

Dr. James B. Henderson

Curriculum Vitae

Xerox Research Centre Europe
6 chemin de Maupertuis
38240 Meylan, France

and

Université de Genève, Département d'Informatique
7 route de Drize, Battelle bâtiment A
1227 Carouge, Switzerland

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Positions

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|---|-------------------------|
| Principal Scientist
Xerox Research Centre Europe (XRCE), Grenoble, France
Scientific head of the Parsing and Semantics group. | May'12 – present |
| Chargé de Cours
Univ. Geneva, Department of Computer Science, Geneva, Switzerland
A permanent part-time teaching position with seniority similar to Associate Professor. | Aug'12 – present |
| Chargé de Enseignement
Univ. Neuchatel, Department of Computer Science, Neuchatel, Switzerland
A temporary part-time position to teach a course on natural language processing. | Feb'12 – Jul'12 |
| Maître d'Enseignement et de Recherche (MER)
Univ. Geneva, Department of Computer Science, Geneva, Switzerland
A grant-funded research position with seniority similar to Associate Professor. | Mar'08 – Apr'12 |
| Research Fellow
Univ. Edinburgh, School of Informatics, Edinburgh, UK | Apr'04 – Feb'08 |
| Maître-assistant
Univ. Geneva, Department of Computer Science, Geneva, Switzerland
A senior research position. | Oct'00 – Mar'04 |
| Visiting Professor
Swiss Federal Institute of Technology in Lausanne (EPFL), Department of Computer Science,
Lausanne, Switzerland | Feb'01 – Oct'01 |
| Lecturer in Computer Science
Univ. Exeter, Department of Computer Science, Exeter, United Kingdom | Nov'94 – Oct'01 |
| Visiting Researcher
Swiss Federal Institute of Technology in Lausanne (EPFL), Artificial Intelligence Lab, Depart-
ment of Computer Science, Lausanne, Switzerland | Aug'99 – Jan'00 |

Qualifications

Ph.D.	1991 – 1994
Univ. Pennsylvania, Department Computer and Information Science, Philadelphia, PA, USA	
M.S.E. with major in Computational Linguistics	1987 – 1991
Univ. Pennsylvania, Department Computer and Information Science, Philadelphia, PA, USA	
B.Sc. in Computer Science	1983 – 1987
Massachusetts Institute of Technology, Department Electrical Engineering and Computer Science, Cambridge, MA, USA	

Grants

French ANRT CIFRE grant, EUR 42,000. <i>Opinion Summarisation with Textual Entailment Recognition.</i>	Mar'15-Feb'18
Hasler Foundation grant, CHF 41,182. <i>Deep Neural Network Dependency Parser for Context-aware Representation Learning</i>	May'15-Dec'15
Swiss CTI R&D Grant, CHF 80,000. <i>Novel, Optimized Machine Learning Methods for Automated Analysis of Journalistic Content.</i>	Jul'13 – Apr'14
Submission for a Swiss National Centre of Competence in Research <i>Language Sciences: Complexity, Frequency and Variation in Language.</i>	2012
European Union STREP grant, EUR 761,370 <i>PARLANCE – Probabilistic Adaptive Real-Time Learning And Natural Conversational Engine.</i> Total funding EUR 3,625,000.	Nov'11 – Oct'14
Swiss NSF Grant, CHF 110,000 <i>Inducing Semantic Representations from Multiple Data Sources.</i>	Oct'11 – Sep'13
Swiss NSF Sinergia Grant, CHF 869,019 (\$843,400) <i>Improving the coherence of machine translation output by modeling intersentential relations.</i>	Mar'10 – Feb'13
Swiss NSF Grant, CHF 98,380 (\$95,500) <i>Sampling and Regularization for Latent Structure Models with Feature Induction.</i>	Oct'09 – Aug'11
European Union STREP grant, EUR 638,000 (\$943,000) <i>CLASSiC - Computational Learning in Adaptive Systems for Spoken Conversation.</i> Total funding EUR 3,400,000 (\$5,030,000).	Mar'08 – Feb'11
British EPSRC grant, GBP 266,907 (\$522,000) <i>End-to-end Integrated Statistical Processing for Context-Aware Dialogue Systems.</i>	Jan'07 – Dec'08
Swiss NSF Grant, CHF 97,300 (\$76,800) <i>Kernel-Based Structure Processing for Natural Language Parsing.</i>	Oct'05 – Sep'07
Swiss NSF Grant, CHF 83,920 (\$65,400) <i>Neural Network Statistical Estimation for Very Broad Coverage Parsing.</i>	Apr'03 – Oct'05
Swiss NSF Grant, CHF 247,934 (\$180,000) <i>Combining Machine Learning and Natural Language Processing for Knowledge Discovery in Text.</i>	Oct'02 – Sep'04

