Curriculum Vitae

Alex Gavryushkin

13th December 2017

Contacts

Address:	Computational Biology Group Department of Biosystems Science and Engineering ETH Zurich Office 3.10, WRO 1078 Mattenstrasse 26 4058 Basel, Switzerland
Homepage:	http://alex.gavruskin.com
Email:	alex@gavruskin.com

Education

2009	Ph. D. in Mathematics	from Sobolev Institute of Mathematics, Novosibirsk
2006	M. S. in Mathematics	from Novosibirsk State University (with First Class Honours)
2004	B. S. in Mathematics	from Novosibirsk State University (with First Class Honours)

Professional Activity

February	2018–present		Senior Lecturer	University of Otago (NZ) Department of Computer Science
August	2016–January	2018	Research Fellow	ETH Zurich (CH) Department Biosystems Science and Engineering
August	2016–January	2018	Member	SIB Swiss Institute of Bioinformatics (CH) Computational Biology Group
February	2012–July	2016	Research Fellow	The University of Auckland (NZ) Department of Computer Science
February	2015–February	2016	Affiliate	Fred Hutchinson Cancer Research Centre (US) Computational Biology Program
January	2016–June	2016	Short-term visitor	Simons Institute for the Theory of Computing UC Berkeley (US)
August	2013–July	2014	Lecturer	Auckland University of Technology (NZ) School of Computer and Mathematical Sciences
November	2012–June	2013	Research Visitor	National University of Singapore School of Computing
September	2009–December	2014	Senior Lecturer	Irkutsk State University (RF) Institute of Mathematics, Economics, and Computer Science

Awards

2017 Rutherford Discovery Fellowship (five years, Royal Society of New Zealand)
2011 Dr of Science Scholarship (three years, Government of Russia)
2009 Siberian Fund for Algebra and Logic Award (2005–2009)
2008 Award for excellence in teaching (at ACM-ICPC North-Eastern European Regional Contest)
2007 Siberian Mathematical Journal Award (from Sobolev Institute of Mathematics)
2006 Best Student Scientific Work Award (from Novosibirsk State University)
2005 Maltsev Award (from Novosibirsk State University)
2000 Gold Medal (from the Government of Russia, Novokuznetsk High School #32)

Publications

- A. Gould, V. Zhang, L. Lamberti, E. Jones, B. Obadia, A. Gavryushkin, J. Carlson, N. Beerenwinkel, W. Ludington. High-dimensional microbiome interactions shape host fitness. *bioRxiv,* DOI 10.1101/232959, 2017.

- C. Lienkaemper, L. Lamberti, J. Drain, N. Beerenwinkel, and A. Gavryushkin. The geometry of partial fitness orders and an efficient method for detecting genetic interactions. *Journal of Mathematical Biology,* under revision. *bioRxiv,* DOI 10.1101/180976, 2017.

- K. Crona*, A. Gavryushkin*, D. Greene*, and N. Beerenwinkel. Inferring genetic interactions from comparative fitness data. *eLife,* 2017;6:e28629, DOI: 10.7554/eLife.28629, 2017. *Equal contribution, alphabetic order.

- A. Gavryushkin, C. Whidden, and F. Matsen IV. The combinatorics of discrete time-trees: theory and open problems. *Journal of Mathematical Biology,* DOI 10.1007/s00285-017-1167-9, 2017.

- C. Zeidler, G. Weber, A. Gavryushkin, and C. Lutteroth. Tiling algebra for constraint-based layout editing. *Journal of Logical and Algebraic Methods in Programming,* Vol. 89, 67–94, 2017.

- A. Gavryushkin and A. Drummond. The space of ultrametric phylogenetic trees. *Journal of Theoretical Biology,* Vol. 403, 197–208, 2016.

- P. Gavryushkin, A. Behtenova, Z. Popov, V. Bakakin, A. Likhacheva, K. Litasov, and A. Gavryushkin. Toward analysis of structural changes common for alkaline carbonates and binary compounds: prediction of high-pressure structures of Li2CO3, Na2CO3, and K2CO3. *Crystal Growth & Design,* 16, 10, 5612–5617, 2016.

- P. Gavryushkin, Z. Popov, K. Litasov, A. Belonoshko, and A. Gavryushkin. Stability of B2-type FeS at Earth's inner core pressures. *Geophysical Research Letters,* 43, 16, 8435–8440, 2016.

- A. Gavryushkin, B. Khoussainov, M. Kokho, and J. Liu. Dynamic algorithms for multimachine interval scheduling through analysis of idle intervals. *Algorithmica,* DOI 10.1007/s00453-016-0148-5, 2016.

- T. Stadler, T. Vaughan, A. Gavryushkin, S. Guindon, D. Kühnert, G.E. Leventhal, and A. Drummond. How well can the exponential-growth coalescent approximate constant-rate birth-death population dynamics? *Proceedings of the Royal Society B: Biological Sciences,* 282, 1806, 2015.

