

Curriculum Vitae

Stefan Riezler

Contact Information

Address Google Inc.
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Research Interests

Stochastic modeling of natural language, including statistical parsing, clustering, summarization, machine translation, question answering, information retrieval

Statistical machine learning methods, especially unsupervised, semi-supervised and discriminative learning techniques

Employment

March 2006–present. Member of Research Staff, Google Inc.

March 2001–March 2006. Member of Research Staff, Natural Language Theory and Technology area at Palo Alto Research Center.

Mathematical conceptualization and implementation of wide-coverage deep-level stochastic parsing technology; application to sentence condensation and machine translation tasks

September 1998–March 2001. Researcher and Lecturer, Institut für Maschinelle Sprachverarbeitung, Universität Stuttgart.

Mathematical conceptualization, implementation, and application of stochastic parsing and clustering models, in cooperation with Detlef Prescher, Mats Rooth, and Franz Beil; teaching undergraduate and graduate courses.

Summer 1998. Visiting Researcher, Department of Cognitive and Linguistic Sciences, Brown University, Providence, RI.

Conceptualization and experimentation with stochastic unification-based grammars, in cooperation with Mark Johnson, Stuart Geman, Zhiyi Chi, and Stephen Canon; taught six-week tutorial on maximum entropy methods.

Education

Dr.phil.(~ Ph.D.) *summa cum laude* in Computational Linguistics, 1998, Seminar für Sprachwissenschaft, Abteilung Computerlinguistik, Universität Tübingen

Dissertation: *Probabilistic Constraint Logic Programming*

Advisors: Erhard Hinrichs, Steven Abney, Mats Rooth, Uwe Mönnich

Mag.phil.(~ M.A.) *summa cum laude* in German Linguistics, 1992, Universität Innsbruck

1. Diplomprüfung (~ B.A.) in German Linguistics, 1989, Universität Innsbruck

Honors

Scholarship at Graduate School “Integriertes Linguistikstudium”, April 1995–March 1998. Seminar für Sprachwissenschaft, Abteilung Computerlinguistik, Universität Tübingen.

DAAD and ERASMUS Scholarships, April 1993–March 1995. Institut für Computerlinguistik der Universität des Saarlandes, Saarbrücken.

Teaching Experience

Formal Languages and Automata, Winter Semester 1999/00, with Sabine Schulte im Walde.

Probabilistic Clustering for NLP Applications, Summer Semester 1999, with Detlef Prescher.

Formal Languages and Automata, Winter Semester 1998/99.

Professional Activities

Member of editorial board of Computational Linguistics Journal, 2004-2006.

Tutorial chair at 43rd Annual Meeting of the Association for Computational Linguistics (ACL'05), Ann Arbor, Michigan.

Workshop organization:

Workshop on Beyond Shallow Analyses - Formalisms and statistical modeling for deep analyses, at 1st International Joint Conference on Natural Language Processing (IJCNLP) 2004

Workshop on Incremental Parsing, at 42nd Annual Meeting of the Association for Computational Linguistics (ACL), 2004

Program Committees / Reviewing:

Reviewing for Machine Learning Journal, Journal of Natural Language Engineering, IEEE Transaction on Speech and Audio Processing, Pattern Recognitions Letter Journal.

Program committee member at conferences of the Association for Computational Linguistics (ACL, EACL, NAACL, HLT, EMNLP, IJCNLP, IWPT).

Program committee member at conferences on Machine Learning (ICML, ECML).

Reviewing of course proposals to the The European Summer School on Logic, Language, and Information.

Reviewing of project proposals to the United States National Science Foundation.

Publications

Journal Articles

Aoife Cahill, Michael Burke, Ruth O'Donovan, Stefan Riezler, Josef van Genabith, Andy Way (2008): Wide-Coverage Deep Statistical Parsing using Automatic Dependency Structure Annotation. In *Computational Linguistics*, 34:1.

Mark Johnson and Stefan Riezler (2002). Statistical Models of Language Learning and Use. In *Cognitive Science*, 26:3.

Book Chapters

Stefan Riezler and John Maxwell (2006). Grammatical Machine Translation. In Miriam Butt, Mary Dalrymple, and Tracy Holloway King (Eds.) *Intelligent Linguistic Structures: Variations on themes by Ronald M. Kaplan*, CSLI Publications, Stanford, CA.

Sabine Schulte im Walde, Helmut Schmid, Mats Rooth, Stefan Riezler, Detlef Prescher (2001). Statistical Grammar Models and Lexicon Acquisition. In Christian Rohrer, Antje Roßdeutscher, Hans Kamp (Eds.) *Linguistic Form and its Computation*, CSLI Publications, Stanford, CA.

Stefan Riezler (2000). Learning Log-Linear Models on Constraint-Based Grammars for Disambiguation. In James Cussens, Sašo Džeroski (Eds.) *Learning Language in Logic*, Lecture Notes in Computer Science 1925, Springer, Berlin.