Professional Recognition

Standing review committee of <i>TACL</i>	Mar' 15–present
Editorial Board of <i>Computational Linguistics</i>	Jan' 12–Dec' 14
Conference chairs	2004 – present
Area Co-Chair for Syntax and Parsing, 51st Annual Meeting of the Association for Computational Linguistics (ACL 2013), Sofia, Bulgaria.	
Area Co-Chair for Syntax, Tagging, Chunking and Parsing, 2013 Conference of the North American Chapter of the Association for Computational Linguistics (NAACL 2013), Atlanta, USA.	
Program Co-Chair for 2012 Joint Conference on Empirical Methods in Natural Language Processing and Conference on Computational Natural Language Learning (EMNLP-CoNLL 2012), Jeju, Korea.	
Area Chair for Parsing, 2006 Conference on Empirical Methods in Natural Language Processing (EMNLP 2006), Sydney, Australia	
Area Chair for Parsing and Grammatical Formalism, 2 nd International Joint Conference on Natural Language Processing (IJCNLP-05), Jeju Island, Korea	
Co-Chair for Tutorials, COLING 2004, Geneva, Switzerland	
Journal and Conference reviewer	1996 – present
Review regularly for top-tier international journals (<i>TACL</i> , <i>CL</i> , etc.) and top-tier international conferences (<i>ACL</i> , <i>EMNLP</i> , <i>NIPS</i> , etc.).	

Courses Taught

At Univ of Geneva, Dept of Computer Science	
Artificial Intelligence (BSc equiv)	Aug' 12 – present
At Univ of Neuchatel, Dept of Computer Science	
Natural Language Processing (MSc)	Feb' 12 – Jul' 12
ESSLLI, Malaga, Spain	2006
At Univ of Exeter, Dept of Computer Science (rated Excellent in teaching)	1994 – 2001
Neural Computing (MSc), Natural Language Engineering (MSc), Computational Linguistics (BSc, final year), Connectionism (BSc, final and second year), Final Project Supervision (BSc, final year), Theory of Computing I (BSc, second year), Formal Foundations of Software Engineering (BSc, second year), Cognitive Science (BSc, second year), Artificial Intelligence I (BSc, first year), Introductory Seminars in Cognitive Science (BSc, first year)	

Personal Details

Citizenship: United States of America

Work permits: C permit (permanent resident) for Switzerland, Scientific permit for France

Languages: English (native), French, Italian comprehension

Publication List

Citation indices available at <http://scholar.google.com/citations?user=CSib0ooAAAAJ>.

Refereed Journal Articles

- Henderson, J., Merlo, P., Titov, I., and Musillo, G. (2013). Joint Parsing of Syntactic and Semantic Dependencies with a Latent Variable Model. *Computational Linguistics*, 39(4):949-998.
- Henderson, J., and Titov, I. (2010). Incremental Sigmoid Belief Networks for Grammar Learning. *Journal of Machine Learning Research*, 11(Dec):3541-3570. (ISI 2010 impact factor 3.0)
- Georgila, K., Lemon, O., Henderson, J., and Moore, JD. (2009). Automatic annotation of context and speech acts for dialogue corpora. *Natural Language Engineering*, 15(03):315-353.
- Henderson, J., Lemon, O., and Georgila, K. (2008). Hybrid Reinforcement/Supervised Learning of Dialogue Policies from Fixed Datasets. *Computational Linguistics* 34(4):487-511. (ISI 2010 impact factor 3.0)
- Henderson, J. (2004). Estimating Probabilities for Unbounded Categorization Problems. *Neurocomputing*, 57:77-86. (ISI 2010 impact factor 1.4)
- Lane, P. and Henderson, J. (2003). Towards Effective Parsing with Neural Networks: Inherent Generalisations and Bounded Resource Effects. *Applied Intelligence*, 19(1):83-99. (ISI 2010 impact factor 0.9)
- Lane, P. and Henderson, J. (2001). Incremental Syntactic Parsing of Natural Language Corpora with Simple Synchrony Networks. *IEEE Transactions on Knowledge and Data Engineering*, 13(2):219-231. (ISI 2010 impact factor 1.9)
- Henderson, J. (1994). Connectionist syntactic parsing using temporal variable binding. *Journal of Psycholinguistic Research*, 23(5):353-379.

