Jason Naradowsky

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Research Interests

Statistical NLP, Graphical Models, Belief Propagation, Joint inference,
Machine Translation, Morphologically Rich Languages, Language Acquisition

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
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

2014–current **Postdoctoral Research Associate**

University College London, London, England

Continuing research in large-scale factor graph models, task-directed parsing models, matrix factorization, and low-rank logic embeddings.

2012 **Visiting Researcher**

Nara Institute of Science and Technology (NAIST), Nara, Japan

Advisor: Yuji Matsumoto

Explored techniques of incorporating syntactic information into sequence models for part-of-speech tagging in inflectional languages. Developed novel coarse-to-fine approaches based on relaxations to marginal inference.

2010 **Research Intern**

Microsoft Research, Redmond, WA

Advisor: Kristina Toutanova

Research in morpheme-based alignment models for machine translation. Resulted in a model for joint morpheme segmentation and alignment based on the HMM alignment model which improved alignment quality and outperformed all previous results on monolingual morphological segmentation for Arabic.

2008-2011 **Research Assistant**

Computer Science Department, University of Massachusetts Amherst

Advisors: Andrew McCallum and David A. Smith

Research in unsupervised language learning, topic-modeling, parsing, and joint inference.

2008 **Google Summer of Code 2008**

Project: Dependency Parsing in the Natural Language Toolkit

Advisors: Sebastian Riedel and Jason Baldridge

Implemented a suite of four dependency parsers, relevant interfaces, and readers for commonly-used corpora.

2005-2006 **Research Assistant**

Psychology Department, State University of New York at Oswego

Advisors: Lin Qiu and Songmei Han

Research on cross-cultural HCI and adaptive feedback systems. Developed web applications for testing interface usability and, in a separate project, augmented a program to provide adaptive natural language critiques for Java code. Conducted a set of experiments using undergraduate student participants for both projects.

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

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] Deep Sequence Models, Multimodality & Conversational Agents
Miyake-ken, Osaka University, Nov 5th, 2015

[2] Learning Latent Syntactic Representations with Joint Models
Xerox Research Center, Grenoble, April 16th, 2015

[3] Learning Latent Syntactic Representations with Joint Models
Cambridge University, March 13th, 2015

Publications

Refereed Conference Proceedings

[1] 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.

[2] Jason Naradowsky, Tim Vieira, and David A. Smith. Grammarless parsing for joint inference. In *24th International Conference on Computational Linguistics (COLING)*, Mumbai, India, 2012.

[3] John Lee, Jason Naradowsky, and David Smith. A discriminative model for joint morphological disambiguation and dependency parsing. In *Association for Computational Linguistics (ACL)*, 2011.

[4] 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.

[5] 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.

[6] 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] 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.

[2] 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.

[3] 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

Reviewer for NESCAI 2010, EMNLP 2010, ACL 2011, CoNLL 2011, EMNLP 2011, and IJCNLP 2011, EACL 2012, ACL 2012, ACL-SRW 2012, EMNLP 2012, ACL 2013, IJCNLP 2013, ACL 2014, EMNLP 2014, AKBC 2015, ACL 2015, T-ASL

Awards and Achievements

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, Ruby, LISP, Clojure