

# CURRICULUM VITAE

**Date:** August 30, 2016.

**Name:** Vibhav Gogate

**School:** Erik Jonsson School of Engineering and Computer Science, University of Texas at Dallas

**Department:** Computer Science

## Educational History

1. Ph.D. in Information and Computer Science, June 2009.  
University of California, Irvine, CA 92697, USA.  
**Thesis:** Sampling Algorithms for Probabilistic Graphical Models with Determinism  
**Thesis Advisor:** Rina Dechter
2. M.S. in Computer Science, September 2002.  
University of Maine, Orono, ME 04469, USA.
3. B.S. in Computer Engineering, June 1999.  
University of Mumbai, Maharashtra, India. First Class.

## Employment History

- Assistant Professor, University of Texas, Dallas (September 2011-present)
- Post Doctoral Research Associate, University of Washington, Seattle (August 2009 to August 2011)

## Professional Recognition and Honors

- Outstanding Teacher Award, Erik Jonsson School of Engineering and Computer Science, University of Texas at Dallas, 2016.
- Winner of the PASCAL/UAI Probabilistic Inference Challenge, 2012 (won six out of six categories participated. Total categories: nine.).
- Winner of the UAI Approximate Inference Challenge, 2010 (won four out of six categories participated. Total categories: nine.).
- Thesis nominated by University of California, Irvine for the ACM Doctoral Dissertation award, 2009.
- Joseph Fischer Memorial Fellowship Award for Outstanding Academic Achievement in Computer Science at University of California, Irvine, 2004.
- Graduate Fellowship, University of California, Irvine, 2002-2003.

## Publications

### Journal Papers

1. V. Gogate and P. Domingos. Probabilistic theorem proving. *Communications of the ACM*, 59(7):107–115, 2016.
2. V. Gogate and R. Dechter. Importance sampling-based estimation over AND/OR search spaces for graphical models. *Artificial Intelligence*, 184-185:38–77, 2012.
3. V. Gogate and R. Dechter. SampleSearch: Importance sampling in presence of determinism. *Artificial Intelligence*, 175(2):694–729, 2011.
4. V. Gogate and R. Dechter. Sampling-based lower bounds for counting queries. *Intelligenza Artificiale*, 5(2):171–188, 2011.
5. R. Mateescu, K. Kask, V. Gogate, and R. Dechter. Iterative Join Graph Propagation algorithms. *Journal of Artificial Intelligence Research*, 37:279–328, 2010.

### Highly Refereed Conference Papers

1. T. Rahman and V. Gogate. Merging strategies for sum-product networks: From trees to graphs. In *Proceedings of the Thirty-Second Conference Conference on Uncertainty in Artificial Intelligence*, pages 617–626, 2016.
2. R. de Salvo Braz, C. O’Reilly, V. Gogate, and R. Dechter. Probabilistic inference modulo theories. In *Proceedings of the Twenty-Fifth International Joint Conference on Artificial Intelligence*, pages 3591–3599, 2016.
3. T. Rahman and V. Gogate. Learning ensembles of cutset networks. In *AAAI conference on Artificial Intelligence*, pages 3301–3307, 2016.
4. S. Sarkhel, D. Venugopal, T. A. Pham, P. Singla, and V. Gogate. Scalable training of markov logic networks using approximate counting. In *AAAI conference on Artificial Intelligence*, pages 1067–1073, 2016.
5. L. Chou, S. Sarkhel, N. Ruoizzi, and V. Gogate. On parameter tying by quantization. In *AAAI conference on Artificial Intelligence*, pages 3241–3247, 2016.
6. D. Smith and V. Gogate. Bounding the cost of search-based lifted inference. In C. Cortes, N.D. Lawrence, D.D. Lee, M. Sugiyama, and R. Garnett, editors, *Advances in Neural Information Processing Systems 28*, pages 946–954. Curran Associates, Inc., 2015.
7. S. Sarkhel, P. Singla, and V. Gogate. Fast lifted map inference via partitioning. In C. Cortes, N.D. Lawrence, D.D. Lee, M. Sugiyama, and R. Garnett, editors, *Advances in Neural Information Processing Systems 28*, pages 3222–3230. Curran Associates, Inc., 2015.
8. H. Mittal, A. Mahajan, V. Gogate, and P. Singla. Lifted inference rules with constraints. In C. Cortes, N.D. Lawrence, D.D. Lee, M. Sugiyama, and R. Garnett, editors, *Advances in Neural Information Processing Systems 28*, pages 3501–3509. Curran Associates, Inc., 2015.

