

Jason M. Eisner

Curriculum Vitae

CONTACT	Department of Computer Science Johns Hopkins University 3400 N. Charles St., Hackerman 324C Baltimore, MD 21218-2691 U.S.A.	Phone: (410) 516-8438 Fax: (410) 516-5050 jason@cs.jhu.edu http://cs.jhu.edu/~jason
EDUCATION AND HONORS	<i>Ph.D. in Computer Science</i> University of Pennsylvania Graduate Teaching Award Thesis: <i>Smoothing a Probabilistic Lexicon via Syntactic Transformations</i> Advisor: Mitch Marcus <i>B.A./M.A. in Mathematics</i> University of Cambridge First-class honours Note: Second undergraduate degree. <i>A.B. in Psychology, Cognitive Science track</i> Harvard University Summa cum laude Junior-year election to Phi Beta Kappa GPA: 3.9/4.0; GRE: 800/800/800 Thesis: <i>Dynamical-Systems Behavior in Recurrent and Non-Recurrent Connectionist Nets</i>	2001 1993 1990
PROFESSIONAL EXPERIENCE	Johns Hopkins University Professor of Computer Science Joint appointment in Cognitive Science (2003–) Member of the Center for Language and Speech Processing (2000–) Member of the Mathematical Institute for Data Science (2017–) Member of the Data Science and AI Institute (2024–) Affiliate of the Human Language Technology Center of Excellence (2007–2019) Microsoft Corporation Partner Principal Researcher Director of Research at Semantic Machines (as dual appointment with academic job) Johns Hopkins University Associate Professor of Computer Science	July 2014– Sep. 2019–Dec. 2024 July 2007–June 2014

Johns Hopkins University Assistant Professor of Computer Science	July 2000–June 2007
University of Rochester Assistant Professor of Computer Science Secondary appointment in Linguistics	Jan. 2000–June 2001
iReactor Inc., Philadelphia, PA Consultant	1994–2004
AT&T Bell Labs, Murray Hill, NJ Artificial Intelligence Research Department	summers 1989–1992
Microsoft Corporation, Seattle, WA Programmer	summer 1988
IBM Research Center, Yorktown Heights, NY Consultant	1987–1988

PROFESSIONAL
ACTIVITIES

Journals

- Associate editor, *Journal of Artificial Intelligence Research* (2012–2018).
- Action editor, *Transactions of the Association for Computational Linguistics* (2012–2018).
- Organizing committee, Jelinek Summer Workshop on Speech and Language Technology (JSALT)—an 8-week annual event (2001–)
- Editorial board member, *Linguistic Issues in Language Technology* (2014–2022).
- Editorial board member, *Research in Language and Computation* (2006–2011).
- Guest editorial board member (special issue), *Journal of Natural Language Engineering* (2011).
- Special issue editor, *Cognitive Science* (2002).
- Journal reviewer, *J. Applied Logic* (2016), *IEEE Trans. on Pattern Matching and Machine Intelligence* (2014, 2012), *J. Machine Learning Research* (2012), *IEEE Signal Processing Letters* (2012), *Foundations and Trends* (2012), *J. Logic and Computation* (2012, 2011), *Computational Linguistics* (2021, 2017, 2016, 2011, 2010, 2007, 2005, 2004, 2002, 2001, 2000), *Phonology* (2010, 2008), *Research on Language and Computation* (2008, 2007), *ACM Trans. on Speech and Language Processing* (2007, 2005), *IEEE Transactions on Audio, Speech, and Language Processing* (2007), *Cognition* (2002), *J. Algorithms* (1997), *Language and Speech* (1999).

Conferences

- Working group on policies for anonymity, ACL (2017, 2023).
- Co-chair of Test-of-Time Paper Award Committee, ACL (2022, 2023).
- Diversity & Inclusion co-chair, NAACL (2019).

- Program area chair or co-chair for ACL (2017, morphology/phonology; 2014, machine learning; 2013, morphology/phonology), COLING (2014, machine learning); NAACL-HLT (2012, morphology/phonology; 2006, syntax/grammar/morphology), EMNLP (2009, phonology/morphology/tagging/chunking/segmentation; 2006, machine learning), EACL (2006, phonology/morphology/finite-state/tagging/segmentation). Guest editor for PNAS (2018).
- Chair of Best Paper Award committee, EMNLP (2010). Member of Best Short Paper Award committee, NAACL (2012).
- Program chair, [EMNLP-CoNLL](#) (2007).
- Program chair, [SIGMORPHON Workshop](#) (2008, with Jeff Heinz); [SIGPHON Workshop on Finite-State Phonology](#) (2000).
- Organizer, NSF-funded international workshop on [Probabilistic Representations of Linguistic Meaning](#) (2014).
- Publications chair, ACL (2005).
- ICML Workshop Review Committee (2021); co-chair for HLT/NAACL Tutorial and Workshop Programs (2003).
- Organizing committee, ACL Workshop on Deep Learning and Formal Languages (2019).
- Program committee member / reviewer for ACL (2023, 2020, 2017, 2016, 2014, 2013, 2012, 2011, 2010, 2009, 2007, 2005, 2004, 2003, 2002), AISTATS (2010), COLING (2014, 2012, 2008), EAAI (2013), EACL (2012, 2006, 2003, 1999), EMNLP (2018, 2017, 2016, 2014, 2013, 2012, 2011, 2010, 2009, 2008, 2007, 2006, 2003, 2002 – “best reviewer” awards in 2018, 2010), FSMNLP (2005, 2001), ICGI (2012), ICFP (2008), ICLR (2017), ICML (2019, 2016, 2004), IJCAI (2007), IWPT (2009), MITWPL (1999), NAACL (2016, 2015, 2013, 2012, 2010, 2009, 2006), NeurIPS (2020, 2019, 2018, 2017, 2016, 2014, 2013, 2011, 2010, 2007), NLP-LING (2010), SCIL (2020, 2018), SIGMORPHON (2023, 2019, 2018, 2014, 2012, 2010, 2008, 2006, 2004, 2002, 2000, 1998), WiNLP—Widening NLP Workshop (2023, 2021, 2019, 2018, 2017), ACL Workshop on Statistical NLP and Weighted Automata (StatFSM) (2016), ACL Workshop on Relevance of Linguistic Structure in Neural Architectures for NLP (RELNLP) (2018), ACL Workshop on Unsupervised Learning (2011), ACL Workshops on Teaching NLP and CL (2024, 2013, 2008, 2005, 2002), CVPR Workshop on Structured Prediction (2013), ICML Workshop on Prediction with Sequential Models (2013), International Conference on Dependency Linguistics (2011), Workshop on Formal Approaches to Slavic Linguistics 8 (1999).

Long-Term Committees

- ACL Doctoral Dissertation Award Committee (2025, 2026).
- Board member, Widening NLP (WiNLP) (2016–2025).

- Organizing committee member, [SIGDAT](#) (which runs the EMNLP conference) (2007–).
- Problems committee, North American Computational Linguistics Olympiad (2006–2013).
- President, ACL SIGMORPHON (Computational Morphology and Phonology) (2001–2021); executive committee (1998–2001).

Other

- Judge for “NLP Idol” special event at NAACL (2012). Panel moderator for NeurIPS Workshop on Interpretability and Robustness in Audio, Speech, and Language (2018).
- Mentor for NAACL Student Research Workshop (2013, 2012, 2009).
- NSF proposal reviewer (2022, 2021, 2019, 2018, 2017, 2014, 2013, 2010, 2009, 2008, 2004, 2003).
- Board of reviewers, *Handbook of Natural Language Processing* (2008–2009).
- Advisor to DARPA seedling in Adaptive Interactive Representations (2008–2009).
- Member, EU/NSF joint working group: “ePhilology: Emerging Language Technologies and the Rediscovery of the Past” (2002).

