Grigory Sokolov (he/him/his)

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Education

08/14/2014	Ph.D. in Applied Mathematics (Concentraion: Statistics)
	Thesis: *"Multipopulation Optimal Change-point Detection"*
	Department of Mathematics,
	University of Southern California, Los Angeles, CA, USA
	Advisors: Alexander G. Tartakovsky and Sergey V. Lototsky
06/10/2008	M.S. in Applied Mathematics and Physics
	—Concentraion: Information Processing and Control Systems
	Department of Electrical Engineering and Cybernetics
	Moscow Institute of Physics and Technology, Moscow, Russia
	Advisor: Alexander P. Lukyanov
06/27/2006	B.S. in Applied Mathematics and Physics
	Department of Electrical Engineering and Cybernetics
	Moscow Institute of Physics and Technology, Moscow, Russia

Employment and Research Experience

2023 – present	Assistant Professor
	Department of Mathematics & Statistics
	The College of New Jersey, Ewing, NJ, USA
2017 – 2023	Assistant Professor
	Department of Mathematics
	Xavier University, Cincinnati, OH, USA
2014 – 2017	Visiting Assistant Professor
	Department of Mathematical Sciences
	Binghamton University, Binghamton, NY, USA
2008 – 2014	Graduate Research and Teaching Assistant
	Department of Mathematics
	University of Southern California, Los Angeles, CA, USA
2005 – 2008	Research Assistant
	Department of Electrical Engineering and Cybernetics
	Moscow Institute of Physics and Technology, Moscow, Russia

Areas of Professional Interest

Applied and Theoretical Probability and Statistics; Sequential Analysis and Hypothesis Testing; Change-Point Detection; Numerical Analysis; Programming.

Teaching Experience at TCNJ (The College of New Jersey)

Statistical Inference & Probability (STA 215)—Fall 2023, Spring 2024

A comprehensive introduction to descriptive statistics and the essential ideas of probability. Students will study foundations of classical parametric inference: point estimation, confidence intervals, hypothesis testing and common statistical techniques including simple regression and correlation.

Regression Analysis (STA 305)—Fall 2023

Regression concepts and techniques as a synthesis of theory, methods and applications. Topics include: multiple regression, interactions, partial and multiple correlation, polynomial regression and logistic regression and time series analysis.

Multivariable Calculus (MAT 229)—Spring 2024

Topics include: geometry of three dimensional space, derivatives of functions of several variables, integrals in dimension two and three, and Stokes' theorem.

Teaching Experience at Xavier University

General Statistics I (MATH 156)—Fall 2017, Fall 2018, Fall 2019, Spring 2020, Fall 2020, Fall 2021, Spring 2022, Fall 2022, Spring 2023

An introduction to the major concepts and tools used for collecting, analyzing, and making inferences from data. Topics include: graphical displays, correlation, introduction to probability theory, random sampling, experimental design, confidence intervals and hypothesis testing.

General Statistics II (MATH 158)—Spring 2018, Spring 2019

A second course in statistics covering various methods of data analysis. Topics include: t-tests, analysis of categorical data, estimation and inference of multiple regression models, ANOVA, and multiple comparisons. The ability to communicate and correctly interpret the results of a statistical data analysis is emphasized.

Probability and Statistics (MATH 256)—Fall 2022, Spring 2023

A major-level introductory course to probability and statistics. Similar to MATH 156 but with a more in-depth exploration of topics as well as hands-on simulations and data analysis using R. Topics include: graphical displays, correlation, introduction to probability theory, random sampling, experimental design, confidence intervals and hypothesis testing, linear regression.

Probability Theory (MATH 311)—Fall 2017, Fall 2020, Fall 2021

A formal introduction to probability theory for math majors. Topics include: sample spaces, basic axioms of probability, Bayes' theorem, expectation, common discrete and continuous distributions, moment generating functions, central limit theorem, inequalities, convergence of random variables, and transformations of random variables.