9. D. Venugopal, S. Sarkhel, and V. Gogate. Just count the satisfied groundings: Scalable local-search and sampling based inference in mlms. In *AAAI conference on Artificial Intelligence*, pages 3606–3612, 2015.
10. D. Venugopal, C. Chen, V. Gogate, and V. Ng. Relieving the computational bottleneck: Joint inference for event extraction with high-dimensional features. In *Proceedings of the 2014 Conference on Empirical Methods in Natural Language Processing, EMNLP*, pages 831–843, 2014.
11. S. Sarkhel, D. Venugopal, P. Singla, and V. Gogate. An integer polynomial programming based framework for lifted MAP inference. In *Advances in Neural Information Processing Systems 27: Annual Conference on Neural Information Processing Systems 2014*, pages 3302–3310, 2014.
12. H. Mittal, P. Goyal, V. Gogate, and P. Singla. New rules for domain independent lifted MAP inference. In *Advances in Neural Information Processing Systems 27: Annual Conference on Neural Information Processing Systems 2014*, pages 649–657, 2014.
13. D. Venugopal and V. Gogate. Scaling-up importance sampling for markov logic networks. In *Advances in Neural Information Processing Systems 27: Annual Conference on Neural Information Processing Systems 2014*, pages 2978–2986, 2014.
14. D. Venugopal and V. Gogate. Evidence-based clustering for scalable inference in markov logic. In *Machine Learning and Knowledge Discovery in Databases - European Conference, ECML PKDD 2014, Nancy, France, September 15-19, 2014. Proceedings, Part III*, pages 258–273, 2014.
15. T. Rahman, P. Kothalkar, and V. Gogate. Cutset networks: A simple, tractable, and scalable approach for improving the accuracy of chow-liu trees. In *Machine Learning and Knowledge Discovery in Databases - European Conference, ECML PKDD 2014, Nancy, France, September 15-19, 2014. Proceedings, Part II*, pages 630–645, 2014.
16. D. Smith and V. Gogate. Loopy Belief Propagation in Presence of Determinism. In *Proceedings of the Seventeenth International Conference on Artificial Intelligence and Statistics*, pages 895–903, 2014.
17. S. Sarkhel, V. Venugopal, P. Singla, and V. Gogate. Lifted MAP Inference for Markov Logic Networks. In *Proceedings of the Seventeenth International Conference on Artificial Intelligence and Statistics*, pages 859–867, 2014.
18. D. Smith and V. Gogate. The Inclusion-Exclusion Rule and its Application to the Junction Tree Algorithm. In *Proceedings of the Twenty Third International Joint Conference on Artificial Intelligence*, pages 2568–2575, 2013.
19. V. Gogate and P. Domingos. Structured Message Passing. In *Proceedings of the Twenty-Ninth Conference on Uncertainty in Artificial Intelligence*, pages 252–261, 2013.
20. D. Venugopal and V. Gogate. Dynamic Blocking and Collapsing for Gibbs Sampling. In *Proceedings of the Twenty-Ninth Conference on Uncertainty in Artificial Intelligence*, pages 664–673, 2013.

