

Ivan A. Titov

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Education

Ph.D. in Computer Science, University of Geneva, Switzerland, 2003 - 2008

“Exploiting Non-linear Probabilistic Models in Natural Language Parsing and Reranking”.

Advisors: Dr. James Henderson, University of Edinburgh, and Prof. Christian Pellegrini, University of Geneva. Other thesis committee members: Dr. Melanie Hilario, Prof. Mark Johnson, Prof. Paola Merlo.

M.Sc. in Applied Mathematics, St. Petersburg State Polytechnical University, Russia, 2001 - 2003

All marks during the period of study are Excellent (average mark 5.00 of 5.00 possible).

Thesis: “Complexity and Approximation of Optimal Communication Cost Spanning Tree Problems.”

Advisor: Dr. Nikolai N. Vassiliev, St. Petersburg Departments of Steklov Institute of Mathematics. Several related communication problems are considered, their complexity is analyzed, approximate algorithms are proposed.

B.Sc. in Applied Mathematics, St. Petersburg State Polytechnical University, Russia 1997 - 2001.

All marks during the period of study are Excellent (average mark 5.00 of 5.00 possible).

Positions

Postdoctoral Researcher

Feb, 2008 - now

University of Illinois at Urbana-Champaign.

Research Project: “Latent Structure Model for Statistical Modeling of Structured Data”

Research and Teaching Assistant

Nov, 2003 - Jan, 2008

University of Geneva, Switzerland.

Research Projects: “Kernel-Based Structure Processing for Natural Language Parsing” (Nov, 2005 - Jan, 2008), “Neural Networks for Structure Processing Applied to Broad Coverage Natural Language Parsing” (Nov, 2003 - Oct, 2005).

Teaching assistant for courses: “Pattern Recognition” and “Algorithms for Learning and Optimization”.

Research Intern

Jul, 2007 - Sep, 2007

Google Inc., New York, NY

Area: Machine learning and natural language processing.

Duties: analytical construction of statistical models for text modeling, their software implementation.

Visiting Student

Sep, 2006 - Oct, 2006

University of Edinburgh

Area: Machine learning and natural language processing.

Duties: research.

Team Leader*Apr, 2002 - Oct, 2003*

Info Soft Ltd., St. Petersburg, Russia

Area: Software application developments for mobile operators and e-commerce (e.g.: mobile banking solutions, location based applications).

Duties: software architecture, software development, project management.

Development Department Engineer*Feb, 2000 - Apr, 2002*

ZAO North-West GSM, St. Petersburg Russia (now, Megafon)

Area: One of the largest mobile operators in Russia (30 mln subscribers).

Duties: software development, evaluation and integration of new technologies and solutions (e.g. GPRS, UMTS, SIM TK).

Skills

Programming Languages and Technologies

Expertise in Java, C.

Knowledge: C++, ASM, J2ME, Python, Pascal.

Technologies: UML, Linux/Unix, Windows, GSM and CDMA networks infrastructure and protocols.

Languages

English (fluent), Russian (native), French (basic), German (basic).

Awards/Achievements

Swiss NSF Grant for Prospective Researchers *2007*3rd place in international multilingual parsing competition: CoNLL Shared Task (out of 23 systems) *2007*Scholarship for a 3 months research internship at Google Labs, NY *2007*“Best Graduate of St. Petersburg State Polytechnical University” Award *2003*St. Petersburg Governor Prize for outstanding achievements in research and study *2002*St. Petersburg Governor Prize for outstanding achievements in research and study *2001*Mathematics Competition Winner (with a team of Petersburg Polytechnical University) *2000*Prize Winner in St. Petersburg Theoretical Mechanics Competition *1999***Reviewing**

Conference on Empirical Methods in Natural Language Processing (EMNLP-2008),

International Conference on Machine Learning (ICML-2008)

International Joint Conference on Natural Language Processing (IJCNLP-2008)

European Conference on Machine Learning (ECML-2006 – ECML-2008)

Research Interests

Machine Learning: methods for structured processing, kernel methods, graphical models

Statistical Natural Language Processing (e.g. constituent parsing, dependency parsing)

Computational Complexity

Publications

Refereed Publications

Titov, I. and McDonald, R. A Joint Model of Text and Aspect Ratings for Sentiment Summarization. To appear in *Proc. 46th Meeting of Association for Computational Linguistics (ACL-08)*. Columbus, OH, USA, 2008. *Acceptance rate (oral): 20%*.

Titov, I. and McDonald, R. Modeling Online Reviews with Multi-Grain Topic Models. In *Proc. 17th International World Wide Web Conference (WWW-2008)*, pages 111-120, Beijing, China, 2008. *Acceptance rate: 11%*.

