

### Occupation

- 2023–present **Postdoc**, *Purdue University*, West Lafayette, USA, Advisor: Milind Kulkarni  
2018–2023 **Graduate Research Assistant**, *Northeastern University*, Boston, USA, Advisor: Jan Vitek  
Summer 2019 **Intern**, *Tweag I/O*, France (remotely; [final report](#))  
Fall 2017 **Researcher**, *Programming Research Lab*, Czech Technical University, Prague, Czechia  
Spring 2017 **Visiting Research Assistant**, *Programming Research Lab*, Northeastern U., Boston, USA  
2010–2017 **Teaching Assistant Professor**, *Southern Federal University*, Rostov-na-Donu, Russia  
2012–2013 **Software Engineer**, *Angstrom-SFEDU Labs (part-time)*, Rostov-na-Donu, Russia

### Education

- 2023 **Ph. D. in Computer Science**, *Northeastern University*, USA  
2009 **M. Sc. in Applied Mathematics and Computer Science**, *Southern Federal University*, Russia, [\[transcript\]](#)  
2007 **B. Sc. in Applied Mathematics and Computer Science**, *Southern Federal University*, Russia, [\[transcript\]](#)  
Ph. D. thesis *Type Stability in Julia: A Simple and Efficient Optimization Technique* (advisor: Jan Vitek)  
M. Sc. thesis *BMS-algorithm and its application to decoding* (advisor: Vladimir Deundyak)

### Research interests

Programming Languages and Compilers, Functional Programming, Types in Programming Languages

### List Of Publications

#### Peer-reviewed International

- PPoPP '25 RT-BarnesHut: Accelerating Barnes-Hut Using Ray-Tracing Hardware // (with Vani Nagarajan, Rohan Gangaraju, Kirshanthan Sundararajah, Milind Kulkarni) In: *ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming*. DOI: [10.1145/3710848.3710885](https://doi.org/10.1145/3710848.3710885)
- OOPSLA '24 SparseAuto: An Auto-scheduler for Sparse Tensor Computations using Recursive Loop Nest Restructuring // (with Adhitha Dias, Logan Anderson, Kirshanthan Sundararajah, Milind Kulkarni) In: *Proceedings of the ACM on Programming Languages*. DOI: [10.1145/3689730](https://doi.org/10.1145/3689730)
- ECOOP '24 Optimizing Layout of Recursive Datatypes with Marmoset: Or, Algorithms + Data Layouts = Efficient Programs // (with Vidush Singhal, Chaitanya Koparkar, Joseph Zullo, Michael Vollmer, Mike Rainey, Ryan Newton, Milind Kulkarni) In: *European Conference on Object-Oriented Programming*. DOI: [10.4230/LIPIcs.ECOOP.2024.38](https://doi.org/10.4230/LIPIcs.ECOOP.2024.38)
- ICS '24 Arkade: k-Nearest Neighbor Search With Non-Euclidean Distances using GPU Ray Tracing // (with Durga Keerthi Mandarapu, Vani Nagarajan, Milind Kulkarni) In: *ACM International Conference on Supercomputing*. DOI: [10.1145/3650200.3656601](https://doi.org/10.1145/3650200.3656601)
- ISMM '24 Garbage Collection for Mostly Serialized Heaps // (with Chaitanya S. Koparkar, Vidush Singhal, Aditya Gupta, Mike Rainey, Michael Vollmer, Sam Tobin-Hochstadt, Milind Kulkarni, Ryan R. Newton) In: *ACM SIGPLAN International Symposium on Memory Management*. DOI: [10.1145/3652024.3665512](https://doi.org/10.1145/3652024.3665512)
- VMIL '23 Approximating Type Stability in the Julia JIT (Work in Progress) // In: *ACM SIGPLAN International Workshop on Virtual Machines and Intermediate Languages*. DOI: [10.1145/3623507.3623556](https://doi.org/10.1145/3623507.3623556)
- OOPSLA '21 Type stability in Julia: avoiding performance pathologies in JIT compilation // (with Julia Belyakova, Benjamin Chung, Ross Tate, Jan Vitek) In: *Proceedings of the ACM on Programming Languages*. DOI: [10.1145/3485527](https://doi.org/10.1145/3485527)
- OOPSLA '18 Julia subtyping: a rational reconstruction // (with Francesco Zappa Nardelli, Julia Belyakova, Benjamin Chung, Jeff Bezanson, Jan Vitek) In: *Proceedings of the ACM on Programming Languages*. DOI: [10.1145/3276483](https://doi.org/10.1145/3276483)
- ML4PL '18 Can we learn some PL theory?: how to make use of a corpus of subtype checks // In: *International Workshop on Machine Learning techniques for Programming Languages*. DOI: [10.1145/3236454.3236471](https://doi.org/10.1145/3236454.3236471)
- TMPA '17 Functional Parser of Markdown Language Based on Monad Combining and Monoidal Source Stream Representation // (with Georgy Lukyanov) In: *International Conference on Tools and Methods for Program Analysis*. DOI: [10.1007/978-3-319-71734-0\\_8](https://doi.org/10.1007/978-3-319-71734-0_8)
- PCS Associated types and constraint propagation for generic programming in Scala // In: *Programming and Computer Software*. DOI: [10.1134/S0361768815040064](https://doi.org/10.1134/S0361768815040064)

