

CURRICULUM VITAE

General:

Name Sergey Igorevich Nikolenko
Date of Birth 11 August 1984
Place of Birth Pskov, USSR
Home Address ul. Uchitelskaya, d. 18, korp. 1, kv. 404, St.-Petersburg, Russia, 195269.
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Education

- 1991-1994: Secondary school #5, Pskov, Russia.
- 1994-1998: Pskov Technical Lyceum, Pskov, Russia.
Graduated cum laude (with a Gold Medal)
- 1998-1999: University High School, Greeley, CO, USA.
Graduated cum laude (among top 10 with maximal GPA)
- 1999-2000: Pskov Polytechnical Institute, Pskov, Russia.
- 2000-2005: St.-Petersburg State University, St.-Petersburg, Russia, Department of Mathematics and Mechanics.
Graduated cum laude.
- 2005-2008: Ph.D. Student at the St.-Petersburg Department of Steklov Mathematical Institute, St.-Petersburg, Russia.
- 2009: Ph.D. from the Steklov Mathematical Institute, St. Petersburg.

Work experience

- 2006-2007: Engineering intern, Google Inc.
- 2006-2010: Assistant Professor, SPSU IFMO, St. Petersburg.
- 2008-2010: Senior Researcher, Speech Technology Center, St. Petersburg.
- 2011-2012: Senior Researcher, Algorithmic Biology Lab, Academic University, St. Petersburg.
- 2011-2014: Research Director, Surfingbird, Moscow.
- 2008-present: Adjunct Professor, Academic University, St. Petersburg.
- 2008-present: Researcher, Steklov Mathematical Institute, St. Petersburg.
- 2013-present: Senior Researcher, Laboratory for Internet Studies, National Research University Higher School of Economics, St. Petersburg.

Research interests Probabilistic graphical models, machine learning, recommender systems
Bioinformatics
Proof theory, automated reasoning, computational complexity, circuit complexity
Algebra (Chevalley groups), algebraic geometry (motives)

Books

A. L. Tulupyev, S. I. Nikolenko, A. V. Sirotkin. *Bayesian Networks: A Probabilistic Logic Approach*. St.-Petersburg, Nauka, 2006 (in Russian).
A. L. Tulupyev, S. I. Nikolenko, A. V. Sirotkin. *Bayesian Belief Networks: Logical-Probabilistic Inference in Acyclic Directed Graphs*. St.-Petersburg State University Publishing, 2009 (in Russian).
A. L. Tulupyev, S. I. Nikolenko. *Learning Systems*. Moscow, MCCME Press, 2009 (in Russian).
S. I. Nikolenko. *Provably Secure Constructions in Cryptography*. Lambert Academic Publishing, 2011.
S.I. Nikolenko. *Mechanism design theory*. Moscow, INTUIT, 2009 (in Russian).

Book chapters

S.I. Nikolenko, K. Kogan. Single and Multiple Buffer Processing. *Encyclopaedia of Algorithms*, Springer, 2014, pp. 1–9.

S.I. Nikolenko. *Provably Secure Cryptographic Constructions*. In Jaydip Sen (ed.), *Cryptography and Security in Computing*, InTech, 2012, pp. 3–22.

S.I. Nikolenko. *The Markov School in the 21st Century*. *Logic in Central and Eastern Europe: History, Science and Discourse*. University Press of America, 2012, pp. 388–427.

G.E. Mints, S.I. Nikolenko. *History of the Leningrad (St. Petersburg) School of Constructive Mathematics and Proof Theory*. *Logic in Central and Eastern Europe: History, Science and Discourse*. University Press of America, 2012, pp. 380–387.