FELLOWSHIPS AND AWARDS	Fellow of the Association of Computational Linguistics	2018
	Outstanding Paper Award (EMNLP)	2024
	Outstanding Paper Award (ACL)	2022
	Best Short Paper Award (NAACL)	2021
	Best Paper Award (EMNLP-IJCNLP)	2019
	Best Long Paper Award (ACL)	2017
	Finalist for 5-year retrospective Best Paper Award (SMT Workshop)	2011
	Finalist for Best Paper Award (ACL, EMNLP-CoNLL, ACL, EMNLP)	2009, 2007, 2005, 2002
	Quora Top Writer	2016, 2017
	Best Featured Actor in a Musical DC Metro Theater Arts, Best of 2014	2014
	Alumni Association Excellence in Teaching Award Johns Hopkins University, Whiting School of Engineering	2013
	Robert B. Pond, Sr. Excellence in Teaching Award Johns Hopkins University, Whiting School of Engineering	2005

NSF Graduate Research Fellowship (computer science)	1993–1996
Herchel Smith Harvard Scholarship (mathematics)	1991–1993
Fulbright Scholarship (creative writing), South Africa	1990–1991
Harvard National Scholarship	1986–1990

UNIVERSITY
SERVICE

AI-X Steering Committee (2019–2023).

Common Question Committee (2019–).

Faculty member, [Center for Language and Speech Processing](#) (2000–).

Executive committee, [Mathematical Institute for Data Science](#) (2017–).

Curriculum committee, Computer Science Department (2016–2019 and 2023–, as chair 2017–2019).

Director of Graduate Studies, Computer Science Department (2002–2013).

Onstage presenter for various Homewood events: admissions open houses and parents’ weekends (spring 2013, fall 2013, spring 2014, fall 2014, fall 2017, spring 2018, fall 2018, fall 2019, spring 2023, spring 2024), Hopkins Engineering Sampler Seminar (2013), Dissertation Writing Workshop (2013, 2016), QuarkNet (2013), WSE centennial video (2013), TA Training Institute (2005–2019).

Mentor for multiple junior faculty members.

Service on tenure and promotion committees.

Search committees: Computer Science lecturer (2019), Bloomberg Distinguished Professorship in Computational Cognitive Science (2014, co-chair), Bloomberg Distinguished Professorship in Computational Healthcare (2014), CS machine learning subcommittee (2010–2014 and thereafter), Director of Admissions (2012), Applied Math and Statistics (2012, 2011), HLTCOE (2008–2019).

Chair of education planning committee, Computer Science Department (2013–2014).

Excellence in Teaching awards committee, Whiting School of Engineering (2014).

Judge for the HopHacks hackathon (2014, 2013).

PI of two NSF IGERT proposals involving 25+ faculty across campus (2011, 2010).

External review committees for Cognitive Science and PBS departments (2011).

Advisory committee member, Zooniverse project of the Adler Planetarium and JHU Space Telescope Science Institute (2009–2012).

Advisory board member, AMS GAANN Fellowship Program (2009–2012).

Advisory board member, cogito.org (2005–2016).

CS/CLSP admissions committee (2001–).

See also “Teaching” section.

GRANTS	DOE: Theseus: A Computational Science Foundation Model (co-PI, \$7M)	2024–2027
	JSALT: AI-Curated Democratic Discourse (PI)	summer 2024
	NSF RI-Small: Linguistic Structure in Neural Sequence Models (PI, \$395K)	2017–2020
	Amazon Research Award: Continuous-Time Reinforcement Learning For Personalization (PI, \$99K)	2018
	Google Faculty Research Award: Neural Modeling of String-to-String Transductions (PI, \$79K)	2017
	NVIDIA Corporation GPU Grant	2016
	XPS:FULL:Collaborative Research: Parallel and Distributed Circuit Programming for Structured Prediction (PI, \$825K)	2016–2019
	Facebook Faculty Gift (PI, \$50K)	2016
	NSF RI-Small: CompCog: Modeling Latent Discrete Knowledge Across Utterances (PI, \$500K)	2014–2017
	Science of Learning: Innovative Technology for Personalized Foreign Language Education (co-PI, \$200K)	2014–2016
	NSF RI-Medium: Learned Dynamic Prioritization (PI, \$900K)	2010–2014
	NSF PIRE: Investigation of Meaning Representations in Language Understanding for Machine Translation Systems (co-PI, \$2.5M)	2005–2014
	JHU Framework for the Future: Initiative in Computational Learning (PI, \$50K, leading a group of 30+ faculty)	2009
	NSF: Computing Innovation Fellows Program (postdoc mentor, \$140K)	2009–2011
	NSF RI: Cross-Cutting Research Workshops in Intelligent Information Systems (co-PI, \$647K plus substantial additional funding from other agencies and corporations)	2007–2012
JHU WSE-APL Partnership Fund: Learning with Less (PI, \$68K)	2006–2007	
NSF CAREER: Finite-State Machine Learning on Strings and Sequences (PI, \$500K)	2004–2010	

NSF ITR: Weighted Dynamic Programming for Statistical Natural Language Processing (PI, \$425K)	2003–2007
ONR MURI: Improving Statistical Translation Models Via Text Analyzers Trained From Parallel Corpora (co-PI, \$4.3M)	2001–2006
NSF ITR/IM+PE+SY: Summer Workshops on Human Language Technology (co-PI, \$2.35M)	2001–2006

PUBLICATIONS AND PRESENTATIONS

Work may be browsed by topic at <http://cs.jhu.edu/~jason/papers>.

Invited talks

- Propositions as parameters. Simons Institute for the Theory of Computing, September 2024.
- Putting planning and reasoning inside language models. Toyota Technological Institute at Chicago, May 2023.
- Dataflow for dialog. 4th Annual Conference on Automated Knowledge Base Construction, November 2022.
- Imposing structure on sequence models. NLPCC (keynote talk), September 2022.
- Is “Introduction to NLP” just “Machine Learning: NLP Edition”? Teaching NLP Workshop at NAACL, June 2021.
- Task-oriented Dialogue as Dataflow Synthesis: A deeper dive. (With Jacob Andreas, Dan Klein, and Percy Liang.) Workshop on Interactive and Executable Semantic Parsing, EMNLP, November 2020.
- Event sequence modeling with the neural Hawkes process. Max Planck Institute for Mathematics in the Sciences (MiS), Leipzig, July 2020; Institute for Advanced Study, Princeton, August 2020; ByteDance, May 2021; George Mason University, October 2021.
- What are natural languages optimized for? NeurIPS Workshop on Emergent Communication (invited talk), December 2019.
- Sequential structure meets hierarchical structure. Carnegie Mellon University, November 2019.
- Improving cross-linguistic robustness by training on synthetic languages. ACL Workshop on Typology for Polyglot NLP (invited talk), August 2019.
- Modeling event streams. NAACL Workshop on Structured Prediction for NLP (invited talk), June 2019.
- [Discrete latent variables in NLP: good, bad, and indifferent](#). ACL Workshop on Relevance of Linguistic Structure in Neural Architectures for NLP (invited talk), August 2018.
- [Recovering syntactic structure from surface features](#). Pennsylvania State University, January 2018. Similar talks at Saarland University, January 2019; Georgetown University (Distinguished Lecture Series), April 2019; Brown University (Eugene Charniak Memorial Workshop), November 2024.

[Probabilistically modeling surface patterns using latent structure](#). Symposium on Perceptions and Syntactic Structures at 60: Computational Modeling of Language (invited talk), at Society for Computation in Linguistics (SCiL), January 2018.

Strategies for discovering underlying linguistic structure. 8th International Joint Conference on Natural Language Processing (IJCNLP), November 2017. ([invited talk](#))

Probabilistic modeling of natural language. Data Science Seminar, Johns Hopkins University, March 2017.