#### Drafts

- o Fuzzy-Testing A Subtyping Relation // 2018 [\[PDF\]](#)

- Handling Recursion in Generic Programming Using Closed Type Families (with A. Bolotina) // 2018 [\[PDF\]](#) Russian
  - Building parsers with algebraic effects // Proceedings of the First Russian Conference on Programming Languages and Compilers (PLC'17), 2017, pp. 185–190. With G. Lukyanov.
  - Pelenitsyn A. Generic and meta- programming approach to design of software implementation of decoder for a class of algebraic geometry codes // “Prikladnaya informatika” (Applied computer science), 2012, No 2(38), pp. 60–70. [\[PDF\]](#), [link to the draft in English](#).
  - Pelenitsyn A. On exploiting one metaprogramming technique. Journal of the Ivanovo Mathematical Society, 2011, No. 1(8), pp.79–84. [\[PDF\]](#).
  - Deundyak V., Pelenitsyn A. Operator-theoretic approach to Berlekamp–Massey Algorithm, // Izvestia vuzov (Universities' Bulletin), Sev.-Kav. Region (Caucasus Region), Estestvennie Nauki (Sciences), 2011, No. 3. Pp. 11–13. [\[PDF\]](#).
  - Mayevskiy A., Pelenitsyn A. Software Implementation of Algebraic-Geometry Codec using Sakata algorithm, // Izvestia Yufu (Southern Federal University Bulletin), Technology Sciences, 2008, No. 8, pp. 196–198. [\[PDF\]](#).
- In Conference Transactions (Russian)**
- Pelenitsyn A. On Implementation of n-Dimensional BMS-algorithm Using Generic Programming // Transactions of Scientific School of I.B. Simonenko, 2010, pp. 197–203. [\[PDF\]](#) [\(in Russian\)](#).
  - Mayevskiy A., Pelenitsyn A. Methodic Supply and IT-infrastructure for Teaching Low-Level Programming // Transactions of Scientific-Methodic Conference “Modern Information Technologies in Education”, 2010, pp. 210–212. [\[PDF\]](#) [\(in Russian\)](#).
  - Mayevskiy A., Pelenitsyn A. On Software Implementation of Algebraic-Geometry Codec using Sakata algorithm, // Transactions of X International Conference on Information Security and Safety, 2008, pp. 55–57.
  - Pelenitsyn A. On Implementation of Decoder for a Class of Algebraic-Geometry Codes on Projective Curves using Sakata algorithm, // Transactions of the Conference “Week of Science” in Southern Federal University, 2008, vol. 1, pp. 55–57. [\[PDF\]](#) [\(in Russian\)](#).
  - Bragilevsky V., Mihalkovich S., Pelenitsyn A. Building Web-portal for Information and Education purposes on Computing Department // Transactions of Scientific-Methodic Conference “Modern Information Technologies in Education”, 2008, pp. 48–49. [\[PDF\]](#) [\(in Russian\)](#).

## Conference Talks: Research

### International

- 2023 **ACM SIGPLAN International Workshop on Virtual Machines and Intermediate Languages, 2023**, “Approximating Type Stability in the Julia JIT (Work in Progress)”  
[Video on SIGPLAN YouTube channel](#)
- 2021 **ACM SIGPLAN conference on Systems, Programming, Languages, and Applications: Software for Humanity, 2021**, OOPSLA Research Papers Track Talk “Type Stability in Julia: Avoiding Performance Pathologies in JIT Compilation”, Chicago, USA, 2021  
[Link to the conference page](#) (includes video)
- 2018 **ACM SIGPLAN Symposium on Scala, 2018**, Student Talk “Julia Subtyping Lessons Scala Could Learn”, St. Louis, USA, 2018 (co-located with ICFP)
- 2018 **2nd Workshop on Machine Learning Techniques for Programming Languages**, Talk “Can We Learn Some PL Theory? How To Make Use of a Corpus of Subtype Checks”, Amsterdam, The Netherlands, 2018 (co-located with ECOOP/ISSTA)

