

Ryan Cotterell

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| CONTACT INFORMATION | Department of Computer Science Johns Hopkins University Hackerman 321 3400 North Charles Street Baltimore, Maryland 21218, USA | <i>mobile:</i> (213) 905-2260 <i>email:</i> ryan.cotterell@jhu.edu <i>www:</i> ryancotterell.github.io |
| EDUCATION | Johns Hopkins University Ph.D. in Computer Science Advisors: Jason Eisner and David Yarowsky | Spring 2019 (Expected) |
| | Ludwig-Maximilians-Universität München Visiting Ph.D. Student Advisor: Hinrich Schütze | 2014-2016 |
| | Johns Hopkins University M.S.E. in Computer Science Advisor: Chris Callison-Burch GPA: 4.0 | Spring 2017 |
| | Johns Hopkins University B.A. in Cognitive Science Minor: Linguistics Advisor: Colin Wilson GPA: 3.87 (<i>General Honors</i>) Major GPA: 4.0 (<i>Departmental Honors</i>) | Spring 2013 |
| | Faculty of Liberal Arts and Sciences of St. Petersburg State University Study Abroad, St. Petersburg, Russia | Fall 2009 |
| | Friends School Baltimore, Maryland | Spring 2007 |
| EMPLOYMENT | Google Research , New York, NY Software Engineering Intern Hosts: Brian Roark and Vlad Schogol | June-September 2017 |
| | Human Language Technology Center of Excellence , Baltimore, MD Participant in the Summer Camp for Applied Language Exploration (SCALE) Supervisor: Benjamin Van Durme | June-August 2012 |
| TEACHING | Teaching Assistant Johns Hopkins University Course: Machine Learning (600.475) Professor: Mark Dredze <i>I held discussion sessions with students to prepare them for homework problem sets.</i> | Fall 2016 |
| | Teaching Assistant Johns Hopkins University Course: Automata and Computation Theory (600.271) Professor: Stephen Checkoway <i>I managed three course assistants and held weekly office hours.</i> | Spring 2014 |

Teaching Assistant

Johns Hopkins University

Fall 2013

Course: Natural Language Processing (600.465)

Professor: Jason Eisner

I led weekly discussion sections to cement concepts and improve problem solving skills. I supervised three course assistants in grading the assignments.

GRANTS

PURA (Provost Undergraduate Research Award)

Awarding body: Johns Hopkins University

Amount: \$1,000

Awarded to investigate phonological opacity in Portuguese and Turkish.

AWARDS

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| Outstanding Paper at ACL | 2017 |
| Outstanding Paper at EACL | 2017 |
| Runner-up for Best Short Paper at NAACL | 2016 |
| Honorable Mention for Best Short Paper at EMNLP | 2015 |
| National Defense Science and Engineering Fellowship (NDSEG) | 2016-2018 |
| DAAD Long-term Research Grant, Germany | 2015-2016 |
| Fulbright Research Grant, Germany | 2014-2015 |
| George M.L. Sommerman Engineering Graduate Teaching Assistant Award Finalist | 2014 |
| Computer Science Department Outstanding Teaching Assistant | 2014 |
| Cognitive Science Undergraduate Research Award | 2013 |

PUBLICATIONS

Refereed Journal Papers

1. Ryan Cotterell and Hinrich Schütze. 2017. [Joint semantic synthesis and morphological analysis of the derived word](#). *Transactions of the Association for Computational Linguistics (TACL)* 5. <https://arxiv.org/abs/1701.00946>.
2. Ryan Cotterell, Nanyun Peng, and Jason Eisner. 2015. [Modeling word forms using latent underlying morphs and phonology](#). *Transactions of the Association for Computational Linguistics (TACL)* 3:433–447. <https://tacl2013.cs.columbia.edu/ojs/index.php/tacl/article/view/480>.

Refereed Conference Papers

3. Ryan Cotterell and Georg Heigold. 2017. Cross-lingual character-level neural morphological tagging. In *Proceedings of the 2017 Conference on Empirical Methods in Natural Language Processing (EMNLP)*. Association for Computational Linguistics, Copenhagen, Denmark.
4. Ryan Cotterell, Katerina Vylomova, Huda Khayrallah, Christo Kirov, and David Yarowsky. 2017. [Paradigm completion for derivational morphology](#). In *Proceedings of the 2017 Conference on Empirical Methods in Natural Language Processing (EMNLP)*. Association for Computational Linguistics, Copenhagen, Denmark. <https://ryancotterell.github.io/papers/cotterell+al.emnlp17.pdf>.
5. Francis Ferraro, Adam Poliak, Ryan Cotterell, and Benjamin Van Durme. 2017. Frame-based continuous lexical semantics through exponential family tensor factorization and semantic protocols. In *Proceedings of the Sixth Joint Conference on Lexical and Computational Semantics (*SEM)*. Association for Computational Linguistics, Vancouver, Canada.
6. Ryan Cotterell and Jason Eisner. 2017. [Probabilistic typology: Deep generative models of vowel inventories](#). In *Proceedings of the 55th Annual Meeting of the Association for Computational Linguistics (ACL)*. Association for Computational Linguistics, Vancouver, Canada. **Outstanding Paper Award**. <https://arxiv.org/abs/1705.01684>.
7. Katharina Kann, Ryan Cotterell, and Hinrich Schütze. 2017. [One-shot neural cross-lingual transfer for paradigm completion](#). In *Proceedings of the 55th Annual Meeting of the Association*

