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Alexander M. Rush

Appointment	<p><i>Harvard University School of Engineering and Applied Sciences</i> 2015-. Assistant Professor of Computer Science</p> <p><i>Facebook Artificial Intelligence Research Lab</i> 2015. Post-Doctoral Fellowship Advisor: Yann LeCunn</p>
Education	<p><i>Massachusetts Institute of Technology</i> 2009-2014. Ph.D, Computer Science. Advisor: Michael Collins Dissertation: <i>Relaxation Methods for Natural Language Decoding.</i></p> <p><i>Columbia University</i> 2011-2014. Visiting Scholar, Department of Computer Science.</p> <p><i>Harvard University</i> 2007. B.A., Computer Science.</p>
Grants and Awards	<p>2017 National Science Foundation (Medium) <i>A Cloudless Universal Translator</i> Bloomberg Faculty Award Best Demo (Runner-Up), ACL</p> <p>2016 Microsoft Azure Award Google Faculty Award Best Paper (Runner-Up), EMNLP</p> <p>2012 Best Paper Award, NAACL</p> <p>2010 Best Paper Award, EMNLP</p> <p>2009 National Science Foundation Graduate Research Fellow, Computing Research Association</p>
Publications	<p><i>Conference Papers</i></p> <p>Junbo Zhao, Yoon Kim, Kelly Zhang, Alexander M. Rush, Yann LeCun. <i>Adversarially Regularized Autoencoders.</i> In submission</p> <p>Sam Wiseman, Stuart M Shieber Alexander M. Rush. <i>Challenges in Data-to-Document Generation.</i> EMNLP 2017</p> <p>Allen Schmitt, Yoon Kim, Alexander M. Rush, Stuart M. Shieber. <i>Adapting Sequence Models for Sentence Correction.</i> EMNLP 2017</p>

- Guillaume Klein, Yoon Kim, Yuntian Deng, Jean Senellart, Alexander M. Rush. *OpenNMT: Open-Source Toolkit for Neural Machine Translation*. *ACL Demo 2017 (Best Demo Runner-up)*
- Ankit Gupta, Alexander M. Rush. *Dilated Convolutions for Modeling Long-Distance Genomic Dependencies*. *ICML CompBio 2017 (Best Poster)*
- Yuntian Deng, Anssi Kanervisto, Jeffrey Ling, and Alexander M. Rush. *Image-to-Markup Generation with Coarse-to-Fine Attention*. *ICML 2017*
- Hendrik Strobelt, Sebastian Gehrmann, Hanspeter Pfister, and Alexander M. Rush. *LSTMVis: A Tool for Visual Analysis of Hidden State Dynamics in Recurrent Neural Networks*. *InfoVis 2017*
- Yoon Kim, Carl Denton, Luong Hoang, and Alexander M. Rush. *Structured Attention Networks*. *ICLR 2017*
- Greg Yang and Alexander M. Rush. *Lie-Access Neural Turing Machines*. *ICLR 2017*
- Yoon Kim and Alexander M. Rush. *Sequence-Level Knowledge Distillation*. *EMNLP 2016*
- Sam Wiseman and Alexander M. Rush. *Sequence-to-Sequence Learning as Beam-Search Optimization*. *EMNLP 2016 (Best Paper Runner-Up)*
- Peter Kraft, Hirsh Jain, and Alexander M. Rush. *An Embedding Model for Predicting Roll-Call Votes*. *Proceedings of EMNLP 2016*
- Allen Schmalz, Alexander M. Rush, and Stuart M. Shieber. *Word Ordering Without Syntax*. *EMNLP 2016*
- Allen Schmalz, Yoon Kim, Alexander M. Rush, and Stuart M. Shieber. *Sentence-Level Grammatical Error Identification as Sequence-to-Sequence Correction*. *Workshop Submission for AESW 2016 (Top Performing System)*
- Sam Wiseman, Alexander M. Rush, and Stuart M. Shieber. *Learning Global Features for Coreference Resolution*. *NAACL 2016*
- Sumit Chopra, Michael Auli, and Alexander M. Rush. *Abstractive Sentence Summarization with Attentive Recurrent Neural Networks*. *NAACL 2016*
- Yoon Kim, Yacine Jernite, David Sontag, and Alexander M. Rush. *Character-Aware Neural Language Models*. *AAAI 2016*
- Alexander M. Rush, Sumit Chopra, and Jason Weston. *A Neural Attention Model for Abstractive Sentence Summarization*. *EMNLP 2015*.
- Jason Weston, Antoine Bordes, Sumit Chopra, Tomas Mikolov, and Alexander M. Rush. *Towards AI-Complete Question Answering A Set of Prerequisite Toy Tasks*. *Arxiv Preprint*
- Sam Wiseman, Alexander M. Rush, Jason Weston, and Stuart M. Shieber. *Learning Anaphoricity and Antecedent Ranking Features for Coreference Resolution*. *ACL 2015*.

