Christopher David Manning

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A. Education

1990–1994 Ph.D. Stanford University, Dept. of Linguistics, awarded December 1994.
Dissertation: *Ergativity: Argument Structure and Grammatical Relations.*
Committee: Joan Bresnan (chair), Mary Dalrymple, Ivan Sag, Peter Sells.

1984–1989 B.A. (Hons) with First Class Honours in Linguistics, The Australian National University. Additional majors in Mathematics and Computer Science.
Honours Thesis: *The Acquisition of Morphology.* Advisor: Avery D. Andrews.

Scholarships and Honors

Bernard and Julia Bloch Memorial Fellow (student representative on the Linguistic Society of America Executive Committee), 1993–1995.

Stanford Centennial Teaching Assistant (award in honor of outstanding teaching), 1993.

Fellowships, 1991 and 1993 Linguistic Society of America Summer Institutes.

Stanford University Fellowship, 1990–1994.

University Medal, Australian National University, 1989.

(Australian) National Undergraduate Scholarship, 1984–1989.

B. Employment

02/14/2016– Thomas M. Siebel Professor in Machine Learning, Professor of Linguistics and of Computer Science, Stanford University.

09/01/2012–2016 Professor of Computer Science and Linguistics, Stanford University.

2010–2011 Visiting faculty at Google while on sabbatical from Stanford.

09/01/2006–2012 Associate Professor of Computer Science and Linguistics, Stanford University.

09/01/1999–2006 Assistant Professor of Computer Science and Linguistics, Stanford University.

1996–1999 Lecturer (tenured from 1998), Department of Linguistics, University of Sydney.

1994–1996 Assistant Professor, Computational Linguistics Program, Department of Philosophy, Carnegie Mellon University.

1989–1990 Teacher, Ichihara Chūō Gakkō, Chiba-ken, Japan

1996 Computer Systems Officer, Department of House of Representatives, Canberra, Australia

C. Professional Service

Association for Computational Linguistics
Member of the *Computational Linguistics* Editorial Board 1998–2000, Treasurer

for NAACL (the North American chapter), 2006–12. President of the ACL, 2015 (ACL Executive Board 2013–2016), ACL Nominating Committee (2015–2020).

Linguistic Society of America
Member of Executive Committee (Bernard and Julia Bloch Memorial Fellow), 1993–95, Member of the Interim Committee on the Status of Minorities in Linguistics 1993–94, Member of Committee on Endangered Languages and Their Preservation, 2003–06.

Member of the National Academies of Sciences, Engineering, and Medicine Review Committee for Selected Divisions of the Information Technology Laboratory at the National Institute of Standards and Technology, 2021.

Refereeing (since 2011)

2021	StarSem 2020, ICLR 2021, WiNLP 2021, *Nature*.
2020	ICLR 2020, NSF CAREER, EMNLP 2020.
2019	ICLR 2019, EMNLP 2019.
2018	ACL 2018, NIPS 2018 (Area Chair), LREC 2018, ICLR 2018, Universal Dependencies Workshop 2018.
2017	EMNLP 2017, NSF CAREER, *Science*, UD workshop 2017, NMT workshop 2017, Royal Society.
2016	NAACL 2016, *Journal of Artificial Intelligence Research*, ACL 2016, ICLR 2016, LREC 2016.
2015	NAACL 2015, ICLR 2015, EMNLP 2015.
2014	*Artificial Intelligence*, *Journal of Machine Learning Research*, LREC 2014, NIPS 2014, ICLR 2014, Allen Distinguished Investigators in Artifical Intelligence.
2013	Coling 2012, DepLing 2013, ICLR 2013 program co-chair, NIPS 2013, NSF CAREER grants.
2012	WWW 2012, NAACL HLT 2012, ACL 2012, Coling 2012
2011	EMNLP 2011, ACL HLT 2011, co-program chair for CoNLL 2011, ICML 2011 *Journal of Machine Learning Research*, NSF Robust Intelligence program grant reviewer, *Machine Learning*, *Machine Translation*.

D. Post-degree honors

Outstanding paper award for Ben Newman at Blackbox 2020 for the paper "The EOS Decision and Length Extrapolation" by Ben Newman, John Hewitt, Percy Liang, and Christopher D. Manning.

Best paper award at BlackboxNLP 2019 for the paper "What does BERT look at? An analysis of BERT's attention" (with Kevin Clark, Urvashi Khandelwal, and Omer Levy).

Outstanding Paper award at EMNLP 2017 for the paper "Position-aware Attention and Supervised Data Improve Slot Filling" (with Yuhao Zhang, Victor Zhong, Danqi Chen, and Gabor Angeli).

