

Alexey Romanov

PERSONAL DATA

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EDUCATION

2015–present | **Ph.D.**, *University of Massachusetts - Lowell*, Lowell
Computer Science
2007–2013 | **Engineer**, *Bauman Moscow State Technical University*, Moscow
Automatic Information Processing and Control Systems

PROFESSIONAL EXPERIENCE

2015–present | **Graduate Research Assistant**, *Text Machine Lab at UMass Lowell*

- Natural Language Processing;
- Deep Learning;
- Data Analysis;
- Data Visualization;

2013–2014 | **Research Developer**, *New Economic School*
Center for the Study of New Media and Society

- Data Analysis;
- Social Network Analysis;
- Development of a system for data collection from social networks;

2011–2013 | **Developer**, *Bauman Moscow State Technical University*

- Development of reporting tools for educational institutions;
- Web-site development:

Internships

2018 | **Research Intern**, *Microsoft Research*, Cambridge, MA
Solving SAT problems with reinforcement learning
Reducing bias and improving fairness in machine learning models
2017 | **Research Intern**, *IBM Research*, San Jose, CA
Transfer learning and knowledge integration for Natural Language Inference systems in clinical domain

SKILLS

Machine Learning PyTorch, TensorFlow, Keras, Scikit-learn, NumPy
Programming Python, JavaScript, C#, R, Go, C/C++, PHP, Java
Databases PostgreSQL, MS SQL Server, MySQL
Cloud Microsoft Azure, Amazon Web Services

SELECTED PROJECTS

Improving fairness in machine learning models

This work focuses on mitigating bias concerning sensitive attributes, such as gender, race, age, in a setting where these attributes are not available, or it is not legal to use them. We proposed a way to leverage biases inherent to word embeddings to improve the fairness of

an underlying model. We use embeddings of peoples' names as universal proxies to jointly reduce prominent biases, presented in our society. In contrast to previous works, our method does not require access to protected attributes during testing and mitigates several biases simultaneously.

Adversarial decomposition of text representation

We proposed a method of decomposition of text representation into several independent vectors, each responsible for a specific aspect of the input sentence. We evaluated the proposed method on two case studies: the conversion between different social registers and diachronic language change. The model uses adversarial-motivational training and includes a special motivational loss, which acts opposite to the discriminator and encourages a better decomposition.

INTERESTS AND ACTIVITIES

- Sport: squash, volleyball, and rock climbing
- Hobby: robotics, music
- Volunteer for multiple music festivals, local events, and hackathons
- Took 2nd place in a machine learning hackathon

PUBLICATIONS

A. Romanov, M. De-Arteaga, H. Wallach, J. Chayes, C. Borgs, A. Chouldechova, S. Geyik, K. Kenthapadi, A. Kalai, A. Rumshisky, *What's in a name? Reducing bias in bios without access to protected attributes*, In Proceedings of NAACL 2019: Conference of the North American Chapter of the Association for Computational Linguistics, 2019. **Best Thematic Paper Award**.

A. Romanov, A. Rumshisky, A. Rogers, D. Donahue, *Adversarial decomposition of text representation*, In Proceedings of NAACL 2019: Conference of the North American Chapter of the Association for Computational Linguistics, 2019.

M. De-Arteaga, A. Romanov, H. Wallach, J. Chayes, C. Borgs, A. Chouldechova, S. Geyik, K. Kenthapadi, A. Kalai, *Bias in Bios: A Case Study of Semantic Representation Bias in a High-Stakes Setting*, In Proceedings of FAT* 2019: ACM Conference on Fairness, Accountability, and Transparency, 2019.

A. Romanov, C. Shivade, *Lessons from Natural Language Inference in the Clinical Domain*, In Proceedings of EMNLP 2018: Conference on Empirical Methods in Natural Language Processing, 2018.

O. Kovaleva, A. Rumshisky, A. Romanov, *Similarity-Based Reconstruction Loss for Meaning Representation*, In Proceedings of EMNLP 2018: Conference on Empirical Methods in Natural Language Processing, 2018.

A. Rogers, A. Romanov, A. Rumshisky, S. Volkova, M. Gronas, A. Gribov, *RuSentiment: An Enriched Sentiment Analysis Dataset for Social Media in Russian*, In Proceedings of COLING 2018: International Conference on Computational Linguistics, 2018.

P. Potash, A. Romanov, A. Rumshisky, *Evaluating Creative Language Generation: The Case of Rap Lyric Ghostwriting*, NAACL 2018 Workshop on Stylistic Variation, 2018

A. Rumshisky, M. Gronas, P. Potash, M. Dubov, A. Romanov, S. Kulshreshtha, A. Gribov, *Combining Network and Language Indicators for Tracking Conflict Intensity*, In Proceedings of SocInfo 2017: International Conference on Social Informatics, 2017.

Y. Meng, A. Rumshisky, A. Romanov, *Temporal Information Extraction for Question Answering Using Syntactic Dependencies in an LSTM-based Architecture*, In Proceedings of EMNLP 2017: Conference on Empirical Methods in Natural Language Processing, 2017.

P. Potash, A. Romanov, A. Rumshisky, *Here's My Point: Joint Pointer Architecture for Argument Mining*, In Proceedings of EMNLP 2017: Conference on Empirical Methods in Natural Language

Processing, 2017.

P. Potash, A. Romanov, A. Rumshisky, M. Gronas, *Tracking Bias in News Sources Using Social Media: the Russia-Ukraine Maidan Crisis of 2013–2014*, EMNLP 2017 Workshop on Natural Language Processing meets Journalism, 2017.

D. Donahue, A. Romanov, A. Rumshisky, *HumorHawk at SemEval-2017 Task 6: Mixing Meaning and Sound for Humor Recognition*, In Proceedings of SemEval 2017: International Workshop on Semantic Evaluation, 2017.

P. Potash, A. Romanov, A. Rumshisky, *SemEval-2017 Task 6 - #HashtagWars: Learning a Sense of Humor*, In Proceedings of SemEval 2017: International Workshop on Semantic Evaluation, 2017.

P. Potash, W. Boag, A. Romanov, V. Ramanishka, A. Rumshisky, *SimiHawk at SemEval-2016 Task 1: A Deep Ensemble System for Semantic Textual Similarity*, In Proceedings of SemEval 2016: International Workshop on Semantic Evaluation, 2016.

P. Potash, A. Romanov, A. Rumshisky, *GhostWriter: Using an LSTM for Automatic Rap Lyric Generation*, In Proceedings of EMNLP 2015: Conference on Empirical Methods in Natural Language Processing, 2015.

A. Panchenko, P. Romanov, O. Morozova, H. Naets, A. Philippovich, A. Romanov, C. Fairon, *Serelex: Search and visualization of semantically related words*, In Proceedings of ECIR 2013: European Conference on Information Retrieval, 2013

A. Panchenko, S. Adeykin, A. Romanov, P. Romanov, *Extraction of Semantic Relations between Concepts with KNN Algorithms on Wikipedia*, In Proceedings of Concept Discovery in Unstructured Data Workshop (CDUD) of International Conference On Formal Concept Analysis, 2012