Alisa Kovtunova

PhD

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Education

2007–2012 **Specialist in Mathematics and System Programming**, *Faculty of Computational Mathematics and Cybernetics*, *Lomonosov Moscow State University*, Moscow, Russia.

The successfully passed courses include theory of coding, cryptography and information security, logic and logical program analysis, combinatory problems in graph theory, computational complexity and control system reliability, effective algorithms on discrete structures, programming including supercomputers.

2013–2017 **PhD in Computer Science**, *Faculty of Computer Science*, *Free University of Bozen-Bolzano*, Bolzano, Italy.

In the Knowledge Representation and Data Management area, students investigate the foundations of data and knowledge management, the basis for the development of advanced prototype software systems.

Period abroad during the PhD program: 01/03/2015 – 31/08/2015 at Birkbeck, University of London, under the supervision of Michael Zakharyaschev, professor in the Department of Computer Science and Information Systems.

Specialist Thesis

Title *"Homomorphic encryption algorithms"* (defended with excellent mark)

Supervisor Prof. Vladimir A. Zakharov

Reviewer Dr Alexey A. Tatuzov, researcher at Information Security Institute, Lomonosov Moscow State University, Russia

Description The homomorphic encryption scheme is used to ensure confidentiality of the client information and convenience of the data processing in the cloud storage. We developed a homomorphic encryption scheme on the basis of Craig Gentry's idea in a polynomial ring for the limited computation; the system is homomorphic under the operations of addition and multiplication of the encrypted data; we proved the cryptographic security of the cryptosystem. Further, we developed a matrix homomorphic encryption scheme, which is applicable for solving large systems of linear equations using a remote computer; the system is homomorphic under the operation of matrix inversion. Cryptographic security of this matrix cryptosystem is also proved.
The thesis was selected by the Faculty and published in the "Book of the best graduate theses." Moscow State University, 2012.

PhD Thesis

Title *"Ontology-Mediated Query Answering with Lightweight Temporal Description Logics"* (defended with very good mark)

Supervisor Prof. Alessandro Artale

Reviewers Prof. Dr.-Ing. Franz Baader, Director of the Institute of Theoretical Computer Science, Faculty of Computer Science, Dresden University of Technology, Germany

Dr Clare Dixon, Reader in the Department of Computer Science, University of Liverpool, United Kingdom

Description In this dissertation we combine standard *DL-Lite* logics with standard temporal logics into logics with a two-dimensional semantics, where one dimension is for time and the other for the DL domain. The temporal ontology and the temporal query generalise the classical counterparts by allowing the use of the operators such as "in the next/previous moment of time" and "always in the future/past". The temporal data assertions are time-stamped concepts and roles that hold at the specified moments of time. Within this framework, we provide a practical algorithm for temporal ontology-mediated query answering which preserves a distinguishing feature of classical *DL-Lite*: low computational complexity of the reasoning tasks (in the size of the data).

Experience

Vocational

2016–now **Research Assistant**, *Faculty of Computer Science, Free University of Bozen-Bolzano*, Bolzano.
Research activity focusing on temporal description logics.

2011–2012 **Engineer**, *Federal State Enterprise: Scientific & Research Institute "Voskhod"*, Moscow.
Writing technical documentation and development of Machine Readable Travel Documents programme.

Teaching

2017-2018 **Teaching Assistant**, *Faculty of Computer Science, Free University of Bozen-Bolzano*, Bolzano.
Lab sessions for the "Empirical Methods" module with about 20 undergraduates.

Professional Activities

2017 **Subreviewer**, *the 11th International Symposium on Frontiers of Combining Systems*, Brasília, Brazil.

2016 **Subreviewer**, *the 15th International Conference on Principles of Knowledge Representation and Reasoning*, Cape Town, South Africa.

2015 **Subreviewer**, *the 10th International Symposium on Frontiers of Combining Systems*, Wroclaw, Poland.

2014 **Presenter of [AKK$^+$14]**, *the Description Logics Workshop*, Vienna, Austria.

Miscellaneous

2010 – 2012 **Clerk in the Faculty Admissions Committee**, *Lomonosov Moscow State University*, Moscow.

Languages

Russian	Mother tongue	
English	C1	*Cambridge English: Advanced (2016)*
Italian	B2	*CELI 3(2017)*
German	A1	*internal assessment at the Language Center in Free University of Bozen-Bolzano*
French	A1	*internal assessment at the Language Center in Free University of Bozen-Bolzano*

Computer skills

Programming languages: good knowledge of C/C++, fair knowledge of R;
Operating systems used: Windows, FreeBSD (through a virtual machine), macOS.
Different: excellent knowledge of LaTeX and Beamer.

Publications

[AKK+14] Alessandro Artale, Roman Kontchakov, Alisa Kovtunova, Vladislav Ryzhikov, Frank Wolter, and Michael Zakharyaschev. Temporal OBDA with LTL and *DL-Lite*. In *Proc. of the 27th Int. Workshop on Description Logics, DL 2014*, pages 21–32, 2014.

[AKK+15] Alessandro Artale, Roman Kontchakov, Alisa Kovtunova, Vladislav Ryzhikov, Frank Wolter, and Michael Zakharyaschev. First-order rewritability of temporal ontology-mediated queries. In *Proc. of the 24th Int. Joint Conf. on Artificial Intelligence, IJCAI'15*, pages 2706–2712. IJCAI/AAAI, 2015.

[AKK+17] Alessandro Artale, Roman Kontchakov, Alisa Kovtunova, Vladislav Ryzhikov, Frank Wolter, and Michael Zakharyaschev. Ontology-mediated query answering over temporal data: A survey (invited talk). In *24th International Symposium on Temporal Representation and Reasoning, TIME 2017, October 16-18, 2017, Mons, Belgium*, pages 1:1–1:37, 2017.

[Kov17] Alisa Kovtunova. *Ontology-Mediated Query Answering with Lightweight Temporal Description Logics*. PhD thesis, KRDB research centre, Faculty of Computer Science, Free University of Bozen-Bolzano, 2017.

Personal information

Date of birth	28/09/1990
Nationality	Russian