Outstanding Paper award at ACL 2016 for the paper "A Thorough Examination of the CNN/Daily Mail Reading Comprehension Task" (with Danqi Chen and Jason Bolton).

Best new data set or resource award at EMNLP 2015 for the paper "A large annotated corpus for learning natural language inference" (with Samuel R. Bowman, Gabor Angeli, and Christopher Potts).

Best paper award at EMNLP 2014 for the paper "Modeling Biological Processes for Reading Comprehension" (with Jonathan Berant, Vivek Srikumar, Pei-Chun Chen, Abby Vander Linden, Brittany Harding, Brad Huang, and Peter Clark).

Fellow of the Association for Computing Machinery, 2013.

Best paper award at ACM Human Factors in Computing Systems (CHI), 2013 for the paper "The Efficacy of Human Post-Editing for Language Translation" (with Spence Green and Jeffrey Heer).

Fellow of the Association for Computational Linguistics (ACL), 2011.

Distinguished paper award at the 25th International Conference on Machine Learning (ICML 2011) for the paper "Parsing Natural Scenes and Natural Language with Recursive Neural Networks" (with Richard Socher, Cliff Chiung-Yu Lin, and Andrew Ng).

American Association for Artificial Intelligence (AAAI) Fellow, 2010.

Springer best paper award at the 22nd International Conference on Computational Linguistics (Coling 2008) for the paper "Modeling semantic containment and exclusion in natural language inference" (with Bill MacCartney).

Sony Faculty Scholar in the School of Engineering, Stanford, 2007–2011.

Best paper award at the 2004 Conference on Empirical Methods in Natural Language Processing for the paper "Max-Margin Parsing" (with Ben Taskar, Dan Klein, Michael Collins, and Daphne Koller).

Best paper award at the 2003 Association for Computational Linguistics Annual Meeting for the paper "Accurate Unlexicalized Parsing" (with Dan Klein).

IBM Faculty Partnership Award, Stanford University, 2001, 2002, 2003, 2005.

Frederick E. Terman Fellowship, Stanford University, 1999–2002.

Membership in Professional Organizations

Association for Computational Linguistics

American Association for Artificial Intelligence

Association for Computing Machinery (including SIGIR and SIGKDD)

E. Publications

Books

Christopher D. Manning, Prabhakar Raghavan, and Hinrich Schütze. 2008. *Introduction to Information Retrieval*. Cambridge: Cambridge University Press. pp. xxi+482.

Christopher D. Manning and Hinrich Schütze. 1999. *Foundations of Statistical Natural Language Processing*. Cambridge, MA: MIT Press. pp. xxvii+680.

Avery D. Andrews and Christopher D. Manning. 1999. *Complex Predicates and Information Spreading in LFG*. Stanford, CA: CSLI Publications. pp. ix+153.

Christopher D. Manning. 1996. *Ergativity: Argument Structure and Grammatical Relations*. Stanford, CA: CSLI Publications. pp. xiii+222.

Journal Articles

Marie-Catherine de Marneffe, Christopher D. Manning, Joakim Nivre, and Daniel Zeman. 2021. Universal Dependencies. *Computational Linguistics* 47: 255–308.

Christopher D. Manning, Kevin Clark, John Hewitt, Urvashi Khandelwal, and Omer Levy. 2020. Emergent linguistic structure in artificial neural networks trained by self-supervision. *Proceedings of the National Academy of Sciences*.

Siva Reddy, Danqi Chen, and Christopher D. Manning. 2019. CoQA: A conversational question answering challenge. *Transactions of the Association for Computational Linguistics* 7:249–266.

Christopher D. Manning. 2015. Computational linguistics and deep learning. *Computational Linguistics* 41:701–707. [Invited contribution].

Spence Green, Jeffrey Heer, and Christopher D. Manning. 2015. Natural language translation at the intersection of AI and HCI. *Communications of the ACM* 58:46–53.

Julia Hirschberg and Christopher D. Manning. 2015. Advances in natural language processing. *Science* 349:261–266. [Review article].

Sonal Gupta, Diana L. MacLean, Jeffrey Heer, and Christopher D. Manning. 2014. Induced lexico-syntactic patterns improve information extraction from online medical forums. *Journal of the American Medical Informatics Association (JAMIA)* 21:902–909.

Mengqiu Wang and Christopher D. Manning. 2014. Cross-lingual projected expectation regularization for weakly supervised learning. *Transactions of the Association for Computational Linguistics* 2:55–66.

Richard Socher, Andrej Karpathy, Quoc V. Le, Christopher D. Manning, and Andrew Y. Ng. 2014. Grounded compositional semantics for finding and describing images with sentences. *Transactions of the Association for Computational Linguistics* pp. 207–218.