Tractable deep models of sequential structure. LTI Colloquium, Carnegie Mellon University, March 2017. Similar talk at NeurIPS Workshop on Interpretability and Robustness in Audio, Speech, and Language (invited talk), December 2018.

Methods to discover underlying linguistic structure. NLP and Text-as-Data Speaker Series, New York University, March 2017. Similar invited talk at Duke University, October 2018.

Probabilistic models of related strings. ACL Workshop on Statistical NLP and Weighted Automata (StatFSM) (keynote talk), August 2016.

[Gradually learning to read a foreign language: Adaptive partial machine translation](#). Science of Learning Symposium at Johns Hopkins University ([keynote talk](#)), January 2016. Similar talks at Mount St. Mary's College, April 2016; ACL Workshop on Cognitive Modeling for Language Learning (keynote talk), August 2016; Duolingo, November 2019.

[Graphical models over string-valued random variables](#). IEEE ASRU ([keynote talk](#)), December 2015.

Probabilistic inference on strings. [Triangle Computer Science Distinguished Lecture Series](#) (UNC+Duke+NCSU), November 2015. Similar talks at Hebrew University of Jerusalem, April 2015; Bar-Ilan University, April 2015; Microsoft Research, May 2015; University of Illinois at Urbana-Champaign, June 2015; Georgetown University, November 2015.

A non-probabilistic language for probabilistic AI. [Dagstuhl Workshop on Challenges and Trends in Probabilistic Programming](#), April 2015.

Weighted deduction for analyzing natural language and other data. AAAI Fall Symposium: Natural Language Access to Big Data ([invited talk](#)), November 2014.

Learning phonology from surface data: Reconstructing the inputs. ACL Joint Workshop on Morphology/Phonology/Phonetics and Finite-State Methods ([keynote talk](#)), June 2014.

Open problems in computational phonology and morphology. ACL Joint Workshop on Morphology/Phonology/Phonetics and Finite-State Methods (invited panelist), June 2014.

[Deep learning of recursive structure: Grammar induction](#). 1st International Conference on Learning Representations ([keynote talk](#)), May 2013.

Grammar induction: Beyond local search. International Conference on Grammatical Inference (keynote talk), September 2012.

[Learning approximate inference policies for fast prediction](#). ICML Workshop on Inferning: Interactions between Inference and Learning (keynote talk), July 2012.

Dyna: A language for propagating and combining information. Workshop on Architectures for Uncertainty in Knowledge at Scale (AUKS), February 2012.

A non-parametric Bayesian approach to inflectional morphology. JHU Applied Math & Statistics Dept., December 2011; University of Maryland, November 2011; ICML/ACL/ICSA Symposium on Machine Learning in Speech and Language Processing, June 2011; Workshop on Machine Translation and Morphologically-Rich Languages, January 2011.

Invited panelist, ACL Workshop on Multiword Expressions, June 2011.

Toward unsupervised web scraping. DIRE Meeting, May 2011.

A weighted deductive language for declaratively specifying (some) algorithms. University of Bielefeld, July 2010.

Using dynamic programming to help search for reorderings. University of Bielefeld, July 2010.

Variational inference over structured variables for linguistic modeling. University of Edinburgh, May 2010.

A weighted deductive language for declaratively specifying (some) algorithms. University of Edinburgh, May 2010.

Constraint interaction, probabilistic models, and approximate inference. Chicago Linguistic Society Annual Conference, April 2010.

Extending logic programming to support modern statistical AI. Datalog 2.0 Workshop, March 2010.

[Weighted deduction as an abstraction level for AI](#). Joint conference on Statistical Relational Learning + Inductive Logic Programming + Mining and Learning with Graphs (keynote talk), July 2009.

[Joint models with missing data for semi-supervised learning](#). NAACL Workshop on Semi-Supervised Learning for Natural Language Processing (keynote talk), June 2009.

Dependency parsing by belief propagation. Boulder Workshop on Dependency Parsing, June 2009; Temple University, November 2008.

Shuffling non-constituents. ACL Workshop on Syntax and Structure in Statistical Translation (keynote talk), June 2008.

The Dyna language. CMU and Google, May 2008; MIT, November 2006; IBM Yorktown Heights, May 2006; Microsoft Research, August 2005; University of Washington, August 2005.

Searching for optimal permutations with very large-scale neighborhoods. JHU Applied Math & Statistics Dept., November 2007.

Discovering syntactic deep structure via Bayesian statistics. U. of Maryland, May 2007.

Bootstrapping without the boot. MITRE Corporation, August 2006; IPAM Document Space Workshop, January 2006.

Parameterized finite-state machines and their training. U. of Saarland, Germany, March 2004; AT&T Research, October 2002.

Inferring transformations. Mathematics of Language Conference (MoL8), Bloomington, June 2003.

Learning natural-language grammars using a Bayesian prior. Rochester Institute of Technology, May 2000; Johns Hopkins University, February 2000; UCLA Linguistics Department, June 1999; Stanford, 1999; U. of Texas at Austin, 1999; U. of Toronto, 1999; U. of Rochester, 1999; U. of Chicago, 1999.

[Doing OT in a straitjacket](#). Johns Hopkins Cognitive Science Dept., 2002; U. of Rochester Linguistics Dept., 2000; UCLA Linguistics Dept., 1999; Stanford Linguistics Dept., 1999; MIT Linguistics Dept., 1997.

Journal Articles

Jessy Lin, Nicholas Tomlin, Jacob Andreas, and Jason Eisner. [Decision-oriented dialogue for human-AI collaboration](#). *Transactions of the Association for Computational Linguistics (TACL)*, June 2024.

Jason Eisner. [Time-and-space-efficient weighted deduction](#). *Transactions of the Association for Computational Linguistics (TACL)*, 11:960–973, August 2023.

Tim Vieira, Ryan Cotterell, and Jason Eisner. [Automating the analysis of parsing algorithms \(and other dynamic programs\)](#). *Transactions of the Association for Computational Linguistics*, 2022. Accepted for publication.

Semantic Machines, Jacob Andreas, John Bufe, David Burkett, Charles Chen, Josh Clausman, Jean Crawford, Kate Crim, Jordan DeLoach, Leah Dorner, Jason Eisner, Hao Fang, Alan Guo, David Hall, Kristin Hayes, Kellie Hill, Diana Ho, Wendy Iwaszuk, Smriti Jha, Dan Klein, Jayant Krishnamurthy, Theo Lanman, Percy Liang, Christopher H. Lin, Ilya Lintsbakh, Andy McGovern, Aleksandr Nisnevich, Adam Pauls, Dmitriy Petters, Brent Read, Dan Roth, Subhro Roy, Jesse Rusak, Beth Short, Div Slomin, Ben Snyder, Stephon Striplin, Yu Su, Zachary Tellman, Sam Thomson, Andrei Vorobev, Izabela Witoszko, Jason Wolfe, Abby Wray, Yuchen Zhang, and Alexander Zotov. [Task-oriented dialogue as dataflow synthesis](#). *Transactions of the Association for Computational Linguistics*, 8:556–571, September 2020.

Xiang Lisa Li, Dingquan Wang, and Jason Eisner. [A generative model for punctuation in dependency trees](#). *Transactions of the Association for Computational Linguistics (TACL)*, 7:357–373, March 2019.

Ryan Cotterell, Christo Kirov, Mans Hulden, and Jason Eisner. [On the complexity and typology of inflectional morphological systems](#). *Transactions of the Association for Computational Linguistics (TACL)*, 7:327–342, March 2019.

Dingquan Wang and Jason Eisner. [Surface statistics of an unknown language indicate how to parse it](#). *Transactions of the Association for Computational Linguistics (TACL)*, 6:667–685, December 2018.

