

# Igor Shalyminov

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## About me

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I'm an applied scientist at Amazon AWS AI working on Conversational NLP. I obtained my PhD from the Interaction Lab, Heriot-Watt University (Edinburgh, UK) working under the supervision of Prof Oliver Lemon and Dr Arash Eshghi on Machine Learning/Natural Language Processing methods for data-efficient, robust, and practically applicable dialogue systems. If you think my background could be useful for you, please feel free to contact me.

## Education

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**PhD, Computer Science** Oct 2016 — Oct 2020  
Heriot-Watt University

Thesis title: Data-efficient methods for neural dialogue systems  
Supervisors: Prof Oliver Lemon, Dr Arash Eshghi  
Examiners: Dr Andreas Vlachos, Dr Ioannis Konstas

**Professional Retraining in Data Analysis (MSc equiv.)** Sep 2010 — Jun 2012

Yandex School of Data Analysis (Moscow Institute of Physics and Technology)  
Major: Computer Science  
GPA: 4,66

**Specialist (MSc equiv.) - with distinction** Sep 2005 — Jun 2010

Moscow State University of Instrument Engineering and Computer Science  
Major: Computing machines, systems, and networks  
GPA: 5,0

Defended thesis "A module for generating data for equipment reliability estimation in the 'Prognosis' software suite"

## Awards

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### 2019

Dialogue System Technology Challenge (DSTC) 8, Fast Domain Adaptation - 1st place  
EMNLP 2019 - Student Travel Scholarship

### 2018

SCAI workshop@EMNLP 2018 - travel grant from sponsors (Microsoft, Facebook, Google, and TextKernel)  
Amazon Alexa Prize 2018 (part of team Alana) - 3rd place prize + research grant

## 2017

Amazon Alexa Prize 2017 (part of team Alana) - 3rd place prize + research grant

## 2016

James Watt Scholarship from Heriot-Watt University

## 2010

Featured in Moscow's Best Graduates journal

# Work experience

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## Amazon AWS AI

Dec 2022

Applied Scientist

Conversational NLP research

## Amazon Alexa

Jun 2021 — Dec 2022

Applied Scientist

Automatic Speech Recognition research

## Alana

Jun 2020

Research Engineer

End-to-end goal-oriented dialogue system bootstrapping

## Microsoft Research Montréal

Jul 2019 — Oct 2019

Research Intern

Mentor: Dr. Hannes Schulz

Project: Dialogue State Tracking Challenge (DSTC) 8 - Fast Domain Adaptation

## Microsoft Research AI

Jun 2018 — Sep 2018

Research Intern

Mentor: Dr. Sungjin Lee

Project title: "Improving robustness of goal-oriented dialog systems in an unsupervised way".

## Yandex

Aug 2013 — Sep 2016

Software Engineer

Projects I participated in:

- Voice interfaces for applications - dialogue management module
- Voice analytics for callcenters - search engine for voice data
- Russian National Corpus - search engine for linguistic research

## Yandex School of Data Analysis (Yandex / Moscow Institute of Physics and Technology)

Sep 2013 — Jun 2015

Teaching Assistant

Natural Language Processing course taught by Dr. Alexey Zobnin (Computer Science department, final year course).

My responsibilities for the course were:

- designing problems for the seminar classes;
- conducting the classes;
- helping the professor with designing home assignments and reviewing students' submissions.

## Microsoft Research

May 2014 — Aug 2014

Research Intern

Mentors: Dr. Yuxiong He, Dr. Sameh Elnikety

I worked on a query optimizer for a term distributed search engine. During my internship, I completed the following tasks:

- built combined analytical and statistical models of a search query for estimating its latency and amount of data for network communication;
- designed and implemented algorithms for producing optimal query plans in terms of minimizing either of the two objectives: latency or network communication.

The prototype of the query optimizer and distributed experimental platform was implemented in Java and Python.

## Yandex

May 2012 — Aug 2013

Junior Software Engineer

Participated in development of Russian National Corpus . I maintained the search engine at its existing architecture and explored the possibilities of improving it for better performance and reliability.

## Yandex

Jun 2011 — Dec 2011

Software Engineer Intern

Mentor: Dr. Alexey Zobnin

Built a prototype of an N-gram search service for Russian National Corpus. The service consisted of two components:

- N-grams storage - a compressed delta-encoded word trie written in C++;
- Search client - an http server in Python receiving user requests and fetching the results from the N-gram storage.

## Intel Corporation

June 2010 — Aug 2010

Software Engineer Intern

Mentor: Dr. Denis Makoshenko

As a part of Intel Summer School 2010, I participated in Intel C/C++ Compiler development with a research project "Enhancing the methodology to access the bottom boundary of software pipelined cycle execution time as the application of an algorithm for finding a maximum cycle in a directed graph".