Daniel A. McFarland, Daniel Ramage, Jason Chuang, Jeffrey Heer, Christopher D. Manning, and Daniel Jurafsky. 2013. Differentiating language usage through topic models. *Poetics* 41:607–625.

Spence Green, Marie-Catherine de Marneffe, and Christopher D. Manning. 2013. Parsing models for identifying multiword expressions. *Computational Linguistics* 39:195–227.

Jason Chuang, Christopher D. Manning, and Jeffrey Heer. 2012. "Without the clutter of unimportant words": Descriptive keyphrases for text visualization. *ACM Transactions on Computer-Human Interaction* 19:1–29.

Marie-Catherine de Marneffe, Christopher D. Manning, and Christopher Potts. 2012. Did it happen? The pragmatic complexity of veridicality assessment. *Computational Linguistics* 38:301–333.

David McClosky, Sebastian Riedel, Mihai Surdeanu, Andrew McCallum, and Christopher D. Manning. 2012. Combining joint models for biomedical event extraction. *BMC Bioinformatics* 13 (Suppl 11).

Sharon Goldwater, Dan Jurafsky, and Christopher D. Manning. 2010. Which words are hard to recognize? Prosodic, lexical, and disfluency factors that increase speech recognition error rates. *Speech Communication* 52:181–200.

Sebastian Padó, Daniel Cer, Michel Galley, Dan Jurafsky, and Christopher D. Manning. 2009. Measuring machine translation quality as semantic equivalence: A metric based on entailment features. *Machine Translation* 23:181–193.

Kristina Toutanova, Aria Haghighi, and Christopher D. Manning. 2008. A global joint model for semantic role labeling. *Computational Linguistics* 34: 161–191.

Nick Chater and Christopher D. Manning. 2006. Probabilistic models of language processing and acquisition. *TRENDS in Cognitive Sciences* 10:335–344.

Kristina Toutanova, Christopher D. Manning, Dan Flickinger, and Stephan Oepen. 2005. Stochastic HPSG parse disambiguation using the Redwoods corpus. *Research on Language & Computation* 3:83–105. Based on the paper: Kristina Toutanova, Christopher D. Manning, Stuart M. Shieber, Dan Flickinger, and Stephan Oepen, Parse Disambiguation for a Rich HPSG Grammar, appearing in *Proceedings of The First Workshop on Treebanks and Linguistic Theories (TLT2002)*, Sozopol, Bulgaria, 2002, pp. 253–263.

Dan Klein and Christopher D. Manning. 2005. Natural language grammar induction with a generative constituent-context model. *Pattern Recognition* 38: 1407–1419.

Shipra Dingare, Malvina Nissim, Jenny Finkel, Christopher Manning, and Claire Grover. 2005. A system for identifying named entities in biomedical text: How results from two evaluations reflect on both the system and the evaluations. *Comparative and Functional Genomics* 6:77–85.

Jenny Finkel, Shipra Dingare, Christopher Manning, Malvina Nissim, Beatrice Alex, and Claire Grover. 2005. Exploring the boundaries: Gene and protein identification in biomedical text. *BMC Bioinformatics* 6 (Suppl 1):S5 (9 pp). Original version in the *Proceedings of the BioCreative Workshop*, Granada.

Stephan Oepen, Dan Flickinger, Kristina Toutanova, and Christopher D. Manning. 2004. LinGO Redwoods: A rich and dynamic treebank for HPSG. *Research on Language & Computation* 2:575–596. Originally appeared in *Proceedings of The First Workshop on Treebanks and Linguistic Theories (TLT2002)*, Sozopol, Bulgaria, 2002, pp. 139–149.

Miriam Corris, Christopher Manning, Susan Poetsch, and Jane Simpson. 2004. How useful and usable are dictionaries for speakers of Australian Indigenous languages? *International Journal of Lexicography* 17:33–68.

Christopher D. Manning, Kevin Jansz, and Nitin Indurkhya. 2001. Kirrkirr: Software for browsing and visual exploration of a structured Warlpiri dictionary. *Literary and Linguistic Computing* 16:135–151.

Christopher D. Manning and Ivan A. Sag. 1998. Argument structure, valence, and binding. *Nordic Journal of Linguistics* 21:107–144.

Edited volumes

Annie Zaenen, Jane Simpson, Tracy Holloway King, Jane Grimshaw, Joan Maling, and Chris Manning (eds.). 2007. *Archictectures, Rules, and Preferences: Variations on Themes by Joan W. Bresnan*. Stanford, CA: CSLI Publications.

Book chapters/sections

Bill MacCartney and Christopher D. Manning. 2014. Natural logic and natural language inference. In Harry Bunt, Johan Bos, and Stephen Pulman (eds.), *Computing Meaning*, volume 4, pp. 129–147. Springer.

