

Jason Naradowsky

Associate Research Scientist

Human Language Technology Center of Excellence

Johns Hopkins University

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Research Interests

Machine Reading, Imitation Learning, Graphical Models, Joint inference,
Machine Translation, Morphologically-rich Languages, Language Acquisition,
Generative Audio Models, Computational Creativity

Education

2008–2014 **PhD in Computer Science**, *University of Massachusetts Amherst*.

Advisor: David A. Smith

Certificate in Cognitive Science

2011–2014 **PhD in Computer Science**, *Macquarie University*.

Advisor: Mark Johnson

2008 **MSc, Artificial Intelligence**, *University of Edinburgh*.

Thesis: Improving Morphology Induction with Phonological Rules

Advisor: Sharon Goldwater

2007 **MS, Computational Linguistics**, *State University of New York at Buffalo*.

Thesis: The Effect of Frequencies and Unseen Events on Parser Portability

Advisor: Doug Roland

2006 **MA, Human Computer Interaction**, *State University of New York at Oswego*.

Thesis: Neural Networks for Automated Design Evaluation

Advisor: Craig Graci

2001–2005 **BS, Computer Science**, *State University of New York at Oswego*.

2001–2005 **BA, Linguistics**, *State University of New York at Oswego*.

Specialization: Artificial Intelligence, with Honors

Thesis: Baroque Music Generation using Genetic Algorithms with Theory-based Crossover

Minor: Cognitive Science

Summer Schools

2007 Linguistic Society of America Summer Institute 2007

Stanford University, Palo Alto, CA

Doctoral Thesis

Title *Learning with Joint Inference and Latent Linguistic Structure in Graphical Models*
Supervisors David A. Smith and Mark Johnson
Committee 1 Ben Marlin, Andrew McCallum, Joe Pater, and Kristina Toutanova
Committee 2 Tiberio Caetano, Ben Marlin, Luke Zettlemoyer
Description Developed a modeling framework for constructing joint factor graph models of NLP problems, and described how latent combinatorially-constrained syntactic representations can be marginalized over during training to produce task-specific syntactic distributions without the need for treebanks.

Research Experience

2017–current **Associate Research Scientist**
Human Language Technology Center of Excellence
Johns Hopkins University, Baltimore, Maryland

2016–2017 **Senior Research Associate**
Supervisor: Anna Korhonen
University of Cambridge, Cambridge, England

2016 **Senior Research Associate**

2014–2016 **Research Associate**
Supervisor: Sebastian Riedel
University College London, London, England

2012 **Visiting Researcher**
Nara Institute of Science and Technology (NAIST), Nara, Japan
Advisor: Yuji Matsumoto

2010 **Research Intern**
Microsoft Research, Redmond, WA
Advisor: Kristina Toutanova

2008–2011 **Research Assistant**
Computer Science Department, University of Massachusetts Amherst
Advisors: Andrew McCallum and David A. Smith

2008 **Google Summer of Code 2008**
Project: Dependency Parsing in the Natural Language Toolkit
Advisors: Sebastian Riedel and Jason Baldridge

2005–2006 **Research Assistant**
Psychology Department, State University of New York at Oswego
Advisors: Lin Qiu and Songmei Han

Teaching Experience

Fall 2009 Grader, Computer Science Department, University of Massachusetts Amherst
Class: CMPSCI 585: Introduction to Natural Language Processing
Instructor: David A. Smith

Advising

Masters Students

Chris Loy, University College London, 2016

Thesis: Deep Hierarchical Architectures for Polyphonic Music Transcription

James Goodman, Co-advised with Andreas Vlachos, University College London, 2015

Thesis: Semantic Parsing from English to AMR using Imitation Learning

Undergraduate Committee

Elias Zeidan, Marlboro College, 2013

Tutorials

Matrix and Tensor Factorization Methods for Natural Language Processing

Presented at ACL 2015

Invited Talks

- [1] *Eliminating Misinformation in Machine Reading with Aggregation*
Kurohashi-Kawahara-ken, Kyoto University, May 12th, 2017
- [1] *Distantly Supervised Event Extraction with Pointer Networks*
Komachi-ken, Tokyo Metropolitan University, June 9th, 2016
- [2] *Computers that Read: Uncovering the Structure of Language with Deep Learning*
Presented with Pontus Stenetorp
Artificial Intelligent Association, Osaka University, June 6th, 2016
- [3] *Distantly Supervised Event Extraction with Pointer Networks*
Matsumoto-ken, NAIST, June 3rd, 2016
- [4] *Artificial Intelligence: A Rationalist Perspective on the Past and Future of AI*
PechaKucha, presented with Sebastian Riedel
Embassy of Japan, London, March 23rd, 2016
- [5] *Deep Sequence Models, Multimodality & Conversational Agents*
Miyake-ken, Osaka University, Nov 5th, 2015
- [6] *Learning Latent Syntactic Representations with Joint Models*
Xerox Research Center, Grenoble, April 16th, 2015
- [7] *Learning Latent Syntactic Representations with Joint Models*
Cambridge University, March 13th, 2015

Publications

Journal Publications

- [1] Daniela Gerz, Ivan Vulić, Eduardo Ponti, Jason Naradowsky, Roi Reichart, and Anna Korhonen. Language modeling for morphologically rich languages: Character-aware modeling for word-level prediction. *Transactions of the Association for Computational*

Linguistics, 2018.