## Moscow State University of Instrument Engineering and Computer Science

2006 — 2012

Software Engineer

Participated in the development of "Prognosis" - a software suite for reliability calculation of the equipment used in nuclear energetics.

# Additional Education

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## Summer Schools attended:

- Microsoft School on Algorithms for Massive Data (ALMADA). Attended lectures on the effective algorithms for External Memory computational model, algorithms and techniques for large-scale graph problems. Did theoretical assignments on graph algorithms and a Linq programming assignment in Linq (2013)
- Yandex Summer School On Distributed Computing. Attended lectures on Information Retrieval and MapReduce computing model. Did a practice assignment in Hadoop (2011)
- Intel Summer School. Attended lectures and webinars on parallel computing and processor architectures. Learned Intel IA64 architecture (Itanium I and II), participated in Intel C++ Compiler development. (2010)

## University Courses Taken:

- Formal Semantics and Typology of Anaphora taught by Barbara H Partee. National Research University Higher School Of Economics (2014)

## MOOCs Taken:

- Generative Adversarial Networks (GANs) Specialization - Coursera (2022)
- Natural Language Processing Specialization - Coursera (2021)
- Practical Reinforcement Learning - Coursera (2019)
- Bayesian Statistics: Techniques and Models - Coursera (2019)
- Bayesian Statistics: From Concept to Data Analysis - Coursera (2019)
- Bayesian Methods for Machine Learning - Coursera (2018)
- Deep Learning Specialization - Coursera (2018)
- Neural Networks For Machine Learning - Coursera (2017)
- Artificial Intelligence for Robotics - Udacity (2016)
- Deep Learning - Udacity (2016)
- Machine Learning: Reinforcement Learning - Udacity (2015)
- Intro to Artificial Intelligence - Udacity (2013)
- Intro To Statistics - Udacity (2012)

## Certifications:

- Microsoft Certified Professional - 70-536 Microsoft .NET Application Development Foundation
- Electronic office programmer - C++ and Pascal programming (Specialist Training Centre at the Bauman Moscow State Technical University)

# Language Ability

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Russian - native, English - upper-intermediate (C1), Spanish - beginner (A1)

# Relevant Skills

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**Programming Languages:** Python, C++, Java, Perl | **Frameworks:** Tensorflow, PyTorch, scikit-learn, numpy/scipy, pandas, Lucene | **Databases:** mongodb, MySQL | **Tools:** Jupyter notebook, matplotlib | **Core Technical Skills:** classic algorithms and data structures, mathematical foundations, machine learning algorithms, natural language processing

# Interests

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Languages, photography, electronic music production.

# References

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Oliver Lemon, PhD

Professor, School of Mathematical & Computer Sciences, Heriot-Watt University

Email: o.lemon@hw.ac.uk

Arash Eshghi, PhD

Assistant Professor, School of Mathematical & Computer Sciences, Heriot-Watt University

Email: a.eshghi@hw.ac.uk

Sungjin Lee, PhD

Principal Machine Learning Scientist, Amazon Alexa AI

Email: sungjinl@amazon.com

Hannes Schulz, PhD

Senior Researcher, Microsoft Research Montréal

Email: haschulz@microsoft.com

# Publications

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## 2021

**Igor Shalyminov**, Alessandro Sordoni, Adam Atkinson, Hannes Schulz. GRTr: Generative-Retrieval Transformers for Data-Efficient Dialogue Domain Adaptation. IEEE/ACM TASLP Special Issue On Eighth Dialog System Technology Challenge

## 2020

**Igor Shalyminov**. Data-Efficient Methods for Dialogue Systems. PhD thesis, Heriot-Watt University

**Igor Shalyminov**, Alessandro Sordoni, Adam Atkinson, Hannes Schulz. Fast Domain Adaptation For Goal-Oriented Dialogue Using a Hybrid Generative-Retrieval Transformer. ICASSP 2020 (to appear)

**Igor Shalyminov**, Alessandro Sordoni, Adam Atkinson, Hannes Schulz. Hybrid Generative-Retrieval Transformers for Dialogue Domain Adaptation. DSTC8@AAAI 2020

## 2019

**Igor Shalyminov**, Sungjin Lee, Arash Eshghi, Oliver Lemon. Data-Efficient Goal-Oriented Conversation with Dialogue Knowledge Transfer Networks. EMNLP 2019

**Igor Shalyminov**, Sungjin Lee, Arash Eshghi, Oliver Lemon. Few-Shot Dialogue Generation Without Annotated Data: A Transfer Learning Approach. SigDial 2019