Refereed Conference Papers

Stefan Riezler, Fabio De Bona (2009). Simple Risk Bounds for Position-Sensitive Max-Margin Ranking Algorithms. In *Proceedings of the Workshop on Advances in Ranking at the 23rd Annual Conference on Neural Information Processing Systems (NIPS'09)*, Whistler, Canada.

Stefan Riezler, Yi Liu, Alexander Vasserman (2008). Translating Queries into Snippets for Improved Query Expansion. In *Proceedings of the 22nd International Conference on Computational Linguistics (COLING'08)*, Manchester, England.

Stefan Riezler, Alexander Vasserman, Ioannis Tsochantaridis, Vibhu Mittal, Yi Liu (2007). Statistical Machine Translation for Query Expansion in Answer Retrieval. In *Proceedings of the 45th Annual Meeting of the Association for Computational Linguistics (ACL'07)*, Prague, Czech Republic.

Stefan Riezler and John Maxwell (2006). Grammatical Machine Translation. In *Proceedings Human Language Technology conference - North American chapter of the Association for Computational Linguistics annual meeting (HLT-NAACL'06)*, New York, NY.

- Stefan Riezler and John Maxwell (2005). On Some Pitfalls in Automatic Evaluation and Significance Testing for MT. In *Proceedings of the Workshop on Intrinsic and Extrinsic Evaluation Methods for MT and Summarization (MTSE) at the 43rd Annual Meeting of the Association for Computational Linguistics (ACL'05)*, Ann Arbor, Michigan.
- Stefan Riezler and Alexander Vasserman (2004). Incremental Feature Selection and l_1 Regularization for Relaxed Maximum-Entropy Modeling. In *Proceedings of the 2004 Conference on Empirical Methods in Natural Language Processing (EMNLP'04)*, Barcelona, Spain.
- Ron Kaplan, Stefan Riezler, Tracy King, John Maxwell, Alexander Vasserman, and Richard Crouch (2004). Speed and Accuracy in Shallow and Deep Stochastic Parsing. In *Proceedings of the Human Language Technology Conference and the 4th Annual Meeting of the North American Chapter of the Association for Computational Linguistics (HLT-NAACL'04)*, Boston, MA.
- Stefan Riezler, Tracy H. King, Richard Crouch, and Annie Zaenen (2003). Statistical Sentence Condensation using Ambiguity Packing and Stochastic Disambiguation Methods for Lexical-Functional Grammar. In *Proceedings of the Human Language Technology Conference and the 3rd Meeting of the North American Chapter of the Association for Computational Linguistics (HLT-NAACL'03)*, Edmonton, Canada.
- Stefan Riezler, Tracy H. King, Richard Crouch, Mary Dalrymple and Ronald M. Kaplan (2003). The PARC 700 Dependency Bank. In *Proceedings of the Workshop on "Linguistically Interpreted Corpora" at the 10th Conference of the European Chapter of the Association for Computational Linguistics (LINC'03)*, Budapest, Hungary.
- Stefan Riezler, Tracy H. King, Ronald M. Kaplan, Richard Crouch, John T. Maxwell, Mark Johnson (2002). Parsing the Wall Street Journal using a Lexical-Functional Grammar and Discriminative Estimation Techniques. In *Proceedings of the 40th Annual Meeting of the Association for Computational Linguistics (ACL'02)*, Philadelphia, PA.
- Richard Crouch, Ronald M. Kaplan, Tracy H. King, Stefan Riezler (2002). A Comparison of Evaluation Metrics for a Broad Coverage Parser. In *Proceedings of the Workshop "Beyond PARSEVAL: Towards Improved Evaluation Measures for Parsing Systems"* in conjunction with the 3rd International Conference on Language Resources and Evaluation (LREC'02), Las Palmas, Spain.
- Stefan Riezler, Detlef Prescher, Jonas Kuhn, and Mark Johnson (2000). Lexicalized Stochastic Modeling of Constraint-Based Grammars using Log-Linear Measures and EM Training. In *Proceedings of the 38th Annual Meeting of the Association for Computational Linguistics (ACL'00)*, Hong Kong.
- Mark Johnson and Stefan Riezler (2000). Exploiting Auxiliary Distributions in Stochastic Unification-Based Grammars. In *Proceedings of the 1st Meeting of the North American Chapter of the Association for Computational Linguistics (ANLP-NAACL 2000)*, Seattle, WA.
- Detlef Prescher, Stefan Riezler, and Mats Rooth (2000). Using a Probabilistic Class-Based Lexicon for Lexical Ambiguity Resolution. In *Proceedings of the 18th International Conference on Computational Linguistics (COLING 2000)*, Saarbrücken, Germany.