for Computational Linguistics (ACL). Association for Computational Linguistics, Vancouver, Canada. <https://arxiv.org/abs/1704.00052>.

8. Ryan Cotterell, Adam Poliak, Benjamin Van Durme, and Jason Eisner. 2017. Explaining and generalizing skip-gram through exponential family principal component analysis. In *Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics (EACL)*. Association for Computational Linguistics, Valencia, Spain, pages 175–181. <http://www.aclweb.org/anthology/E17-2028>.
9. Ryan Cotterell, John Sylak-Glassman, and Christo Kirov. 2017. Neural graphical models over strings for principal parts morphological paradigm completion. In *Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics (EACL)*. Association for Computational Linguistics, Valencia, Spain, pages 759–765. **Outstanding Paper Award**. <http://www.aclweb.org/anthology/E17-2120>.
10. Arun Kumar, Ryan Cotterell, Lluís Padró, and Antoni Oliver. 2017. Morphological analysis of the Dravidian language family. In *Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics (EACL)*. Association for Computational Linguistics, Valencia, Spain, pages 217–222. <http://www.aclweb.org/anthology/E17-2035>.
11. Christo Kirov, John Sylak-Glassman, Rebecca Knowles, Ryan Cotterell, and Matt Post. 2017. A rich morphological tagger for english: Exploring the cross-linguistic tradeoff between morphology and syntax. In *Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics (EACL)*. Association for Computational Linguistics, Valencia, Spain, pages 112–117. <http://www.aclweb.org/anthology/E17-2018>.
12. Ekaterina Vylomova, Ryan Cotterell, Timothy Baldwin, and Trevor Cohn. 2017. Context-aware prediction of derivational word-forms. In *Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics (EACL)*. Association for Computational Linguistics, Valencia, Spain, pages 118–124. <http://www.aclweb.org/anthology/E17-2019>.
13. Katharina Kann, Ryan Cotterell, and Hinrich Schütze. 2017. Neural multi-source morphological inflection. In *Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics (EACL)*. Association for Computational Linguistics, Valencia, Spain, pages 514–524. <http://aclweb.org/anthology/E/E17/E17-1049.pdf>.
14. Ryan Cotterell, Arun Kumar, and Hinrich Schütze. 2016. Morphological segmentation inside-out. In *Proceedings of the 2016 Conference on Empirical Methods in Natural Language Processing (EMNLP)*. Association for Computational Linguistics, Austin, Texas, pages 2325–2330. <https://aclweb.org/anthology/D16-1256>.
15. Katharina Kann, Ryan Cotterell, and Hinrich Schütze. 2016. Neural morphological analysis: Encoding-decoding canonical segments. In *Proceedings of the 2016 Conference on Empirical Methods in Natural Language Processing (EMNLP)*. Association for Computational Linguistics, Austin, Texas, pages 961–967. <https://aclweb.org/anthology/D16-1097>.
16. Tim Vieira*, Ryan Cotterell*, and Jason Eisner. 2016. Speed-accuracy tradeoffs in tagging with variable-order CRFs and structured sparsity. In *Proceedings of the 2016 Conference on Empirical Methods in Natural Language Processing (EMNLP)*. Association for Computational Linguistics, Austin, Texas, pages 1973–1978. <https://aclweb.org/anthology/D16-1206>.
17. Ryan Cotterell, Hinrich Schütze, and Jason Eisner. 2016. Morphological smoothing and extrapolation of word embeddings. In *Proceedings of the 54th Annual Meeting of the Association for Computational Linguistics (ACL)*. Association for Computational Linguistics, Berlin, Germany, pages 1651–1660. <http://www.aclweb.org/anthology/P16-1156>.
18. Ryan Cotterell, Tim Vieira, and Hinrich Schütze. 2016. A joint model of orthography and morphological segmentation. In *Proceedings of the 2016 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies*