21. D. Venugopal and V. Gogate. GiSS: Combining SampleSearch and Importance Sampling for Inference in Mixed Probabilistic and Deterministic Graphical Models. In *Proceedings of the Twenty-Seventh AAAI Conference on Artificial Intelligence*, pages 897–904, 2013.
22. D. Venugopal and V. Gogate. On Lifting the Gibbs Sampling Algorithm. In *Proceedings of the Twenty Sixth Annual Conference on Neural Information Processing Systems*, pages 1664–1672, 2012.
23. V. Gogate, A. Jha, and D. Venugopal. Advances in Lifted Importance Sampling. In *Proceedings of the Twenty-Sixth AAAI Conference on Artificial Intelligence*, pages 1910–1916, 2012.
24. V. Gogate and P. Domingos. Probabilistic Theorem Proving. In *Proceedings of the Twenty-Seventh Conference on Uncertainty in Artificial Intelligence*, pages 256–265, 2011.
25. V. Gogate and P. Domingos. Approximation by Quantization. In *Proceedings of the Twenty-Seventh Conference on Uncertainty in Artificial Intelligence*, pages 247–255, 2011.
26. A. Jha, V. Gogate, A. Meliou, and D. Suci. Lifted Inference from the Other Side: The tractable Features. In *Proceedings of the Twenty Fourth Annual Conference on Neural Information Processing Systems*, pages 973–981, 2010.
27. V. Gogate, W. A. Webb, and P. Domingos. Learning Efficient Markov Networks. In *Proceedings of the Twenty Fourth Annual Conference on Neural Information Processing Systems*, pages 748–756, 2010.
28. V. Gogate and P. Domingos. Formula-Based Probabilistic Inference. In *Proceedings of the Twenty-Sixth Conference on Uncertainty in Artificial Intelligence*, pages 210–219, 2010.
29. V. Gogate and R. Dechter. On combining graph-based variance reduction schemes. In *Proceedings of the Thirteenth International Conference on Artificial Intelligence and Statistics*, pages 257–264, 2010.
30. V. Gogate and R. Dechter. AND/OR Importance Sampling. In *Proceedings of the Twenty-Fourth Conference on Uncertainty in Artificial Intelligence*, pages 212–219, 2008.
31. V. Gogate and R. Dechter. Studies in Solution Sampling. In *Proceedings of the Twenty-Third AAAI Conference on Artificial Intelligence*, pages 271–276, 2008.
32. V. Gogate and R. Dechter. Approximate Solution Sampling (and Counting) on AND/OR Spaces. In *Proceedings of Fourteenth International Conference on Principles and Practice of Constraint Programming*, pages 534–538, 2008.
33. V. Gogate and R. Dechter. Approximate Counting by Sampling the Backtrack-free Search Space. In *Proceedings of the Twenty-Second National Conference on Artificial Intelligence*, pages 198–203, 2007.

34. V. Gogate, B. Bidyuk, and R. Dechter. Studies in Lower Bounding Probability of Evidence using the Markov Inequality. In *Proceedings of the Twenty-Third Conference on Uncertainty in Artificial Intelligence*, pages 141–148, 2007.
35. V. Gogate and R. Dechter. SampleSearch: A Scheme that Searches for Consistent Samples. In *Proceedings of the Eleventh International Conference on Artificial Intelligence and Statistics*, pages 147–154, 2007.
36. V. Gogate, R. Dechter, B. Bidyuk, J. Marca, and C. Rindt. Modeling transportation and activity routines using hybrid dynamic mixed networks. In *Eighty Fifth annual meeting of the Transportation Research Board*, 2006.
37. V. Gogate and R. Dechter. A new algorithm for sampling CSP solutions uniformly at random. In *Proceedings of Twelfth International Conference on Principles and Practice of Constraint Programming*, pages 711–715, 2006.
38. V. Gogate and R. Dechter. Approximate inference algorithms for hybrid Bayesian networks with discrete constraints. In *Proceedings of the Twenty-First Conference on Uncertainty in Artificial Intelligence*, pages 209–216, 2005.
39. V. Gogate, R. Dechter, B. Bidyuk, J. Marca, and C. Rindt. Modeling transportation routines using hybrid dynamic mixed networks. In *Proceedings of the Twenty-First Conference on Uncertainty in Artificial Intelligence*, pages 216–223, 2005.
40. K. Kask, R. Dechter, and V. Gogate. Counting-based look-ahead schemes for constraint satisfaction. In *Proceedings of Tenth International Conference on Principles and Practice of Constraint Programming*, pages 317–331, 2004.
41. V. Gogate and R. Dechter. A Complete Anytime Algorithm for Treewidth. In *Proceedings of the Twentieth Conference on Uncertainty in Artificial Intelligence*, pages 201–208, 2004.