Statistical Inference (MATH 312)—Spring 2018, Spring 2020, Spring 2022, Spring 2023

Mathematical statistics for math majors. Topics include: maximum likelihood principle, Bayesian estimation, properties of estimators, sufficiency, likelihood ratio tests, chi-square distribution, t-distribution, F-distribution, power, nonparametrics, bootstrap, and Markov Chain Monte Carlo.

Actuarial Mathematics (MACS 201)—Spring 2019

An introduction to actuarial mathematics. Topics include: survival distributions and life tables, force of morality, laws of morality, life insurance, life annuities, benefit premiums, and benefit reserves.

Introduction to Statistics (MATH 516 online)—Summer 2018, Fall 2018, Summer 2019, Summer 2022

An introduction to statistical thinking and its applications to a wide variety of areas. Topics include: statistical and visual methods for summarizing data, basic principles of probability, regression, and fundamentals of hypothesis testing and confidence intervals. Critical examinations of the results of a statistical analysis in SAS are emphasized.

Statistics for Business I (STAT 210)—Fall 2019

An introductory course into statistics with focus on business applications and Excel. Topics include: descriptive statistics, basic probability, normal distribution, confidence intervals, regression, correlation, hypothesis tests, and analysis of categorical data within the context of business data; including the use of technology appropriate to business applications of these statistical concepts.

Teaching Experience Prior to Xavier University

As instructor of record at Binghamton University:

Mathematical Statistics (MATH 448)—Fall 2016

Topics include: statistical inference; estimation, confidence intervals and hypothesis testing; linear regression models, regression analysis.

Linear Algebra (MATH 304)—Spring 2017

Topics include: linear equations, matrices, Gaussian elimination; matrix algebra; vector spaces in R^n; linear transformations, orthogonality; quadratic forms.

Economic Forecasting (ECON 504)—Spring 2016

Topics include: statistics and econometric methods, time series analysis, forecasting techniques, evaluating economic forecasts.

Ordinary Differential Equations (MATH 324)—Fall 2016

Topics include: separable and exact differential equations; higher order linear equations, Green's function; Laplace transform.

Actuarial Mathematics I (MATH 450)—Fall 2014, Fall 2015

Topics include: Markov chains, Poisson processes, survival models, life tables, life insurance, life annuities.

Actuarial Mathematics II (MATH 452)—Spring 2015

Topics include: Markov chains, Poisson processes, survival models, life tables, life insurance, life annuities.

Introduction to Financial Mathematics (MATH 346)—Spring 2015, Fall 2015, Spring 2016

Topics include: basic interest theory, annuities, bonds, loans, amortization, asset-liability management, basic financial derivatives.

As teaching assistant at the University of Southern California:

Calculus III (MATH 226)—Spring 2014, Fall 2011

Topics include: vectors and geometry in R^3; partial derivatives; multiple integrals; vector calculus: Green's theorem, Stokes' theorem, divergence theorem.

Calculus I (MATH 125)—Spring 2011

Topics include: limits; continuity; derivatives and applications; antiderivatives; fundamental theorem of calculus; exponential and logarithmic functions.

Mathematics of Physics and Engineering (MATH 245)—Fall 2012

Topics include: first-order differential equations; second-order linear differential equations; determinants and matrices; systems of linear differential equations; Laplace transform.

Probability for Business (MATH 218)—Spring 2012

Topics include: basic probability; discrete and continuous distributions; expectation and variance; independence; sampling; estimation; confidence intervals; hypothesis testing.

Calculus for Business (MATH 118)—Summer 2011

Topics include: relations and functions; exponential and logarithmic functions; limits; continuity; derivatives; techniques of differentiation; chain rule; anti-derivatives; definite integrals; fundamental theorem of calculus.

Introduction to Mathematics for Business and Economics (MATH 117)—Summer 2011

Topics include: functions; graphs; polynomial and rational functions; exponential and logarithmic functions; matrices; systems of linear equations.

