

Michael L. Wick

PERSONAL INFORMATION

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EDUCATION

Ph.D. Computer Science, 2015
University of Massachusetts, Amherst

M.S. Computer Science, 2009
University of Massachusetts, Amherst

B.S. Computer Science, 2006
University of Massachusetts, Amherst

AWARDS/HONORS

Winning model: best entity-resolution model for USPTO competition (2016). Model chosen to drive patent-search for USPTO going forward. Press.

Yahoo! Key Scientific Challenge Award (2010). Press.

Yahoo! Award for Excellence in Search and Mining (2009).

Best Paper Runner Up at AKBC 2012: Automated Knowledge Base Construction workshop.

Passed Ph.D. qualifiers with distinction.

NIPS 2009 spotlight presentation.

KDD 2008 Student Travel Award.

Dean's List 2002-2006.

Graduated with Commonwealth College Honors (*Magna Cum Laude*).

PROFESSIONAL ACTIVITIES

Area Chair for first conference on Automated Knowledge Base Construction (AKBC) 2019.

Invited Talk at the UMass Data Science Research Symposium (2019) on Homomorphic Compression for Scalable Machine Learning and NLP.

Invited Talk at the UMass Data Science Research Symposium (2017) on Gradient-based Inference for Enforcing Hard Constraints in Neural Networks.

Organizer for the workshops on the Interactions Between Learning and Inference (Infering) in 2012 and in 2013 at ICML.

Programming Committee/Review for top machine learning conference and journals including: Neural Information Processing Systems (NeurIPS), International Conference on Machine Learning (ICML), Artificial Intelligence and Statistics (AISTATS), Empirical Methods on Natural Language Processing (EMNLP), Computational Linguistics (COLING), DAMI, Workshop on Automated Knowledge Base Construction (AKBC), Workshop on Big Learning, New England Student Conference on AI (NESCAI), Data Mining and Knowledge Discovery (DAMI), Advances in Artificial Intelligence (AAAI).

Undergraduate Representative 2006: represent undergraduates in faculty meetings.

WORK HISTORY

Senior Member of Technical Staff 2014–present
Oracle Labs

Conduct machine learning research especially as applied to natural language processing, information extraction, and even machine vision. Investigate techniques, including deep learning, to reduce the amount of labeled training required to train good quality models. Provide machine learning consulting to product groups and other groups in the labs.

Research/Teaching Assistant 2004-2014
Computer Science Department at the University of Massachusetts, Amherst

- Graduate Research Assistant (2005–2014): Graduate student of Andrew McCallum working on machine learning, natural language processing, information extraction and knowledge base construction.
- Undergraduate Research Assistant (2005–2006): Undergraduate student working with Andrew McCallum and Andres Corrada-Emmanuel on machine learning and information extraction.
- Teaching Assistant (Spring 2011): CMPSCI 691GM – Graphical Models. Gave lectures, created homework assignments, provided office hours, helped with course design.
- Research Assistant (Fall 2006): Investigated context-specific language models on optical character recognition with Professor Erik Learned-Miller
- Research Assistant (Spring 2004): Worked with Professor Hava Siegelmann researching information retrieval methods for the online medical research repository PubMed.

Intern Summer 2008
BB&N Technologies

Worked in the natural language processing group on entity coreference resolution.

Visiting Graduate Researcher Summer 2007
Johns Hopkins University

Participated in the summer school and research project on entity coreference resolution.

PUBLICATIONS

In 2019, Google Scholar reported nearly **1000 citations** to **60 articles** with an **h-index of 17**, many of which appear at top venues including NuerIPS, ICML, KDD, ACL, EMNLP, VLDB, etc.

Gradient-based Inference for Networks with Output Constraints.

Jay-Yoon Lee, Sanket Mehta, Michael L. Wick, Jean-Baptiste Tristan, Jaime Carbonell.
In **AAAI'19**: Thirty-Third Conference on Artificial Intelligence, 2019.

Scaling Hierarchical Coreference with Homomorphic Compression.

Michael Wick, Swetasudha Panda, Joseph Tassarotti, Jean-Baptiste Tristan.
In **AKBC'19**: First Conference on Automated Knowledge Base Construction, 2019.

Sketching for latent Dirichlet-categorical models.

Joseph Tassarotti, Jean-Baptiste Tristan, Michael Wick.
In **AISTATS'19**: International Conference on Artificial Intelligence and Statistics, 2019.

Enforcing Output Constraints via SGD: A Step Towards Neural Lagrangian Relaxation.

Jay-Yoon Lee, Michael L. Wick, Jean-Baptiste Tristan, Jaime Carbonell.

In **AKBC'17**: Workshop on Automated Knowledge Base Construction, 2017.

