

Curriculum Vitae

Stefan Riezler

Contact Information

Affiliation Chair of Linguistic Informatics
Department of Computational Linguistics
University of Heidelberg
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Research Interests

Machine learning for natural language processing,
with applications to statistical parsing, clustering, summarization, machine translation, question answering, information retrieval.

Employment

April 2010–present. Professor of Linguistic Informatics, Department of Computational Linguistics, University of Heidelberg, Germany.

March 2009–March 2010. Research Scientist, Google Research, Zürich, Switzerland.
Work on natural language processing and machine learning for information retrieval, especially learning-to-rank for query rewriting.

March 2006–March 2009. Research Scientist, Google Research, Mountain View, CA.
Work on machine translation and natural language processing for information retrieval, especially monolingual translation for query expansion in web search and question answering.

March 2001–March 2006. Member of Research Staff, Natural Language Theory and Technology area at Palo Alto Research Center, Palo Alto, CA.
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. *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. *summa cum laude* in German Linguistics, 1992, Universität Innsbruck

1. Diplomprüfung in German Linguistics, 1989, Universität Innsbruck

Honors/Grants

Google Faculty Research Award for “Learning Answer Quality Rankings for Non-Factoid QA”, 2010.

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

Statistical Methods for Computational Linguistics

Empirical Methods for Computational Linguistics

Topics in Machine Learning for NLP

Multi-Task Learning

Introduction to Semi-supervised Learning

Learning-to-Rank

Statistical Machine Translation

Discriminative Methods for Machine Translation

Advanced Topics in Information Retrieval

Probabilistic Clustering for NLP Applications

Formal Languages and Automata

Professional Activities

Memberships:

Member of Network of Excellence for Pattern Analysis, Statistical Modeling and Computational Learning (PASCAL-2) funded by European Union, since 2010.

Member of Interdisciplinary Center for Scientific Computing (IWR), Heidelberg, since 2010.

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

Chairing:

Area chair for Machine Translation at the 2011 Conference on Empirical Methods in Natural Language Processing (EMNLP'2011)

Area chair for Parsing at Human Language Technology Conference/North American chapter of the Association for Computational Linguistics Annual meeting (HLT/NAACL 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

- Patrick Simianer, Katharina Wäschle, Stefan Riezler (2011). Multi-Task Minimum Error Rate Training for SMT. In *The Prague Bulletin of Mathematical Linguistics*, Number 96, October 2011.
- Stefan Riezler and Yi Liu (2010). Query Rewriting using Monolingual Statistical Machine Translation. In *Computational Linguistics*, 36:3. .
- 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

- Felix Hieber and Stefan Riezler (2011). Improved Answer Ranking in Social Question-Answering Portals. In *Proceedings of the 3rd International Workshop on Search and Mining User-generated Contents (SMUC 2011)*, Glasgow, Scotland, UK.
- Fabio De Bona, Stefan Riezler, Keith Hall, Massimiliano Ciaramita, Amaç Herdağdelen, Maria Holmqvist (2010). Learning Dense Models of Query Similarity from User Click Logs. In *Proceedings of the 11th Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL-HLT 2010)*, Los Angeles, CA.
- Amaç Herdağdelen, Massimiliano Ciaramita, Daniel Mahler, Maria Holmqvist, Keith Hall, Stefan Riezler, Enrique Alfonseca (2010). Generalized syntactic and semantic models of query reformulation. In *Proceedings of the 33rd ACM SIGIR Conference*, Geneva, Switzerland.

- 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

7,613,664: Systems and Methods for Determining User-Interests, Stefan Riezler, Daniel H. Greene, granted 11/3/2009

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

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

Learning to Rank for Answer Suggestion in QA Portals. Invited talk at Google, Zürich, 2011.

Generative and Discriminative Models for Query Rewriting. Invited talk at Technische Universität, Darmstadt and Universität des Saarlandes, Saarbrücken, 2010.

Statistical Natural Language Processing in the Wild. Invited talk at University of Zürich, 2009.

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.