#### Refereed Workshop Papers

1. D. Smith, P. Singla, and V. Gogate. Lifted region-based belief propagation. In *IJCAI workshop on Statistical Relational Artificial Intelligence*, 2016.
2. H. Mittal, S. Singh, P. Singla, and V. Gogate. Fine-grained weight learning in markov logic through latent subtype discovery. In *IJCAI workshop on Statistical Relational Artificial Intelligence*, 2016.
3. Rodrigo de Salvo Braz, Ciaran O’Reilly, Vibhav Gogate, and Rina Dechter. Probabilistic inference modulo theories. *Workshop on Hybrid Reasoning at IJCAI*, 2015.
4. S. Sarkhel and V. Gogate. Lifting WALKSAT-based Local Search Algorithms for MAP Inference. In *AAAI 2013 Workshop on Statistical Relational AI*, 2013.
5. V. Gogate and P. Domingos. Probabilistic Theorem Proving: A Unifying Approach for Inference in Probabilistic Programming. In *NIPS 2012 Workshop on Probabilistic Programming*, 2010.

6. D. Venugopal and V. Gogate. On Lifting the Gibbs Sampling Algorithm. In *Second Workshop on Statistical Relational AI*, 2012.
7. V. Gogate and P. Domingos. Exploiting Logical Structure in Lifted Probabilistic Inference. In *AAAI 2010 Workshop on Statistical Relational Learning*, 2010.
8. A. Darwiche, R. Dechter, A. Choi, V. Gogate, and L. Otten. Results from the Probabilistic Inference Evaluation of UAI 2008. In *Workshop on Evaluating and Disseminating Probabilistic Reasoning Systems*, 2008.
9. V. Gogate and R. Dechter. Approximate Solution Sampling (and Counting) on AND/OR Spaces. In *First Workshop on Counting Problems in CSP, SAT and other neighboring problems*, 2008.
10. V. Gogate. Approximate Inference in Probabilistic Graphical Models with Determinism. In *AAAI 2007 Doctoral Program*, 2007.
11. V. Gogate and R. Dechter. A simple application of sampling importance resampling to solution sampling. In *Doctoral Program of Thirteenth International Conference on Principles and Practice of Constraint Programming*, 2007.
12. V. Gogate and R. Dechter. A new algorithm for sampling CSP solutions uniformly at random. In *Doctoral Program of Twelfth International Conference on Principles and Practice of Constraint Programming*, 2006.
13. K. Kask, R. Dechter, and V. Gogate. New look-ahead schemes for constraint satisfaction. In *Proceedings of the Eighth International Symposium on Artificial Intelligence and Mathematics*, 2004.

### Invited Talks and Tutorials

- 2016, AI seminar, University of Texas, Austin, USA. Title: Approximate Counting and Lifting for Scalable Inference and Learning in Markov Logic, August 2016. *Invited Talk*.
- 2016, UAI'16, 32nd Conference on Uncertainty in Artificial Intelligence, New York City, New York, July 2016. Title: Probabilistic Inference Evaluation. *Invited Talk*.
- 2014, AAAI'14, 4th Workshop on Statistical Relational Artificial Intelligence, Quebec City, Quebec, Canada, July 2014. Title: Fast, Lifted, Sampling-Based Inference in Statistical Relational Models. *Invited Talk*.
- 2014, UAI'14, 30th Conference on Uncertainty in Artificial Intelligence, Quebec City, Quebec, Canada, July 2014. Title: Probabilistic Inference Competition. *Invited Talk*.
- 2013, ICMR '13, ACM International Conference on Multimedia Retrieval, Dallas, Texas, USA, April 16 - 19, 2013. Title: Advanced Machine Learning Techniques for Temporal, Multimedia, and Relational Data. *Tutorial*
- 2012, University of Rochester, Rochester Big Data Forum, October, 2012. Title: Scaling up Probabilistic Inference by Exploiting Logical Structure. *Invited Talk*.
- 2012, UAI'12, 28th Conference on Uncertainty in Artificial Intelligence, Catalina Island, California, USA. Title: Structured Propagation-based and Sampling-based Algorithms for Graphical Models. *Invited Talk*.

