
Dr. CHANGHE YUAN

Department of Computer Science
Queens College/City University of New York
Queens, NY 11367
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ACADEMIC BACKGROUND:

- Ph.D. Intelligent Systems, University of Pittsburgh, Pittsburgh, PA, 2006
Dissertation: Importance Sampling in Bayesian Networks: Principles, Algorithms, and Performance
Committee: Marek J. Druzdzel (Chair), Greg F. Cooper, Leon Gleser, Milos Hauskrecht, Eric P. Xing
- M.S. Intelligent Systems, University of Pittsburgh, Pittsburgh, PA, 2003
- M.E. Computer Science, Tongji University, Shanghai, China, 2001
- B.E. Computer Science, Tongji University, Shanghai, China, 1998
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PROFESSIONAL EXPERIENCE:

Associate Professor w/tenure	Computer Science, CUNY Queens College,	2014 – Current
Associate Professor	Computer Science, CUNY Queens College	2012 – 2014
Associate Professor w/tenure	Computer Science & Engineering, Mississippi State U	2011 – 2012
Assistant Professor	Computer Science & Engineering, Mississippi State U	2006 – 2011
Academic Visitor	IBM T. J. Watson Researcher Center	Summer 2008
Research Intern	Palo Alto Research Center (PARC), Palo Alto, CA	Summer 2003

RESEARCH INTERESTS:

- *Probabilistic Graphical Models*: probabilistic inference; structure learning; causal discovery
Probabilistic graphical models are a successful marriage between graph theory and probability theory, and provide compact and intuitive graphical representations of the relations between random variables in a domain. The goal of my research is develop efficient and scalable algorithms for learning graphical models from data and for inference with the models.
- *Multimodal Inference and Learning*: diverse multiple predictions; learning diverse models
Facing complex and noisy modern data, no single prediction or model is conclusive enough due to incompleteness of information and intrinsic ambiguity. Selecting a single hypothesis and conditioning all future analysis on the choice may result in underestimation of uncertainty and risky decision making. It is preferable to find multiple promising solutions as new hypotheses for further investigation. The goal of my research is to develop novel methodologies for the discovery of multiple hypotheses that are not only highly possible but also diverse, robust, interpretable and domain agnostic.
- *Decision making and decision support*: influence diagrams; decision analytics; anytime decision making
Influence diagrams provide a natural framework for modeling the relations between random variables, decisions and preferences; they provide principled methods for finding an optimal decision policy that maximizes the expected utility. This project aims to relax the restrictive assumptions behind influence diagrams and develop novel algorithms and representations for solving more general and realistic decision theoretic problems under uncertainty.
- *Interdisciplinary research*: brain network modeling; quantitative finance; computational biology

I have genuine interest in interdisciplinary research, as I believe an application area typically presents its unique challenges and requires the development of novel methods. I have several ongoing collaborative projects in areas such as brain network modeling, quantitative finance, and computational biology. A common theme of these projects is the application of state-of-the-art machine learning methods to model and extract useful information from big data.

FUNDING (Over 2 million dollars):

- *Machine Learning Modeling for Financial Stability Analysis Using Big Data*. PSC-CUNY #60591-00 48. PI. \$6,000. July 1, 2017 to June 30, 2018.
 - *Genome and Geospatial-based Adaptive Importance Sampling for Avian Influenza Surveillance*. PSC-CUNY #68867-00 46. PI. \$12,000. July 1, 2015 to June 30, 2016.
 - *A New Approach to Influence Diagram Evaluation*. NSF IIS- 1219114. Co-PI (PI: Eric A. Hansen, Mississippi State University). \$445,000. September 1, 2012 to August 31, 2015.
 - *Scalable Algorithms for Learning Bayesian Networks from Big Data*. PSC-CUNY #67836-00 45. PI. \$12,000. July 1, 2014 to June 30, 2015.
 - *CAREER: Explanation, Decision Making, and Learning in Graphical Models*. NSF IIS-0953723. Sole-PI. \$455,233. August 16, 2010 to July 31, 2015.
 - *A Supplemental Funding to Catalyze an International Collaboration*. NSF OISE and CISE. Sole-PI. \$25,000. May 16, 2012 to August 15, 2012.
 - *Modeling and Simulation of Complex Biological Systems (Computational Biology)*, a subcontract of NSF EPS-0903787. Co-PI (PI: Susan Bridges, Mississippi State University). \$1,092,450. September 1, 2009 to August 31, 2014.
 - *SGER: A Framework for Explanation in Bayesian Networks*. NSF IIS-0842480. Sole-PI. \$63,203. September 1, 2008 to February 28, 2010.
 - *An Intelligent Collaborative Learning System*. NSF MS-EPSCoR Undergraduate Research Fund. Sole-PI. \$2,000. Summer 2008.
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AWARDS & HONORS:

- Best Paper Award, the FLAIRS Conference, 2015
 - NSF CAREER Award, 2010 – 2015
 - State Pride Faculty Award, 2010 & 2011
 - MS State Honors Faculty, 2010
 - Upsilon Pi Epsilon Honor Society in Computer Science (UPE), 2008
 - Andrew Mellon Pre-doctoral Fellowship, University of Pittsburgh, 2004 – 2005, 2005 – 2006
 - Faculty of Arts and Sciences Fellowship, University of Pittsburgh, 2001 – 2002, 2002 – 2003
-

PUBLICATIONS (Google Scholar citations 941, h-index 17, i10-index 27 as of 3/2018):**Journal articles:**

- Wu, Tingting, Alexander J. Dufford, Laura J. Egan, Melissa-Ann Mackie, Cong Chen, [Changhe Yuan](#), Chao Chen et al. Hick–Hyman Law is Mediated by the Cognitive Control Network in the Brain. *Cerebral Cortex* (2017): 1-16.
- Xiaoyuan Zhu, [Changhe Yuan](#). Hierarchical Beam Search for Solving Most Relevant Explanation in Bayesian Networks. *Journal of Applied Logic*. 2016.
- Xiaoyuan Zhu, [Changhe Yuan](#). Exact Algorithms for MRE Inference. *Journal of Artificial Intelligence Research* (JAIR). Volume 55, Pages 653-683. 2016.