Pi-Chuan Chang, Michel Galley, Niyu Ge, and Christopher D. Manning. 2011. Customizing Chinese word segmentation for improved machine translation. In Joseph Olive, Caitlin Christianson, and John McCary (eds.), *Handbook of Natural Language Processing and Machine Translation: DARPA Global Autonomous Language Exploitation*, pp. 145–152. New York, NY: Springer.

Marie-Catherine de Marneffe, Anna N. Rafferty, and Christopher D. Manning. 2011. Identifying conflicting information in texts. In Joseph Olive, Caitlin Christianson, and John McCary (eds.), *Handbook of Natural Language Processing and Machine Translation: DARPA Global Autonomous Language Exploitation*, pp. 683–690. New York, NY: Springer.

Sebastian Pado, Michel Galley, and Christopher Manning. 2011. The Stanford RTE-based metrics (RTE and RTE+MT). In Joseph Olive, Caitlin Christianson, and John McCary (eds.), *Handbook of Natural Language Processing and Machine Translation: DARPA Global Autonomous Language Exploitation*, pp. 835–837. New York, NY: Springer.

Dan Klein and Christopher D. Manning. 2004. Parsing and hypergraphs. In Harry Bunt, John Carroll, and Giorgio Satta (eds.), *New Developments in Parsing Technology*, pp. 351–372. Dordrecht: Kluwer Academic Publishers. Originally appeared in the *Proceedings of the 7th International Workshop on Parsing Technologies (IWPT-2001)*, pp. 123–134.

Christopher D. Manning. 2003. Probabilistic syntax. In Rens Bod, Jennifer Hay, and Stefanie Jannedy (eds.), *Probabilistic Linguistics*, pp. 289–341. Cambridge, MA: MIT Press.

Miriam Corris, Christopher Manning, Susan Poetsch, and Jane Simpson. 2002. Dictionaries and endangered languages. In David Bradley and Maya Bradley

(eds.), *Language Endangerment and Language Maintenance*, pp. 329–347. London: RoutledgeCurzon. Previously presented at the Endangered Languages Workshop, La Trobe University, 1999, and the 1999 Perth Congress of the Applied Linguistics Association of Australia.

Christopher D. Manning and Bob Carpenter. 2000. Probabilistic parsing using left corner language models. In Harry Bunt and Anton Nijholt (eds.), *Advances in Probabilistic and Other Parsing Technologies*, pp. 105–124. Dordrecht: Kluwer Academic Publishers. Originally appeared in the *Proceedings of the Fifth International Workshop on Parsing Technologies (IWPT-97)*, pp. 147–158, 1997.

Christopher David Manning, Ivan A. Sag, and Masayo Iida. 1999. The lexical integrity of Japanese causatives. In Robert D. Levine and Georgia M. Green (eds.), *Studies in Contemporary Phrase Structure Grammar*, pp. 39–79. Cambridge: Cambridge University Press.

Christopher D. Manning and Ivan A. Sag. 1999. Dissociations between argument structure and grammatical relations. In Gert Webelhuth, Jean-Pierre Koenig, and Andreas Kathol (eds.), *Lexical And Constructional Aspects of Linguistic Explanation*, pp. 63–78. Stanford, CA: CSLI Publications.

Christopher D. Manning. 1997. Grammatical relations versus binding: On the distinctness of argument structure. In F. Corblin, D. Godard, and J.-M. Marandin (eds.), *Empirical Issues in Formal Syntax and Semantics*, pp. 79–102. Bern: Peter Lang.

Christopher D. Manning. 1993. Analyzing the verbal noun: Internal and external constraints. In Soonja Choi (ed.), *Japanese/Korean Linguistics*, volume 3, pp. 236–253. Stanford, CA: Stanford Linguistics Association.

Refereed Full Papers in Conference Proceedings

Eric Mitchell, Chelsea Finn, and Chris Manning. 2021. Challenges of acquiring compositional inductive biases via meta-learning. *Proceedings of Machine Learning Research* 140:138–148.

Jenny Hong, Catalin Voss, and Christopher Manning. 2021. Challenges for information extraction from dialogue in criminal law. In *Proceedings of the 1st Workshop on NLP for Positive Impact*, pp. 71–81.

Siddharth Karamcheti, Ranjay Krishna, Li Fei-Fei, and Christopher Manning. 2021. Mind your outliers! Investigating the negative impact of outliers on active learning for visual question answering. In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing (Volume 1: Long Papers)*, pp. 7265–7281.

Haojun Li, Dilara Soylu, and Christopher Manning. 2021. Large-scale quantitative evaluation of dialogue agents' response strategies against offensive users. In *Proceedings of the 22nd Annual Meeting of the Special Interest Group on Discourse and Dialogue*, pp. 556–561.