- Dingquan Wang and Jason Eisner. [Fine-grained prediction of syntactic typology: Discovering latent structure with supervised learning](#). *Transactions of the Association for Computational Linguistics (TACL)*, 5:147–161, June 2017.
- Tim Vieira and Jason Eisner. [Learning to prune: Exploring the frontier of fast and accurate parsing](#). *Transactions of the Association for Computational Linguistics (TACL)*, 5:263–278, August 2017.
- Dingquan Wang and Jason Eisner. [The Galactic Dependencies treebanks: Getting more data by synthesizing new languages](#). *Transactions of the Association for Computational Linguistics (TACL)*, 4:491–505, September 2016.
- Matthew R. Gormley, Mark Dredze, and Jason Eisner. [Approximation-aware dependency parsing by belief propagation](#). *Transactions of the Association for Computational Linguistics (TACL)*, 3:489–501, August 2015.
- Ryan Cotterell, Nanyun Peng, and Jason Eisner. [Modeling word forms using latent underlying morphs and phonology](#). *Transactions of the Association for Computational Linguistics (TACL)*, 3:433–447, August 2015.
- Francisco Sánchez-Vega, Jason Eisner, Laurent Younes, and Donald Geman. [Learning multivariate distributions by competitive assembly of marginals](#). *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, 99, April 2012. 14 pages plus 32-page supplement.
- John Eng and Jason M. Eisner. [Radiology report entry with automatic phrase completion driven by language modeling](#). *Radiographics*, 24(5):1493–1501, 2004.
- Jason Eisner. [Discovering syntactic deep structure via Bayesian statistics](#). *Cognitive Science*, 26(3):255–268, May-June 2002.
- Jason Eisner. [Introduction to the special section on linguistically apt statistical methods](#). *Cognitive Science*, 26(3):235–237, May-June 2002.

Book Chapters

- Jason Eisner and Nathaniel W. Filardo. [Dyna: Extending Datalog for modern AI](#). In Oege de Moor, Georg Gottlob, Tim Furche, and Andrew Sellers, editors, *Datalog Reloaded*, volume 6702 of *Lecture Notes in Computer Science*, pages 181–220. Springer, 2011. Longer version available as tech report.
- Antti-Veikko Rosti, Eugene Matusov, Jason Smith, Necip Ayan, Jason Eisner, Damianos Karakos, Sanjeev Khudanpur, Gregor Leusch, Zhifei Li, Spyros Matsoukas, Hermann Ney, Richard Schwartz, B. Zhang, and J. Zheng. [Confusion network decoding for MT system combination](#). In *Handbook of Natural Language Processing and Machine Translation*, pages 333–361. Springer, 2011.
- Jason Eisner and Noah A. Smith. [Favor short dependencies: Parsing with soft and hard constraints on dependency length](#). In Harry Bunt, Paola Merlo, and Joakim Nivre, editors, *Trends in Parsing Technology: Dependency Parsing, Domain Adaptation, and Deep Parsing*, chapter 8, pages 121–150. Springer, 2010.

Jason Eisner. [Bilexical grammars and their cubic-time parsing algorithms](#). In Harry Bunt and Anton Nijholt, editors, *Advances in Probabilistic and Other Parsing Technologies*, pages 29–62. Kluwer Academic Publishers, October 2000.

Book Reviews

Jason Eisner. [Review of Optimality Theory by René Kager](#). *Computational Linguistics*, 26(2):286–290, June 2000.

Ph.D. Thesis

Jason Eisner. [Smoothing a Probabilistic Lexicon via Syntactic Transformations](#). PhD thesis, University of Pennsylvania, July 2001. 318 pages.

Refereed Conference and Workshop Proceedings

Nishant Subramani, Jason Eisner, Justin Svegliato, Benjamin Van Durme, Yu Su, and Sam Thomson. [MICE for CATs: Model-internal confidence estimation for calibrating agents with tools](#). In *Proceedings of the North American Conference on Computational Linguistics*, Albuquerque, April 2025.

João Loula, Benjamin LeBrun, Li Du, Ben Lipkin, Clemente Pasti, Gabriel Grand, Tianyu Liu, Yahya Emara, Marjorie Freedman, Jason Eisner, Ryan Cotterell, Vikash Mansinghka, Alexander K. Lew, Tim Vieira, and Timothy J. O’Donnell. [Syntactic and semantic control of large language models via sequential Monte Carlo](#). In *Proceedings of the International Conference on Learning Representations*, Singapore, April 2025.

Yunmo Chen, Tongfei Chen, Harsh Jhamtani, Patrick Xia, Richard Shin, Jason Eisner, and Benjamin Van Durme. [Learning to retrieve iteratively for in-context learning](#). In *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, pages 7156–7168, November 2024.

Kaj Bostrom, Harsh Jhamtani, Hao Fang, Sam Thomson, Richard Shin, Patrick Xia, Benjamin Van Durme, Jason Eisner, and Jacob Andreas. [Language-to-code translation with a single labeled example](#). In *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, pages 8101–8112, November 2024.

Helia Hashemi, Jason Eisner, Corby Rosset, Benjamin Van Durme, and Chris Kedzie. [LLM-Rubric: A multidimensional, calibrated approach to automated evaluation of natural language texts](#). In *Proceedings of the 62nd Annual Meeting of the Association for Computational Linguistics (ACL)*, pages 13806–13834, August 2024.

Boshi Wang, Hao Fang, Jason Eisner, Benjamin Van Durme, and Yu Su. [LLMs in the Imaginarium: Tool learning through simulated trial and error](#). In *Proceedings of the 62nd Annual Meeting of the Association for Computational Linguistics (ACL)*, pages 10583–10604, August 2024.

Sky CH-Wang, Benjamin Van Durme, Jason Eisner, and Chris Kedzie. [Do androids know they’re only dreaming of electric sheep?](#) In *Findings of the 62nd Annual Meeting of the Association for Computational Linguistics (ACL)*, pages 4401–4420, August 2024.

Giovanni Monea, Maxime Peyrard, Martin Josifoski, Vishrav Chaudhary, Jason Eisner, Emre Kıcıman, Hamid Palangi, Barun Patra, and Robert West. [A glitch in the Matrix? Locating](#)

- and detecting language model grounding with Fakepedia. In *Proceedings of the 62nd Annual Meeting of the Association for Computational Linguistics (ACL)*, pages 6828–6844, August 2024.
- Li Du, Jason Eisner, Holden Lee, and Ryan Cotterell. [When is a language process a language model?](#) In *Findings of the 62nd Annual Meeting of the Association for Computational Linguistics (ACL)*, pages 11083–11094, August 2024.
- Li Du, Afra Amini, Lucas Torroba Hennigen, Xinyan Velocity Yu, Holden Lee, Jason Eisner, and Ryan Cotterell. [Principled gradient-based MCMC for conditional sampling of text.](#) In *Proceedings of the 41st International Conference on Machine Learning (ICML)*, July 2024.
- Nikita Moghe, Patrick Xia, Jacob Andreas, Jason Eisner, Benjamin Van Durme, and Harsh Jhamtani. [Interpreting user requests in the context of natural language standing instructions.](#) In *Findings of the North American Conference on Computational Linguistics (NAACL)*, volume arXiv:2311.09796, pages 4043–4060, June 2024.
- Weiting Tan, Chu-Cheng Lin, and Jason Eisner. [Structure-aware path inference for neural finite state transducers.](#) In *Proceedings of the NeurIPS 2023 Workshop “I Can’t Believe It’s Not Better: Failure Modes in the Age of Foundation Models”*, December 2023.
- Subhro Roy, Sam Thomson, Tongfei Chen, Richard Shin, Adam Pauls, Jason Eisner, and Benjamin Van Durme. [BenchCLAMP: A benchmark for evaluating language models on syntactic and semantic parsing.](#) In *Proceedings of the Thirty-Seventh Conference on Neural Information Processing Systems*, December 2023. Datasets and Benchmarks Track.
- Ruiqi Zhong, Charlie Snell, Dan Klein, and Jason Eisner. [Non-programmers can label programs indirectly via active examples: A case study with text-to-SQL.](#) In *Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing*, pages 5126–5152, December 2023.
- Jie Chi, Brian Lu, Jason Eisner, Peter Bell, Preethi Jyothi, and Ahmed M. Ali. [Unsupervised code-switched text generation from parallel text.](#) In *Proceedings of INTERSPEECH*, Dublin, August 2023.
- Hao Fang, Anusha Balakrishnan, Harsh Jhamtani, John Bufe, Jean Crawford, Jayant Krishnamurthy, Adam Pauls, Jason Eisner, Jacob Andreas, and Dan Klein. [The whole truth and nothing but the truth: Faithful and controllable dialogue response generation with dataflow transduction and constrained decoding.](#) In *Findings of the Association for Computational Linguistics: ACL 2023*, pages 5682–5700, July 2023.
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- Jason Eisner. [Comprehension and compilation in Optimality Theory](#). In *Proceedings of the 40th Annual Meeting of the Association for Computational Linguistics (ACL)*, pages 56–63, Philadelphia, July 2002.