- Brandon Malone, Changhe Yuan. A Depth-first Branch and Bound Algorithm for Learning Optimal Bayesian Networks. *Lecture Notes in Computer Science*, Volume 8323, Pages 111-122. 2014.
- Changhe Yuan, Brandon Malone. Learning Optimal Bayesian Networks: A Shortest Path Perspective. *Journal of Artificial Intelligence Research (JAIR)*. Vol. 48. Pages 23-65. 2013.
- Zhifa Liu, Changhe Yuan, Stephen Pruet. Machine Learning Analysis of the Relationship between Changes in Immunological Parameters and Changes in Resistance to *Listeria monocytogenes*: A New Approach for Risk Assessment and Systems Immunology. *Toxicological sciences*. 129(1). Pages 57-73. 2012.
- Zhifa Liu, Brandon Malone, Changhe Yuan. Empirical Evaluation of Scoring Functions for Bayesian Network Model Selection. *BMC Bioinformatics*. 13(Suppl 15): S14. Pages 1-16. 2012.
- Changhe Yuan, Heejin Lim, Tsai-Ching Lu. Most Relevant Explanation in Bayesian Networks. *Journal of Artificial Intelligence Research (JAIR)*. Vol. 42. Pages 309-352. 2011.
- Changhe Yuan, Heejin Lim, Michael L. Littman. Most Relevant Explanation: Computational Complexity and Approximation Methods. *Annals of Mathematics and Artificial Intelligence*. Volume 61. Issue 3. Pages 159 - 183. 2011. DOI: 10.1007/ s10472-011-9260-z.
- Changhe Yuan, Marek J. Druzdzel. Theoretical Analysis and Practical Insights into Importance Sampling for Bayesian Networks. *International Journal of Approximate Reasoning*. Vol. 46 (2), Pages 320-333, October 2007.
- Changhe Yuan, Marek J. Druzdzel. Importance Sampling Algorithms for Bayesian Networks: Principles and Performance. *Mathematical and Computer Modeling*, Vol. 43, Pages 1189-1207, 2006.
- Changhe Yuan, Yongming Wu, Research and Development of Decision Support Systems Based on Data Warehouse, *Computer Engineering and Application*, 37(16), 2001.

Major peer reviewed conferences (acceptance rate included if available):

- Pengxiang Wu, Chao Chen, Yusu Wang, Shaoting Zhang, Changhe Yuan, Zhen Qian, Dimitris Metaxas, Leon Axel. Optimal Topological Cycles and Their Application in Cardiac Trabeculae Restoration. *International Conference on Information Processing in Medical Imaging (IPMI-17)*. Pages 80-92. 2017.
- Cong Chen, Changhe Yuan, Chao Chen. Solving M-Modes Using Heuristic Search. In *Proceedings of the 25th International Joint Conference on Artificial Intelligence (IJCAI-16)*. 2016.
- Xiannian Fan, Changhe Yuan. An Improved Lower Bound for Bayesian Network Structure Learning, In *Proceedings of the 29th AAAI Conference on Artificial Intelligence (AAAI-15)*. Austin, Texas. 2015. Accepted. (Acceptance rate: **27%**)
- Xiaoyuan Zhu, Changhe Yuan. An Exact Algorithm for Solving Most Relevant Explanation in Bayesian Networks. In *Proceedings of the 29th AAAI Conference on Artificial Intelligence (AAAI-15)*. Austin, Texas. 2015. Accepted. (Acceptance rate: **27%**)
- Xiaoyuan Zhu, Changhe Yuan. Hierarchical Beam Search for Solving Most Relevant Explanation in Bayesian Networks. In *Proceedings of the 28th International FLAIRS Conference (FLAIRS-15)*. Hollywood, Florida. 2015. **Best Paper Award**.
- Xiannian Fan, Brandon Malone, Changhe Yuan. Learning Optimal Bayesian Network Structures with Constraints Learned from Data. In *Proceedings of the 30th Conference on Uncertainty in Artificial Intelligence (UAI-14)*. Pages 200-209. Quebec City, Quebec, Canada. 2014. (Acceptance rate: **32%**)
- Xiannian Fan, Changhe Yuan, Brandon Malone. Tightening Bounds for Bayesian Network Structure Learning. In *Proceedings of the 28th AAAI Conference on Artificial Intelligence (AAAI-14)*. Pages 2439-2445. Quebec City, Quebec. 2014. (Acceptance rate: **28%**)
- Ruilin Liu, Wendy Hui Wang, Changhe Yuan. Result Integrity Verification of Outsourced Bayesian Network Structure Learning. In *Proceedings of the 2014 SIAM International Conference on Data Mining (SDM-14)*. Pages 713-721. April 24 - 26, 2014, Philadelphia, Pennsylvania, USA.