Amelia Hardy, Ashwin Paranjape, and Christopher Manning. 2021. Effective social chatbot strategies for increasing user initiative. In *Proceedings of the 22nd Annual Meeting of the Special Interest Group on Discourse and Dialogue*, pp. 99–110.

Abigail See and Christopher Manning. 2021. Understanding and predicting user dissatisfaction in a neural generative chatbot. In *Proceedings of the 22nd Annual Meeting of the Special Interest Group on Discourse and Dialogue*, pp. 1–12.

Shikhar Murty, Tatsunori B. Hashimoto, and Christopher Manning. 2021. DReCa: A general task augmentation strategy for few-shot natural language inference. In *Proceedings of the 2021 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies*, pp. 1113–1125.

Ashwin Paranjape and Christopher Manning. 2021. Human-like informative conversations: Better acknowledgements using conditional mutual information. In *Proceedings of the 2021 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies*, pp. 768–781.

John Hewitt, Michael Hahn, Surya Ganguli, Percy Liang, and Christopher D. Manning. 2020. RNNs can generate bounded hierarchical languages with optimal memory. In *Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, pp. 1978–2010.

Haejun Lee, Drew A. Hudson, Kangwook Lee, and Christopher D. Manning. 2020. SLM: Learning a discourse language representation with sentence unshuffling. In *Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, pp. 1551–1562.

Kevin Clark, Minh-Thang Luong, Quoc Le, and Christopher D. Manning. 2020. Pre-training transformers as energy-based cloze models. In *Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, pp. 285–294.

Benjamin Newman, John Hewitt, Percy Liang, and Christopher D. Manning. 2020. The EOS decision and length extrapolation. In *Proceedings of the Third BlackboxNLP Workshop on Analyzing and Interpreting Neural Networks for NLP*, pp. 276–291.

Peng Qi, Yuhao Zhang, and Christopher D. Manning. 2020. Stay hungry, stay focused: Generating informative and specific questions in information-seeking conversations. In *Findings of the Association for Computational Linguistics: EMNLP 2020*, pp. 25–40.

Ethan A. Chi, John Hewitt, and Christopher D. Manning. 2020. Finding universal grammatical relations in multilingual BERT. In *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics*, pp. 5564–5577.

Yuhao Zhang, Derek Merck, Emily Tsai, Christopher D. Manning, and Curtis Langlotz. 2020. Optimizing the factual correctness of a summary: A study of summarizing radiology reports. In *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics*, pp. 5108–5120.

Kevin Clark, Minh-Thang Luong, Quoc V. Le, and Christopher D. Manning. 2020. Electra: Pre-training text encoders as discriminators rather than generators. In *International Conference on Learning Representations (ICLR)*. arxiv 2003.10555.

Peng Qi, Yuhao Zhang, Yuhui Zhang, Jason Bolton, and Christopher D. Manning. 2020. Stanza: A Python natural language processing toolkit for many human languages. In *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics: System Demonstrations*, pp. 101–108.

Joakim Nivre, Marie-Catherine de Marneffe, Filip Ginter, Jan Hajič, Christopher D. Manning, Sampo Pyysalo, Sebastian Schuster, Francis Tyers, and Daniel Zeman. 2020. Universal Dependencies v2: An evergrowing multilingual treebank collection. In *Proceedings of The 12th Language Resources and Evaluation Conference*, pp. 4034–4043.

Drew A. Hudson and Christopher D. Manning. 2019. Learning by abstraction: The neural state machine. In *Advances in Neural Information Processing Systems 32*. abs/1907.03950.

Abigail See, Aneesh Pappu, Rohun Saxena, Akhila Yerukola, and Christopher D. Manning. 2019. Do massively pretrained language models make better storytellers? In *Proceedings of the 23rd Conference on Computational Natural Language Learning (CoNLL)*, pp. 843–861.

Peng Qi, Xiaowen Lin, Leo Mehr, Zijian Wang, and Christopher D. Manning. 2019. Answering complex open-domain questions through iterative query generation. In *Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing and the 9th International Joint Conference on Natural Language Processing (EMNLP-IJCNLP)*, pp. 2590–2602.

Kevin Clark, Minh-Thang Luong, Urvashi Khandelwal, Christopher D. Manning, and Quoc V. Le. 2019a. BAM! Born-again multi-task networks for natural language understanding. In *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics*, pp. 5931–5937.

Kevin Clark, Urvashi Khandelwal, Omer Levy, and Christopher D. Manning. 2019b. What does BERT look at? An analysis of BERT's attention. In *Proceedings of the 2019 ACL Workshop BlackboxNLP: Analyzing and Interpreting Neural Networks for NLP*, pp. 276–286.