- Jason Eisner. [An interactive spreadsheet for teaching the forward-backward algorithm](#). In Dragomir Radev and Chris Brew, editors, *Proceedings of the ACL Workshop on Effective Tools and Methodologies for Teaching NLP and CL*, pages 10–18, Philadelphia, July 2002.
- Jason Eisner. [Transformational priors over grammars](#). In *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, pages 63–70, Philadelphia, July 2002. Nominated for Best Paper Award.
- Jason Eisner. [Expectation semirings: Flexible EM for finite-state transducers](#). In Gertjan van Noord, editor, *Proceedings of the ESSLLI Workshop on Finite-State Methods in Natural Language Processing (FSMNLP)*, Helsinki, August 2001. Extended abstract (5 pages).
- Jason Eisner. [Easy and hard constraint ranking in Optimality Theory: Algorithms and complexity](#). In Jason Eisner, Lauri Karttunen, and Alain Thériault, editors, *Finite-State Phonology: Proceedings of the 5th Workshop of the ACL Special Interest Group in Computational Phonology (SIGPHON)*, pages 22–33, Luxembourg, August 2000.
- Jason Eisner. [Directional constraint evaluation in Optimality Theory](#). In *Proceedings of the 18th International Conference on Computational Linguistics (COLING 2000)*, pages 257–263, Saarbrücken, Germany, August 2000.
- Jason Eisner and Giorgio Satta. [A faster parsing algorithm for lexicalized tree-adjoining grammars](#). In *Proceedings of the 5th Workshop on Tree-Adjoining Grammars and Related Formalisms (TAG+5)*, pages 14–19, Paris, May 2000.
- Jason Eisner and Giorgio Satta. [Efficient parsing for bilexical context-free grammars and head-automaton grammars](#). In *Proceedings of the 37th Annual Meeting of the Association for Computational Linguistics (ACL)*, pages 457–464, University of Maryland, June 1999.
- Jason Eisner. [FOOTFORM decomposed: Using primitive constraints in OT](#). In Benjamin Bruening, editor, *Proceedings of SCIL VIII*, number 31 in MIT Working Papers in Linguistics, pages 115–143, Cambridge, MA, 1998.
- Jason Eisner. [Bilexical grammars and a cubic-time probabilistic parser](#). In *Proceedings of the 5th International Workshop on Parsing Technologies (IWPT)*, pages 54–65, MIT, Cambridge, MA, September 1997.
- Jason Eisner. [Efficient generation in primitive Optimality Theory](#). In *Proceedings of the 35th Annual Meeting of the Association for Computational Linguistics (ACL)*, pages 313–320, Madrid, July 1997.
- Jason Eisner. [Three new probabilistic models for dependency parsing: An exploration](#). In *Proceedings of the 16th International Conference on Computational Linguistics (COLING-96)*, pages 340–345, Copenhagen, August 1996.
- Jason Eisner. [Efficient normal-form parsing for combinatory categorial grammar](#). In *Proceedings of the 34th Annual Meeting of the Association for Computational Linguistics (ACL)*, pages 79–86, Santa Cruz, June 1996.
- Breck Baldwin, Jeff Reynar, Mike Collins, Jason Eisner, Adwait Ratnaparkhi, Joseph Rosenzweig, Anoop Sarkar, and Srinivas. [Description of the University of Pennsylvania entry](#)

- in the MUC-6 competition. In *Proceedings of the Sixth Message Understanding Conference*, pages 177–191, Maryland, October 1995.
- Jason Eisner. [∇-less in Wonderland? Revisiting any](#). In Janet Fuller, Ho Han, and David Parkinson, editors, *Proceedings of ESCOL 11 (October 1994)*, pages 92–103, Ithaca, NY, 1995. DMLL Publications.
- Mark A. Jones and Jason M. Eisner. [A probabilistic parser applied to software testing documents](#). In *Proceedings of National Conference on Artificial Intelligence (AAAI-92)*, pages 322–328, San Jose, July 1992.
- Mark A. Jones and Jason M. Eisner. [A probabilistic parser and its application](#). In Carl Weir, editor, *Statistically-Based Natural Language Processing Techniques: Papers from the 1992 Workshop*, pages 20–27. Menlo Park: AAAI Press, July 1992. Technical Report WS-92-01.

Refereed Presentations

- Ryan Cotterell, Sabrina J. Mielke, Jason Eisner, and Brian Roark. [Are all languages equally hard to language-model?](#) *Proceedings of the Society for Computation in Linguistics (SCiL)*, 2(47):361–362, January 2019.
- Jason Eisner and Nathaniel Wesley Filardo. [Treating machine learning algorithms as declaratively specified circuits](#). In *Proceedings of the Conference on Systems and Machine Learning (SysML)*, Palo Alto, February 2018.
- Dingquan Wang and Jason Eisner. [Predicting fine-grained syntactic typology from surface features](#). In *Proceedings of the Society for Computation in Linguistics (SCiL)*, volume 1, Salt Lake City, January 2018.
- Ryan Cotterell, Christo Kirov, Mans Hulden, and Jason Eisner. [Quantifying the trade-off between two types of morphological complexity](#). In *Proceedings of the Society for Computation in Linguistics (SCiL)*, volume 1, pages 209–210, Salt Lake City, January 2018.
- Nicholas Andrews and Jason Eisner. [Transformation process priors](#). In *NeurIPS Workshop on Bayesian Nonparametrics: Hope or Hype?*, Sierra Nevada, Spain, December 2011. Extended abstract (3 pages).
- Matthew R. Gormley, Mark Dredze, Benjamin Van Durme, and Jason Eisner. [Shared components topic models with application to selectional preference](#). In *NeurIPS Workshop on Learning Semantics*, Sierra Nevada, Spain, December 2011. Extended abstract (3 pages).
- Jason Eisner. [Dyna: A non-probabilistic programming language for probabilistic AI](#). Extended abstract for talk at the NeurIPS*2008 Workshop on Probabilistic Programming, December 2008.
- Jason Eisner, Michael Kornbluh, Gordon Woodhull, Raymond Buse, Samuel Huang, Constantinos Michael, and George Shafer. [Visual navigation through large directed graphs and hypergraphs](#). In *Proceedings of the IEEE Symposium on Information Visualization (InfoVis'06), Poster/Demo Session*, pages 116–117, Baltimore, October 2006.

Jason Eisner. [What constraints should OT allow?](#) Talk handout available online (22 pages), Linguistic Society of America (LSA), January 1997.