Refereed Conference Proceedings

- [1] Rachel Rudinger, Jason Naradowsky, Brian Leonard, and Benjamin Van Durme. Gender bias in coreference resolution. In *NAACL*, 2018.
- [2] Matko Bosnjak, Tim Rocktäschel, Jason Naradowsky, and Sebastian Riedel. Programming with a differentiable forth interpreter. In *International Conference on Machine Learning (ICML)*, 2017.
- [3] Lucas Sterckx, Jason Naradowsky, Bill Byrne, Thomas Demeester, and Chris Develder. Break it down for me: A study in automated lyric annotation. In *Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2017.
- [4] James Goodman, Andreas Vlachos, and Jason Naradowsky. Noise reduction and targeted exploration in imitation learning for abstract meaning representation parsing. In *Association for Computational Linguistics (ACL)*, 2016.
- [5] James Goodman, Andreas Vlachos, and Jason Naradowsky. Ucl+sheffield at semeval-2016 task 8: Imitation learning for amr parsing with an alpha-bound. In *Proceedings of the 10th International Workshop on Semantic Evaluation*, 2016.
- [6] Jason Naradowsky, Sebastian Riedel, and David Smith. Improving nlp through marginalization of hidden syntactic structure. In *Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2012.
- [7] Jason Naradowsky, Tim Vieira, and David A. Smith. Grammarless parsing for joint inference. In *24th International Conference on Computational Linguistics (COLING)*, Mumbai, India, 2012.
- [8] John Lee, Jason Naradowsky, and David Smith. A discriminative model for joint morphological disambiguation and dependency parsing. In *Association for Computational Linguistics (ACL)*, 2011.
- [9] Jason Naradowsky and Kristina Toutanova. Unsupervised bilingual morpheme segmentation and alignment with context-rich hidden semi-markov models. In *Association for Computational Linguistics (ACL)*, 2011.
- [10] David Mimno, Hanna Wallach, Jason Naradowsky, David Smith, and Andrew McCallum. Polylingual topic models. In *Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2009.
- [11] Jason Naradowsky and Sharon Goldwater. Improving morphology induction by learning spelling rules. In *International Joint Conference on AI (IJCAI)*, pages 1531–1537, 2009.

Workshop Proceedings

- [1] Adam Poliak, Jason Naradowsky, Aparajita Haldar, Rachel Rudinger, and Benjamin Van Durme. Hypothesis only baselines in natural language inference. In *Proceedings of the 7th Joint Conference on Lexical and Computational Semantics, *SEM s2018*, New Orleans, Louisiana, June 2018. Association for Computational Linguistics.

- [2] Jason Naradowsky and Sebastian Riedel. Modeling exclusion with a differentiable factor graph constraint. In *Workshop on Deep Structured Prediction, International Conference on Machine Learning (ICML)*, 2017.
- [3] Matko Bošnjak, Tim Rocktäschel, Jason Naradowsky, and Sebastian Riedel. A neural forth abstract machine. In *Neural Abstract Machines & Program Induction (NAMPI)*, Barcelona, 2016.
- [4] Matko Bošnjak, Tim Rocktäschel, Jason Naradowsky, and Sebastian Riedel. A neural forth abstract machine. In *RNN Symposium*, Barcelona, 2016.
- [5] Jason Naradowsky, Joe Pater, and David Smith. Feature induction for online constraint-based phonology acquisition. In *The Northeast Computational Phonology Workshop (NECPhon)*, New Haven, Connecticut, 2011.
- [6] Jason Naradowsky, Joe Pater, David Smith, and Robert Staubs. Learning hidden metrical structure with a log-linear model of grammar. In *Computational Modelling of Sound Pattern Acquisition*, pages 59–60, Edmonton, 2010.
- [7] David Mimno, Hanna Wallach, Limin Yao, and Jason Naradowsky. Polylingual topic models. In *The Learning Workshop (Snowbird)*, Clearwater, Florida, 2009.

Demo Proceedings

- [1] Sameer Singh, Tim Rocktäschel, Luke Hewitt, Jason Naradowsky, and Sebastian Riedel. WOLFE: An NLP-friendly Declarative Machine Learning Stack. In *Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)*, 2015.

Professional Service

Program Committee

- 2018 ACL, CoNLL, EMNLP, NAACL
- 2017 ACL, CoNLL, EACL, EMNLP, EthNLP, 1stDeepStructWS, LGNL
- 2016 ACL, AKBC, COLING, EMNLP
- 2015 ACL, AKBC
- 2014 ACL, EMNLP
- 2013 ACL, IJCNLP
- 2012 ACL, ACL-SRW, EACL, EMNLP
- 2011 ACL, CoNLL, EMNLP, IJCNLP
- 2010 EMNLP, NESCAI

Standing Reviewer

- 2016- Transactions of the American Association for Computational Linguistics (TACL)

Journal Reviewer

- 2015 Transactions on Audio, Speech and Language Processing (T-ASL)

Organizer

- 2016 AI4Exams, with Yusuke Miyao & Sebastian Riedel

Awards and Achievements

- 2015 Daiwa Foundation Small Grant Award
- 2014 Best Reviewer, ACL 2014
- 2012 East Asia and Pacific Summer Institute (EAPSI) Fellowship
National Science Foundation
- 2012 Best Reviewer, EMNLP 2012
- 2011 Cotutelle International Macquarie University Research Scholarship (iMQRES)
Macquarie University
- 2011 Institute for Computational and Experimental Study of Language (ICESL) Seed Grant
University of Massachusetts Amherst
- 2005 Oebele Van Dyk Outstanding Senior in Computer Science Award
State University of New York at Oswego
- 2001-2005 Presidential Scholarship
State University of New York at Oswego

Personal Details

Citizenship: USA

Date of Birth: July 9th, 1983

Languages: English (native), Latin (reading), Japanese (beginner)

Programming Languages: Scala, Java, Python, Ruby, LISP, Clojure

Notable Packages: PyTorch, TensorFlow