- Brandon Malone, Changhe Yuan. Evaluating Anytime Algorithms for Learning Optimal Bayesian Networks. In *Proceedings of the 29th Conference on Uncertainty in Artificial Intelligence (UAI-13)*. Pages 381-390. Seattle, Washington. 2013. (Acceptance rate: **31%**)
- Arindam Khaled, Changhe Yuan, Eric Hansen. Solving Limited Memory Influence Diagrams Using Branch-and-Bound Search. In *Proceedings of the 29th Conference on Uncertainty in Artificial Intelligence (UAI-13)*. Pages 331-340. Seattle, Washington. 2013. (Acceptance rate: **31%**)
- Changhe Yuan, Brandon Maone. An Improved Admissible Heuristic for Learning Optimal Bayesian Networks. In *Proceedings of the 28th Conference on Uncertainty in Artificial Intelligence (UAI-12)*. Pages 924-933. Catalina Island, CA. 2012. (Acceptance rate: **31%**)
- Brandon Malone, Changhe Yuan. A Parallel, Anytime, Bounded Error Algorithm for Exact Bayesian Network Structure Learning. In *Proceedings of the Sixth International Conference on Probabilistic Graphical Models (PGM-12)*. Pages 235-242. Granada, Spain. 2012.
- Arindam Khaled, Changhe Yuan, Eric Hansen. Solving Limited Memory Influence Diagrams Using Branch-and-Bound Search. In *Proceedings of the International Symposium on Artificial Intelligence and Mathematics (ISAIM-12)*. 2012.
- Changhe Yuan, Brandon Malone and Xiaojian Wu. Learning Optimal Bayesian Networks Using A* Search. In *Proceedings of the 22nd International Joint Conference on Artificial Intelligence (IJCAI-11)*. Pages 2186--2191. Barcelona, Catalonia, Spain, July 2011. (Acceptance rate: **17%**)
- Brandon Malone, Changhe Yuan, Eric Hansen and Susan Bridges. "Memory-Efficient Dynamic Programming for Learning Optimal Bayesian Networks," In *Proceedings of the 25th AAAI Conference on Artificial Intelligence (AAAI-11)*. Pages 1057-1062. San Francisco, CA. August 2011. (Acceptance rate: **25%**)
- Brandon Malone, Changhe Yuan, Eric Hansen and Susan Bridges. Improving the Scalability of Optimal Bayesian Network Learning with Frontier Breadth-First Branch and Bound Search. In *Proceedings of the 27th Conference on Uncertainty in Artificial Intelligence (UAI-11)*. Pages 479-488. Barcelona, Catalonia, Spain, July 2011. (Acceptance rate: **34%**)
- Changhe Yuan, Xiaojian Wu, Eric Hansen. Solving Multistage Influence Diagrams using Branch-and-Bound Search. In *Proceedings of the 26th Conference on Uncertainty in Artificial Intelligence (UAI-10)*. Pages 631-638. July 8-11, 2010. Catalina Island, CA. (Acceptance rate: **33%**)
- Heejin Lim, Changhe Yuan, Eric Hansen. Scaling Up MAP Search in Bayesian Networks Using External Memory. In *Proceedings of the Fifth International Conference on Probabilistic Graphical Models (PGM-10)*. Pages 177-184. September 13-15, 2010. Helsinki, Finland.
- Changhe Yuan, Xiaojian Wu. Solving influence diagrams using heuristic search. In *Proceedings of the Eleventh International Symposium on Artificial Intelligence and Mathematics (ISAIM-10)*. January 6-8, 2010. Ft Lauderdale, FL.
- Heejin Lim, Changhe Yuan. Computational complexity and approximation methods of most relevant explanation. In *Proceedings of the Eleventh International Symposium on Artificial Intelligence and Mathematics (ISAIM-10)*. January 6-8, 2010. Ft Lauderdale, FL.
- Changhe Yuan, Xiaolu Liu, Tsai-Ching Lu, Heejin Lim, Most Relevant Explanation: Properties, Algorithms, and Evaluations. In *Proceedings of the 25th Conference on Uncertainty in Artificial Intelligence (UAI-09)*. Pages 631-638. June 18-21, 2009. Montreal, Canada. (Acceptance rate: **31%**)
- Changhe Yuan, Eric Hansen. Efficient Computation of Jointree Bounds for Systematic MAP Search. In *Proceedings of the Twenty-First International Joint Conference on Artificial Intelligence (IJCAI-09)*. Pages 1982--1989. Pasadena, CA. 2009. (Acceptance rate: **25%**)