Refereed Conference Papers

- Henderson, J., Popa, D.N. (2016). A Vector Space for Distributional Semantics for Entailment. In *Proc. 54th Annual Meeting of the Association for Computational Linguistics (ACL 2016)*, Berlin, Germany.
- Farahmand, M., Henderson, J. (2016). Modeling the Non-Substitutability of Multiword Expressions with Distributional Semantics and a Log-Linear Model. In *Proceedings of the 12th Workshop on Multiword Expressions (MWE-ACL 2016)*, Berlin, Germany.
- Yazdani, M., Farahmand, M., Henderson, J. (2015). Learning Semantic Composition to Detect Non-compositionality of Multiword Expressions. In *Proc. 2015 Conf. on Empirical Methods in Natural Language Processing (EMNLP 2015)*, Lisbon, Portugal.
- Yazdani, M., Henderson, J. (2015). A Model of Zero-Shot Learning of Spoken Language Understanding. In *Proc. 2015 Conf. on Empirical Methods in Natural Language Processing (EMNLP 2015)*, Lisbon, Portugal.

- Radford, W., Carreras, X., Henderson, J. (2015). Named entity recognition with document-specific KB tag gazetteers. In *Proc. 2015 Conf. on Empirical Methods in Natural Language Processing (EMNLP 2015)*, Lisbon, Portugal.
- Yazdani, Y., Henderson, J. (2015). Incremental Recurrent Neural Network Dependency Parser with Search-based Discriminative Training. In *Proc. 19th Conf. on Computational Natural Language Learning (CoNLL 2015)*, Beijing, China.
- Gesmundo, G., Henderson, J. (2014). Undirected Machine Translation with Discriminative Reinforcement Learning. In *Proc. 14th Conf. European Chapter of the Association for Computational Linguistics (EACL 2014)*, Gothenburg, Sweden.
- Lang, J., Henderson, J. (2013) Graph-Based Seed Set Expansion For Relation Extraction Using Random Walk Hitting Times. In *Proc. 2013 Conf. North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL 2013)*, Atlanta, Georgia, USA.
- Hastie, H., Afaure, M.A., Alexopoulos, P., Cuayhuitl, H., Dethlefs, N., Gasic, M., Henderson, J., Lemon, O., Liu, X., Mika, P., Ben Mustapha, N., Rieser, V., Thomson, B., Tsiakoulis, P., Vanrompay, Y., Villazon-Terrazas, B., Young, S., (2013) Demonstration of the Parlance system: a data-driven, incremental, spoken dialogue system for interactive search. In *Proc. SIGDIAL 2013*, Metz, France.
- Garg, N., Henderson, J. (2012). Unsupervised Semantic Role Induction with Global Role Ordering. In *Proc. 50th Annual Meeting of the Association for Computational Linguistics (ACL 2012)*, Jeju Island, Korea. (short paper)
- Gesmundo, A., Satta, G., Henderson, J. (2012). Heuristic Cube Pruning in Linear Time. In *Proc. 50th Annual Meeting of the Association for Computational Linguistics (ACL 2012)*, Jeju Island, Korea. (short paper)
- Gesmundo, A., Henderson, J. (2011). Heuristic Search for Non-Bottom-Up Tree Structure Prediction. In *Proc. 2011 Conf. on Empirical Methods in Natural Language Processing (EMNLP 2011)*, Edinburgh, UK. (23% acceptance rate)
- Garg, N., Henderson, J. (2011). Temporal Restricted Boltzmann Machines for Dependency Parsing. In *Proc. 49th Annual Meeting of the Association for Computational Linguistics (ACL 2011)*, Portland, Oregon, USA. (short paper)
- van der Plas, L., Merlo, P., Henderson, J. (2011). Scaling up Cross-Lingual Semantic Annotation Transfer. In *Proc. 49th Annual Meeting of the Association for Computational Linguistics (ACL 2011)*, Portland, Oregon, USA. (short paper)
- Gesmundo, A., Henderson, J. (2010). Faster Cube Pruning. In *Proc. International Workshop on Spoken Language Translation (IWSLT 2010)*, Paris, France.
- Gesmundo, A., Henderson, J., Merlo, P., Titov, I. (2009) A Latent Variable Model of Synchronous Syntactic-Semantic Parsing for Multiple Languages. In *Proc. Thirteenth Conf. on Computational Natural Language Learning: Shared Task (CoNLL-09)*, Boulder, Colorado, USA.