- P. Gavryushkin, Z. Popov, K. Litasov, and A. Gavryushkin. Unbiased crystal structure prediction of NiSi under high pressure. *Journal of Applied Crystallography,* 48, 3, 906–908, 2015.

- A. Gavryushkin, B. Khoussainov, and F. Stephan. Reducibilities among equivalence relations induced by recursively enumerable structures. *Theoretical Computer Science,* Vol. 612, 137–152, 2015.

- A. Gavryushkin. Decidable models of small theories. *Lobachevskii Journal of Mathematics,* 36, 4, 446–449, 2015.

- A. Gavryushkin, B. Khoussainov, M. Kokho, and J. Liu. Dynamic algorithms for monotonic interval scheduling problem. *Theoretical Computer Science,* Vol. 562, 227–242, 2014.

- A. Gavryushkin and A. Nies. Universality for left-computably enumerable metric spaces. *Lobachevskii Journal of Mathematics,* 35, 4, 292–294, 2014.

- A. Gavryushkin, B. Khoussainov, M. Kokho, and J. Liu. Dynamic interval scheduling for multiple machines. *ISAAC 2014, Springer LNCS,* Vol. 8889, 235–246, 2014.

- A. Gavryushkin, S. Jain, B. Khoussainov, and F. Stephan. Graphs realised by r. e. equivalence relations. *Annals of Pure and Applied Logic,* 165, 7, 1263–1290, 2014.

- A. Gavryushkin, B. Khoussainov, M. Kokho, and J. Liu. Dynamising interval scheduling: the monotonic case. *IWOCA 2013, Springer LNCS,* Vol. 8288, 178–189, 2013.

- A. Gavryushkin and B. Khoussainov. On decidable and computable models of theories. *CiE 2013, Springer LNCS,* Vol. 7921, 200–209, 2013.

- A. Gavryushkin. On constructive models of theories with linear Rudin-Keisler ordering. *Journal of Logic and Computation,* 22, 4, 793–805, 2012.

- A. Gavryushkin. Computable models of Ehrenfeucht theories. *CRM Documents*, Centre de Recerca Matemàtica, Bellaterra (Barcelona), Vol. 11, 67–77, 2012.

- A. Gavryushkin. A new spectrum of computable models. *Bulletin of ISU. Series: mathematics,* 4, 4, 7–20, 2010.

- A. Gavryushkin. Computable limit models. *Programs, Proofs, Processes—CiE,* 188–193, 2010.

- A. Gavryushkin. Computable limit models for Ehrenfeucht theories. *Bulletin of ISU. Series: mathematics,* 3, 2, 56–61, 2009.

- A. Gavryushkin. Computable models of theories with linear Rudin-Keisler ordering. *Bulletin of NSU. Series: mathematics, mechanics, informatics,* 9, 2, 30–37, 2009.
- A. Gavryushkin. Spectra of computable models for Ehrenfeucht theories. *Algebra and Logic,* 46, 3, 149–157, 2007.
- A. Gavryushkin. On complexity of Ehrenfeucht theories with computable model. *Logical Approaches to Computational Barriers—CiE,* 105–108, 2006.
- A. Gavryushkin. Complexity of Ehrenfeucht models. *Algebra and Logic,* 45, 5, 289–295, 2006.

Invited Talks

July	2017	*SIAM Applied Algebraic Geometry*	Symposium talk
		Polyhedral and Combinatorial Biology Symposium	
		at Georgia Tech in Atlanta	
May	2017	*Interactions between algebra and the sciences*	Workshop talk
		at Max Planck Institute in Leipzig	
June	2016	*Evolution Meeting*	Spotlight session talk
		in Austin, Texas	
November	2015	*Computational Biology Group Seminar*	Seminar talk
		at ETH—Zurich	
February	2015	*Matsen Group Seminar*	Seminar talk
		at Fred Hutchinson Cancer Research Centre	
February	2015	*Workshop on Networks of Life*	Workshop talk
		at the University of Canterbury	
June	2014	*Algebra and Mathematical Logic:*	Special session talk
		Theory and Applications in Kazan	
November	2013	*Randomness Workshop*	Workshop talk
		at the University of Auckland	
November	2012	National University of Singapore	Seminar talk
March	2012	Auckland University of Technology	Seminar talk
October	2011	*Maltsev Meeting* in Novosibirsk	Plenary talk
October	2011	*Logic Seminar* at Cornell University	Seminar talk
September	2011	*Southern Wisconsin Logic Colloquium*	Seminar talk
		University of Wisconsin—Madison	
November	2009	*Computational Logic Seminar*	Seminar talk
		at CUNY Graduate Centre	
October	2009	*Logic Seminar* at Cornell University	Seminar talk
October	2009	*Logic Seminar*	Seminar talk
		at the University of Notre Dame	
November	2007	*Maltsev Meeting* in Novosibirsk	Plenary talk
September	2006	*Algebra and Logic Seminar*	Seminar talk
		at Novosibirsk State University	