- Changhe Yuan, Tsai-Ching Lu. A General Framework for Generating Multivariate Explanations in Bayesian Networks. In *Proceedings of the Twenty-Third National Conference on Artificial Intelligence* (AAAI-08). Pages 1119-1124. Chicago, IL. 2008. (Acceptance rate: **24%**)
- Nan Wang, Changhe Yuan, Bindu Nanduri, Susan Bridges. Generating Robust Gene Interaction Networks using Bayesian Methods. In *Proceedings of the International Conference on Bioinformatics & Computational Biology* (BIOCOMP-08). Pages 838-843. Las Vegas, NV. 2008.
- Changhe Yuan, Marek J. Druzdzal. Evidence Pre-propagated Importance Sampling Algorithm for General Hybrid Bayesian Networks. In *Proceedings of the Twenty-second National Conference on Artificial Intelligence* (AAAI-07). Pages 1296-1302. Vancouver, BC, Canada. 2007. (Acceptance rate: **27.5%**)
- Xiaoxun Sun, Marek J. Druzdzal, Changhe Yuan. Dynamic Weighting A* Search-Based MAP Algorithm for Bayesian Networks. In *Proceedings of the International Joint Conference on Artificial Intelligence* (IJCAI-07). Pages 2385-2390. 2007. (Acceptance rate: **15.7%**)
- Changhe Yuan, Marek J. Druzdzal. Importance Sampling for General Hybrid Bayesian Networks. In *Proceedings of the 11th International Conference on Artificial Intelligence and Statistics* (AISTAT-07). Pages 332--343. San Juan, Puerto Rico. 2007. (Acceptance rate: **50%**)
- Changhe Yuan, and Tsai-Ching Lu. Finding Explanations in Bayesian Networks. In *Proceedings of the 18th International Workshop on Principles of Diagnosis* (DX-07). Pages 414-419. June 2007.
- Changhe Yuan, Marek J. Druzdzal. Improving Importance Sampling by Adaptive Split-Rejection Control in Bayesian Networks. In *Proceedings of the Twentieth Canadian Conference on Artificial Intelligence* (CAI-07). Pages 332-343. 2007. (Acceptance rate: **17%**)
- Changhe Yuan, Marek J. Druzdzal. Hybrid Loopy Belief Propagation. In *Proceedings of the Third International Conference on Probabilistic Graphical Models* (PGM-06), pages 317-324, Milan Studeny and Jiri Vomlel (eds.), Prague: Action M Agency, 2006.
- Xiaoxun Sun, Marek J. Druzdzal, Changhe Yuan. Dynamic Weighting A* Search-Based MAP Algorithm for Bayesian Networks. In *Proceedings of the Third International Conference on Probabilistic Graphical Models* (PGM-06), pages 279-286, Milan Studeny and Jiri Vomlel (eds.), Prague: Action M Agency, 2006.
- Changhe Yuan, Marek J. Druzdzal. Importance Sampling in Bayesian Networks: An Influence-Based Approximation Strategy for Importance Functions. In *Proceedings of the 21st Annual Conference on Uncertainty in Artificial Intelligence* (UAI-05). Pages 650-657. July 2005. (Acceptance rate: **34%**)
- Changhe Yuan, Marek J. Druzdzal. How Heavy Should the Tails Be? In *Proceedings of the 18th International Florida Artificial Intelligence Research Society Conference* (FLAIRS-05). Pages 799-805. May 2005. (Acceptance rate: **53%**)
- Changhe Yuan, Marek J. Druzdzal. A Comparison on the Effectiveness of Two Heuristics for Importance Sampling. In Peter Lucas (Ed.): *Proceedings of the Second International Conference on Probabilistic Graphical Models* (PGM-04). Pages 225-232. Leiden, October 2004.
- Changhe Yuan, Tsai-Ching Lu, Marek J. Druzdzal. Annealed MAP. In *Proceedings of the 20th Annual Conference on Uncertainty in Artificial Intelligence* (UAI-04). Pages 628-635. July 2004. (Acceptance rate: **10.4%**)
- Changhe Yuan, Marek J. Druzdzal. An Importance Sampling Algorithm Based on Evidence Pre-propagation. In *Proceedings of the 19th Annual Conference on Uncertainty in Artificial Intelligence* (UAI-03). Pages 624-631. August 2003. (Acceptance rate: **23%**)

Other peer reviewed conferences, workshops, symposia, patents and book chapters:

- Changhe Yuan, Feng Cheng, Henry Dao, Markus Ettl, Grace Lin, Karthik Sourirajan. A Bayesian Framework for Supply Chain Risk Management Using Business Process Standards. In the *Handbook of Inte-*

- grated Risk Management in Global Supply Chains* (eds P. Kouvelis, L. Dong, O. Boyabatli and R. Li). Pages 537-564. 2012. John Wiley & Sons, Inc., Hoboken, NJ, USA.
- Changhe Yuan, Brandon Malone. An Improved Admissible Heuristic for Learning Optimal Bayesian Networks. *New England Machine Learning Day* (NEML-12). Microsoft Research New England. May 16, 2012.
 - Feng Cheng, Henry H. Dao, Markus Ettl, Mary E. Helander, Jayant Kalagnanam, Karthik Sourirajan, Changhe Yuan, Method and System for Business Process Oriented Risk Identification and Qualification. *United States Patent* 20110178948. 2011.
 - Brandon Malone, Changhe Yuan, Eric Hansen and Susan Bridges, "Using Optimal Bayesian Networks to Decipher the Histone Code," *Mississippi EPSCoR Meeting*, Jackson, Mississippi, April 2011.
 - Brandon Malone, Changhe Yuan, Eric Hansen and Susan Bridges, "Cracking the Histone Code with Exact Bayesian Networks," *MidSouth Computational Biology and Bioinformatics Society*, College Station, Texas, April 2011.
 - Brandon Malone, Changhe Yuan, and Susan Bridges, "Using Equivalence Classes of Bayesian Networks to Crack the Histone Code," *Mississippi EPSCoR Meeting*, Jackson, Mississippi, September 2010.
 - Xiaojian Wu, Changhe Yuan. Learning optimal Bayesian networks using heuristic search. *The Fifth Machine Learning Symposium*. New York, NY. October 22, 2010.
 - Changhe Yuan. Some Properties of Most Relevant Explanation. In *Proceedings of the Twenty-First International Joint Conference on Artificial Intelligence ExaCt Workshop* (ExaCt-09), Pasadena, CA. Pages 118--126. 2009.
 - Changhe Yuan, Eric Hansen. MAP Search in Bayesian Networks Using Joint Bounds. In *Proceedings of the AAAI-08 workshop on Search for Artificial Intelligence and Robotics*. Pages 140-146. Chicago, IL. 2008.
 - Bindu Nanduri, Changhe Yuan, Nan Wang, Susan Bridges, Mark Lawrence, and Shane Burgess. From the genome sequence to systems analysis; a fowl cholera pathogen example. *International Avian genomics conference and Gene Ontology annotation workshop*. May 19-22, 2008. Mississippi State University, Starkville, MS.
 - Kui Xie, Changhe Yuan. iDiscuss: An Intelligent Online Discussion System Based on Bayesian Motivation Modeling. *The IADIS Intelligent Systems and Agents 2008 Conference* (ISA-08). 22 - 24 July 2008. Amsterdam, the Netherlands.
 - He Yan, Changhe Yuan, Bindu Nanduri. Systems biology modeling of 'OMICS' datasets from non-model species. *The Fifth Annual Conference of the MidSouth Computational Biology and Bioinformatics Society* (MCBIOS). February 23-24, 2008. Oklahoma City, Oklahoma.
 - Kui Xie, Changhe Yuan. Using Artificial Intelligence to Promote Students' Motivation in Asynchronous Online Discussion. *Association for Educational Communications and Technology International Convention* (AECT-07). October 22-26, 2007. Anaheim, CA.