### Russian

- 2015 **Scientific Conference “Modern Information Technologies and IT-Education”**, talk “C++17 Concepts in their relation to C++0x ones”, Lomonosov Moscow State University, Faculty of Computational Mathematics and Cybernetics
- 2012 **Research and Practice Conference: Free Open Source Software “FOSS Lviv 2012”**, talk “Software Implementation of Decoder For a Class Of Error-Correcting Codes on Algebraic Curves: Designing on a Basis of Generic Metaprogramming Templates”, Ivan Franko National University of Lviv, Lviv, Ukraine
- 2008 **Conference “Week of Science” in Southern Federal University**, talk “On Implementation of Decoder for a Class of Algebraic-Geometry Codes on Projective Curves using Sakata algorithm”, Rostov-na-Donu, Russia

## Seminar Talks

- 2021 **Linear Haskell**, Boston Computation Club, Boston, USA (virtually, [Video](#))
- 2017 **Introduction to Dependent Types in Idris**, PL Seminar Jr., Northeastern University, USA
- 2016 **Functional Visitors**, Programming Languages and Compilers seminar, Southern Federal University, Russia
- 2016 **Seminar on Galois Theory**, Southern Federal University, Russia
- 2011 **Minicourse on Galois Theory**, Algebra seminar, Southern Federal University, Russia
- 2011 **Talks “Foundations for programming Languages”, “Automata and Formal Languages”**, seminar for undergraduates “Introduction to Theoretical Computer Science”, Southern Federal University, Russia
- 2009 **Talk “Higher-Order Computations and Model Checking”**, Interchair seminar on Computer Science, Southern Federal University, Russia
- 2009 **Talk “On multi-dimensional version of Berlekamp-Massey algorithm”**, Seminar on Mathematical Methods in Information Safety and Security, Southern Federal University, Russia
- 2009 **Talk “Inductive Data Types in Programming”**, Seminar on Category Theory, Southern Federal University, Russia
- 2008 **Talk “Spring Framework”**, Rostov Java User Group, Computing Center of Southern Federal University, Russia

## Conference Talks: Education, Technology, Popular Science

### International

- 2014 **Joint International Program For Scientific and Technology Cooperation**, talk *"Computer Science Projects Developed inside (in connection with) Department of Mathematics, Mechanics and Computer Sciences / SFedU"*, Sao Paulo, Rio de Janeiro, Fortaleza, Brasil  
Russian
- 2015 **Scientific Conference "Modern Information Technologies in Education"**, talk *"Store and publication assignment infrastructure for Moodle LMS"*, Institute for Mathematics, Mechanics and Computer Science in honour of I. I. Vorovich, Rostov-na-Donu, Russia
- 2010 **Scientific-Methodic Conference "Modern Information Technologies in Education"**, talk *"Methodic Supply and IT-infrastructure for Teaching Low-Level Programming"*, Computing Center of Southern Federal University, Rostov-na-Donu, Russia
- 2008 **International Conference on Information Security and Safety**, talk *"Building Web-portal for Information and Education purposes on Computing Department"*, Taganrog, Russia

## Teaching Experience

### Teaching Assistantship at [Northeastern University](#)

- CS4500: Software Development — 2020 (Spring).
- CS4410/6410: Compilers — 2019 (Fall).

### Teaching at [Southern Federal University](#) (in Russian, unless marked otherwise)

- Quantum Computations (lectures in English) — 2016 (Fall).
- Computer Architecture (lectures & labs) — 2013–2016 (Spring).
- Automata and Ciphers (lectures) — 2013–2016 (Fall).
- Programming Basics labs — 2008, 2010–2012, 2014–2016.
- Programming Languages labs — 2008, 2010, 2012–2015 (Fall).
- Functional Programming labs — 2011 (Spring).
- Automata and Languages — 2010 (Spring).
- Microprogramming/Assembler Programming labs — 2009 (Fall).
- Geometry and Algebra — 2009 (Fall).

### Supervising Students at Southern Federal University

- *Structuring Effectful Computations* — MSc G. Lukyanov, 2017, [\[PDF\]](#)
- *Generic Programming and Zippers* — A. Bolotina, 2017
- *Generation of algebraic data types descriptions based on JSON data via Template Haskell* — BSc O. Maroseev, 2016
- *Generation of type class instances based on instances of superclasses via GHC API* — BSc O. Filippskaya, 2016
- *Functional parser for Markdown using monad combination and monoidal representation of input* — BSc G. Lukianov, 2015
- *Deduction system for linear logic in Haskell* — BSc V. Pankov, 2015