- van der Plas, L., Henderson, J., Merlo, P. (2009) Domain Adaptation with Artificial Data for Semantic Parsing of Speech. In *Proc. 2009 Conf. North American Chapter of the Association for Computational Linguistics: Short Papers* (NAACL HLT 2009), Boulder, Colorado, USA.
- Titov, I., Henderson, J., Merlo, P., and Musillo, G. (2009) Online Graph Planarisation for Synchronous Parsing of Semantic and Syntactic Dependencies. In *Proc. 2009 International Joint Conferences on Artificial Intelligence (IJCAI-09)*. Pasadena, California, USA. (26% acceptance rate)
- Henderson, J., Merlo, P., Musillo, G., and Titov, I. (2008) A Latent Variable Model of Synchronous Parsing for Syntactic and Semantic Dependencies. In *Proc. Twelfth Conf. on Computational Natural Language Learning: Shared Task* (CoNLL-08). Manchester, UK.
- Henderson, J., and Lemon, O. (2008). Mixture model POMDPs for efficient handling of uncertainty in dialogue management. In *Proc. 46th Annual Meeting of the Association for Computational Linguistics* (ACL-08), Columbus, Ohio, USA. (short paper)
- Titov, I. and Henderson, J. (2007). Incremental Bayesian Networks for Structure Prediction. In *Proc. 24th Int. Conf. on Machine Learning* (ICML-07). Corvallis, OR, USA. (29% acceptance rate)
- Titov, I. and Henderson, J. (2007). Constituent Parsing with Incremental Sigmoid Belief Networks. In *Proc. 45th Meeting of Assoc. for Computational Linguistics* (ACL-07). Prague, Czech Republic. (22% acceptance rate)
- Titov, I. and Henderson, J. (2007). Fast and Robust Multilingual Dependency Parsing with a Generative Latent Variable Model. In *Proc. CoNLL 2007 Shared Task. Joint Conf. on Empirical Methods in Natural Language Processing and Computational Natural Language Learning* (EMNLP-CoNLL-07). Prague, Czech Republic. (3rd result out of 23)
- Titov, I. and Henderson, J. (2007). A Latent Variable Model for Generative Dependency Parsing. In *Proc. International Conference on Parsing Technologies* (IWPT-07). Prague, Czech Republic. (unofficial best paper)
- Titov, I. and Henderson, J. (2006). Loss minimization in parse reranking. In *Proc. 2006 Conf. on Empirical Methods in Natural Language Processing* (EMNLP 2006), Sydney, Australia. (18% acceptance rate)
- Titov, I. and Henderson, J. (2006). Porting statistical parsers with data-defined kernels. In *Proc. Tenth Conf. on Computational Natural Language Learning* (CoNLL 2006), New York, NY, USA.
- Lemon, O., Georgila, K., and Henderson, J. (2006). Evaluating Effectiveness and Portability of Reinforcement Learned Dialogue Strategies with real users: the TALK TownInfo Evaluation, In *Proc. IEEE/ACL Spoken Language Technology*.
- Lemon, O., Georgila, K., Henderson, J., and Stuttle, M. (2006). An ISU dialogue system exhibiting reinforcement learning of dialogue policies: generic slot-filling in the TALK in-car system. In *Proc. Conf. of the European Chapter of the Association for Computational Linguistics* (EACL 2006), Trento, Italy.
- Georgila, K., Henderson, J., and Lemon, O. (2006). User Simulation for Spoken Dialogue Systems: Learning and Evaluation. In *Proc. Interspeech 2006*.