Drew A. Hudson and Christopher D. Manning. 2019. GQA: A new dataset for real-world visual reasoning and compositional question answering. In *The IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*.

John Hewitt and Christopher D. Manning. 2019. A structural probe for finding syntax in word representations. In *Proceedings of the 2019 Conference of the North American Chapter of the Association for Computational Linguistics:*

Human Language Technologies, Volume 1 (Long and Short Papers), pp. 4129–4138.

Peng Qi, Timothy Dozat, Yuhao Zhang, and Christopher D. Manning. 2018. Universal dependency parsing from scratch. In *Proceedings of the CoNLL 2018 Shared Task: Multilingual Parsing from Raw Text to Universal Dependencies*, pp. 160–170.

Matthew Lamm, Arun Chaganty, Christopher D. Manning, Dan Jurafsky, and Percy Liang. 2018. Textual analogy parsing: What's shared and what's compared among analogous facts. In *Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing*, pp. 82–92.

Kevin Clark, Minh-Thang Luong, Christopher D. Manning, and Quoc Le. 2018. Semi-supervised sequence modeling with cross-view training. In *Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing*, pp. 1914–1925.

Yuhao Zhang, Peng Qi, and Christopher D. Manning. 2018. Graph convolution over pruned dependency trees improves relation extraction. In *Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing*, pp. 2205–2215.

Zhilin Yang, Peng Qi, Saizheng Zhang, Yoshua Bengio, William Cohen, Ruslan Salakhutdinov, and Christopher D. Manning. 2018. HotpotQA: A dataset for diverse, explainable multi-hop question answering. In *Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing*, pp. 2369–2380.

Yuhao Zhang, Daisy Yi Ding, Tianpei Qian, Christopher D. Manning, and Curtis P. Langlotz. 2018. Learning to summarize radiology findings. In *Proceedings of the Ninth International Workshop on Health Text Mining and Information Analysis*, pp. 204–213.

Timothy Dozat and Christopher D. Manning. 2018. Simpler but more accurate semantic dependency parsing. In *Proceedings of the 56th Annual Meeting of the Association for Computational Linguistics (Volume 2: Short Papers)*, pp. 484–490.

Sebastian Schuster, Joakim Nivre, and Christopher D. Manning. 2018. Sentences with gapping: Parsing and reconstructing elided predicates. In *Proceedings of the 2018 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, Volume 1 (Long Papers)*, pp. 1156–1168.

Yuhao Zhang, Victor Zhong, Danqi Chen, Gabor Angeli, and Christopher D. Manning. 2017. Position-aware attention and supervised data improve slot filling. In *Proceedings of the 2017 Conference on Empirical Methods in Natural Language Processing*, pp. 35–45.

Arun Chaganty, Ashwin Paranjape, Percy Liang, and Christopher D. Manning. 2017. Importance sampling for unbiased on-demand evaluation of knowledge

base population. In *Proceedings of the 2017 Conference on Empirical Methods in Natural Language Processing*, pp. 1038–1048.

Drew A Hudson and Christopher D Manning. 2018. Compositional attention networks for machine reasoning. In *International Conference on Learning Representations (ICLR)*.

Sebastian Schuster, Éric Villemonte de la Clergerie, Marie Candito, Benoît Sagot, Christopher D. Manning, and Djamé Seddah. 2017. Paris and stanford at epe 2017: Downstream evaluation of graph-based dependency representations. In *The 2017 Shared Task on Extrinsic Parser Evaluation at the Fourth International Conference on Dependency Linguistics and the 15th International Conference on Parsing Technologies (EPE2017)*.

Matthew Lamm, Arun Chaganty, Dan Jurafsky, Christopher D. Manning, and Percy Liang. 2018. QSRL: A semantic role-labeling schema for quantitative facts. In *First Financial Narrative Processing Workshop (FNP 2018)*, pp. 44–51.

Mihail Eric and Christopher Manning. 2017. A copy-augmented sequence-to-sequence architecture gives good performance on task-oriented dialogue. In *Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics: Volume 2, Short Papers*, pp. 468–473.

Sida I. Wang, Samuel Ginn, Percy Liang, and Christopher D. Manning. 2017. Naturalizing a programming language via interactive learning. In *Proceedings of the 55th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, pp. 929–938.

Abigail See, Peter J. Liu, and Christopher D. Manning. 2017. Get to the point: Summarization with pointer-generator networks. In *Proceedings of the 55th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, pp. 1073–1083.

Peng Qi and Christopher D. Manning. 2017. Arc-swift: A novel transition system for dependency parsing. In *Proceedings of the 55th Annual Meeting of the Association for Computational Linguistics (Volume 2: Short Papers)*, pp. 110–117.