Invited Papers

Ryan Cotterell, Christo Kirov, John Sylak-Glassman, Géraldine Walther, Ekaterina Vylomova, Arya D. McCarthy, Katharina Kann, Sabrina Mielke, Garrett Nicolai, Miikka Silfverberg, David Yarowsky, Jason Eisner, and Mans Hulden. [The CoNLL–SIGMORPHON 2018 shared task: Universal morphological reinflection](#). In *Proceedings of the CoNLL SIGMORPHON 2018 Shared Task: Universal Morphological Reinflection*, pages 1–27, Brussels, October 2018.

Ryan Cotterell, Christo Kirov, John Sylak-Glassman, Géraldine Walther, Ekaterina Vylomova, Patrick Xia, Manaal Faruqui, Sandra Kübler, David Yarowsky, Jason Eisner, and Mans Hulden. [CoNLL-SIGMORPHON 2017 shared task: Universal morphological reinflection in 52 languages](#). In *Proceedings of the Conference on Natural Language Learning: CoNLL-SIGMORPHON Shared Task System Descriptions*, pages 1–30, Vancouver, August 2017.

Ryan Cotterell, Christo Kirov, John Sylak-Glassman, David Yarowsky, Jason Eisner, and Mans Hulden. [The SIGMORPHON 2016 shared task—morphological reinflection](#). In *Proceedings of the 14th SIGMORPHON Workshop on Computational Research in Phonetics, Phonology, and Morphology*, pages 10–22, Berlin, August 2016. Supplementary material (4 pages) also available.

Damianos Karakos, Sanjeev Khudanpur, Jason Eisner, and Carey E. Priebe. [Unsupervised classification via decision trees: An information-theoretic perspective](#). In *Proceedings of the 2005 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, volume 5, pages 1081–1084, Philadelphia, March 2005. Invited talk.

Technical Reports (some under review as conference/journal submissions)

Shepard Xia, Brian Lu, and Jason Eisner. [Let’s think var-by-var: Large language models enable *ad hoc* probabilistic reasoning](#). *Computing Research Repository*, arXiv:2412.02081, December 2024.

Kumar Shridhar, Harsh Jhamtani, Hao Fang, Benjamin Van Durme, Jason Eisner, and Patrick Xia. [SCREWS: A modular framework for reasoning with revisions](#). *Computing Research Repository*, arXiv:2309.13075, September 2023.

Li Du, Hongyuan Mei, and Jason Eisner. [Autoregressive modeling with lookahead attention](#). *Computing Research Repository*, arXiv:2305.12272, May 2023.

Clemente Pasti, Andreas Opedal, Tiago Pimentel, Tim Vieira, Jason Eisner, and Ryan Cotterell. [On the intersection of context-free and regular languages](#). *Computing Research Repository*, arXiv:2209.06809, September 2022.

Ryan Cotterell, Christo Kirov, Mans Hulden, and Jason Eisner. [On the diachronic stability of irregularity in inflectional morphology](#). *Computing Research Repository*, arXiv:1804.08262, April 2018.

Jia Cui and Jason Eisner. [Finite-state Dirichlet allocation: Learned priors on finite-state models](#). Technical Report 53, Center for Language and Speech Processing, Johns Hopkins University, April 2006. 18 pages.

Jan Hajič, Martin Čmejrek, Bonnie Dorr, Yuan Ding, Jason Eisner, Daniel Gildea, Terry Koo, Kristen Parton, Gerald Penn, Dragomir Radev, and Owen Rambow. [Natural language generation in the context of machine translation](#). Technical report, Center for Language and Speech Processing, Johns Hopkins University, Baltimore, March 2004. Final report from 2002 CLSP summer workshop (87 pages).

Jason Eisner. [State-of-the-art algorithms for minimum spanning trees: A tutorial discussion](#). Manuscript available online (78 pages), University of Pennsylvania, 1997.

Jason Eisner. [An empirical comparison of probability models for dependency grammar](#). Technical Report IRCS-96-11, Institute for Research in Cognitive Science, Univ. of Pennsylvania, 1996. Available online (18 pages).

Jason Eisner. [Indirect STV election: A voting system for South Africa](#). White paper, University of Cape Town, June 1991. Available online (16 pages).

Jason Eisner. [Dynamical-systems behavior in recurrent and non-recurrent connectionist nets](#). Undergraduate honors thesis, Harvard University, April 1990. Available online (57 pages).

General Audience

Leon Derczynski, Jason Eisner, Yoav Goldberg, Iryna Gurevych, Lillian Lee, Joakim Nivre, Brian Roark, Tamar Solorio, Yue Zhang, Chengqing Zong, and Diyi Yang. [Report of the ACL committee on the anonymity policy](#). Report available on the wiki of the Association for Computational Linguistics, December 2023.

Jason Eisner, Jennifer Foster, Iryna Guryvech, Marti Hearst, Heng Ji, Lillian Lee, Christopher Manning, Paola Merlo, Yusuke Miyao, Joakim Nivre, Amanda Stent, and Ming Zhou. [ACL policies and guidelines for submission, review and citation](#). Report available on the wiki of the Association for Computational Linguistics, October 2017.

Jason Eisner. [The science of language: Computational linguistics](#). *Imagine Magazine*, 7(4):14–15, March 2000.

Jason Eisner. [Cognitive science and the search for intelligence](#). Invited paper presented to the Socratic Society, University of Cape Town, South Africa, May 1991. Available online (24 pages).

Edited Volumes

Mans Hulden, Ryan Cotterell, Jason Eisner, Manaal Faruqui, Christo Kirov, Sandra Kübler, John Sylak-Glassman, Ekaterina Vylomova, Géraldine Walther, Patrick Xia, and David Yarowsky, editors. [Proceedings of the CoNLL SIGMORPHON 2017 Shared Task: Universal Morphological Reinflection](#). Association for Computational Linguistics, Vancouver, August 2017. 125 pages.

Jason Eisner and Jeffrey Heinz, editors. *Proceedings of the Tenth Meeting of the ACL Special Interest Group on Computational Morphology and Phonology*. Association for Computational Linguistics, Columbus, Ohio, June 2008. 57 pages.

Jason Eisner, editor. *Proceedings of the 2007 Joint Conference on Empirical Methods in Natural Language Processing and Computational Natural Language Learning (EMNLP-CoNLL)*. Association for Computational Linguistics, Prague, June 2007. 1220 pages.

Jason Eisner, Lauri Karttunen, and Alain Thériault, editors. *Finite-State Phonology: Proceedings of the 5th Workshop of the ACL Special Interest Group in Computational Phonology (SIGPHON)*. Association for Computational Linguistics, Luxembourg, August 2007. 67 pages.

PATENTS

Frederick S. M. Herz, Lyle H. Ungar, Jason M. Eisner, and Walter Paul Labys. [Stock market prediction using natural language processing](#). U.S. Patent #8,285,619 issued 10/9/2012, 2002.

Frederick S. M. Herz, Jonathan Smith, Paul Labys, and Jason Michael Eisner. [Method of combining shared buffers of continuous digital media data with media delivery scheduling](#). Patent pending, filed 2001.

Frederick S. M. Herz, Walter Paul Labys, David C. Parkes, Sampath Kannan, and Jason M. Eisner. [Secure data interchange](#). U.S. Patent 7,630,986, issued 2009, 2000.

Frederick Herz, Jason Eisner, Lyle Ungar, Walter Paul Labys, Bernie Roemmele, and Jon Hayward. [System for the automatic determination of customized prices and promotions](#). U.S. Patent Application 20,010/014,868, filed 1998.

Jeffrey C. Reynar, Fred Herz, Jason Eisner, and Lyle Ungar. [A Lempel-Ziv data compression technique utilizing a dictionary pre-filled with frequent letter combinations, words and/or phrases](#). U.S. Patent #5,951,623 issued 9/14/1999, 1996.

Frederick S. M. Herz, Jason M. Eisner, and Lyle H. Ungar. [System for generation of object profiles for a system for customized electronic identification of desirable objects](#). U.S. Patent #5,835,087 issued 11/10/1998, 1995.