Publications

Tartakovsky, A.G., Pergamenchtchikov, S.M., Sokolov, G., "Optimal Sequential Detection in Multiple Data Streams", *in preparation.*

Sokolov, G., Spivak, V.S., Tartakovsky, A.G., "Detecting an Intermittent Change of Unknown Duration", *Sequential Analysis*, **42**:(3), pp. 269–302, 2023.

Tartakovsky, A.G., Sokolov, G., Bar-Shalom, Y., "Nearly Optimal Adaptive Sequential Tests for Object Detection", *IEEE Transactions on Signal Processing*, **68**, pp. 3371–3384, 2020.

Fellouris, G., Sokolov, G., "Second-order asymptotic optimality in multisensor sequential change detection", *IEEE Transactions on Information Theory*, **62**:(6), pp. 3662–3675, 2016.

Polunchenko, A.S., and Sokolov, G., "An Analytic Expression for the Distribution of the Generalized Shiryaev–Roberts Diffusion", *Methodology and Computing in Applied Probability*, **18**:(4), pp. 1153–1195, 2016.

Du, W., Polunchenko, A.S., and Sokolov, G., "On Robustness of the Shiryaev–Roberts Procedure for Quickest Change-Point Detection under Parameter Misspecification in the Post-Change Distribution", *Communications in Statistics – Simulation and Computation*, **46**:(3), pp. 2187—2208, 2015.

Polunchenko, A.S., Sokolov, G., and Du, W., "Toward Optimal Design of the Generalized Shiryaev–Roberts Procedure for Quickest Change-Point Detection under Exponential Observations", *Proceeding of the Engineering and Telecommunications 2014 International Conference*, Moscow Institute of Physics and Technology, Moscow, Russia, November 2014.

Du, W., Sokolov, G., and Polunchenko, A.S., "An Exact Formula for the Average Run Length to False Alarm of the Generalized Shiryaev–Roberts Detection Procedure under Exponential Observations", *Proceedings of the 12-th German-Polish Workshop on Stochastic Models, Statistics and Their Applications*, February 2015.

Polunchenko, A.S., Sokolov, G., and Tartakovsky, A.G., "Optimal Design and Analysis of the Exponentially Weighted Moving Average Chart for Exponential Data", *Sri Lankan Journal of Applied Statistics, Special Issue: Modern Statistical Methodologies in the Cutting Edge of Science*, **5**:(4), pp. 57–80, 2014.

Polunchenko, A.S., Sokolov, G., and Du, W., "Efficient Performance Evaluation of the Generalized Shiryaev–Roberts Detection Procedure in a Multi-Cyclic Setup", *Applied Stochastic Models in Business and Industry*, **30**:(6), pp. 723–739, 2014.

Polunchenko, A.S., Sokolov, G., and Du, W., "An Accurate Method for Determining the Pre-Change Run-Length Distribution of the Generalized Shiryaev–Roberts Detection Procedure", *Sequential Analysis*, **33**:(1), pp. 112–134, 2014.

Polunchenko, A.S., Sokolov, G., and Du, W., "On Efficient and Reliable Performance Evaluation of the Generalized Shiryaev–Roberts Change-Point Detection Procedure", *Proceedings of the 56-th Moscow Institute of Physics and Technology Annual Scientific Conference*, Moscow Institute of Physics and Technology, Moscow, Russia, November 2013.

Polunchenko, A.S., Sokolov, G., and Du, W., "Quickest Change-Point Detection: A Bird's Eye View", *Proceedings of the 2013 Joint Statistical Meetings (JSM-2013)*, Montréal, Québec, Canada, August 2013.

Tartakovsky, A.G., Polunchenko, A.S., and Sokolov, G., "Efficient Computer Network Anomaly Detection by Changepoint Detection Methods", *IEEE Journal of Selected Topics in Signal Processing*, **7**:(1), pp. 4–11, 2013.