Selected research papers

- 2015** P. Chuprikov, S.I. Nikolenko, K. Kogan. Priority Queueing with Multiple Packet Characteristics. Accepted to INFOCOM 2015.
- 2014** K. Kogan, S.I. Nikolenko, O. Rottenstreich, W. Culhane, P. Eugster. SAX-PAC (Scalable And eXpressive PAcKet Classification). Proceedings of the 2014 ACM conference on SIGCOMM (SIGCOMM 2014), ACM Press, 2014, pp. 15–26
- P. Eugster, K. Kogan, S.I. Nikolenko, A.V. Sirotkin. Shared-Memory Buffer Management for Heterogeneous Packet Processing. Proceedings of the 34th International Conference on Distributed Computing Systems (ICDCS 2014), IEEE Press, 2014, pp. 471–480
- K. Kogan, A. López-Ortiz, S.I. Nikolenko, G. Scalosub. Balancing Work and Size with Bounded Buffers. Proc. 6th International Conference on Communication Systems and Networks (COMSNETS 2014), 2014, pp. 1–8
- S. Koltcov, O. Koltsova, S.I. Nikolenko. Latent Dirichlet Allocation: Stability and Applications to Studies of User-Generated content. Proceedings of the 2014 ACM conference on Web science (WebSci 2014), pp. 161–165
- S.I. Nikolenko, S. Koltsov, O. Koltsova. Measuring Topic Quality in Latent Dirichlet Allocation. Proc. Philosophy, Mathematics, Linguistics: Aspects of Interaction 2014 (PhML-2014), pp. 149–157.
- D.I. Ignatov, S.I. Nikolenko, T. Abaev, J. Poelmans. Improving Quality Of Service For Radio Station Hosting: An Online Recommender System Based On Information Fusion. Working papers by NRU Higher School of Economics. Series MAN ``Management'', 2014, no. 31
- 2013** T. Alexandrov, I. Chernyavsky, M. Becker, F. von Eggeling, S.I. Nikolenko. Analysis and Interpretation of Imaging Mass Spectrometry Data by Clustering Mass-to-Charge Images According to Their Spatial Similarity. *Analytical Chemistry*, (ACS link), vol. 85 (23), pp. 11189–11195
- S.I. Nikolenko, A.I. Korobeynikov, M.A. Alekseyev. BayesHammer: Bayesian clustering for error correction in single-cell sequencing. *BMC Genomics*, vol. 14, Suppl. 1, S7, 2013
- S.I. Nikolenko, D. Tugaryov. A Complete One-Way Function based on a Finite Rank Free ZxZ-module. *Journal of Mathematical Sciences*, vol. 192, no. 3, pp. 307–315, 2013
- A.P. Davydov, S.I. Nikolenko. Circuit Complexity of Linear Functions: Gate Elimination and Feeble Security. *Journal of Mathematical Sciences*, vol. 188, no. 1, pp. 35–43, 2013
- E.A. Hirsch, O. Melanich, S.I. Nikolenko. Feebly Secure Cryptographic Primitives. *Journal of Mathematical Sciences*, vol. 188, no. 1, pp. 17–34, 2013 (springerlink). *Zapiski nauchnyh seminarov POMI (Journal of Mathematical Sciences)*, vol. 399, 2012, pp. 32–64
- S. Bodrunova, S. Koltcov, O. Koltsova, S.I. Nikolenko, A. Shimorina. Interval Semi-Supervised LDA: Classifying Needles in a Haystack. Proc. 12th Mexican International Conference on Artificial Intelligence (MICAI 2013), LNCS vol. 8625, pp. 265–274, 2013
- K. Kogan, A. López-Ortiz, S.I. Nikolenko, A.V. Sirotkin. Multi-Queued Network Processors for Packets with Heterogeneous Processing Requirements. Proc. 5th International Conference on Communication Systems and Networks (COMSNETS 2013), 2013
- V.A. Leksin, S.I. Nikolenko. Semi-Supervised Tag Extraction in a Web Recommender System. Proc. 6th International Conference on Similarity Search and Applications (SISAP 2013), LNCS vol. 8199, pp. 206–212, 2013
- K. Kogan, S.I. Nikolenko, S. Keshav, A. López-Ortiz. Efficient Demand Assignment in Multi-Connected Microgrids with a Shared Central Grid. Proc. 3rd IFIP Conference on Sustainable Internet and ICT for Sustainability 2013 (SustainIT 2013)

