

Ivan Titov

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Date of birth: March 29th, 1980
Citizenship: Russian

Research Interests

Computational linguistics (syntactic parsing, semantic analysis, summarization, sentiment analysis) and machine learning (structured prediction, latent variable models, large-scale approximate inference)

Education

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

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

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

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

All grades during the period of study are Excellent (GPA 5.00 of 5.00 possible).

Thesis: “Complexity and Approximation of Optimal Communication Cost Spanning Tree Problems.” Adviser: Dr. Nikolai N. Vassiliev, St. Petersburg Departments of Steklov Institute of Mathematics.

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

All grades during the period of study are Excellent (GPA 5.00 of 5.00 possible).

Employment

Assistant Professor (UD)

Institute for Logic, Language and Computation (ILLC).
University of Amsterdam

Apr, 2013 - now

Head of Independent Research Group

Saarland University, Germany.

Research group “Machine Learning for Natural Language Processing”,

Faculty member (W2, fixed term) at the Departments of Computational Linguistics and Computer Science

Oct, 2009 - Aug, 2013

Postdoctoral Researcher

University of Illinois at Urbana-Champaign.

Research on semi-supervised and supervised learning (latent variable models, constrained models) for structured problems in NLP (semantic and syntactic analysis, relation extraction, ranking)

Supervisor: Prof. Dan Roth

Feb, 2008 - Sep, 2009

Research and Teaching Assistant*Nov, 2003 - Jan, 2008*

University of Geneva, Switzerland.

Research projects on latent variable models for syntactic dependency and constituent parsing.

Research Intern*Jul, 2007 - Sep, 2007*

Google Inc., New York, NY

Weakly-supervised modeling for sentiment summarization and mention extraction from online reviews.

Visiting Student*Sep, 2006 - Oct, 2006*

University of Edinburgh

Team Leader*Apr, 2002 - Oct, 2003*

Info Soft Ltd., St. Petersburg, Russia

Development of server-side software for mobile operators and e-commerce.

R&D Engineer*Feb, 2000 - Apr, 2002*

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

Software development, integration of new technologies and platforms.

Awards/Achievements

Google Focused Award on Natural Language Understanding *2013*Google Research Award "Inducing Multilingual Semantic Representation" *2011*MMCI Strategic Innovation Funding (with C. Sporleder, A. Palmer) "Exploiting Linguistic Knowledge and Partially Labeled Data for Semantic Parsing" *2010*3rd place in international parsing competition: CoNLL Shared Task (out of 14 systems) *2009*Office of Naval Research Grant (co-PI with D. Roth and G. DeJong)
"Guiding Learning and Decision Making in the Presence of Multiple Forms of Information" *2009*Swiss NSF Personal Post-doc Scholarship *2007*3rd place in international parsing competition: CoNLL Shared Task (out of 23 systems) *2007*Top 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 Applied Mechanics Competition *1999***Professional Services**

Action Editor for Journal of Machine Learning Research (JMLR), 2013-15

Area Chair / Senior PC member:

Conference of European chapter of the Association for Comput. Linguistics (EACL), 2012

International Joint Conference on AI (IJCAI), 2011

Best Paper Award Committee for the Conference of European chapter of the Association for Comput. Linguistics (EACL), 2012

PC member / Reviewer for:

Annual Meeting of the Association for Computational Linguistics (ACL), 2009-13

International Conference on Machine Learning (ICML), 2008-10, 13-14

Advances in Neural Information Processing Systems (NIPS), 2011-13
European Conference on Machine Learning (ECML), 2006-08, 2012 (incl. the Nectar track)
Conf. of the N. American chapter of the Assoc. for Comput. Linguistics (NAACL), 2009-13
Conference on Empirical Methods in Natural Language Processing (EMNLP), 2008-13
AAAI Conference on Artificial Intelligence (AAAI), 2011-12
Conference of the European chapter of the Association for Comput. Linguistics (EACL), 2009
Conference on Computational Natural Language Learning (CoNLL), 2009-10, 12-13
International Conference on Computational Linguistics (COLING), 2010
International Conference on Parsing Technologies (IWPT), 2011, 2013
International Joint Conference on Natural Language Processing (IJCNLP), 2007, 2009
International Conference on Learning Representations (ICLR), 2013
Computational Linguistics Journal (CL)
Journal of Machine Learning Research (JMLR)
Journal of Artificial Intelligence Research (JAIR)
Journal of Natural Language Engineering (JNLE)
Transactions of the Association for Computational Linguistics (TACL)