June	2005	*Joint Seminar on Constructive Models* Notre Dame and Novosibirsk Universities	Seminar talk
November	2004	*Algebra and Logic Seminar* at Novosibirsk State University	Seminar talk

Contributed Talks

February	2016	*Computational Cancer Biology* at University of California, Berkeley	Participant
October	2015	*Alan Wilson Centre Annual Meeting* at Massey University	Long talk
February	2015	*The Interface of Mathematics and Biology* *NZ Phylogenomics Meeting* in Dunedin	Long talk
February	2014	*Workshop on Networks of Life* at the University of Canterbury	Participant
June	2013	*Mathematical and Computational* *Evolutionary Biology* in Montpellier	Participant
July	2013	*Computability in Europe* in Milan	Two contributed talks
July	2011	*Infinity Conference* in Barcelona	Contributed talk
July	2011	*Logic Colloquium* in Barcelona	Contributed talk
July	2010	*Logic Colloquium* in Paris	Contributed talk
June	2010	*Computability in Europe* in Azores	Contributed talk
May	2010	*Maltsev Meeting* in Novosibirsk	Contributed talk
August	2009	*Logic Colloquium* in Sofia	Contributed talk
June	2008	*Computability in Europe* in Athens	Contributed talk
July	2007	*Logic Colloquium* in Wroclaw	Contributed talk
July	2006	*Computability in Europe* in Swansea	Contributed talk

Grants

2018–2023	Principal Investigator and Coordinator of a Rutherford Discovery Fellowship from the Royal Society of New Zealand Contract #RDF-17-UOO-007 for NZ$ 800,000 (GST exclusive)
2012–2013	Associate Investigator of an FRDF grant from the University of Auckland Contract # 2795185 for NZ$ 200,000
2011–2013	Principal Investigator and Coordinator of a Russian Government Grant Contract # 16.740.11.0567 for US$ 50,000
2010–2012	Principal Investigator and Coordinator of a Russian Government Grant Contract # П1227 for US$ 65,000
2006–2010	Participant of a Russian Fund for Fundamental Research Grant
2003–2009	Participant of a Russian President Grant

Travel Grants

2012–2013	School of Computing, National University of Singapore
2011	University of Chicago, University of Wisconsin–Madison, and Cornell University
2011	Participation in the Logic Colloquium 2011
2010	Participation in the Logic Colloquium 2010
2010	Participation in the Computability in Europe 2010
2009	University of Notre Dame, Cornell University, and NYC University
2009	Participation in the Logic Colloquium 2009
2008	Participation in the Computability in Europe 2008
2008	Participation in the Summer School Marktoberdorf 2008
2007	Participation in the Logic Colloquium 2007
2006	Participation in the Computability in Europe 2006

Students

2017–present	Lena Collienne	Master	University of Greifswald
2015–2016	Lena Collienne	Intern	The University of Auckland (University of Greifswald)
2015–2016	Edwardo Reynolds	Intern	The University of Auckland

Teaching

2017–2017	ETH Zurich	Systems Genomics (636-0101-00L)
2012–2014	The University of Auckland	Discrete Structures in Math and CS (CompSci 225)
2013–2014	Auckland U of Technology	Engineering Mathematics I and II (715001/716001)
2013–2013	Auckland U of Technology	Finite Mathematics (715205)
2012–2012	Auckland U of Technology	Theory of Computation (717300)
2012–2012	The University of Auckland	Software Engineering Theory (SoftEng 211)
2010–2011	Irkutsk State University	Computable Model Theory
2009–2010	Irkutsk State University	Model Theory
2009–2011	Irkutsk State University	Mathematical Logic
2010–2011	Irkutsk State University	Discrete Mathematics
2009–2010	Irkutsk State University	Theory of Computation
2006–2009	Novosibirsk State University	Theory of Algorithms
2007–2009	Novosibirsk State University	Theoretical Programming
2007–2009	Novosibirsk State University	Mathematical Logic
2007–2008	Novosibirsk State University	Number Theory

Professional Affiliation

2016	Society of Systematic Biologists	Member
2016	The Geological Society of America	Member

Service to Department and University

2013	Auckland–Novosibirsk Workshop on Algebra, Logic, Geometry, and Combinatorics	Co-Chair of the Program Committee
2009	Maltsev Meeting	Organizing Committee
2007	Mathematics in the Modern World	Organizing Committee
2007	Domains VIII and Computability Over Continuous Data Types	Organizing Committee
2005	Asian Logic Conference	Organizing Committee

I am a regular reviewer for *AMS Mathematical Reviews*. I recently acted as a referee for:

- *Genome Biology and Evolution*
- *Systematic Biology*
- *Journal of Mathematical Biology*
- *Discrete Applied Mathematics*
- *LICS Symposium*
- *Algebra and Logic*

Up-to-date full CV: http://lab.gavruskin.com/alex/AGcv.pdf

Up-to-date short CV: http://lab.gavruskin.com/alex/AGcv_short.pdf