Sketchy LDA: Towards Streaming Inference.

Jean-Baptiste Tristan, Michael L. Wick, Joseph Tassarotti.

In **ML Systems'17**: Workshop on ML Systems, 2017.

Minimally-constrained multilingual embeddings via artificial code switching.

Michael Wick, Pallika Kanani, Adam Pockock.

In **AAAI'16**: : Thirtieth Conference on Artificial Intelligence, 2016.

Exponential Stochastic Cellular Automata for Massively Parallel Inference.

Manzil Zaheer, Michael Wick, Jean-Baptiste Tristan, Alex Smola, Guy Steele.

In **AISTATS'16**: International Conference on Artificial Intelligence and Statistics, 2016.

Attribute Extraction from Noisy Text Using Character Based Sequence Tagging Models.

Pallika Kanani, Michael Wick, Adam Pockock.

In **NeurIPS-WS'16**: NeurIPS Workshop on e-Commerce 2016.

Minimally-constrained multilingual embeddings via artificial code switching.

Michael Wick, Pallika Kanani, Adam Pockock.

In **NeurIPS-WS'16**: NeurIPS Workshop on Multi-Task and Transfer Learning 2016.

Comparing Gibbs, EM and SEM for MAP Inference in Mixture Models.

Manzil Zaheer, Michael Wick, Satwik Kottur, Jean-Baptiste Tristan.

In **OPT'15**: Optimization for Machine Learning workshop, 2015.

Exponential Stochastic Cellular Automata for Massively Parallel Inference.

Manzil Zaheer, Michael Wick, Jean-Baptiste Tristan, Alex Smola, Guy Steele.

In **LearningSys'15**: Workshop on Machine Learning Systems, 2015. **Spotlight.**

Epistemological Databases for Probabilistic Knowledge Base Construction.

Michael Wick, Ph.D. Dissertation, University of Massachusetts 2014/2015.

Readers: Andrew McCallum, Benjamin Marlin, Gerome Miklau, Jon Machta, Tom Mitchell.

Large-scale author coreference via hierarchical entity representations.

Michael Wick, Ari Kobren, Andrew McCallum.

In **ICML-WS'13**: Workshop on Peer Reviewing and Publishing Models 2013.

Probabilistic Reasoning about Human Edits in Information Integration.

Michael Wick, Ari Kobren, Andrew McCallum.

In **ICML-WS'13**: Machine Learning Meets Crowdsourcing workshop at ICML, 2013.

A Joint Model for Discovering and Linking Entities.

Michael Wick, Sameer Singh, Harshal Pandya, Andrew McCallum.

In **AKBC'13** Automated Knowledge Base Construction (AKBC) WS at CIKM 2013.

Assessing Confidence of Knowledge Base Content with an Experimental Study in Entity Resolution.

Michael Wick, Sameer Singh, Ari Kobren, Andrew McCallum.

In **AKBC'13** Automated Knowledge Base Construction (AKBC) WS at CIKM 2013.

A Discriminative Hierarchical Model for Fast Coreference at Large Scale.

Michael Wick, Sameer Singh, Andrew McCallum.

In **ACL'12**: Association for Computational Linguistics 2012.

Monte Carlo MCMC: Efficient Inference by Approximate Sampling.
Sameer Singh, Michael Wick, Andrew McCallum.
In **EMNLP'12**: Empirical Methods in Natural Language Processing 2012.

Human Machine Cooperation with Epistemological DBs: Supporting User Corrections to Automatically Constructed KBs.
Michael Wick, Karl Schultz, Andrew McCallum.
In **AKBC-WEKEX'12**: Automated Knowledge Base Construction Workshop at NAACL 2012.

Monte Carlo MCMC: Efficient Inference by Sampling Factors.
Sameer Singh, Michael Wick, Andrew McCallum.
In **AKBC-WEKEX'12** Automated Knowledge Base Construction Workshop at NAACL 2012.

Hybrid In-Database Inference for Declarative Information Extraction.
Daisy Zhe Wang, Michael J. Franklin, Minos Garofalakis, Joseph M. Hellerstein, Michael Wick.
In **SIGMOD'11**: International Conference on Management of Data 2011.

Query-Aware MCMC.
Michael Wick, Andrew McCallum.
In **NIPS'11**: Neural Information Processing Systems (NIPS) 2011.

SampleRank: Training Factor Graphs with Atomic Gradients.
Michael Wick, Khashayar Rohanimanesh, Kedare Bellare, Aron Culotta, Andrew McCallum.
In **ICML'11**: International Conference on Machine Learning 2011.