- Henderson, J. and Titov, I. (2005). Data-defined kernels for parse reranking derived from probabilistic models. In *Proc. 43rd Meeting of Association for Computational Linguistics (ACL 2005)*, Ann Arbor, MI, USA. (18% acceptance rate)
- Titov, I. and Henderson, J. (2005). Deriving kernels from MLP probability estimators for large categorization problems. In *Proc. 2005 International Joint Conf. on Neural Networks (IJCNN 2005)*, Montreal, Quebec, Canada.
- Henderson, J., Lemon, O., and Georgila, K. (2005). Hybrid reinforcement/supervised learning for dialogue policies from COMMUNICATOR data. In *Proc. IJCAI workshop on Knowledge and Reasoning in Practical Dialogue Systems*.
- Georgila, K., Henderson, J., and Lemon, O. (2005). Learning User Simulations for Information State Update Dialogue Systems. In *Proc. 9th European Conf. on Speech Communication and Technology (INTERSPEECH - EUROSPEECH 2005)*.
- Georgila, K., Lemon, O., and Henderson, J. (2005). Automatic annotation of COMMUNICATOR dialogue data for learning dialogue strategies and user simulations. In *Proc. Ninth Workshop on the Semantics and Pragmatics of Dialogue (SEMDIAL: DIALOR)*.
- Henderson, J. (2004). Discriminative training of a neural network statistical parser. In *Proc. 42nd Meeting of Association for Computational Linguistics (ACL 2004)*, Barcelona, Spain. (25% acceptance rate)
- Henderson, J. (2004). Lookahead in deterministic left-corner parsing. In *Proc. Workshop on Incremental Parsing: Bringing Engineering and Cognition Together*, Barcelona, Spain.
- Lemon, O. and Henderson, J. (2004). Machine learning and the Information State Update approach to dialogue management. In *Proc. Joint AMI-PASCAL-IM2-M4 workshop*.
- Henderson, J. (2003). Structural Bias in Inducing Representations for Probabilistic Natural Language Parsing. In *Proc. of 13th Int. Conf. on Artificial Neural Networks (ICANN/ICONIP 2003)*, Istanbul, Turkey.
- Henderson, J. (2003). Inducing History Representations for Broad Coverage Statistical Parsing. In *Proc. of the Joint Meeting of the North American Chapter of the Association for Computational Linguistics and the Human Language Technology Conf. (HLT-NAACL 2003)*, pages 103–110, Edmonton, Canada. (22% acceptance rate)
- Henderson, J. (2003). Generative Versus Discriminative Models for Statistical Left-Corner Parsing. In *Proc. of 8th Int. Workshop on Parsing Technologies (IWPT 2003)*, pages 115–126, Nancy, France, 2003.
- Henderson, J. (2003). Neural Network Probability Estimation for Broad Coverage Parsing. In *Proc. of 10th Conf. of the European Chapter of the Association for Computational Linguistics (EACL 2003)*, pages 131–138, Budapest, Hungary. (27% acceptance rate)
- Henderson, J., Merlo, P., Petroff, I., and Schneider, G. (2002). Using Syntactic Analysis to Increase Efficiency in Visualizing Text Collections. In *Proc. of 19th Int. Conf. on Computational Linguistics (COLING 2002)*, pages 335–341, Taipei, Taiwan.