- 2012, AI seminar, University of Texas, Austin, USA. Title: Efficient Sampling-based Inference in presence of Logical Structure. *Invited Talk*.
- 2010, Statistics Seminar, University of Washington, Seattle, USA. Title: Formula-Based Probabilistic Inference. *Invited Talk*.
- 2010, AAAI'10, 24th Conference on Artificial Intelligence, Atlanta, Georgia, USA. Title: Sampling Algorithms for Probabilistic and Deterministic Graphical Models. *Tutorial*.
- 2010, UAI'10, 26th Conference on Uncertainty in Artificial Intelligence, Catalina Island, California, USA. Title: Formula SampleSearch. *Invited Talk*.
- 2010, UAI'10, 26th Conference on Uncertainty in Artificial Intelligence, Catalina Island, California, USA. Title: Iterative Join Graph Propagation. *Invited Talk*.
- 2008, Counting'08, First Counting Workshop, Sydney, Australia. Title: Second Probabilistic Reasoning Evaluation. *Invited Talk*.
- 2007, California State University, Long Beach, California, USA. Title: Solution Counting in Backtrack-free search spaces. *Invited Talk*.

**External Funding for Original Investigations:**

1. Title: RI: Small: Fast, Scalable Joint Inference for NLP using Markov Logic  
PIs: V. Ng (PI, UTDallas) and **V. Gogate** (Co-PI, UTDallas)  
Time Duration: 36 months (Sep. 2015 to Aug. 2018)  
Agency: NSF  
Total Requested: \$360,348
2. Title: A Decision Support System for Predicting the Likelihood of C-section and Delivery Complications  
PIs: Dr. Jack Stecher (PI, Baylor Hospital) and **V. Gogate**  
Time Duration: 12 months (March 2014 to June 2015)  
Agency: Baylor Foundation  
Total Requested: \$70K (UTD share: Approx. \$25K)
3. Title: Lifted Inference for Probabilistic Programming  
PIs: R. de Salvo Braz (SRI International, PI), **V. Gogate** and D. Sontag (New York University)  
Time Duration: 48 months (October 2013 to November 2017)  
Agency: DARPA  
Total Requested: \$3,168,927 (UTD share: Approx. \$740K)
4. Title: SBIR: Enhancing the Scaling and Accuracy of Text Analytics Using Joint Inference  
PIs: A. Pfeffer (PI, Charles Rivers Analytics), **V. Gogate** and V. Ng (University of Texas, Dallas)  
Time Duration: 9 months (October 2013 to July 2014)  
Agency: Air Force  
Total Requested: \$150K (UTD share: Approx. \$75K)

5. Title: A Unified Approach to Abductive Inference  
PIs: P. Domingos (PI, University of Washington), **V. Gogate**, T. Diettrich (Oregon State University), C. Guestrin (University of Washington), D. Lowd (University of Oregon), H. Kautz (University of Rochester), J. Tennenbaum (Massachusetts Institute of Technology), and R. Mooney (University of Texas at Austin)  
Time Duration: 2 years 10 months (August 2011 to June 2014).  
Agency: Army Research Office (ARO)  
Total Requested: \$6,250,000. (UTD share: \$279,249)

**Teaching:**

**Doctoral Advisement:**

1. Islam Beltagy, Natural Language Semantics Using Probabilistic Logic, Ph.D., UT Austin, Spring 2016. (Committee member)
2. Deepak Venugopal, Dissertation title: Scalable Inference Techniques for Markov Logic, Ph.D., UTDallas, Summer 2015. (**Thesis Advisor**)
3. Chen Chen, Beyond Entity Coreference: New Models for Resolving Zero and Event Anaphora, Ph.D., UTDallas, Fall 2015. (Committee member)
4. Kyle Marple, Dissertation title: Goal-Directed Answer Set Programming, Ph.D., UTDallas, Summer 2014. (Committee member)
5. Tatiana Erekhinskaya, Dissertation title: Probabilistic models for Text Understanding, Ph.D., UTDallas, Fall 2014 (Committee member)
6. Dong Wang, Dissertation title: Opinion summarization on spontaneous conversations, Ph.D., UTDALLAS, Spring 2013. (Committee member)
7. Kirk Roberts, Dissertation title: Processing events and spatiality in multiple text domains, Ph.D., UTDALLAS, Spring 2013. (Committee member)
8. Bryan Rink, Dissertation title: Processing linguistic relations across textual genres, Ph.D., UTDALLAS, Spring 2013. (Committee member)
9. Altaf Rahman, Dissertation title: Noun Phrase Coreference Resolution: A Knowledge-Rich, Cluster-Based Approach, Ph.D., UTDALLAS, Fall 2012. (Committee member)
10. Nima Taghipour, Dissertation title: Lifted Probabilistic Inference by Variable Elimination, Ph.D., KU Leuven, Spring 2013. (Committee member)

**Masters Advisement:**

1. Srikanth Doss, M.S., 2014. (**Thesis supervisor**).
2. Prasanna Kothalkar, M.S., 2014. (**Thesis supervisor**).
3. Ramprasad Srinivasan. M.S., 2011. (Thesis Committee member).
4. Tatiana Erekhinskaya. M.S., 2012. (Thesis Committee member).