A number of workshops, incl. recently Structured Learning W. at ICML 2013, Deep Learning W. at NIPS 2013, Internat. FrameNet W. 2013, W. on Inducing Linguistic Structure at NAACL 12.

Proposal Reviewer for the French National Research Agency (ANR)

Membership in Professional Organizations

Member of ACL (Association for Computational Linguistics), SIGPARSE (Special Interest Group on Natural Language Parsing), SIGNLL (SIG on Natural Language Learning), SIGDAT (SIG on Linguistic Data and Corpus-based Approaches), SIGSEM (SIG on Compositional Semantics), PASCAL.

Teaching Experience

Semantic Role Labeling Tutorial at NAACL 2013 (with Martha Palmer and Shumin Wu)
Natural Language Models and Interfaces (lecturer, U. Amsterdam, 2012-13, 13-14)
Elements of Statistical NLP (lecturer, U. Amsterdam, 2013)
Un- and Semi-supervised learning for NLP (seminar, Saarland U., 2011-12)
Learning for Structured Prediction (seminar, Saarland U., 2010-12)
Unsupervised and Weakly-Supervised Probabilistic Modeling of Text (seminar, Saarland U., 2010)
Machine Learning in Natural Language Processing (lecturer, Univ. Illinois, 2009)
Algorithms for Learning and Optimization (teaching assistant, Univ. Geneva, 2007)
Pattern Recognition (teaching assistant, Univ. Geneva, 2006)

Research Supervision / Thesis Committees

Ehsan Khoddam Mohammadi (PhD student), 2013 - ...
Ashutosh Modi (PhD student), 2011 - ...
Mikhail Kozhevnikov (PhD student), 2009 - ...
Alexandre Klementiev (PostDoc), 2011-13 (now at Amazon)
Minwoo Jeong (PostDoc), 2009 -11 (now at Microsoft)
PhD committee member for Saeedeh Momtazi, Fatemeh Torabi Asr, Linlin Li.

Languages

English (fluent), Russian (native), French (intermediate), German (low intermediate, B1).

Selected Refereed Papers

Kozhevnikov M. and Titov I. Crosslingual Transfer of Semantic Role Models. In *Proc. of the 51th Annual Meeting of the Association for Computational Linguistics (ACL-2013)*, pages 1190-1200, Sofia, Bulgaria, 2013. *Acceptance rate: 17% (oral)*.

Lazaridou A., Titov I. and Sporleder C. A Bayesian Model for Joint Unsupervised Induction of Sentiment, Aspect and Discourse Representations. In *Proc. of the 51th Annual Meeting of the Association for Computational Linguistics (ACL-2013)*, pages 1630-39, Sofia, Bulgaria, 2013. *Acceptance rate: 17% (oral)*.

Henderson, J., Merlo, P., Titov, I. and Musillo, G. Multi-lingual Joint Parsing of Syntactic and Semantic Dependencies with a Latent Variable Model. *Computational Linguistics (Journal)*, 39 (4), 46 pages, 2013.

Engonopoulos N., Villalba M., Titov I. and Koller A. Predicting the resolution of referring expressions from user behavior. To appear in *Proc. of Empirical Methods in Natural Language Processing (short papers)*, 6 pages, Seattle, WA, USA, 2013.

Rohrbach M., Qiu W., Titov I., Pinkal M. and Schiele B. Translating video into natural language descriptions. To appear in *Proc. of the International Conference on Computer Vision (ICCV 2013)*, 8 pages, Sydney, Australia, 2013. *Acceptance rate: 28%*.

