

Member, University Committee on Tenure and Promotion (elected by University Faculty vote), three-year term starting Fall 2013; chair of the criteria and procedure review subcommittee, 2014-15; chair of committee, 2015-16.

Member, Faculty Advisory Committee, 2014-2015.

Faculty Senator, Fall 2012-Summer 2013, Fall 2007–Summer 2010, Fall 2003–Summer 2006, Fall 2000-Summer 2001, Spring 1999.

Member, University Committee on Curricula and Courses, University of South Carolina, Summer 2008–Summer 2011.

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