Daniel Zeman, Martin Popel, Milan Straka, Jan Hajic, Joakim Nivre, Filip Ginter, Juhani Luotolahti, Sampo Pyysalo, Slav Petrov, Martin Potthast, Francis Tyers, Elena Badmaeva, Memduh Gokirmak, Anna Nedoluzhko, Silvie Cinkova, Jan Hajic jr., Jaroslava Hlavacova, Václava Kettnerová, Zdenka Uresova, Jenna Kanerva, Stina Ojala, Anna Missilä, Christopher D. Manning, Sebastian Schuster, Siva Reddy, Dima Taji, Nizar Habash, Herman Leung, Marie-Catherine de Marneffe, Manuela Sanguinetti, Maria Simi, Hiroshi Kanayama, Valeria de-Paiva, Kira Droganova, Héctor Martínez Alonso, Çağrı Çöltekin, Umut Sulubacak, Hans Uszkoreit, Vivien Macketanz, Aljoscha Burchardt, Kim Harris, Katrin Marheinecke, Georg Rehm, Tolga Kayadelen, Mohammed Attia, Ali Elkahky, Zhuoran Yu, Emily Pitler, Saran Lertpradit, Michael Mandl, Jesse Kirchner, Hector Fernandez Alcalde, Jana Strnadová, Esha Banerjee, Ruli Manurung, Antonio Stella, Atsuko Shimada, Sookyoung Kwak, Gustavo Men-

donca, Tatiana Lando, Rattima Nitisaroj, and Josie Li. 2017. CoNLL 2017 shared task: Multilingual parsing from raw text to Universal Dependencies. In *Proceedings of the CoNLL 2017 Shared Task: Multilingual Parsing from Raw Text to Universal Dependencies*, pp. 1–19.

Timothy Dozat, Peng Qi, and Christopher D. Manning. 2017. Stanford's graph-based neural dependency parser at the CoNLL 2017 shared task. In *Proceedings of the CoNLL 2017 Shared Task: Multilingual Parsing from Raw Text to Universal Dependencies*, pp. 20–30.

Kevin Clark and Christopher D. Manning. 2016. Deep reinforcement learning for mention-ranking coreference models. In *Proceedings of the 2016 Conference on Empirical Methods in Natural Language Processing*, pp. 2256–2262.

Sebastian Schuster, Matthew Lamm, and Christopher D. Manning. 2017. Gapping constructions in Universal Dependencies v2. In *Proceedings of the NoDaLiDa 2017 Workshop on Universal Dependencies (UDW 2017)*, pp. 123–132.

Mihail Eric, Lakshmi Krishnan, Francois Charette, and Christopher D. Manning. 2017. Key-value retrieval networks for task-oriented dialogue. In *Proceedings of the 18th Annual SIGdial Meeting on Discourse and Dialogue*, pp. 37–49.

Timothy Dozat and Christopher D. Manning. 2017. Deep biaffine attention for neural dependency parsing. In *Proceedings of the International Conference on Learning Representations (ICLR 2017)*.

Gabor Angeli, Neha Nayak, and Christopher D. Manning. 2016. Combining natural logic and shallow reasoning for question answering. In *Proceedings of the 54th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, pp. 442–452.

Kevin Clark and Christopher D. Manning. 2016. Improving coreference resolution by learning entity-level distributed representations. In *Proceedings of the 54th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, pp. 643–653.

Minh-Thang Luong and Christopher D. Manning. 2016. Achieving open vocabulary neural machine translation with hybrid word-character models. In *Proceedings of the 54th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, pp. 1054–1063.

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Christopher D. Manning. 1996. Argument structure as a locus for binding theory. In Miriam Butt and Tracy Holloway King (eds.), *Proceedings of the First Lexical Functional Grammar Conference (LFG '96)*, Rank Xerox, Grenoble.

John T. Maxwell, III and Christopher D. Manning. 1996. A theory of non-constituent coordination based on finite state rules. In *Proceedings of the First Lexical Functional Grammar Conference (LFG '96)*, Grenoble.

Christopher D. Manning. 1996. Romance complex predicates: In defence of the right-branching structure. Paper presented at the Workshop on Surface-Based Syntax and Romance Languages, 1996 European Summer School on Logic, Language, and Information, Prague.

Avery D. Andrews and Christopher D. Manning. 1993. Information spreading and levels of representation in LFG. Technical Report CSLI-93-176, CSLI, Stanford CA.

Christopher D. Manning. 1992. Romance is so complex. Technical Report CSLI-92-168, Stanford University, Stanford CA.

Recent invited talks

Natural Language Understanding and Conversational AI. Nvidia GTC 2020.