- K. Kogan, S.I. Nikolenko, S. Keshav, A. Lòpez-Ortiz. Efficient demand assignment in multi-connected microgrids. Proc. 4th Energy-Efficient Computing and Networking (e-Energy 2013), pp. 277–278
- K. Kogan, S.I. Nikolenko, W. Culhane, P. Eugster, E. Ruan. Towards efficient implementation of packet classifiers in SDN/OpenFlow. Proc. 2nd ACM SIGCOMM Workshop on Hot Topics in Software Defined Networking (HotSDN 2013), pp. 153–154
- O. Koltsova, S. Koltsov, S.I. Nikolenko. Comment-Based Discussion Communities in the Russian LiveJournal and Their Topical Coherence. Higher School of Economics Research Paper No. WP BRP 33/SOC/2013.
- 2012** K. Kogan, A. Lòpez-Ortiz, S.I. Nikolenko, A.V. Sirotkin. *A Taxonomy of Semi-FIFO Policies*. Proceedings of the 31st IEEE International Performance Computing and Communications Conference (IPCCC 2012), 2012, pp. 295–304.
- K. Kogan, A. Lòpez-Ortiz, S.I. Nikolenko, A.V. Sirotkin, D. Tugaryov. *FIFO Queueing Policies for Packets with Heterogeneous Processing*, Proceedings of the 1st Mediterranean Conference on Algorithms (MedAlg 2012), LNCS vol. 7659, pp. 248–260, 2012.
- A.P. Davydow, S.I. Nikolenko. *Circuit complexity of linear functions: gate elimination and feeble security*. Zapiski nauchnyh seminarov POMI (Journal of Mathematical Sciences), vol. 399, pp. 65–87, 2012.
- E. A. Hirsch, O. Yu. Melanich, S. I. Nikolenko. *Feebly secure cryptographic primitives*. Записки . Zapiski nauchnyh seminarov POMI (Journal of Mathematical Sciences), vol. 399, 2012, c. 32-64.
- S.I. Nikolenko, D.S. Tugaryov. *A complete one-way function based on a free finite rank (ZxZ)-module*. Zapiski nauchnyh seminarov POMI (Journal of Mathematical Sciences), vol. 402, pp. 91–107, 2012.
- D.Yu. Grigoriev, S.I. Nikolenko. *Continuous hard-to-invert functions and biometric authentication*. Groups – Complexity – Cryptology, vol. 4, no. 1, pp. 19–32, 2012.
- A. Bankevich, S. Nurk, D. Antipov, A.A. Gurevich, M. Dvorkin, A.S. Kulikov, V.M. Lesin, S.I. Nikolenko, S. Pham, A.D. Prjibelski, A.V. Pyskin, A.V. Sirotkin, N. Vyahhi, G. Tesler, M.A. Alekseyev, and P.A. Pevzner. *SPAdes: A New Genome Assembly Algorithm and Its Applications to Single-Cell Sequencing*. Journal of Computational Biology, May 2012, vol. 19, no. 5, pp. 455–477.
- I.I. Chernyavsky, T. Alexandrov, P. Maass, S.I. Nikolenko. *A Two-Step Soft Segmentation Procedure for MALDI Imaging Mass Spectrometry Data*. Proceedings of the 18th German Conference in Bioinformatics (GCB-2012), OASICs vol. 26, 2012, pp. 39–48.
- A. Fishkov, S.I. Nikolenko. *A New Click Model for Relevance Prediction in Web Search*. Proceedings of EEML 2012, an ICFA 2012 workshop, 2012, pp. 45–54.
- D. Ignatov, S.I. Nikolenko, V. Zaharchuk, A. Konstantinov. *A New Recommender System for the Interactive Radio Network FMhost*. Proceedings of EEML 2012, an ICFA 2012 workshop, 2012, pp. 72–85.
- I.I. Chernyavsky, T. Alexandrov, S.I. Nikolenko. *Segmentation of MALDI imaging results based on graphical models*. SPIIRAS Proceedings, vol. 21, 2012, pp. 120–142.
- S.I. Nikolenko, D.V. Serdyuk, A.V. Sirotkin. *Bayesian rating systems with additional information on tournament results*. SPIIRAS Proceedings, vol. 22, 2012, pp. 189–204.
- A. Fishkov, S.I. Nikolenko. *SCM: a new user behaviour model for web search*. SPIIRAS Proceedings, vol. 20, 2012, pp. 72–100.
- A. Fishkov, S.I. Nikolenko. *A survey of user behaviour models for search results ranking*. SPIIRAS Proceedings, vol. 22, 2012, pp. 139–175.
- 2011** S.I. Nikolenko, A.V. Sirotkin. *A New Bayesian Rating System for Team Competitions*. Proc. of the 28th International Conference on Machine Learning (ICML 2011), pp. 601-608.
- A. Davydow, S. I. Nikolenko. *Gate Elimination for Linear Functions and New Feebly Secure Constructions*. Proceedings of the 6th Computer Science Symposium in Russia (CSR 2011), LNCS vol. 6651, pp. 148-161.
- I.A. Baltiysky, S.I. Nikolenko. *Probabilistic Graphical Models of Harmony in Automated Music Analysis: a Survey*. SPIIRAS Proceedings, vol. 17, 2011, pp. 174–196.
- I.A. Baltiysky, S.I. Nikolenko. *A Probabilistic Graphical Model for the Music Harmony Similarity Problem*. SPIIRAS Proceedings, vol. 18, 2011, pp. 136–163.