### Doctoral Students Currently Supervising:

- David Smith, Expected Graduation date: Fall 2016
- Tahrima Rahman, Expected Graduation date: Fall 2016
- Somdeb Sarkhel, Expected Graduation date: Fall 2016
- Li Chou, Expected Graduation date: Spring 2018
- Sara Rouhani, Expected Graduation date: Spring 2019
- Shasha Jin, Expected Graduation date: Spring 2021
- Ueda Ken, Expected Graduation date: Spring 2021

### Masters Students Currently Supervising:

None.

### Classroom Teaching:

<u>Semester</u>	<u>Prefix</u>	<u>Number</u>	<u>Course Name</u>
Fall 2011	CS	6V81	Statistical Methods in AI and ML
Spring 2012	CS	6375	Machine Learning
Fall 2012	CS	4365	Undergraduate Artificial Intelligence
Spring 2013	CS	6301	Statistical Methods in AI and ML
Fall 2013	CS	6375	Machine Learning
Fall 2013	CS	7301	Seminar on Deep learning and Statistical Relational Learning
Spring 2014	CS	6301	Statistical Methods in AI and ML
Fall 2014	CS	6375	Machine Learning
Spring 2015	CS	6375	Machine Learning
Fall 2015	CS	6364	Artificial Intelligence
Spring 2016	CS	7301	Advanced Machine Learning
Fall 2016	CS	6364	Artificial Intelligence
Fall 2016	CS	4365	Undergraduate Artificial Intelligence

### Other:

- Senior Thesis Advisor: Tuan Pham, Title: Predicting Dropouts in MOOC. March 2016.
- Senior Design Project: Graduate Application Prediction. Students: Tetyana Mitrofanova, Soyeon Yun, Daniel Esponda, and Cameron Brown. Spring 2013.

### Professional Service

- Program Chair
  - AAAI Workshop on Statistical Relational Artificial Intelligence, 2013.
- Tutorials Chair
  - Uncertainty in Artificial Intelligence Conference (UAI) 2014.

- Fundraising Chair
  - AAAI Conference on Artificial Intelligence (AAAI), 2014.
- Program Committee
  - Conferences
    - \* International Conference on Machine Learning (ICML)- 2012, 2013.
    - \* Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL HLT)- 2012
    - \* International Joint Conference on Artificial Intelligence (IJCAI) - 2009, 2011, 2013, 2014, 2016.
    - \* International Conference on Principles and Practice of Constraint Programming (CP) - 2007, 2008, 2012, 2013.
    - \* AAAI Conference on Artificial Intelligence (AAAI)- 2010, 2013, 2016.
    - \* Uncertainty in Artificial Intelligence Conference (UAI) - 2006, 2009, 2011, 2012, 2013, 2014, 2015, 2016.
    - \* Neural Information Processing Systems (NIPS) - 2011, 2012, 2013, 2014, 2015.
    - \* International Symposium on Artificial Intelligence and Mathematics (ISAIM) - 2012.
  - Journals
    - \* Artificial Intelligence Journal (AIJ)
    - \* Journal of Machine Learning Research (JMLR)
    - \* Journal of Artificial Intelligence Research (JAIR)
    - \* Communications of the ACM
    - \* Machine Learning Journal
- Organizing Committee
  - 2016, Organized the Probabilistic Inference Competition at UAI 2016.
  - 2014, Organized the Probabilistic Inference Competition at UAI 2014.
  - 2008, Co-Organized the Probabilistic Inference Evaluation at UAI 2008.
- Department Committees
  - TA Selection Committee, 2011, 2012, 2013, 2014, 2015 and 2016.