

## Dr. James B. Henderson

## Curriculum Vitae

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

### 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

### Positions

- Maître d'Enseignement et de Recherche (MER) Mar'08 – present  
Univ. Geneva, Department of Computer Science, Geneva, Switzerland  
A grant-funded research position with seniority similar to Associate Professor.
- Research Fellow Apr'04 – Feb'08  
Univ. Edinburgh, School of Informatics, Edinburgh, UK
- Maître-assistant Oct'00 – Mar'04  
Univ. Geneva, Department of Computer Science, Geneva, Switzerland  
A senior research position.
- Visiting Professor Feb'01 – Oct'01  
Swiss Federal Institute of Technology in Lausanne (EPFL), Department of Computer Science, Lausanne, Switzerland
- Lecturer in Computer Science Nov'94 – Oct'01  
Univ. Exeter, Department of Computer Science, Exeter, United Kingdom
- Visiting Researcher Aug'99 – Jan'00  
Swiss Federal Institute of Technology in Lausanne (EPFL), Artificial Intelligence Lab, Department of Computer Science, Lausanne, Switzerland

### Grants

- European Union STREP grant, EUR 761,370 Nov'11 – Oct'14  
*PARLANCE – Probabilistic Adaptive Real-Time Learning And Natural Conversational Engine.*  
Total funding EUR 3,625,000.
- Swiss NSF Grant, CHF 110,000 Oct'11 – Sep'13  
*Inducing Semantic Representations from Multiple Data Sources.*

- Swiss NSF Sinergia Grant, CHF 869,019 (\$843,400) Mar'10 – Feb'13  
*Improving the coherence of machine translation output by modeling intersentential relations.*
- Swiss NSF Grant, CHF 98,380 (\$95,500) Oct'09 – Aug'11  
*Sampling and Regularization for Latent Structure Models with Feature Induction.*
- European Union STREP grant, EUR 638,000 (\$943,000) Mar'08 – Feb'11  
*CLASSiC - Computational Learning in Adaptive Systems for Spoken Conversation.* Total funding EUR 3,400,000 (\$5,030,000).
- British EPSRC grant, GBP 266,907 (\$522,000) Jan'07 – Dec'08  
*End-to-end Integrated Statistical Processing for Context-Aware Dialogue Systems.*
- Swiss NSF Grant, CHF 97,300 (\$76,800) Oct'05 – Sep'07  
*Kernel-Based Structure Processing for Natural Language Parsing.*
- Swiss NSF Grant, CHF 83,920 (\$65,400) Apr'03 – Oct'05  
*Neural Network Statistical Estimation for Very Broad Coverage Parsing.*
- Swiss NSF Grant, CHF 247,934 (\$180,000) Oct'02 – Sep'04  
*Combining Machine Learning and Natural Language Processing for Knowledge Discovery in Text.*

### Professional Recognition

- Editorial Board of *Computational Linguistics* Jan 2012–Dec 2014
- Conference chairs 2004 – present
- 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.
  - Invited to be Area Co-Chair for Parsing and Syntax for ACL 2012, but had to refuse.
  - Invited to be Area Co-Chair for Machine Learning for Language Processing for NAACL-HLT 2012, but had to refuse.
  - 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<sup>nd</sup> International Joint Conference on Natural Language Processing (IJCNLP-05), Jeju Island, Korea
  - Co-Chair for Tutorials, 20<sup>th</sup> Int. Conf. on Computational Linguistics (COLING 2004), Geneva, Switzerland
- Discussion Panel of Statistical Parsing of Morphologically Rich Languages (SPMRL 2011) 2011
- Google Faculty Summit, Zurich 2010
- Journal and Conference reviewer 1996 – present  
 Reviewed over 15 times for international journals and over 50 times for international conferences.

## Publication List

### Refereed Journal Articles

- Henderson, J., and Titov, I. (2010). Incremental Sigmoid Belief Networks for Grammar Learning. *Journal of Machine Learning Research*, 11(Dec):3541-3570. (ISI 2009 impact factor 2.8)
- 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 2009 impact factor 2.2)
- Henderson, J. (2004). Estimating Probabilities for Unbounded Categorization Problems. *Neurocomputing*, 57:77-86. (ISI 2009 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 2009 impact factor 1.0)
- 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 2009 impact factor 2.3)
- Henderson, J. (1994). Connectionist syntactic parsing using temporal variable binding. *Journal of Psycholinguistic Research*, 23(5):353-379.

### Refereed Conference Papers

- Henderson, J. (2011). Bayesian network automata for modelling unbounded structures. In *Proc. 12th International Conference on Parsing Technologies (IWPT 2011)*, Dublin, Ireland.
- 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.
- 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 (INTER\_SPEECH - EURO\_SPEECH 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. (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.