Dmitry Kolobkov

Personal profile

Since high school, I have developed interest in both mathematics and biology. I always liked solving complex and non-typical tasks; in past years I won awards in several national olympiads. In my undergraduate years, I was involved in mathematical modelling of biological processes. Now I am focused on statistics: my main occupation is to analyze and develop methodology for parameter estimation and experimental design in systems biology. Apart from this, my topics include machine learning for personalized medicine, population genetics and genogeography, genetic association studies.

Education

2012–present	**PhD**, *Department of Bioengineering and Bioinformatics*, Lomonosov Moscow State University.
2006–2012	**MSc, BSc**, *Department of Mechanics and Mathematics*, Lomonosov Moscow State University.

Master thesis

title	*A model of transcription regulation: complexity of Boolean programming*
supervisors	Lyubetsky V.A.

PhD thesis (in progress)

title	*Identification of a mathematical model using heterogeneous experimental data*
supervisors	Demin O.V.

Experience

2014–present	**Senior researcher**, *Laboratory of Animal Genetics*, Vavilov Institute of General Genetics, Russian Academy of Sciences, Moscow.
	Here, I am responsible for statistical analysis of genetic data as well as genogeography in application to sable populations. Analysis is conducted in R.
	One paper is published.
	tags: data cleaning, descriptive analysis, exploratory analysis, phylogenetic analysis, microsatellite data, discriminant analysis of principal components, genogeography
2014–present	**Senior researcher**, *Laboratory of Ecological Genetics*, Vavilov Institute of General Genetics, Russian Academy of Sciences, Moscow.
	Here, I am providing statistical support to genetic studies. This includes basic biostatistic procedures, meta-analysis, gene network analysis.
	Three papers published.
	tags: meta-analysis, SNP-SNP interaction, gene networks

2011–present	**Researcher**, Institute for Systems Biology, Moscow.
	Here, I am doing methodological work in application to systems biology, namely, parameter identification, confidence estimation, experimental design. Methods are evaluated in R. Parallelization is used for computer intensive procedures (such as Monte-Carlo simulations and bootstrapping).
	Two papers published. An R package is published. Three local conferences were attended.
	tags: experimental design, cross-validation, nonlinear regression, model linearization, confidence intervals, confidence regions, confidence bands, statistical tests, bootstrapping, Monte-Carlo simulations, model sloppiness, identifiability analysis, sensitivity analysis
2015	**Researcher**, Pathway Pharmaceuticals.
	Here, my task was to analyze gene and pathway expression of cancer patients and apply machine learning techniques to predict patient's response to a specific therapy.
	tags: personalized medicine, machine learning, random forest, gene expression, pathway expression
2009–2012	**Probationer researcher**, *Laboratory of Mathematic Methods and Models in Bioinformatics*, Kharkevich Institute for Information Transmission Problems, Russian Academy of Sciences, Moscow.
	Here, I was first testing, and then improving the model of attenuation regulation in bacteria, which is essentially a conglomerate of three simultaneous processes: transcription, translation and mRNA folding. The expectation of the exploratory variable was computed via Monte-Carlo method.
	Two courseworks and a master thesis were written. A local conference was attended.
	tags: mathematical modelling, Monte-Carlo simulations, bacteria attenuation, gene expression regulation, RNA secondary structure, transcription, translation

Languages

English	Fluent
Hebrew	Elementary
Russian	Native

Specific computer skills

LaTeX	document markup language
R	programming language
Beamer	R package for creating presentations
ggplot2	R package for visualization
Sweave/knitr	R package for dynamic reports & reproducible research
Linux	Parallel computing on a server

Other skills

o Good scientific writing

Hobbies

o Chess   o Backpacking

Publications

Oleg Demin Jr, Tatiana Yakovleva, Dmitry Kolobkov, and Oleg Demin. Analysis of the efficacy of sglt2 inhibitors using semi-mechanistic model. *The Emerging Discipline of Quantitative Systems Pharmacology*, page 21, 2015.

SN Kashtanov, GR Svishcheva, OE Lazebny, DS Kolobkov, SL Pishchulina, IG Meshchersky, and VV Rozhnov. Influence of anthropogenous factors on the genetic variety of the sable (martes zibellina l.). *Molecular Biology*, 49(3):397–402, 2015.

Maryam B Khadzhieva, Dmitry S Kolobkov, Svetlana V Kamoeva, Anastasia V Ivanova, Serikbay K Abilev, and Lyubov E Salnikova. Verification of the chromosome region 9q21 association with pelvic organ prolapse using regulomedb annotations. *BioMed research international*, 2015, 2015.

Dmitry Kolobkov, Oleg Demin, and Evgeny Metelkin. Comparison of asymptotic confidence sets for regression in small samples. *Journal of biopharmaceutical statistics*, pages 1–16, 2016.

LE Salnikova and DS Kolobkov. Germline and somatic genetic predictors of pathological response in neoadjuvant settings of rectal and esophageal cancers: systematic review and meta-analysis. *The Pharmacogenomics Journal*, 16(3):249–265, 2016.

Lyubov E Salnikova, Maryam B Khadzhieva, and Dmitry S Kolobkov. Biological findings from the phewas catalog: focus on connective tissue-related disorders (pelvic floor dysfunction, abdominal hernia, varicose veins and hemorrhoids). *Human genetics*, pages 1–17, 2016.