Theses:

- Changhe Yuan. Importance Sampling for Bayesian Networks: Principles, Algorithms, and Performance. *Ph.D. Dissertation*, Intelligent Systems Program, University of Pittsburgh, 2006.
- Changhe Yuan. EPIS-BN: An Importance Sampling Algorithm Based on Evidence Pre-propagation. *M.S. Thesis*. Intelligent Systems, University of Pittsburgh, 2003.
- Changhe Yuan. Research and Development of Rough Set Theory-based Data Mining Technology. *M.S. Thesis*. Computer Science, Tongji University, 2001.

SOFTWARE DEVELOPMENT (C++):

- **URLearning** (You Are Learning): A C++ software package that implements a suite of state of the art search algorithms developed by the URL Lab for learning optimal structures of causal Bayesian networks. Software can be downloaded at <http://www.urllearning.org>.
 - **MRE** (Most Relevant Explanation): exact and approximate algorithms for solving MRE, a new inference task in Bayesian networks that finds the most relevant partial instantiation of target variables as the explanation for given evidence. Software can be downloaded at <http://url.cs.qc.edu/software.html>.
 - **LIMID** (Limited Memory Influence Diagrams): algorithms for solving limited memory influence diagrams, which are general decision theoretical models that relax the regular and no-forgetting assumptions of influence diagrams. Software can be downloaded at <http://url.cs.qc.edu/software.html>.
 - **SMILE**[®] (Structural Modeling, Inference, and Learning Engine): A fully portable library of C++ classes implementing graphical decision-theoretic methods, such as Bayesian networks and influence diagrams, directly amenable to inclusion in intelligent systems; I was responsible for the development of the following inference algorithms: EPIS sampling, Annealed MAP, Hybrid LW, Hybrid EPIS and Hybrid LBP. Software can be downloaded at <https://www.bayesfusion.com/>.
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PROFESSIONAL SERVICE:**Grant panelists:**

- National Science Foundation, 2009, 2010 (twice), 2017

Conference organizing committees:

- Local arrangement chair, Annual Conference on Uncertainty in Artificial Intelligence (UAI-2016)
- Local arrangement collocated events chair, International Joint Conference on Artificial Intelligence (IJCAI-2016)
- Publicity chair, Annual Conference on Uncertainty in Artificial Intelligence (UAI-2014)

Area chair:

- International Conference on Tools with Artificial Intelligence (ICTAI-16), 2016

Session chair:

- Annual Conference on Uncertainty in Artificial Intelligence (UAI), 2014, 2015
- AAAI Conference on Artificial Intelligence (AAAI), 2013
- International Symposium on Artificial Intelligence and Mathematics (ISAIM), 2010
- International Joint Conference on Artificial Intelligence (IJCAI), 2009
- Canadian Conference on Artificial Intelligence (CAI), 2007

Conference senior program committees:

- International Joint Conference on Artificial Intelligence (IJCAI), 2016
- AAAI Conference on Artificial Intelligence (AAAI), 2016

Conference program committees:

- Annual Conference on Uncertainty in Artificial Intelligence (UAI), 2009, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018
- International Conference on Machine Learning (ICML), 2017, 2018
- International Joint Conference on Artificial Intelligence (IJCAI), 2009, 2011, 2013, 2018
- AAAI Conference on Artificial Intelligence (AAAI), 2010, 2013, 2014, 2015, 2016, 2018
- Annual Conference on Neural Information Processing Systems (NIPS), 2016, 2017, 2018
- Artificial Intelligence and Statistics Conference (AISTATS), 2017, 2018

- International Conference on Learning Representation (ICLR), 2018
- International Conference on Probabilistic Graphical Models (PGM), 2018
- International Joint Conference on Artificial Intelligence-Machine learning track (IJCAI-ML), 2015
- AAAI Late Breaking Papers Track (AAAI-LBP), 2013
- AAAI Conference on Artificial Intelligence Nectar Track (AAAI-Nectar), 2008
- Biennial European Conference on Artificial Intelligence (ECAI), 2016
- International Florida Artificial Intelligence Research Society Conference (FLAIRS), 2008-2014, 2015, 2016
- International Workshop on Advanced Methodologies for Bayesian Networks (AMBN), 2010, 2015, 2017
- International Conference on Bioinformatics & Computational Biology (BIOCOMP), 2008, 2009
- International Workshop on Distance Education Technologies (DET), 2007