Kozhevnikov M. and Titov I. Bootstrapping Semantic Role Labelers from Parallel Data In *Proc. of the Joint Conference on Lexical and Computational Semantics (*SEM)*, pages 317-327, Atlanta, GA, USA, 2013. *Acceptance rate: 31%*.

Titov, I. and Klementiev, A. Crosslingual Induction of Semantic Roles. In *Proc. of the 50th Annual Meeting of the Association for Computational Linguistics (ACL-2012)*, pages 647-656, Jeju, South Korea, 2012. *Acceptance rate: 19%*.

Titov, I. and Klementiev, A. A Bayesian Approach to Unsupervised Semantic Role Induction. In *Proc. of the Conference of the European Chapter of the Association for Computational Linguistics (EACL-12)*, pages 12-22, Avignon, France, 2012. *Acceptance rate: 27%*.

Titov, I. and Klementiev, A. Semi-Supervised Semantic Role Labeling: Approaching from an Un-supervised Perspective. *Proc. of Conference on Computational Linguistics (COLING-2012)*, pages 2635 - 2651, Bombay, India, 2012. *Acceptance rate: 16% (oral)*.

Klementiev, A., Titov, I., Bhattarai B. Inducing Crosslingual Distributed Representations of Words. In *Proc. of Conference on Computational Linguistics (COLING-2012)*, pages 1459-1473, Bombay, India, 2012. *Acceptance rate: 16% (oral)*.

Titov, I. and Klementiev, A. A Bayesian Model for Unsupervised Semantic Parsing. In *Proc. of the 49th Annual Meeting of the Association for Computational Linguistics (ACL-2011)*, pages 1145-1155, Portland, Oregon, USA, 2011. *Acceptance rate: 26%*.

Titov, I. Domain Adaptation by Constraining Inter-Domain Variability of Latent Feature Representation. In *Proc. of the 49th Annual Meeting of the Association for Computational Linguistics (ACL-2011)*, pages 62-71, Portland, Oregon, USA, 2011. *Acceptance rate: 26%*.

Henderson, J. and Titov, I. Incremental Sigmoid Belief Networks for Grammar Learning. *Journal of Machine Learning Research (JMLR), Special Issue on Grammar Induction, Representation of Language and Language Learning* 11, pages 3541-3570, 2010.

Titov, I. and Henderson, J. A Latent Variable Model for Generative Dependency Parsing. Chapter in *H. Bunt, P. Merlo and J. Nivre, editors, Trends in Parsing Technology, Text, Speech and Language Technology Series (Springer)*, pages 35-56, 2010.

Titov I., Kozhevnikov M. Bootstrapping Semantic Analyzers from Non-Contradictory Texts. In *Proc. 48th Annual Meeting of the Association for Computational Linguistics (ACL-2010)*, pages 958-967, Uppsala, Sweden, 2010. *Acceptance rate: 25%*.

Jeong M., Titov I. Unsupervised Discourse Segmentation of Documents with Inherently Parallel Structure. In *Proc. 48th Annual Meeting of the Association for Computational Linguistics (ACL-2010)*, pages 151-155, Uppsala, Sweden, 2010 (short paper). *Acceptance rate: 22%*.

Jeong, M. and Titov, I. Multi-document Topic Segmentation. In *Proc. 19th ACM International Conference on Information and Knowledge Management (CIKM-10)*, pages 1119-1128, Toronto, Canada, 2010. *Acceptance rate: 13%*.

Titov I., Klementiev A., Small K., Roth D. Unsupervised Aggregation for Classification Problems with Large Numbers of Categories. In *Proc. Thirteenth International Conference on Artificial Intelligence and Statistics (AISTATS-09)*, pages 836-843, Sardegnia, Italy, 2010. *Acceptance rate: 40%*.

Titov I., Henderson J., Merlo P., Musillo G. Online Graph Planarisation for Synchronous Parsing of Semantic and Syntactic Dependencies. In *Proc. International Joint Conference on Artificial Intelligence (IJCAI-09)*, pages 1562-1567, Pasadena, CA, USA, 2009. *Acceptance rate: 25%*.