Scalable Probabilistic Databases with Factor Graphs and MCMC.
Michael Wick, Andrew McCallum, Gerome Miklau.
In **VLDB'10**: Very Large Databases 2010.

Distantly labeling data for large scale cross-document coreference.
Sameer Singh, Michael Wick, Andrew McCallum.
University of Massachusetts Technical Report 2010.

Training Factor Graphs with Reinforcement Learning for Efficient MAP Inference.
Michael Wick, Khashayar Rohanimanesh, Sameer Singh, Andrew McCallum.
In **NIPS'09**: Neural Information Processing Systems 2009.

An Entity Based Model for Coreference Resolution
Michael Wick, Aron Culotta, Khashayar Rohanimanesh, Andrew McCallum.
In **SDM'09**: SIAM International Conference on Data Mining 2009.

SampleRank: Learning Preferences from Atomic Gradients.
Michael Wick, Khashayar Rohanimanesh, Aron Culotta, Andrew McCallum.
In **NIPS-WS'09**: Workshop on Advances in Ranking 2009.

Representing Uncertainty in Databases with Scalable Factor Graphs.
Michael Wick, University of Massachusetts Masters Thesis, 2009.

Advances in Learning and Inference for Partition-wise Models of Coreference Resolution.
Michael Wick, Andrew McCallum.
University of Massachusetts Technical Report #UM-CS-2009-028

Inference and Learning in Large Factor Graphs with Adaptive Proposal Distributions. Khashayar Rohanimanesh, Michael Wick, Andrew McCallum.

University of Massachusetts Technical Report #UM-CS-2009-008

A Unified Approach for Schema Matching, Coreference, and Canonicalization. Michael Wick, Khashayar Rohanimanesh, Karl Schultz, Andrew McCallum.
In **KDD'08**: Knowledge Discovery and Data Mining 2008.

A Corpus for Cross-Document Co-reference.
David Day, Janet Hitzeman, Michael Wick, Keith Crouch, Massimo Poesio.
In **LREC'08**: Language Resources and Evaluation.

FACTORIE: Efficient Probabilistic Programming for Relational Factor Graphs via Imperative Declarations of Structure, Inference and Learning.
Andrew McCallum, Khashayar Rohanimanesh, Michael Wick, Karl Schultz, Sameer Singh.
In **NIPS-WS'08** Workshop on Probabilistic Programming 2008.

Author Disambiguation using Error-Driven Machine Learning With a Ranking Loss Function.
Aron Culotta, Pallika Kanani, Robert Hall, Michael Wick, Andrew McCallum.
In **AAAI-WS'08**: IIRWeb workshop 2008.

A Discriminative Approach to Ontology Alignment. Michael Wick, Khashayar Rohanimanesh, Andrew McCallum, AnHai Doan.
In **VLDB-WS'08** workshop on New Trends in Information Integration (NTII) 2008.

Reinforcement Learning for MAP Inference in Large Factor Graphs.
Khashayar Rohanimanesh, Michael Wick, Sameer Singh, Andrew McCallum.
University of Massachusetts Technical Report #UM-CS-2008-040

First Order Probabilistic Models for Coreference Resolution.
Aron Culotta, Michael Wick, Rob Hall, Andrew McCallum.
In **NAACL-HLT'08**: The North American Chapter of the Association of Computational Linguistics and Human Language Technologies 2007.

Canonicalization of Database Records using Adaptive Similarity Measures.
Aron Culotta, Michael Wick, Rob Hall, Matthew Marzilli, Andrew McCallum.
In **KDD'07**: Knowledge Discovery and Data Mining 2007.

Context-Sensitive Error Correction: Using Topic Models to Improve OCR.
Michael Wick, Michael Ross, Erik Learned-Miller.
In **ICDAR'07**: International Conference on Document Recognition 2008.

Exploiting Encyclopedic and Lexical Resources for Entity Disambiguation.
Massimo Poesio, David Day, Ron Arstein, Jason Dunacn, Vladimir Eidelman, Claudio Guiliano, Rob Hall, Janet Hitzeman, Alan Jern, Mijail Kabadjov, Gideon Mann, Paul McNamee, Alessandro Moschitti, Simone Ponzetto, Jason Smith, Josef Steinberger, Michael Strube, Jian Su, Yannick Versley, Xiaofeng Yang, Michael Wick, Michael Wick.
Johns Hopkins Technical Report 2007.

Learning Field Compatibilities to Extract Database Records from Unstructured Text. Michael Wick, Aron Culotta, Andrew McCallum.
In **EMNLP'06**: Empirical Methods in Natural Language Processing 2006.

PATENTS

Multilingual Word Embeddings for Natural Language Processing
Michael Wick, Pallika Kanani, Adam Pockock.