- (*NAACL-HLT*). Association for Computational Linguistics, San Diego, California, pages 664–669. **Runner-up for Best Paper**. <http://www.aclweb.org/anthology/N16-1080>.
19. Pushpendre Rastogi, Ryan Cotterell, and Jason Eisner. 2016. **Weighting finite-state transductions with neural context**. In *Proceedings of the 2016 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT)*. Association for Computational Linguistics, San Diego, California, pages 623–633. <http://www.aclweb.org/anthology/N16-1076>.
 20. John Sylak-Glassman and Ryan Cotterell. 2015. **Contrastive morphological typology and logical hierarchies**. In Jessica Kantarovich, Tran Truong, and Orest Xherija, editors, *Proceedings of the 52nd Meeting of the Chicago Linguistic Society (CLS52)*, Chicago Linguistic Society. <https://ryancotterell.github.io/papers/sylak-glassman+cotterell.cls16.pdf>.
 21. Nanyun Peng, Ryan Cotterell, and Jason Eisner. 2015. **Dual decomposition inference for graphical models over strings**. In *Proceedings of the 2015 Conference on Empirical Methods in Natural Language Processing (EMNLP)*. Association for Computational Linguistics, Lisbon, Portugal, pages 917–927. <http://aclweb.org/anthology/D15-1108>.
 22. Thomas Müller, Ryan Cotterell, Alexander Fraser, and Hinrich Schütze. 2015. **Joint lemmatization and morphological tagging with LEMMING**. In *Proceedings of the 2015 Conference on Empirical Methods in Natural Language Processing (EMNLP)*. Association for Computational Linguistics, Lisbon, Portugal, pages 2268–2274. **Honorable Mention for Best Paper**. <http://aclweb.org/anthology/D15-1272>.
 23. Ryan Cotterell, Thomas Müller, Alexander Fraser, and Hinrich Schütze. 2015. **Labeled morphological segmentation with semi-Markov models**. In *Proceedings of the Nineteenth Conference on Computational Natural Language Learning (CoNLL)*. Association for Computational Linguistics, Beijing, China, pages 164–174. <http://www.aclweb.org/anthology/K15-1017>.
 24. Ryan Cotterell and Jason Eisner. 2015. **Penalized expectation propagation for graphical models over strings**. In *Proceedings of the 2015 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT)*. Association for Computational Linguistics, Denver, Colorado, pages 932–942. <http://www.aclweb.org/anthology/N15-1094>.
 25. Ryan Cotterell and Hinrich Schütze. 2015. **Morphological word embeddings**. In *Proceedings of the 2015 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT)*. Association for Computational Linguistics, Denver, Colorado, pages 1287–1292. <http://www.aclweb.org/anthology/N15-1140>.
 26. Ryan Cotterell, Nanyun Peng, and Jason Eisner. 2014. **Stochastic contextual edit distance and probabilistic FSTs**. In *Proceedings of the 52nd Annual Meeting of the Association for Computational Linguistics (ACL)*. Association for Computational Linguistics, Baltimore, Maryland, pages 625–630. <http://www.aclweb.org/anthology/P14-2102>.
 27. Ryan Cotterell and Chris Callison-Burch. 2014. **A multi-dialect, multi-genre corpus of informal written Arabic**. In Nicoletta Calzolari (Conference Chair), Khalid Choukri, Thierry Declerck, Hrafn Loftsson, Bente Maegaard, Joseph Mariani, Asuncion Moreno, Jan Odijk, and Stelios Piperidis, editors, *Proceedings of the Ninth International Conference on Language Resources and Evaluation (LREC)*. European Language Resources Association (ELRA), Reykjavik, Iceland. <https://ryancotterell.github.io/papers/cotterell+callison-burch.lrec14.pdf>.

Refereed Workshop Papers

28. Gaurav Kumar, Yuan Cao, Ryan Cotterell, Chris Callison-Burch, Daniel Povey, and Sanjeev Khudanpur. 2014. **Translations of the CALLHOME Egyptian Arabic corpus for conversational speech translation**. In *Proceedings of the International Workshop on Spoken Lan-*

guage Translation (IWSLT). Association for Computational Linguistics, Lake Tahoe, USA. <https://ryancotterell.github.io/papers/kumar+al.iwslt14.pdf>.

29. Ryan Cotterell, Adithya Renduchintala, Naomi Saphra, and Chris Callison-Burch. 2014. [An Algerian Arabic-French code-switched corpus](#). In *Workshop on Free/Open-Source Arabic Corpora and Corpora Processing Tools (OSACT)*. European Language Resources Association, Reykjavik, Iceland. <https://ryancotterell.github.io/papers/cotterell+al.osact14.pdf>.