Sungjin Lee and **Igor Shalyminov**. Contextual Out of domain Utterance Handling with Counterfeit Data Augmentation. ICASSP 2019

## 2018

**Igor Shalyminov** and Sungjin Lee. Improving Robustness of Neural Dialog Systems in a Data-Efficient Way with Turn

Dropout. NeurIPS 2018 workshop on Conversational AI

**Igor Shalyminov**, Arash Eshghi, and Oliver Lemon. Multi-Task Learning for Domain-General Spoken Disfluency Detection in Dialogue Systems. SemDial 2018

**Igor Shalyminov**, Ondrej Dusek, and Oliver Lemon. Neural Response Ranking for Social Conversation: A Data-Efficient Approach. Search-Oriented Conversational AI, an EMNLP 2018 Workshop

Amanda Cercas Curry, Ioannis Papaioannou, Alessandro Suglia, Shubham Agarwal, **Igor Shalyminov**, Xinnuo Xu, Ondřej Dušek, Arash Eshghi, Ioannis Konstas, Verena Rieser and Oliver Lemon. Alana v2: Entertaining and Informative Open-domain Social Dialogue using Ontologies and Entity Linking. Alexa Prize proceedings, 2018

## 2017

**Igor Shalyminov**, Arash Eshghi, and Oliver Lemon. Challenging Neural Dialogue Models with Natural Data: Memory Networks Fail on Incremental Phenomena. SemDial 2017

Arash Eshghi, **Igor Shalyminov**, and Oliver Lemon. Bootstrapping incremental dialogue systems from minimal data: the generalisation power of semantic grammars. EMNLP 2017

Arash Eshghi, **Igor Shalyminov**, and Oliver Lemon. Bootstrapping Dialogue Systems: Using a Semantic Model of Dialogue to Generalise from Minimal Data. LaML 2017

Arash Eshghi, **Igor Shalyminov**, and Oliver Lemon. Interactional Dynamics and the Emergence of Language Games. FADLI 2017

Ioannis Papaioannou, Amanda Cercas Curry, Jose L. Part, **Igor Shalyminov**, Xinnuo Xu, Yanchao Yu, Ondrej Dušek, Verena Rieser, Oliver Lemon. Alana: Social Dialogue using an Ensemble Model and a Ranker trained on User Feedback. 2017 Alexa Prize Proceedings

Ioannis Papaioannou, Amanda Cercas Curry, Jose L. Part, **Igor Shalyminov**, Xinnuo Xu, Yanchao Yu, Ondrej Dušek, Verena Rieser, Oliver Lemon. An Ensemble Model with Ranking for Social Dialogue. NIPS Workshop on Conversational AI 2017

## 2010

**Igor Shalyminov**. Using Policies in Designing of a Library for Cell Operations in 'Prognoz' Software Package. Software for PC-based systems for various purposes #13, pp. 101–107. ISBN 978-5-8068-0462-5

## 2009

**Igor Shalyminov**. Algorithms for calculation of constructions fault probability in 'Prognoz' software package. Applied Mathematics and Mathematical Modelling, pp. 70–77. ISBN 978-5-8122-1023-6

## 2008

Aleksandr Aleksandrov, Alexey Vostrikov, and **Igor Shalyminov**. An algorithm for generation geometric objects for crack formation analysis. Software for PC-based systems for various purposes #11, pp. 145–148. ISBN 978-5-8068-0418-2

## 2007

Aleksandr Aleksandrov and **Igor Shalyminov**. An algorithm for definition of crack formation probability in statistical modeling. Software for PC-based systems for various purposes #10, pp. 11–15. ISBN 978-5-8068-0393-2

# Professional Service

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Program committee/reviewing:

## **2023**

AAAI 2023, ICASSP 2023, ACL 2023

## **2022**

AAAI 2022, NAACL 2022 Industry Track, COLING 2022

Transactions on Audio, Speech and Language Processing (IEEE/ACM TASLP) 2022

## **2021**

AAAI 2021, EACL 2021, NAACL-HLT 2021 (main + industry tracks), ACL 2021

Transactions on Audio, Speech and Language Processing (IEEE/ACM TASLP) 2021

## **2020**

ACL 2020 (main + demo tracks), AAAI 2020, EMNLP 2020, COLING 2020, SCAI@EMNLP 2020

## **2019**

EMNLP 2019, SCAI@IJCAI 2019, ACL 2019

## **2018**

ACL 2018 (last-minute reviewer), COLING 2018, EMNLP 2018 (secondary reviewer), SCAI@EMNLP 2018