Klementiev A., Roth D., Small K., Titov I. Unsupervised Rank Aggregation with Domain-Specific Expertise. In *Proc. International Joint Conference on Artificial Intelligence (IJCAI-09)*, pages 1101-1006, Pasadena, CA, USA, 2009. *Acceptance rate: 25%.**

Roth D., Small K., Titov I. Sequential Learning of Classifiers for Structured Prediction Problems. In *Proc. of the Twelfth International Conference on Artificial Intelligence and Statistics (AISTATS-09)*, pages 440-447, Clearwater, Florida, USA, 2009.*

Gesmundo, A., Henderson J., Merlo P., Titov, I. A Latent Variable Model of A Latent Variable Model of Synchronous Parsing Syntactic-Semantic Parsing for Multiple Languages. In *Proceedings of the Conference on Natural Language Learning (CoNLL), Shared Task*, Boulder, CO, USA, 2009.*

Titov, I. and McDonald, R. A Joint Model of Text and Aspect Ratings for Sentiment Summarization. In *Proc. 46th Meeting of Association for Computational Linguistics (ACL-08)*, pages 308-316, Columbus, OH, USA, 2008. *Acceptance rate (oral): 20%. The top-cited paper of ACL-08.*

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

Henderson, J., Merlo P., Musillo G. and Titov, I. A Latent Variable Model of Synchronous Parsing for Syntactic and Semantic Dependencies. In *Proceedings of the CoNLL, Shared Task*, pages 178-182, Manchester, UK, 2008. *Acceptance rate (oral, shared task): 26%.**

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 (oral): 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. 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 (oral): 18%*.

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.

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

Note: for papers marked with an asterisk () authors are in alphabetical order.*

Invited Talks

Inducing Cross-Lingual Semantic Representations of Words, Phrases, Sentences and Events. Workshop on Deep Learning for Audio, Speech and Language Processing at ICML 2013. Jun 2013.

Inducing Crosslingual Semantic Representations of Documents, Sentences, Phrases and Words. Workshop on Crosslingual Technologies at NIPS 2012. Dec 2012.

Inducing Shallow Semantic Representations from Monolingual and Multilingual Data. Workshop on Syntactic and Semantic Processing of Morphologically Rich Languages at ACL 2012. Jul 2012.

Inducing Shallow Semantic Representations with Little or No Supervision. Joint Workshop on Unsupervised and Semi-Supervised Learning in NLP at EACL 2012. Apr 2012.

Unsupervised Induction of Shallow Semantic Representations. Data. Google Zurich / Uni Zurich. Feb 2013.

Inducing Shallow Semantic Representations from Monolingual and Multilingual Data. Potsdam University. Jan 2013.

Inducing Shallow Semantic Representations from Monolingual and Multilingual Data. Heidelberg University. Nov 2012.

Inducing Shallow Semantic Representations from Monolingual and Multilingual Data. Google, New York. Dec 2012.

Inducing Meaning Representations from Text. Xerox Research Centre Europe (XRCE), Grenoble, France. Sep 2012.

Inducing Semantic Representations with Little or No Supervision. Univ of Amsterdam. Sep 2012.

Inducing Meaning Representations from Text. École Polytechnique Fédérale de Lausanne (EPFL), Lausanne. May 2012.

A Bayesian Approach to Monolingual and Multilingual Unsupervised Semantic Analysis. Edinburgh University. Mar 2012.

A Bayesian Approach to Unsupervised Semantic Analysis. University College of London. Nov 2011.

Exploiting Weak Supervision in NLP Tasks: Application to Sentiment Summarization. Univ. of Geneva, Apr 2010.

Exploiting Weak Supervision in NLP Tasks: Application to Sentiment Summarization. Univ. of Saarland / Max Planck Institute for Computer Science, Saarbruecken, Germany, Mar 2009.

Incremental Bayesian Networks for Structured Prediction. MIT (CSAIL), Cambridge, 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. U. Pennsylvania, Sep 2007.

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

Exploiting Trained Probabilistic Models in Natural Language Parsing. Univ. Edinburgh, Sep 2006.

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