

CURRICULUM VITAE

General:

Name Sergey Igorevich Nikolenko
Date of Birth 11 August 1984
Place of Birth Pskov, USSR
Home Address 198328, pr. Kuznetsova, d. 22, korp. 1, kv. 26, St.-Petersburg, Russia.
E-mail snikolenko@gmail.com, sergey@logic.pdmi.ras.ru
Web page <http://logic.pdmi.ras.ru/~sergey>

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.
- 2008-present: Adjunct Professor, Academic University, St. Petersburg.
- 2008-present: Researcher, Steklov Mathematical Institute, St. Petersburg.
- 2011-present: Senior Researcher, Algorithmic Biology Lab, Academic University,
St. Petersburg.
- 2011-present: Research Director, Surfingbird.

Research interests: Probabilistic graphical models
Machine learning
Bioinformatics
Proof theory, automated reasoning
Computational complexity
Higher 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.
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.

A. L. Tulupyev, S. I. Nikolenko. *Learning Systems*. Moscow, MCCME Press, 2009.
S. I. Nikolenko. *Provably Secure Constructions in Cryptography*. Lambert Academic Publishing, 2011.
S.I. Nikolenko. *Mechanism design theory*. Moscow, INTUIT, 2009.
S.I. Nikolenko. *Provably Secure Constructions in Cryptography*. Lambert Academic Publishing, 2011.

Book chapters:

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, 2011, 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:

- 2012** E.A. Hirsch, O.Yu. Melanich, S.I. Nikolenko. *Feebly secure cryptographic primitives*. Accepted to Journal of Mathematical Sciences, 2012.
A.P. Davydow, S.I. Nikolenko. *Circuit complexity of linear functions: gate elimination and feeble security*. Accepted to Journal of Mathematical Sciences, 2012.
A. Fishkov, S.I. Nikolenko. *A new click model for relevance prediction in web search*. Accepted to Proc. of EEML-2012, 2012.
S.I. Nikolenko, D.S. Tugaryov. *A complete one-way function based on a free finite rank (ZxZ)-module*. Submitted, 2012.
- 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.
- 2010** S.I. Nikolenko, A.V. Sirotkin. *Extensions of the TrueSkill™ rating system*. Proceedings of the 9th International Conference on Applications of Fuzzy Systems and Soft Computing (ICAFS 2010), pp. 151–160.
I. Gnilomedov, S.I. Nikolenko. *Fuzzy computing via multiagent negotiations*. Proceedings of the 9th International 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, July 02–13, 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. 2007, *The Event Bush as a Potential Core Methodology of Volcanic Hazard Assessment*. – Abstracts, IUGG General Assembly XXIV 2007, Perugia, Italy.
- 2006** S. I. Nikolenko, N. Semenov. *Chow ring structure made simple*. ArXiv preprint.
- 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*. Priborostroenie, 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 Proceedings, 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). SPIIRAS proceedings, issue 2, vol. 1. p. 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
(courses): Cryptographic Protocols
Introduction to Machine Learning
Bayesian Inference
Fundamentals of Mathematical Logic
Advanced Mathematical Logic
Mechanism Design

Grants and awards: Winner of the 2010-2011 and 2012-2013 Russian President Grant for Young Ph.D.'s.
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).
Participant of the U.S. Civilian Research & Development Foundation (CRDF) projects CRDF GAP 1373(1) and CRDF GAP RM0-1373-ST-03