Titov, I. and Henderson, J. A Latent Variable Model for Generative Dependency Parsing. To Appear in *H. Bunt, P. Merlo and J. Nivre, editors, Trends in Parsing Technology, Text, Speech and Language Technology Series (Kluwer), 2008*.

Titov, I. and Henderson, J. Incremental Bayesian Networks for Structure Prediction. In *Proc. 24th International Conference on Machine Learning (ICML-07)*, pages 887-894, Corvallis, OR, USA, 2007. *Acceptance rate: 29%*.

Titov, I. and Henderson, J. Constituent Parsing with Incremental Sigmoid Belief Networks. In *Proc. 45th Meeting of Association for Computational Linguistics (ACL-07)*, pages 632-639, Prague, Czech Republic, 2007. *Acceptance rate: 22%*.

Titov, I. and Henderson, J. A Latent Variable Model for Generative Dependency Parsing. In *Proc. 10th International Conference on Parsing Technologies (IWPT-07)*, pages 144-155, Prague, Czech Republic, 2007.

Titov, I. and Henderson, J. Fast and Robust Multilingual Dependency Parsing with a Generative Latent Variable Model. To appear in *CoNLL 2007 Shared Task. Joint Conf. on Empirical Methods in Natural Language Processing and Computational Natural Language Learning (EMNLP-CoNLL-07)*, pages 947-951, Prague, Czech Republic, 2007. *3rd result out of 23 systems*.

Titov, I. and Henderson, J. Loss Minimization in Parse Reranking. In *Proc. Conference on Empirical Methods in Natural Language Processing (EMNLP-06)*, pages 560-567, Sydney, Australia, 2006. *Acceptance rate for full papers with oral present.: 18.4%*.

Titov, I. and Henderson, J. Porting Statistical Parsers with Data-Defined Kernels. In *Proc. 10th Conference on Computational Natural Language Learning (CoNLL-X)*, pages 6-13, New York, USA, 2006. *Acceptance rate: 35%*.

Henderson, J. and Titov, I. Data-Defined Kernels for Parse Reranking Derived from Probabilistic Models. In *Proc. 43rd Meeting of Association for Computational Linguistics (ACL-05)*, pages 181-188, Ann Arbor, USA, 2005. *Acceptance rate: 18%*.

Titov, I. and Henderson, J. Deriving Kernels from MLP Probability Estimators for Large Categorization Problems. In *Proc. 18th International Joint Conference on Neural Networks (IJCNN-05)*, pages 937-942, Montreal, Canada, 2005.

Kosinov, S., Titov, I. and Marchand-Maillet, S. Large Margin Multiple Hyperplane Classification for Content-Based Multimedia Retrieval. In *Proc. Workshop on Machine Learning Techniques for Processing Multimedia Content, International Conf. on Machine Learning (ICML-05)*, pages 60-62, Bonn, Germany, 2005.

Titov, I. and Henderson, J. Parsing with Kernels Induced from Probabilistic Models. In *Proc. Conference on Computational Linguistics and Intelligent Technologies (Dialog-05)*, pages 131-135, Moscow, Russia, 2005.

Other Publications

Titov, I. and Henderson, J. Bayes Risk Minimization in Natural Language Parsing. Technical report. University of Geneva, Computer Science Department, Artificial Intelligence Lab, 2006.

Titov, I. and Henderson, J. Kernels from Probabilistic Models for Multiclass Classification and Reranking with Arbitrary Loss Functions. Technical report. University of Geneva, Computer Science Department, Artificial Intelligence Lab, 2005.

Titov, I. and Zhukov, S. Y. Hardness of network topology optimization in communication networks. Technical report. St. Petersburg State Polytechnical University, Russia, 2001.

Talks

Incremental Bayesian Networks for Structured Prediction. MIT (CSAIL), Cambridge, MA, May 2008.

Modeling Online Reviews: Exploiting User Annotations for Sentiment Summarization. Microsoft Research Asia, Beijing, Apr 2008.

Modeling Online Reviews: Exploiting User Annotations for Sentiment Summarization. University of Illinois, Urbana-Champaign, Mar 2008.

Incremental Bayesian Networks for Natural Language Parsing. University of Pennsylvania, Philadelphia, Sep 2007.

Incremental Bayesian Networks for Structured Prediction. Google, New York, Sep 2007.

Exploiting Trained Probabilistic Models in Natural Language Parsing. University of Edinburgh, UK, Sep 2006.

Inducing Features from Probabilistic Models for Structured Prediction and Multi-Class Classification. St. Petersburg State Polytechnical University, Russia, Mar 2006.