- Yacine Jernite, Alexander M. Rush, and David Sontag. *A Fast Variational Approach for Learning Markov Random Field Language Models*. ICML 2015.
- Lingpeng Kong, Alexander M. Rush, and Noah A. Smith. *Transforming Dependencies into Phrase Structures*. NAACL 2015.
- Yin-Wen Chang, Alexander M. Rush, John DeNero, and Michael Collins. *A Lagrangian Relaxation Algorithm for Bilingual Word Alignment*. Proceedings of ACL 2014.
- Alexander M. Rush, Yin-Wen Chang, and Michael Collins. *Optimal Beam Search for Machine Translation*. Proceedings of EMNLP 2013.
- Karl Stratos, Alexander M. Rush, Shay B. Cohen, and Michael Collins. *Spectral Learning of Refinement HMMs*. Proceedings of CoNLL 2013.
- Alexander M. Rush, Roi Reichert, Michael Collins, and Amir Globerson. *Improved Parsing and POS Tagging Using Inter-Sentence Consistency Constraints*, Proceedings of EMNLP 2012.
- Alexander M. Rush and Slav Petrov, *Vine Pruning for Efficient Multi-Pass Dependency Parsing*. Proceedings of NAACL 2012. (Best Paper Award)
- Alexander M. Rush and Michael Collins. *Exact Decoding of Syntactic Translation Models through Lagrangian Relaxation*. Proceedings of ACL 2011.
- Terry Koo, Alexander M. Rush, Michael Collins, Tommi Jaakkola, and David Sontag. *Dual Decomposition for Parsing with Non-Projective Head Automata*. Proceedings of EMNLP 2010. (Best Paper Award)
- Alexander M. Rush, David Sontag, Michael Collins, and Tommi Jaakkola *On Dual Decomposition and Linear Programming Relaxations for Natural Language Processing*. Proceedings of EMNLP 2010.
- Rebecca Nesson, Stuart M. Shieber, and Alexander M. Rush. *Induction of probabilistic synchronous tree-insertion grammars for machine translation*. Proceedings of AMTA 2006.

Journal Papers

- Alexander M. Rush and Michael Collins. *A Tutorial on Dual Decomposition and Lagrangian Relaxation for Inference in Natural Language Processing*. Journal of Artificial Intelligence Research 2012.

- 2018 Instructor, Machine Learning for NLP , Harvard University, Spring.
- 2017 Instructor, Machine Learning , Harvard University, Spring.
Instructor, Graduate Machine Learning , Harvard University, Fall.
- 2016 Instructor, Machine Learning for NLP , Harvard University, Spring.
- 2015 Instructor, Artificial Intelligence, Harvard University, Fall.
- 2013 Instructor (with Michael Collins), Natural Language Processing, Columbia University, Fall.
Head Teaching Assistant, Natural Language Processing , Michael Collins, Columbia University, Spring (taught on Coursera, 30,000+ registered students).
- 2012 Head Teaching Assistant, Natural Language Processing, Michael Collins, Columbia University, Fall.

Patents

- A neural attention model for abstractive summarization (Facebook). Alexander M. Rush, Sumit Chopra, Jason Weston 2017.
- Techniques for discriminative dependency parsing (Google). Slav Petrov, Alexander M. Rush, 2015.
- Efficient parsing with structured prediction cascades (Google). Slav Petrov, Alexander M. Rush, 2013
- Determining user affinity towards applications on a social networking website (Facebook., Thomas S. Whitnah, Alexander M. Rush, Ding Zhou, Ruchi Sangyhi, 2010.

Libraries

OpenNMT

Open-source neural machine translation system.