Emergent linguistic Structure in deep contextual neural word representations. Institute of Advanced Studies, 2019.

The State of Deep Learning for Natural Language Processing. Invited talk at the Arthur M. Sackler Colloquium, National Academy of Science, 2019.

Making the L in VQA Matter. Invited talk at the Visual Question Answering workshop at CVPR 2019.

Knowledge is embedded in language neural networks but can they reason? Invited talk at the Simons Institute workshop on Emerging Challenges in Deep Learning 2019.

Building neural network models that can reason. Invited talk at Microsoft Research, Redmond, 2019.

The Scoietal Impacts of the AI Wave. Invited talk at the Bay Area Robotics Symposium 2018.

Towards real-world visual reasoning. Invited talk at the Visually Grounded Interaction and Language (ViGIL) workshop at NeurIPS 2018.

Understanding Human Language: Can NLP and Deep Learning Help. Invited talk at the 39th International ACM SIGIR conference (SIGIR 2016).

The Case for Universal Dependencies. Invited talk at the 2015 International Conference on Dependency Linguistics (DepLing 2015).

Computational Linguistics and Deep Learning. Presidential Address at the 2015 Annual Meeting of the Association for Computational Linguistics.

Compositional Deep Learning. Invited talk at the NAACL 2015 Workshop on Vector Space Modeling for NLP.

Distributed representations of language are back. Invited talk at BayLearn 2014.

Grants (since 2011)

Conversational and Multi-modal Question and Answering, Samsung 2019–2021. Funded.

Reasoning and fact aggregation for machine reading comprehension, Samsung 2018–2019. Funded.

Robust and Interpretable Machine Learning via Natural Language Explanations, Toyota Research Institute 2018–2020. With Percy Liang and Dan Jurafsky. Funded.

Knowledge Graph Research Program, Aug 1, 2018–July 31, 2021, JD. With Jure Leskovec. Funded.

Effective Explanation of Complex Machine Learning using Coordinated Language and Visualization, DARPA XAI, 2017–2021. With Kathy McKeown. Not funded.

Deep Models of Compositionality and Context. DARPA CwC (Communicating with Computers), Oct 1, 2015–Sept 30, 2020. With Percy Liang and Dan Jurafsky. Funded.

Deep Understanding: Integrating Neural and Symbolic Models of Meaning. NSF RI Medium. July 1, 2015–June 30, 2018. Funded.

Question Answering Using Linguistic Features and Textual Inference. Sponsored Project funded by Vulcan, Inc. For second and third year, transferred to Allen Institute for Artificial Intelligence. Aug 1, 2012–Apr 30, 2016. Funded.

Robust Deep Semantics for Language Understanding. DARPA DEFT (Deep Exploration and Filtering of Text), Oct 2012–Mar 2017. With Dan Jurafsky and Percy Liang. Funded.

DELPHI MT System. DARPA BOLT: Broad Operational Language Translation program. Subcontractor to IBM. Oct 19, 2011–Dec. 30, 2014. With Dan Jurafsky.

Machine Reading: FAUST: Flexible Acquisition and Understanding System for Text. 2009-2014. Subcontractor to SRI. With Dan Jurafsky and Andrew Ng.

GALE Phase 4-5: Rosetta: An Analyst Co-Pilot. DARPA GALE program. 2009–2011. Subcontractor to IBM. With Dan Jurafsky.

Distributed Open Source Software

Stanza: A Python NLP Library for Many Human Languages.
https://stanfordnlp.github.io/stanza/

GloVe: Global Vectors for Word Representation.
https://nlp.stanford.edu/projects/glove/

Stanford CoreNLP.
https://stanfordnlp.github.io/CoreNLP/

Stanford Phrasal: A Phrase-Based Translation System.
http://nlp.stanford.edu/phrasal/

Stanford Parser.
http://nlp.stanford.edu/software/lex-parser.html

Stanford Part-of-Speech Tagger.
http://nlp.stanford.edu/software/tagger.html

Stanford Named Entity Recognizer.
http://nlp.stanford.edu/software/CRF-NER.html

Stanford Word Segmenter.
http://nlp.stanford.edu/software/segmenter.html

Stanford Classifier.
http://nlp.stanford.edu/software/classifier.html

Tregex, Tsurgeon, and Semgrex.
http://nlp.stanford.edu/software/tregex.html

Stanford Temporal Tagger (SUTime).
http://nlp.stanford.edu/software/sutime.html

Kirrkirr: software for the exploration of indigenous language dictionaries.
http://nlp.stanford.edu/kirrkirr/

University Committees

2012–13 Committee on Academic Computing and Information Systems (C-ACIS)

Stanford, January 30, 2022