Journal reviews:

- Journal of Artificial Intelligence Research (JAIR), 2007, 2008, 2013, 2016, 2018
- Artificial Intelligence Journal (AIJ), 2009, 2010, 2011, 2012, 2013, 2014 (twice), 2016, 2017, 2018
- Statistics and Computing, 2018
- International Journal of Approximate Reasoning (IJA), 2007, 2009, 2010, 2011, 2012, 2014 (twice), 2015, 2017 (twice), 2018
- Behaviormetrika 2018
- IEEE Transaction on Big Data, 2017
- Journal of Parallel and Distributed Computing (JPDC), 2017
- International Journal of Intelligent Systems, 2014
- Biostatistics, 2014
- IEEE Transactions on Systems, Man, and Cybernetics, Part B, 2013 (twice)
- International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems (IJUFKS), 2011
- Decision Support Systems (DSS), 2011
- Annals of Mathematics and Artificial Intelligence (AMAI), 2010
- Pattern Recognition Letters (PR), 2009
- Neural Processing Letters (NP), 2009
- Journal of Information Science (JIS), 2008
- Journal of Classification (JoC), 2007, 2008

Conference reviews:

- International Joint Conference on Artificial Intelligence (IJCAI), 2003, 2007, 2017
- Annual Conference on Uncertainty in Artificial Intelligence (UAI), 2003-2007, 2010
- National Conference on Artificial Intelligence (AAAI), 2007
- International Florida Artificial Intelligence Research Society Conference (FLAIRS), 2004, 2005
- AAMAS workshop on Sequential decision making in uncertain multi-agent domains, 2008
- European Workshop on Probabilistic Graphical Models (PGM), 2004, 2006

Service to universities, colleges and departments:

- Faculty membership committee, Graduate Center, 2015-Current
- Election committee, Graduate Center, 2014-Current
- Executive committee of Center for Computational Infrastructure for the Sciences, Queens College, 2013-Current
- Faculty search committee – Data Science, Queens College, 2014-2016
- Graduate curriculum committee, Queens College, 2012-2014
- Volunteer judge for the Long Island Science & Engineering Fair, 2014

- Faculty Search Committee, Mississippi State University, 2011 - 2012
 - Strategic Planning Committee, Mississippi State University, 2010 – 2012
 - Computer Science Undergraduate Studies Committee, Mississippi State University, 2010 - 2011
 - Ad-hoc committee on outstanding female graduate student scholarship, Mississippi State University, 2010
 - Research Initiation Program (RIP) reviewing committee, Mississippi State University, 2010
 - Software engineering Undergraduate Studies committee, Mississippi State University, 2009 - 2010
 - Scholarships and Fellowships Committee, Mississippi State University, 2008 - 2010
 - Graduate qualify examination committee, Mississippi State University, 2007 - 2010
 - Graduate admission committee, Mississippi State University, 2007 - 2008
 - Facilities committee, Mississippi State University, 2006 – 2007, 2009-2010
 - Member of ad hoc committee on emphasis areas, Mississippi State University, 2007
 - Fellow of Institute of Digital Biology, Mississippi State University, 2007 - 2012
 - Member of Center for Computational Sciences, Mississippi State University, 2007 - 2012
 - Member of Center for Computer Security Research, Mississippi State University, 2006 - 2012
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TEACHING EXPERIENCE:

City University of New York, New York, NY

- Artificial Intelligence, Fall 2017 (Queens College)
- Artificial Intelligence, Fall 2017 (Graduate Center)
- Design and Analysis of Algorithms, Fall 2017 (Queens College)
- Machine Learning in Quantitative Finance, Spring 2017 (Queens College)
- Design and Analysis of Algorithms, Spring 2017 (Queens College)
- Machine Learning, Fall 2016 (Queens College)
- Artificial Intelligence, Spring 2016 (Queens College)
- Artificial Intelligence, Spring 2016 (Graduate Center)
- Machine Learning in Quantitative Finance, Winter 2016 (Queens College)
- Artificial Intelligence, Fall 2015 (Queens College)
- Machine Learning in Quantitative Finance, Spring 2015 (Queens College)
- Machine Learning in Quantitative Finance, Spring 2015 (Graduate Center)
- Artificial Intelligence, Fall 2014 (Queens College)
- Machine Learning, Spring 2014 (Queens College)
- Artificial Intelligence, Fall 2013 (Queens College)
- Graphical Models, Spring 2013 (Queens College)
- Graphical Models, Spring 2013 (Graduate Center)
- Machine Learning, Fall 2012 (Queens College)

Mississippi State University, Mississippi State, MS

- Graphical Models, Spring 2012
- Introduction to Analysis of Algorithms, Spring 2012
- Artificial Intelligence, Fall 2011
- Topics in Artificial Intelligence: Probabilistic Methods, Spring 2011
- Introduction to Analysis of Algorithms, Spring 2011
- Artificial Intelligence, Fall 2010
- Advanced Artificial Intelligence, Spring 2010
- Discrete Structures, Spring 2010
- Artificial Intelligence, Fall 2009

- Probabilistic Methods in Artificial Intelligence, Spring 2009
 - Undergraduate Directed Individual Study, Spring 2009
 - Artificial Intelligence, Fall 2008
 - Graduate Directed Individual Study, Summer 2008
 - Introduction to Analysis of Algorithms, Spring 2008
 - Artificial Intelligence, Fall 2007
 - Topics in Artificial Intelligence: Probabilistic Graphical Models, Spring 2007
 - Discrete Structures, Fall 2006
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MENTORING ACTIVITIES:

Doctorates supervised:

- Xiannian Fan (CUNY CS Ph.D. student, Major advisor), Scaling Up Bayesian Network Learning, Spring 2016.
- Arindam Khaled (MSU CS Ph.D. student, Dissertation advisor), Solving Influence Diagrams Using Branch and Bound Search, Fall 2015.
- Brandon Malone (MSU CSE Ph.D. student, Major advisor), Learning Optimal Bayesian Networks with Heuristic Search, Spring 2012.