- 2010** S.I. Nikolenko, A.V. Sirotkin. *Extensions of the TrueSkill™ rating system*. Proc. of the 9th Intl. Conference on Applications of Fuzzy Systems and Soft Computing (ICAFS 2010), pp. 151–160.
- I. Gnilomedov, S.I. Nikolenko. *Fuzzy computing via multiagent negotiations*. Proc. of the 9th Intl. Conference on Applications of Fuzzy Systems and Soft Computing (ICAFS 2010), pp. 210–220.
- I. Gnilomedov, S.I. Nikolenko. *Agent-Based Economic Modeling with Finite State Machines*. Proceedings of the 36th Annual Convention of the Society for the Study of Artificial Intelligence and Simulation of Behaviour (AISB 2010).
- 2009** S. I. Nikolenko, N. Semenov, K. Zainoulline. *Motivic decomposition of anisotropic varieties of type F_4 into generalized Rost motives*. Journal of K-Theory, vol. 3, 2009, pp. 85-102.
- A. Kojevnikov, S.I. Nikolenko. *On Complete One-Way Functions*. Problems of Information Transmission, vol. 45, no. 2, 2009, pp. 108-189.
- C. A. Pshenichny, S.I. Nikolenko, A.V. Yakovlev. *The event bush formalism for knowledge representation and probabilistic inference in geological hazard evaluation*. Geoinformatics, no. 2, 2009, pp. 62–71.
- C. A. Pshenichny, S. I. Nikolenko, R. Carniel et al. *The Event Bush as a Semantic-based Numerical Approach to Natural Hazard Assessment (Exemplified by Volcanology)*, Computers and Geosciences, vol. 35, issue 5, 2009, pp. 1017-1034.
- E. A. Hirsch, S. I. Nikolenko. *A feebly secure trapdoor function*. Proceedings of the 4th Computer Science Symposium in Russia, LNCS vol. 5675, 2009, pp. 129-142.
- S.I. Nikolenko, A.V. Sirotkin. *Bayesian Inference in Rating Systems: a Survey*. Proceedings of IMMVII-2009, vol. 2, 2009, pp. 29–48.
- S.I. Nikolenko, K.E. Levin, Yu.Yu. Khokhlov. *Two-pass Automated Speech Recognition with Text Mining*. Proceedings of IMMVII-2009, vol. 1, 2009, pp. 192-202.
- 2008** E.A. Hirsch, A. Kojevnikov, A.S. Kulikov, S.I. Nikolenko. *Complexity of Semialgebraic Proofs with Restricted Degree of Falsity*. Journal of Satisfiability, vol. 6, 2008, pp. 53-69.
- N.A. Vavilov, S.I. Nikolenko. *A_2 proof of structure theorems for Chevalley groups of type F_4* , Algebra i Analiz, vol. 20, no. 4, 2008, pp. 27-63; translated in St. Petersburg Mathematical Journal, vol 20, no. 4, 2009, pp. 527-551.
- D.Yu. Grigoriev, A. Kojevnikov, S.I. Nikolenko. *Algebraic Cryptography: New Constructions and Their Security against Provable Break*. St. Petersburg Mathematical Journal, vol. 20, no. 6, 2008, pp. 119-147.
- S. I. Nikolenko, C. A. Pshenichny, R. Carniel. *Learning Conditional Probabilities in Event Bushes with Temporal Labels*. Proceedings of iEMSS'08: International Congress on Environmental Modelling and Software, 2008.
- C. A. Pshenichny, S. I. Nikolenko, R. Carniel, A. L. Sobissevitch et al. *The Event Bush as a Potential Complex Methodology of Conceptual Modeling in Geosciences*. Proceedings of iEMSS'08: International Congress on Environmental Modelling and Software, 2008.
- A. Kojevnikov, S. I. Nikolenko. *New Combinatorial Complete One-Way Functions*. Proceedings of the 25th Symposium of Theoretical Aspects of Computer Science (STACS-2008), Bordeaux, France, 2008, pp. 457-466.
- 2007** S. I. Nikolenko, C. A. Pshenichny, A. L. Sobissevich, A. V. Yakovlev. *Spatial Volcanic Hazard Assessment by the Event Bush Method*. XXIV IUGG General Assembly, 2007. Perugia, Italy.
- Pshenichny C. A., Nikolenko S. I., Carniel R., Vaganov P. A., Khrabrykh Z. V., Moukhachov, V. P., Akimova-Shterkhun V. L., Rezyapkin A. A., Yakovlev, A.V. *The Event Bush as a Potential Core Methodology of Volcanic Hazard Assessment*. IUGG General Assembly XXIV, 2007
- 2006** S. I. Nikolenko, N. Semenov. *Chow ring structure made simple*. arXiv:math/0606335 [math.AG]
- M. R. Gavrilovich, S. I. Nikolenko, N. A. Vavilov. *Structure of Chevalley Groups: the Proof from the Book*. Journal of Mathematical Sciences, vol. 140, no. 5, 2007, pp. 626-645.
- A. L. Tulupyev, A. V. Sirotkin, S. I. Nikolenko. *Coordinated estimates of probabilities of statements in intellectual informational systems*. Priborostroenie, no. 7, 2006, pp. 20-26
- A. L. Tulupyev, S. I. Nikolenko, D. A. Nikitin, A. V. Sirotkin. *A posteriori estimates of statement probabilities in intellectual informational systems: deterministic case*. Priborostroenie, no. 11, 2006, pp. 35-39.