Frederick S. M. Herz, Jason M. Eisner, Lyle H. Ungar, and Mitchell P. Marcus. [System for generation of user profiles for a system for customized electronic identification of desirable objects](#). U.S. Patent #5,754,939 issued 5/19/1998, 1995.

Frederick S. M. Herz, Jason Eisner, and Marcos Salganicoff. [Pseudonymous server for system for customized electronic identification of desirable objects](#). U.S. Patent #5,754,938 issued 5/19/1998, 1995.

Frederick S. M. Herz, Jason M. Eisner, Jonathan M. Smith, and Steven L. Salzberg. [System for customized electronic identification of desirable objects](#). Patent pending, filed 1995.

DISSERTATIONS SUPERVISED

Matthew Francis-Landau. *Declarative Programming via Term Rewriting*. PhD thesis, Johns Hopkins University, February 2024.

- Sabrina J. Mielke. *Building and Evaluating Open-Vocabulary Language Models*. PhD thesis, Johns Hopkins University, October 2023.
- Tim Vieira. *Automating the Analysis and Improvement of Dynamic Programming Algorithms with Applications to Natural Language Processing*. PhD thesis, Johns Hopkins University, July 2023.
- Chu-Cheng Lin. *On Expressiveness, Inference, and Parameter Estimation of Discrete Sequence Models*. PhD thesis, Johns Hopkins University, October 2022.
- Ryan Cotterell. *The Probabilistic Typology of Vowel Systems*. PhD thesis, Johns Hopkins University, July 2021.
- Hongyuan Mei. *Neural Probabilistic Methods for Event Sequence Modeling*. PhD thesis, Johns Hopkins University, July 2021.
- Dingquan Wang. *Supervised Training on Synthetic Languages: A Novel Framework for Unsupervised Parsing*. PhD thesis, Johns Hopkins University, October 2019.
- Nathaniel Wesley Filardo. *Dyna 2: Towards a General Weighted Logic Language*. PhD thesis, Johns Hopkins University, October 2017.
- Nicholas Oliver Andrews. *Generative Non-Markov Models for Information Extraction*. PhD thesis, Johns Hopkins University, February 2016.
- Matthew R. Gormley. *Graphical Models with Structured Factors, Neural Factors, and Approximation-Aware Training*. PhD thesis, Johns Hopkins University, October 2015.
- Markus Dreyer. *A Non-Parametric Model for the Discovery of Inflectional Paradigms from Plain Text Using Graphical Models over Strings*. PhD thesis, Johns Hopkins University, Baltimore, MD, April 2011.
- David A. Smith. *Efficient Inference for Trees and Alignments: Modeling Monolingual and Bilingual Syntax with Hard and Soft Constraints and Latent Variables*. PhD thesis, Johns Hopkins University, Baltimore, MD, October 2010.
- Zhifei Li. *Discriminative Training and Variational Decoding in Machine Translation Via Novel Algorithms for Weighted Hypergraphs*. PhD thesis, Johns Hopkins University, Baltimore, MD, April 2010.
- Roy Tromble. *Search and Learning for the Linear Ordering Problem with an Application to Machine Translation*. PhD thesis, Johns Hopkins University, Baltimore, MD, April 2009.
- Noah A. Smith. *Novel Estimation Methods for Unsupervised Discovery of Latent Structure in Natural Language Text*. PhD thesis, Johns Hopkins University, Baltimore, MD, October 2006.

OTHER SCHOLARLY AND TECHNICAL OUTPUT

In addition to the items below, code and data associated with my papers are often available from <http://cs.jhu.edu/~jason/papers>, or on request. Some older releases are listed below.

My student Matt Gormley in 2014 released [Pacaya](#), a general graphical models package with support for structured factors.

Veselin Stoyanov and I released the [ERMA](#) toolkit in 2012 for robust training of graphical models under approximations.

We have 4 partial implementations of the [Dyna programming language](#). My students and I released a Dyna-to-C++ compiler in 2005 for the semiring-weighted subset of Dyna. It was used for both research and teaching. Tim Vieira's 2022 dissertation has an interpreter for this subset that includes program transformations and static analysis. In 2013, we prototyped a new, more flexible runtime engine for the full design, and it was used for teaching. Matthew Francis-Landau has been developing a new type of runtime engine, [Dyna-R](#), based on rewriting of relational expressions (R-exprs).

I provide various tutorial materials at <http://cs.jhu.edu/~jason/tutorials>. These include interactive software visualizations for log-linear models (2013), hidden Markov models, and Gaussian mixture models, as well as software for experimenting with probabilistic context-free grammars. They include other writings, slides, and videos as well. My course slides have also been used at a number of other institutions.

Several undergraduates and I released the [Dynasty](#) hypergraph browser in 2006. We are designing a more powerful successor for use with version 2 of Dyna.

Philipp Koehn and I produced the [aclpub](#) publications package that has been used since 2005 for the ACL, NAACL, EMNLP, EACL, COLING, IJCNLP, and CoNLL conferences (among others), as well as their associated workshops.

TEACHING

Department of Computer Science, Johns Hopkins University

Alumni Association Excellence in Teaching Award, Whiting School of Engineering, 2013

Robert B. Pond, Sr. Excellence in Teaching Award, Whiting School of Engineering, 2005

- [Natural Language Processing](#) 2001–, except for 2005, 2015, 2019
A mixed graduate-undergraduate class that teaches a synthesis of statistical models, formal grammars, and linguistic theory, with associated algorithms. It is reputed to be one of the most challenging classes in the Computer Science department, requiring both rigor and intellectual flexibility.
Faculty at several other universities have asked to use the extensive online course materials.
Enrollment: 70.
- [CS Freshman Experience](#) 2020, 2021
A weekly seminar to introduce a group of new majors to a range of high-level ideas in computer science.
Enrollment: 10.
- [Current Topics in Natural Language Processing](#) every semester 2001–
A weekly reading and discussion group, exploring important current research in natural language processing and potentially relevant material from related fields. Topics are chosen by the group; each lasts 3–4 weeks.

Enrollment: 10.

- *Machine Learning: Linguistic and Sequence Modeling* 2018, 2019
A graduate class that teaches formal methods for mathematical modeling of real-world sequence data, including finite-state methods, Bayesian nonparametrics, deep learning, and reinforcement learning. Examples are drawn primarily from natural language processing.
Enrollment: 30.
- *Declarative Methods* 2005–2017, except 2015
A new course for juniors, seniors, and graduate students. It surveys computational problems that tend to pop up frequently in different guises (e.g., constraint satisfaction); the specification languages used to describe instances of these problems; general toolkits for solving these instances; and the algorithms run by these toolkits.
Enrollment: 15–35.
- *Current Topics in Machine Learning* 2013, 2014
A weekly reading and discussion group with a participatory format, jointly led by three faculty.
Enrollment: about 20.
- *Puzzles, Graphs, and NLP* 2008, 2011
A 3-class unit to expose freshman CS majors to natural language processing. Discusses various contest puzzles and applied NLP problems, and connects many of them to computational questions about directed graphs.
Enrollment: About 20.
- *Totally Random* 2004, 2005
A 4-class discussion unit about random numbers and the uses of randomness in computer science. Part of the department's new freshman experience course.
Enrollment: 8–10.
- *Data Structures* 2003, 2004
A sophomore-level class, the third and last in the programming sequence for majors. Covers basic data structures and algorithms, basic analysis of algorithms, and object-oriented programming style. Online "warmups" and highly interactive classes stimulated the students to come up with designs and variations. The challenging weekly assignments often used real-world data.
Faculty at a dozen other universities have asked to use the course materials.
Enrollment: about 50.
- *Finite-State Methods in Natural Language Processing* 2000–2001
A graduate class on semiring-weighted finite-state transducers. Covers theory and practice, including the theory of formal power series, the extended regular expression calculus, and a range of applications to natural language. Rigorous assignments.
Attendance: about 20.
- *Statistical Language Learning* 2002
A graduate class about past and present research that has attempted to induce the structure of language from raw data such as text. Lectures are intermixed with reading and discussion of the primary literature.