- Henderson, J., Merlo, P., Petroff, I., and Schneider, G. (2002). Using NLP to Efficiently Visualize Text Collections with SOMs. In *Proc. of 3rd Int. Workshop on Natural Language and Information Systems (NLIS 2002)*, 5 pages, Aix-en-Provence, France.
- Henderson, J. (2002). Estimating Probabilities for Unbounded Categorization Problems. In *Proc. of 10th European Symposium on Artificial Neural Networks (ESANN 2002)*, pages 383–388, Bruges, Belgium.
- Henderson, J. (2000). Estimating a Probabilistic Grammar Using a Neural Network. In *Proc. of 1st Workshop on Robust Methods in Analysis of Natural Language Data (ROMAND 2000)*, 9 pages, Lausanne, Switzerland.
- Henderson, J. (2000). Segmenting State into Entities and its Implication for Learning. In *Proc. of Int. Workshop on Current Computational Architectures Integrating Neural Networks and Neuroscience (EmerNet)*, 10 pages, Durham, UK.
- Henderson, J. (2000). A Neural Network Parser that Handles Sparse Data. In *Proc. of 6th Int. Workshop on Parsing Technologies (IWPT 2000)*, pages 123–134, Trento, Italy.
- Henderson, J. and Lane, P. (1998). A Connectionist Architecture for Learning to Parse. In *Proc. of 36th Annual Meeting of the Association for Computational Linguistics and 17th Int. Conf. on Computational Linguistics (COLING-ACL 1998)*, pages 531–537, Montreal, Canada.
- Lane, P. and Henderson, J. (1998). Simple Synchrony Networks: Learning to Parse Natural Language with Temporal Synchrony Variable Binding. In *Proc. of Int. Conf. on Artificial Neural Networks (ICANN 1998)*, pages 615–620, Skövde, Sweden.
- Henderson, J. (1996). A connectionist architecture with inherent systematicity. In *Proc. of 18th Conference of the Cognitive Science Society (CogSci 1996)*, pages 574–579, La Jolla, CA.
- Henderson, J. (1992). A Connectionist Parser for Structure Unification Grammar. In *Proc. of 30th Annual Meeting of the Association for Computational Linguistics (ACL 1992)*, pages 144–151, Newark, DE.

Refereed Book Chapters

- Henderson, J., Jurčiček, F. (2012). Data-Driven Methods for Spoken Language Understanding. In Oliver Lemon and Olivier Pietquin, editors, *Data-Driven Methods for Adaptive Spoken Dialogue Systems* (Springer).
- Henderson, J. (2010). Artificial Neural Networks. In Alex Clark, Chris Fox, and Shalom Lappin, editors, *Handbook of Computational Linguistics and Natural Language Processing* (Blackwell). (by invitation)
- Titov, I. and Henderson, J. (2010). A Latent Variable Model for Generative Dependency Parsing. In H. Bunt, P. Merlo and J. Nivre, editors, *Trends in Parsing Technology. Text, Speech and Language Technology Series* (Springer). (by invitation)
- Henderson, J. (2004). A neural network parser that handles sparse data. In H. Bunt, J. Carroll, and G. Satta, editors, *New Developments in Parsing Technology*. Kluwer, Boston/Dordrecht/London.

Henderson, J. (2001). Segmenting State into Entities and its Implication for Learning. In Wermter, S., Austin, J., and Willshaw, D., editors, *Emergent Neural Computational Architectures based on Neuroscience*, pages 227–236. Springer-Verlag, Heidelberg.

Henderson, J. (2000). Constituency, context, and connectionism in syntactic parsing. In Crocker, M., Pickering, M., and Clifton, C., editors, *Architectures and Mechanisms for Language Processing*, pages 189–209. Cambridge University Press, Cambridge UK.

Unrefereed Publications

Garg, N. and Henderson, J. (2016). A Bayesian Model of Multilingual Unsupervised Semantic Role Induction. ArXiv e-prints, 1603.01514.

Henderson, J. (1994). *Description Based Parsing in a Connectionist Network*. PhD thesis, University of Pennsylvania, Philadelphia, PA. Technical Report MS-CIS-94-46.

Henderson, J. (1993). Review of *Connectionist Approaches to Natural Language Processing*, Reilly and Sharkey (eds) *Computational Linguistics*, 19(3):557–559.

Henderson, J. (1992). *A Structural Interpretation of Combinatory Categorical Grammar*. Technical Report MS-CIS-92-49, University of Pennsylvania, Philadelphia, PA.

Henderson, J. (1990). *Structure Unification Grammar: A Unifying Framework For Investigating Natural Language*. Masters thesis, University of Pennsylvania, Philadelphia, PA. Technical Report MS-CIS-90-94.