Unrefereed Publications

30. Ryan Cotterell, Christo Kirov, John Sylak-Glassman, Géraldine Walther, Ekaterina Vylomova, Patrick Xia, Manaal Faruqui, Sandra Kübler, David Yarowsky, Jason Eisner, and Mans Hulden. 2017. The CoNLL-SIGMORPHON 2017 shared task: Universal morphological reinflection in 52 languages. In *Proceedings of the CoNLL-SIGMORPHON 2017 Shared Task: Universal Morphological Reinflection*. Association for Computational Linguistics, Vancouver, Canada.
31. Ryan Cotterell, Christo Kirov, John Sylak-Glassman, David Yarowsky, Jason Eisner, and Mans Hulden. 2016. [The SIGMORPHON 2016 shared task—morphological reinflection](#). In *Proceedings of the 14th SIGMORPHON Workshop on Computational Research in Phonetics, Phonology, and Morphology*. Association for Computational Linguistics, Berlin, Germany, pages 10–22. <http://anthology.aclweb.org/W16-2002>.
32. Chandler May, Ryan Cotterell, and Benjamin Van Durme. 2016. [Analysis of morphology in topic modeling](#). *CoRR* abs/1608.03995. <http://arxiv.org/abs/1608.03995>

Technical Reports

33. David Etter, Francis Ferraro, Ryan Cotterell, Olivia Buzek, and Benjamin Van Durme. 2013. [Nerit: Named entity recognition for informal text](#). Technical Report 11, Human Language Technology Center of Excellence, Johns Hopkins University. <https://ryancotterell.github.io/papers/etter+al.tr13.pdf>.

INVITED TALKS

1. Neural Weighted Finite-State Machines Location: First Workshop on Subword and Character Level Models in NLP, held at EMNLP 2017
Tutorial Talk
2. Neural Graphical Models over Strings May, 2017
Location: Universität Heidelberg
Host: Stefan Riezler
3. Neural String-Valued Graphical Models January, 2017
Location: Schloss Dagstuhl
From Characters to Understanding Natural Language (Dagstuhl Seminar 17042)
4. Graphical Models over Strings October, 2016
Location: University of Alberta
Host: Greg Kondrak
5. Graphical Models over Strings September, 2016
Location: Johns Hopkins University
CLSP Seminar
6. Modeling Word Forms Using Latent Underlying Morphs and Phonology July, 2016
Location: Universität Tübingen
Host: Gerhard Jäger
7. Modeling Word Forms Using Latent Underlying Morphs and Phonology February, 2016
Location: Xerox Research Centre Europe
Host: Xavier Carreras

8. Modeling Word Forms Using Latent Underlying Morphs and Phonology September, 2015
Location: Priberam Labs
Host: André Martins
9. A Probabilistic Approach to Synchronic Phonology November, 2014
Institut für Phonetik und Sprachverarbeitung, LMU München
Host: Jonathan Harrington

SHARED TASK
ORGANIZER

1. CoNLL-SIGMORPHON-2017 Shared Task: Universal Morphological Reinflection
2. SIGMORPHON 2016 Shared Task: Morphological Reinflection

SERVICE

Journal Reviewer: *Computational Linguistics* (2017, 2015), *Computer Speech and Language* (2017)
Conference Reviewer: ACL (2017, 2016), EMNLP (2017, 2016), NAACL (2016), EACL (2017), COLING (2016), AAAI (2016 secondary)
Workshop Reviewer: ICML Workshop on Deep Structured Prediction (2017), Subword and character level models in NLP (2017), Ethics in NLP (2017), SIGMORPHON (2016), Multilingual and Cross-lingual Methods in NLP (2016)
Other: SIGMORPHON Officer At-Large, CLSP Happy Hour Coordinator

REFERENCES

Jason Eisner (jason@cs.jhu.edu), Johns Hopkins University
David Yarowsky (yarowsky@jhu.edu), Johns Hopkins University
Colin Wilson (wilson@cogsci.jhu.edu), Johns Hopkins University

SKILLS

Programming Languages: Python, Cython, Java, Perl, Ocaml, Lisp, C, C++, R, Scala, L^AT_EX

Deep Learning Frameworks: PyTorch, Theano, TensorFlow

Natural Languages: English, German, Spanish, Russian, Portuguese

Graduate Coursework in Computer Science: Natural Language Processing, Speech Processing, Graphical Models, Artificial Intelligence, Programming Language Theory, Software Engineering, Representation Learning, Big Data, Causality (audit)

Graduate Coursework in Mathematics and Statistics: Nonlinear Optimization I, Stochastic Optimization, Convex Optimization, Neural Networks, Real Analysis I, Real Analysis II (Measure Theory), Bayesian Statistics

Graduate Coursework in Linguistics: Syntax I, Semantics I, Event Semantics (audit), Phonology I, Phonology II, Morpho-Phonology, Psycholinguistics