Postdoc supervised:

- Xiaoyuan Zhu (QC CS Postdoc associate), Exact Algorithms for Solving Most Relevant Explanations, 2015

M.Sc. and undergraduate theses supervised:

- Erjon Skenderi (CUNY QC CS M.Sc. student), Twitter Sentiment Analysis to Predict EUR/USD Index Price Movement. M.Sc. thesis. Fall 2017.
- Yigal Saperstein (CUNY QC CS undergraduate student), Sentiment Analysis of Social Media using Naïve Bayes. B.S. thesis. Fall 2017.
- Jason Farkas (CUNY QC CS undergraduate student), A Study of Chunking and Indexable Data Structures. B.S. thesis. Spring 2017.
- Haijun Su (CUNY QC CS M.Sc. student), A Comparative Study of Performance of Gobnilp and Astar Algorithms for Learning Bayesian Networks. M.Sc. thesis. Spring 2015.
- Marina Tanasyuk (CUNY QC CS M.Sc. student), Application of Bayesian Network to Pairs Trading. M.Sc. thesis. Spring 2015.
- Liming Luo (CUNY QC CS M.Sc. student), Multithreading Implementation for BFBnB in URLearning Software. M.Sc. thesis. Spring 2015.
- Justin Murray (CUNY QC CS M.Sc. student), Apache Spark Perspective on Learning Optimal Bayesian Network Structures using External Memory Frontier Breadth First Branch and Bound Search. M.Sc. thesis. Spring 2015.
- Jianglin Wu (CUNY QC CS undergraduate student), A Weka tool for Learning Bayesian Networks. B.S. thesis. Summer 2013.
- Zhifa Liu (MSU CSE MS student, Major advisor), Empirical Evaluation of Scoring Functions for Bayesian Network Model Selection, M.Sc. thesis, April 2012.
- Xiaojian Wu (MSU CSE MS student, now at UMass Amherst), A Heuristic Search Algorithm for Learning Optimal Bayesian Networks, M.Sc. thesis, 2010.
- Heejin Lim (MSU CSE undergraduate student), Local Search Methods for Solving Most Relevant Explanation, B.S. thesis, 2010

Ph.D. dissertation committees:

- Min Ma (CUNY CS Ph.D. student, Major advisor: Michael Mandel), Adaptation and Augmentation: Towards Better Rescoring Strategies For Automatic Speech Recognition And Spoken Term Detection. 2018.
- Cheuk Man Chan (CUNY CS Ph.D. student, Major advisor: Robert Haralick), Flow Theory in Game Design. 2018.
- Suhua Wei (CUNY Earth Environmental Sciences Ph.D. student, Major advisor: Chuixiang Yi), The terrestrial net ecosystem carbon exchange (NEE) model. 2016.
- Zimi Li (CUNY CS Ph.D. student, Major advisor: Simon Parsons), Formal Argumentation Schemes. 2016.
- Hua Liu (HKUST CSE Ph.D. student, Major advisor: Nevin Zhang), Unidimensional clustering using latent tree models. 2015.
- Srishti Srivastava (MSU CSE Ph.D. student, Major advisor: Ioana Banicescu), Evaluating the Robustness of Resource Allocations Obtained via Performance Modeling with Stochastic Process Algebra, 2014.
- Yongjie Cai (CUNY Graduate Center CS Ph.D. student, Major advisor: Ping Ji), Network Monitoring And Data Analysis In Wireless Networks, expected 2015.
- Ranjit Kumar (MSU Vet Med Sci Ph.D. student, Principal supervisor: Baidu Nanduri), Development of Computational Tools and Resources for Systems Biology of Bacterial Pathogens, 2011.
- Hohyun Lee (MSU ISE Ph.D. student, Minor advisor. Principal supervisor: Lesley Strawderman), Pedestrian Dynamics: Modeling and Analyzing Cognitive Processes and Traffic Flows to Evaluate Facility Service Level, December 2011.
- Nan Wang (MSU CSE Ph.D. student, Major advisor: Susan Bridges), Novel Algorithms for Structural Annotation of Prokaryote Genomes, 2009.