Talks

05/22/2024	The 8-th International Workshop in Sequential Methodologies (IWSM), Utah Valley University, Orem, UT
07/21/2021	Bernoulli-IMS 10th World Congress in Probability and Statistics (online)
04/13/2020	Statistics Seminar, California State University Channel Islands (online)
07/30/2018	Joint Statistical Meetings (JSM), Vancouver, Canada
06/14/2017	The 34-th Quality and Productivity Research Conference (QPRC), University of Connecticut, Storrs, CT
01/08/2017	Joint Mathematical Meetings, Atlanta, GA
06/20/2016	The International Workshop in Applied Probability, Toronto, ON, Canada
04/23/2016	The 30-th New England Statistics Symposium (NESS), Yale University, New Haven, CT
04/22/2016	Finger Lakes Probability Seminar, Department of Mathematics at Cornell University, Ithaca, NY
10/16/2015	Statistics Seminar, Department of Mathematics, Computer Science, and Statistics at SUNY Oneonta, Oneonta, NY
06/23/2015	The 5-th International Workshop in Sequential Methodologies (IWSM), Columbia University, New York, NY
04/24/2015	The 29-th New England Statistics Symposium (NESS), University of Connecticut, Storrs, CT
11/19/2014	Corning Inc. Headquarters, Corning, NY
10/09/2014	Statistics Seminar, Department of Mathematical Sciences at SUNY Binghamton, Binghamton, NY
04/26/2014	The 28-th New England Statistics Symposium (NESS), Harvard University, School of Public Health, Cambridge, MA
07/19/2013	The 4-th International Workshop in Sequential Methodologies (IWSM), University of Georgia, Athens, GA
06/05/2013	The 30-th Quality and Productivity Research Conference (QPRC), GE Global Research, Niskayuna, NY
02/20/2013	The 11-th Workshop on Stochastic Models and Their Applications, Helmut Schmidt University, Hamburg, Germany
06/05/2012	The 29-th Quality and Productivity Research Conference (QPRC), California State University, Long Beach, CA

Service

Research With Undergraduate Students—As part of the Mathematics program at Xavier University, I've been supervising math-major senior research projects, aimed to acquaint students with academic life. This is a one-year-long endeavor where the undergraduate student, under the guidance of their advisor, writes a paper and makes a presentation to the general audience. Both paper and presentation are reviewed by principal faculty at the Math Department.

Sharing My Knowledge—my research-related programming code is available to anybody interested in the topic at https://github.com/ropufu.

Preview Mock Classes—I've been volunteering for and conducting mock classes for prospective students at Xavier University.

Calculus Sequence Revision Committee—I've been participating in the revision of the Calculus courses sequence offered by the Math Department at Xavier University.

Course Coordination—I've been coordinating introductory statistics courses at Xavier University.

Hiring Committee—I've been part of the hiring committee for a statistics position and an NTT teaching position at Xavier University.

Ohio River Cleanup—along with others, I've helped collect litter along the Ohio River bank in the vicinity of the Four Season's Marina.

Marker Recycling—I've established a pilot program for recycling used markers, pens, and pencils at Xavier University.

Contributing to Open-source Projects—I've identified a bug in .NET 6.0 (issue #68461) and proposed a solution (pull request #71851) that was merged into the main branch (https://github.com/dotnet/runtime).

Professional Societies

Institute of Mathematical Statistics (IMS), American Mathematical Society (AMS), New England Statistical Society (NESS).

Skills and Certifications

Programming experience: C++, C#, Julia; R, Mathematica, MATLAB; LaTeX.

Programming recognition: Microsoft Certified Professional (MS 70-536).

Teaching recognition: Ignatian Educator of Distinction, 2020.

Other: Completed "Introduction to Online Course Design" course at Xavier University in 2021.

Languages

Russian – *native*, English – *fluent*, French – *intermediate*, Japanese – *intermediate*.

Hobbies

Piano, sailing, hiking.