## Summer Schools and Workshops

- 2018 **Programming Languages Mentoring Workshop @ ICFP**, St. Louis, USA, September 23rd 2018
- 2017 **Oregon Programming Languages Summer School**, *Univeristy of Oregon*, Eugene, USA, June 26th to July 8th 2017
- 2015 **Summer School on Generic and Effectful Programming**, *Department of Computer Science, Univeristy of Oxford*, St Anne's College, Oxford, 6th to 10th July 2015
- 2011 **Summer School "Algebra and Geometry"**, *Laboratory of Algebraic Geometry in the National Research University Higher School of Economics, Teachers' Training University of Yaroslavl'*, Yaroslavl', Russia
- 2010 **Microsoft Algorithms and Data Structures Summer School**, *Microsoft Research in Silicon Valey*, Saint-Petersburg, Russia
- 2010 **Winter School on Applied Mathematics and Computer Science**, *National Research University Higher School of Economics*, Moscow province, Russia
- 2009 **Marktoberdorf Summer School "Logics and Languages for Reliability and Security"**, Marktoberdorf, Germany

## Service

### Conference Organization

- **Program Committees:** PLDI '25, SBLP '25
- **Organizing Committees:** [ML4PL '18](#), [PLC '17](#)
- **Artifact Evaluation Committee:** [ICFP '22](#)
- **Web Co-Chair:** [ETAPS '19](#)
- **Student Volunteer:** ECOOP '18, SPLASH '18, ICFP '20, '21

## Book Translations (English to Russian)

- Dowek, Gilles, Levy, Jean-Jacques. Introduction to the Theory of Programming Languages. / Springer. 2011. Russian translation together with V. Bragilevsky. Published by DMK Press in 2013. [Link to web page](#), [link to Google Books preview](#).
- Bird, Richard. Pearls of Functional Algorithm Design. / Cambridge University Press. 2010. Russian translation together with V. Bragilevsky. Published by DMK Press in 2013. [Link to web page](#), [link to Google Books preview](#).

## Open Source Software Contributions

- [Cabal](#) Contributor, maintainer, release manager for the Haskell build system Cabal ([10+ commits](#))
- [GHC](#) Contributor to the Glasgow Haskell Compiler ([10+ commits](#))
- [BNFC-meta](#) Maintainer of the Haskell BNFC-meta package for embedding BNF grammars into source via Template Haskell
- [Monads.jl](#) Maintainer for Julia Mondas.jl package implementing monadic do-notation for the Julia programming language

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## Pet Projects

- [covid-19-in-russia](#) Updating the Wikipedia table showing dynamics of COVID-19 in Russia by region / Julia, 2020
- [tiger-test](#) The v2 of check-test (see below) developed at NEU / Haskell, 2019
- [subtype-fuzzer](#) A fuzzer to test a tricky subtype relation as found in the Julia programming language / Haskell, 2018
- [chek-test](#) Remove groove from checking students' submissions / Haskell, 2016
- [cpp-mv-poly](#) C++-implementation of multivariate polynomials and the BMS-algorithm massively using C++ templates
- [mmcs-entrance](#) Generation of entrance diagrams (in PNG) in MMCS/SFedU from official data (XLS) / Java, 2010
- [lj-comments-notifier](#) Notifications about new comments in some livejournal.com-based blog / Haskell, 2011
- [Project Euler Me @ GitHub](#) Link to the participant record / Haskell (mostly), C++  
ulysses4ever

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## Computer skills

- Programming languages Proficient: Haskell, Julia; Experienced: C++, Java, C, Pascal; Familiar: Scala, C#
- Markup, Scripting **LaTeX**, HTML, CSS, JavaScript, PHP, bash, Regular expressions
- Environment Git, Make, Nix, Emacs, Wiki/Markdown
- Operating systems **GNU/Linux family**, Windows family

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## Awards, Scholarships, etc.

- 2012 **Participation in all-russian final of international student olympiad "IT-planet"**, competition: "Oracle Java Olympic"
- 2012 **Diploma for taking second place in regional stage of international student olympiad "IT-planet"**, competition: "Oracle Java Olympic"
- 2012 **Participation in the final stage of VI Open Programming Contest of Southern Federal University**, individual event
- 2011 **Scholarship from foundation "Education and Science on the South of Russia"**
- 2011 **Rector's commendation for participating in international accreditation of university teaching programmes**, *Southern Federal University*
- 2008 **Diploma for the best talk**, *student session during annual "Week of Science", Southern Federal University*

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## Personal Info

- Gender Male
- Pronouns He/His/him
- Marital status Married to [Julia Belyakova](#)
- Current place of living Lafayette, IN, USA
- Citizenship, Homeland Russia
- Name spelling To reflect the reality, my first name transliteration should be, in fact, something like Artyom. Also, there is no 'ch' sound after the 'r' sound — just 't'.

Languages Russian: Native; English: Advanced