Preliminary examination committees:

- Thomas Flynn (CUNY CS Ph.D. student, Major advisor: Felisa Vasquez-Abad), 2017
- Dezhong Deng (CUNY CS Ph.D. student, Major advisor: Liang Huang), 2015
- Mingbo Ma (CUNY CS Ph.D. student, Major advisor: Liang Huang), 2015
- James Cross (CUNY CS Ph.D. student, Major advisor: Liang Huang), 2015
- Kai Zhao (CUNY CS Ph.D. student, Major advisor: Liang Huang), 2015
- Guozhen An (CUNY CS Ph.D. student, Major advisor: Andrew Rosenberg), 2015
- Ligon Liu (CUNY CS Ph.D. student, Major advisor: Robert Haralick), 2015
- Zimi Li (CUNY CS Ph.D. student, Major advisor: Simon Parsons), 2013
- Cheuk Man Chan (CUNY CS Ph.D. student, Major advisor: Robert Haralick), 2013
- Ranjit Kumar (MSU MedSci Ph.D. student, Major advisor: Bindu Nanduri), 2010
- Hohyun Lee (MSU ISE Ph.D. student, Major advisor: Lesley Strawderman), 2009
- Nan Wang (MSU CSE Ph.D. student, Major advisor: Susan Bridges), 2008
- Peter Lamborn (MSU CSE Ph.D. student, Major advisor: Eric Hansen), 2007

M.Sc. oral examination committees:

- Dilip Gautum (MSU CSE Ph.D. student, Major advisor: Andy Perkins), 2011
- Dae Glendowe (MSU CSE MS student, Major advisor: David Dampier), 2011
- Blake Wall (MSU CSE MS student, Major advisor: David Dampier), 2010

Current advisees:

- Ni Lu Yen, (CUNY CS Ph.D. student, Major advisor), “Scalable Bayesian Networks Learning for Causal Discovery”
- Cong Chen (CUNY CS Ph.D. student, Major advisor), “Efficient Methods for Multiple Diverse Predictions”

- Cuiyuan Wang (CUNY CS Ph.D. student, Major advisor), “Most Relevant Multi-Label Prediction”
 - Jiaqi Yang (CUNY CS Ph.D. student, Major advisor), TBD
-

PROFESSIONAL TALKS:

- *Advanced Heuristic Search Methods for Learning Optimal Bayesian Network Structures*. Keynote Speaker, Advanced Methods for Bayesian Networks (AMBN-2015). Tokyo, Japan. 2015.
- *Methods and Algorithms for Learning and Reasoning with Uncertainty*. Computer Science Program, CUNY Graduate Center, New York, NY. 2015.
- *Advances in Learning Optimal Bayesian Networks Using Admissible Heuristic Search*. Computer Science Program, CUNY Graduate Center, New York, NY. Nov. 20, 2014.
- *Learning Optimal Bayesian Networks: Novel Formulations and Efficient Algorithms*. Department of Electrical Engineering, Rensselaer Polytechnic Institute, Troy, NY. Nov. 7, 2012
- *Methods and Algorithms for Learning and Reasoning with Uncertainty*. Department of Computer Science, CUNY Graduate Center, New York, NY. Sep. 13, 2012.
- *Learning Optimal Bayesian Networks: Novel Formulations and Efficient Algorithms*. Department of Computer Science, CUNY Queens College, Flushing, NY. Apr. 9, 2012.
- *Bayesian Networks: Inference, Learning, and Application*. Department of Computer Science and Engineering, Mississippi State University, Mississippi State, Mississippi. Oct 7, 2011.
- *Bayesian Networks: Inference, Learning, and Applications*. Department of Computer Science, University of Massachusetts, Lowell. April 12, 2011.
- *Solving Influence Diagrams Using Heuristic Search*. Department of Computer Science and Engineering, Mississippi State University, Mississippi State, Mississippi. Oct 21, 2009.
- *Most Relevant Explanation in Bayesian Networks*. Department of Computer Science, University of Mississippi, Oxford, Mississippi. March 24, 2009.
- *Most Relevant Explanation in Bayesian Networks*. Department of Computer Science and Engineering, Mississippi State University, Mississippi State, Mississippi. March 4, 2009.
- *Bayesian Modeling and Reasoning for Risk Management*. IBM Beijing Research Lab. Beijing, China. December 17, 2008.
- *Reasoning and Explanation in Bayesian Networks*. Chinese Academy of Science. Beijing, China. December 16, 2008.
- *A General Framework for Generating Explanations in Bayesian Networks*. Intelligent Systems Program, University of Pittsburgh, Pittsburgh, Pennsylvania. October 3, 2008.
- *Graphical Modeling Techniques for Computational Biology*. Institute of Digital Biology, Mississippi State University, Mississippi State, Mississippi. November 14, 2007.
- *Finding Explanations in Bayesian Networks*. Department of Computer Science and Engineering, Mississippi State University, Mississippi State, Mississippi. October 17, 2007.
- *Making Inference in Bayesian Networks Feasible*. Center for Computational Learning Systems, Columbia University, New York. April 20, 2006.
- *Making Inference in Bayesian Networks Feasible*. Department of Computer Science and Engineering, Mississippi State University, Mississippi State, Mississippi. April 5, 2006.
- *Making Inference in Bayesian Networks Feasible*. Department of Computer Science and Lewis-Sigler Institute for Integrative Genomics, Princeton University, Princeton, New Jersey. March 22, 2006.
- *Hybrid Bayesian Networks: Representation and Reasoning*. Intelligent Systems Program, University of Pittsburgh, Pittsburgh, Pennsylvania, November 18, 2005.
- *Importance Sampling Algorithms for Bayesian Networks: Principles, Algorithms, and Performance*. Intel-

ligent Systems Program, University of Pittsburgh, Pittsburgh, Pennsylvania, November 5, 2004.

- *EPIS-BN: An Importance Sampling Algorithm Based on Evidence Pre-propagation*. Intelligent Systems Program, University of Pittsburgh, Pittsburgh, Pennsylvania, September 5, 2003.
- *Parsing Bibliography Citations by Using Probabilistic Multi-agent System*. Xerox Palo Alto Research Center, Palo Alto, California, June 29, 2003.