- A. L. Tulupyev, S. I. Nikolenko, A. V. Sirotkin. *A posteriori probability estimates with probabilistic evidence in intellectual informational systems with interval probabilities*. Priboroostroenie, no. 11, 2006, pp. 39-44.
- A. L. Tulupyev, S. I. Nikolenko, A. V. Sirotkin. *Cycles in Bayesian Networks: Probabilistic Semantics and Relations with Neighboring Nodes*. SPIIRAS Proceedings, issue 3, vol. 1, 2006, pp. 240-263.
- A.E. Paschenko, A.L. Tulupyev, S.I. Nikolenko. *Statistical Estimates of the Probability of Contracting HIV based on Last Episodes of Risky Behaviour*. SPIIRAS Proceedins, issue 3, vol. 2, 2006, pp. 257-268.
- 2005** E. A. Hirsch, S. I. Nikolenko. *Simulating Cutting Planes proofs with restricted degree of falsity by Resolution*. Proceedings of SAT'05, Lecture Notes in Computer Science, vol. 3569, 2005, pp. 135-142.
- S. I. Nikolenko, N. Semenov, K. Zainoulline. *Motivic decomposition of anisotropic varieties of type F_4 and generalized Rost motives*. ArXiv preprint math.AG/0502382.
- A.L. Tulupyev, S.I. Nikolenko. *Directed Cycles in Bayesian Belief Networks: Probabilistic Semantics and Consistency Checking Complexity*. MICAI-2005 Proceedings, Lecture Notes in Artificial Intelligence vol. 3789, 2005, pp. 214-223.
- S.I. Nikolenko, A.L. Tulupyev. *Probabilistic semantics of Bayesian networks in the case of a linear chain of knowledge patterns* (in Russian). SPIIRAS proceedings, issue 2, vol. 2, pp. 53-75. St.-Petersburg, Nauka, 2005.
- 2004** S. S. Fedin, A. Kojevnikov, B. Konev, A. S. Kulikov, S. I. Nikolenko, V. P. Orevkov. *First report on the semialgebraic prover*. PDMI preprint.
- S.I. Nikolenko, A.L. Tulupyev. *Simple cycles in Bayesian belief networks: probabilistic distribution and an inconsistent assignment* (in Russian). Proc. SPIIRAS, vol. 1, no. 2, pp. 119-126. St.-Petersburg, Nauka, 2004.
- 2003** S. I. Nikolenko, A. V. Sirotkin. *Worst-case upper bounds for SAT: automated proof*. Student Session Proceedings, 15th European Summer School in Logic, Language, and Information (ESSLLI 2003), pp. 225-232. Vienna, Austria, 2003.
- S. I. Nikolenko. *Hard satisfiable instances for DPLL-type algorithms*. Journal of Mathematical Sciences, vol. 293, p. 139-149, 2003.

Teaching	Machine Learning	Cryptographic Protocols
(courses):	Introduction to Machine Learning	Fundamentals of Mathematical Logic
	Bayesian Inference	Model Theory
	Probabilistic Graphical Models	Mechanism Design

- Grants and awards:** Project Leader, Samsung research grant “Recommender Systems Based on Probabilistic Graphical Models”, PDMI RAS, 2014.
- Head of the Russian President Grant for Young Ph.D.'s MK-6628.2012.1, 2012-2013.
- Head of the Russian Fund for Basic Research grant 12-01-00450-a, 2012-2013.
- Head of the Russian President Grant for Young Ph.D.'s MK-4089.2010.1, 2010-2011.
- PDMI representative for Governmental Contract 02.740.11.5192, 2010-2011.
- INTAS Fellowship YSF 05-109-5565
- Participant of several Russian Fund for Basic Research grants and Governmental Contracts for Fundamental Research of the Federal Target Programme “Scientific Personnel”.
- Winner of the 2004 and 2003 student personal grant contest conducted by the International Soros Science Education Program (ISSEP).