Attendance: about 10.

Tutorials at conferences

- [Structured Belief Propagation for Natural Language Processing](#) 2014, 2015
(with Matt Gormley, at ACL 2014 and ACL 2015)

NAACL Professor (named professorship) at the [Linguistic Institute](#) 2013

- [Computational linguistics course](#) at the biennial summer school of the Linguistic Society of America.

Lecturer, 1st [Lisbon Machine Learning School](#) 2011

- Lectures on generative Bayesian modeling.

Lecturer, NAACL Summer School in Human Language Technology summers 2002–2012, 2016

- Lectures on NLP and applied probability.
- [Laboratory exercise](#) in competitive grammar writing.

Speaker, TA Training Institute, Johns Hopkins University 2005–2018

- Large fall lectures: “Preparing for the first day in sciences and engineering.”
- Small spring workshop (some years): “Starting the semester off right in engineering and sciences.”

Department of Computer Science, University of Rochester

- *Statistical Learning of Natural Language* 2000
- *Graduate Problem Seminar* 2000

Boot camp for new Ph.D. students. Students learn research skills by teaming up to tackle a series of open-ended engineering problems that touch on research in the department. (I made them build systems for face orientation detection, distributed calendar management, and information retrieval.) Several written and oral presentations are required and receive extensive feedback. The class also includes career advice, familiarization with departmental resources, presentations by other faculty, and a final research project.

Enrollment: 10.

Department of Computer Science, University of Pennsylvania

Graduate Teaching Award, 1995

- TA in *Introduction to Programming* 1994–1995

ADVISING

Postdoctoral fellows

Veselin Stoyanov (*NSF Computational Innovation Fellow;*
now at Facebook) 2009–2011

Ph.D. dissertation students

Li (Leo) Du	2021–
Brian (Zhichu) Lu	2020–
Sabrina Mielke	2017–2023
Hongyuan Mei (<i>Bloomberg Fellow; Jelinek Memorial Award; research prof at TTIC; now prof at Purdue</i>)	2016–2021
Matthew Francis-Landau	2016–2024
Chu-Cheng Lin (<i>now at Google</i>)	2015–2022
Dingquan Wang (<i>now at Google</i>)	2014–2019
Ryan Cotterell (<i>Fulbright Scholar; NDSEG Fellow; Facebook Fellow; Jelinek Memorial Award; now prof at ETH Zurich</i>)	2013–2021
Tim Vieira (<i>now postdoc at ETH Zurich</i>)	2011–2023
Nathaniel W. Filardo (<i>HLTCOE Fellow; postdoc at U. Cambridge; now at Microsoft Research</i>)	2007–2017
Nicholas Andrews (<i>now research scientist, JHU HLTCOE</i>)	2009–2016
Matthew Gormley (<i>HLTCOE Fellow; now teaching prof, CMU MLD</i>)	2009–2015
Markus Dreyer (<i>Wolman Fellow; now Sr. Machine Learning Scientist, Amazon</i>)	2003–2011
Zhifei Li (co-adv.) (<i>later at Google; now CEO/founder of Mobvoi</i>)	2008–2010
David A. Smith (<i>NSF Fellow; research prof at Mass; now prof at Northeastern</i>)	2002–2010
Roy Tromble (<i>NDSEG Fellow; now at Google</i>)	2002–2009
Noah A. Smith (<i>Hertz Foundation Fellow; prof at CMU; now prof at U. Washington</i>)	2001–2006

Other former Ph.D. students (period as primary advisee)

Jacob Buckman (<i>now at MILA</i>)	2018–2019
Michael Paul (<i>NSF Fellow; Microsoft Fellow; Dean's Fellow; now Asst. Prof., UC-Boulder</i>)	2010–2015
Adam Teichert (<i>now Asst. Prof., Snow College</i>)	2010–2014
Darcey Riley (<i>Dean's Fellow; moved to Google; now at Notre Dame</i>)	2012–2015
Jason R. Smith (<i>switched advisors in 2011; now at Google</i>)	2006–2011
Omar Zaidan (<i>now at Microsoft Research</i>)	2005–2008
John Blatz (<i>now at Google</i>)	2004–2008
Eric Goldlust (<i>Wolman Fellow; Muuss Research Award; Hon. Mention for CRA Outstanding Undergraduate Award</i>)	2004–2005

H.S./B.S./M.S.E. research students

Reva Hirave (<i>visitor from George Mason</i>)	2024–
Kateryna Morhun (<i>visitor from MIT</i>)	2024–
Yuqi Li	2024–
Tom Wang	2024–
T.J. Bai	2024–

Weitao Shepard Xia	2024–
Tsugunobu Miyake (<i>visitor from Bucknell;</i> <i>Hon. Mention for CRA Outstanding Undergraduate Award</i>)	2024
Steven Tan	2021–2023
Qi He	2021–2023
Chenghao Yang (<i>visitor from Columbia</i>)	2020–2022
Xiang Lisa Li (<i>CRA Outstanding Undergraduate Award;</i> <i>now at Stanford</i>)	2018–
Guanghai Qin (<i>visitor from Peking University, then Ph.D. at JHU</i>)	2018–2019
Hao Zhu (<i>visitor from Tsinghua University, then Ph.D. at CMU</i>)	2018–2019
Shijie Wu	2017–2018
Xiaochen Li	2017
Bo Liu	2016–2017
Yuan Jing (Vincent) Yan	2016–2017
Jiawei Huang	2016–2020
Nikita Srivatsan	2016–2018
Mozhi Zhang	2015–2018
Elan Hourticolon-Retzler	2015
Juneki Hong (<i>Most Valuable Peer Award</i>)	2013–2018
Sharon Li (<i>Outstanding Senior Award</i>)	2013–2014
Katherine Wu (<i>Pistrutto Fellow, Outstanding Senior Award</i>)	2012–2013
Jay Feldman (<i>Pistrutto Fellow, Outstanding Senior Award</i>)	2012–2013
Michael Tontchev (<i>High school—Grand Prize Winner,</i> <i>Baltimore Science Fair</i>)	2010–2012
Alex Ropson	2010–2011
Ashish Sharma	2009–2010
Wren Thornton	2008
Ian Nowland	2008–2009
Jay Van Der Wall	2007–2009
Asheesh Laroia	2006–2007
Samuel Huang (<i>Pistrutto Fellow</i>)	2006–2007
Constantinos Michael	2005–2006
George Shafer	2005–2006
John Graettinger (<i>Outstanding Research Award</i>)	2005–2006
Michael Kornbluh (<i>Pistrutto Fellow, Outstanding Senior Award</i>)	2004–2005
Chalaporn Hathaidharm	2002–2004

Ph.D. dissertation committees (not as advisor)

Benjamin Börschinger (Macquarie U.)	exp. 2015
Yonatan Bisk (UIUC)	2015
Jiarong Jiang (U. of Maryland)	2014
Francisco Sánchez-Vega (JHU Applied Math & Stats Dept.)	2012
Will Headden (Brown University)	2011
Jia Cui	2008
Mark Thober	2007

Gaja Jarosz Snover (JHU Cognitive Science Dept.)	2006
Jonathan Allen	2006
Gideon Mann	2006
Charles Schafer	2006
Myroslava Dzikovska (Univ. of Rochester)	2004
Silviu Cucerzan	2003
Radu "Hans" Florian	2002
Jun Wu	2002
Richard Wicentowski	2002
Grace Ngai	2000

February 18, 2025