LSTMVis

Visual analysis of recurrent neural network dynamics.

Sequence-to-Sequence with Attention

General-purpose sequence-to-sequence model .

CNN for Text Classification

Convolutional sentence classification.

Im2Markup

A neural image-to-markup system.

Academic Internships	<p>Research Intern, <i>Google Research</i>, 2011 – 2013 , New York, NY. Advisor: Slav Petrov.</p> <p>Research Intern, <i>USC/ISI</i> , Summer 2010, Marina Del Rey, CA. Advisor: Liang Huang.</p>
Industry	<p>Lead Engineer (Platform Team), <i>Facebook</i>, 2007 – 2009, Palo Alto, CA.</p> <p>Developed compiler for Facebook Markup Language (FBML) to sanitize user content.</p> <p>Developed system for crowd-sourced translation of Facebook user text.</p>
Service	<p>Area Chair: NAACL (Machine Learning) 2016, ICLR (NLP) 2017, 2018, EMNLP (Generation/Summarization) 2017, ACL (Parsing and Tagging) 2017</p> <p>Tutorial Chair: NAACL 2016</p> <p>Reviewer:</p> <p>EMNLP, NAACL, ACL, EACL, (Natural Language Processing).</p> <p>UAI, NIPS, ICML, AAAI, ICLR (Machine Learning and Artificial Intelligence).</p>
Invited Talks	<p>2018 Invited Talk, University of Washington, Spring.</p> <p> Invited Talk, Allen Institute for AI, Spring.</p> <p> Invited Talk, MSR, Spring.</p> <p> Invited Talk, American Machine Translation Association, Spring.</p> <p> Invited Talk, University of Texas, Spring.</p> <p> Invited Talk, University of Maryland, Spring.</p> <p> Invited Talk, Georgetown, Spring.</p> <p> Invited Talk, Lisbon ML Summer School, Spring.</p> <p>2017 Invited Talk, Google Faculty Day, Spring.</p> <p> Invited Talk, New England Machine Learning Day, Spring.</p> <p> Invited Talk, Google, Spring.</p> <p> Invited Talk, Berkeley CS, Spring.</p> <p> Invited Talk, Notre Dame, Spring.</p> <p> Colloquium, TTI-Chicago, Spring.</p> <p> Invited Talk, Apple, Siri Team, Spring.</p> <p> Colloquium, Samsung Global AI Forum, Fall.</p> <p> Invited Talk, AMD, Fall.</p>

- 2016 Invited Talk, NYU, Fall.
- Invited Talk, BBN Research, Fall.
- Invited Talk, Bloomberg, Fall.
- Invited Talk (Speech Group), MIT, Fall.
- Invited Talk, IBM Research, Fall.
- Colloquium, CMU, Fall.
- Invited Talk, Stanford NLP, Summer.
- Invited Talk, Oracle Labs, Summer.
- Invited Talk, Twitter, Summer.
- Colloquium, John Hopkins University, Spring.
- Colloquium, Rakuten, Spring.
- 2014 Colloquium, University of Washington, Spring.
- Colloquium, NYU, Spring.
- Colloquium, CMU, Spring.
- Colloquium, MIT, Spring.
- Colloquium, Harvard, Spring.
- Colloquium, TTIC, Spring.
- Colloquium, University of Maryland, Spring.
- 2013 Invited Tutorial, UMBC, October.
- Invited Talk, CS and Social Science Seminar, UMass Amherst, October.
- Talk, NLP Seminar, Columbia University, October.
- Invited Talk, ML Seminar, UMass Amherst, October.
- Invited Talk, Johnson Research Labs, NY, August.
- Invited Talk, Society for Historians of American Foreign Relations, Arlington, June.
- Invited Talk, Columbia University, Spring.
- Invited Talk, NLP Seminar, City University of New York, Spring.
- 2012 Invited Tutorial, Neural Information Processing Systems (NIPS), December.
- 2011 Invited Tutorial, Google Research, Mountain View, August.
- Tutorial. Association of Computational Linguistic (ACL), June.
- Invited Talk, ML Seminar, University of Massachusetts, Amherst, Spring.
- ML Tea, MIT, January.
- 2010 NLP Seminar, USC/ISI, Summer.
- 2006 Invited Talk, Computational Linguistics Seminar, University of Pennsylvania, November.