- Mark Johnson, Stuart Geman, Stephen Canon, Zhiyi Chi, and Stefan Riezler (1999). Estimators for Stochastic Unification-Based Grammars. In *Proceedings of the 37th Annual Meeting of the Association for Computational Linguistics (ACL'99)*, College Park, MD.
- Mats Rooth, Stefan Riezler, Detlef Prescher, Glenn Carroll, Franz Beil (1999). Inducing a Semantically Annotated Lexicon via EM-Based Clustering. In *Proceedings of the 37th Annual Meeting of the Association for Computational Linguistics (ACL'99)*, College Park, MD.
- Franz Beil, Glenn Carroll, Detlef Prescher, Stefan Riezler, and Mats Rooth (1999). Inside-Outside Estimation of a Lexicalized PCFG for German. In *Proceedings of the 37th Annual Meeting of the Association for Computational Linguistics (ACL'99)*, College Park, MD.
- Stefan Riezler (1998). Statistical Inference and Probabilistic Modeling for Constraint-Based NLP. In *Proceedings of the 4th Conference on Natural Language Processing (KONVENS'98)*, Bonn, Germany.
- Stefan Riezler (1998). Statistical Inference for Probabilistic Constraint Logic Programming. In *Proceedings of the Workshop on Probabilistic Logic and Randomized Computation, held at European Summer School on Logic, Language, and Information (ESSLLI'98)*, Saarbrücken, Germany.
- Stefan Riezler (1997). Quantitative Constraint Logic Programming for Weighted Grammar Applications. In *Proceedings of the 1st International Conference on Logical Aspects of Computational Linguistics (LACL'96)*, Nancy, France.

Book Reviews

- Stefan Riezler (2006). Book Review of *New Developments in Parsing Technology*, by Harry Bunt, John Carroll, and Giorgio Satta (eds.), Dordrecht (Kluwer), 2004. In *Computational Linguistics*, Vol. 32, No. 3: 439-442.

Technical Reports

- Stefan Riezler (1999). Probabilistic Constraint Logic Programming. *AIMS Report 5(1)*, Institut für Maschinelle Sprachverarbeitung, Universität Stuttgart.
- Mats Rooth, Stefan Riezler, Detlef Prescher, Glenn Carroll, and Franz Beil (1998). EM-Based Clustering for NLP Applications. In *Inducing Lexicons with the EM Algorithm, AIMS Report 4(3)*, Institut für Maschinelle Sprachverarbeitung, Universität Stuttgart.
- Franz Beil, Glenn Carroll, Detlef Prescher, Stefan Riezler, and Mats Rooth (1998). Inside-Outside Estimation of a Lexicalized PCFG for German - GOLD. In *Inducing Lexicons with the EM Algorithm, AIMS Report 4(3)*, Institut für Maschinelle Sprachverarbeitung, Universität Stuttgart.
- Stefan Riezler (1997). Probabilistic Constraint Logic Programming. *Arbeitsberichte des SFB 340*, Bericht Nr. 117, Seminar für Sprachwissenschaft, Universität Tübingen.
- Stefan Riezler (1995). Binding without Hierarchies. *Claus Report 50*, Computational Linguistics at the University of the Saarland, Saarbrücken.

Patents

20080319962: Machine Translation for Query Expansion, Stefan Riezler, Alexander Vasserman, filed 3/17/2008

200602245522: Systems and Methods for Determining User-Interests, Stefan Riezler, Daniel H. Greene, filed 3/31/2005

20040230415: Systems and Methods for Grammatical Text Condensation, Stefan Riezler, Richard S Crouch, Tracy H King, Annie E. Zaenen, Alexander Vasserman, filed 5/12/2003

Invited Presentations

Linguistic Ideas for Statistical Natural Language Processing. Invited talk at University of Heidelberg, 2008.

Grammatical Machine Translation. Invited talk at Yahoo!, Sunnyvale, CA, 2006.

Revisiting Transfer-Based Machine Translation in a Phrase-Based SMT Framework. Invited talk at Center for Language and Speech Processing, Johns Hopkins University, Baltimore, MD, 2005.

Feature Selection over Feature Forests for Efficient Deep Stochastic Parsing. Invited talks at Universities of Saarbrücken and Stuttgart, 2005.

Stochastic LFG Parsing for Real-World Applications. Invited talk at Information Sciences Institute, Marina del Rey, 2003.

Parsing the Wall Street Journal using LFG and Discriminative Estimation. Invited talk at Stanford University, 2002.

Getting EM to Work. Invited talk at panel on “The Efficacy of EM” at the *Conference on Empirical Methods in Natural Language Processing*, 2001, Pittsburgh.

On Some Open Questions in Stochastic Parsing with MaxEnt and EM Techniques. Invited talk at panel on “Modeling Techniques for Combining Multiple Information Sources” at *Workshop on Mathematical Foundations of Natural Language Modeling*, November 2000, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis.

An Introduction to Maximum Entropy Methods. Invited tutorial, held at *Department for Cognitive and Linguistic Sciences, Brown University*, 1998, Providence, RI.