

Ksenia N. Kyzyurova*Name:* Ksenia Kyzyurova (AKA: Kseniia N. Kyziurova)*E-mail:* ksenia.kyzyurova@gmail.com*Mobile :* +1 323 713 8180*Skype:* ksenia_kyzyurova*Web:* <http://kseniak.ucoz.net/><http://stat.duke.edu/people/ksenia-kyzyurova>**Education**

Duke university	MSc (2014), PhD (2017)	Statistical science
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Trinity college of arts & sciences

Durham, North Carolina (NC), USA

Dissertation : *On Uncertainty Quantification for Systems of Computer Models*

Advisors: Jim Berger , Robert Wolpert

ITMO university	BSc (2009), MSc (2011)	Applied math & computer science
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Division of natural sciences

St.-Petersburg, Russia

Academic appointments

Research associate	The University of Sheffield, School of mathematics and statistics
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Sheffield, United Kingdom	May — October 2019
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Postdoctoral research associate	Brown university, Data science initiative
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Providence, Rhode Island (RI), USA	August — December 2018
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Postdoctoral fellow	King Abdullah university of science and technology
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Thuwal, Makkah Province, Kingdom of Saudi Arabia	September 2017 — May 2018
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Other scientific appointments

Graduate research assistant	Los Alamos National Lab (LANL), CCS-6 Statistical sciences division
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Los Alamos, New Mexico (NM), USA	May — August 2016
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Scientific research interests

Mathematical models analysis

Testing scientific theories with experiments

Application areas

Mathematics, philosophy, data analysis, computer science, mathematical physics, computational fluid dynamics, engineering

Publications

1. Ksenia N. Kyzyurova, James O. Berger, and Robert L. Wolpert. Coupling Computer Models through Linking Their Statistical Emulators. *SIAM/ASA Journal on Uncertainty Quantification*, 6(3):1151–1171, 2018

DOI 10.1137/17M1157702

Direct coupling of computer models is often difficult for computational and logistical reasons. We propose coupling two computer models by linking independently developed Gaussian process emulators (GASPs) of these models. The linked emulator results in a smaller epistemic uncertainty than a direct GASP of the coupled computer model would have (if such a model were available). This feature is illustrated via simulations. The application of the methodology to complex computer models is demonstrated as well.

2. Software: Ksenia N. Kyzyurova. *LinkedGASP: Linked Emulator of a Coupled System of Simulators: R package version 1.0*. Comprehensive R Archive network (CRAN) repository, 2018

The previous publication is accompanied by this software which prototypes implementation for solutions to coupled emulators of large-scale simulations.

3. Ksenia N. Kyzyurova. *On Uncertainty Quantification for Systems of Computer Models*. PhD thesis, Duke University, 2017

In my dissertation I have developed and analyzed a fully probabilistic Bayesian framework for testing theoretical scientific models with respect to experimental data.

4. Irina V. Blinova, Ksenia N. Kyzyurova, and Igor Yu. Popov. Stokes flow driven by a Stokeslet in a cone. *Acta Mechanica*, 225(11):3115–3121, 2014

DOI 10.1007/s00707-014-1117-1

We consider an axisymmetric Stokes flow in an infinite right circular cone, which has a source of momentum (a Stokeslet) on its axis. It produces an infinite sequence of eddies in the conical flow region. A boundary problem for a stream function is solved. The picture of the streamlines is obtained. We investigate an eddy structure of the flow. The results can be used for constructing nanoreactors while carrying out chemical reactions in strictly localized nanosized spatial regions.

Ksenia N. Kyzyurova. Mathematical modeling of a liquid flow driven by a Stokeslet in a cone (in Russian). *Transactions of a students' research center of Applied Mathematics, ITMO University*, 2011

Monographs

Ksenia N. Kyzyurova. *Analysis of scientific computer models. Methodology in numerical simulator data analysis*. ■, 2019

This monograph provides methodological foundation for analysis of data from scientific computationally challenging mathematical models. Mathematical topics include statistical modelling, Bayesian inference, stochastic processes, and decision-theoretic model assessment.

The publications and the monograph are available from me upon request or may be found on my web-site <http://kseniak.ucoz.net/> .

Ksenia N. Kyzyurova. *Stochastic processes*. ■, 2019

Ksenia N. Kyzyurova. *Philosophy of mathematical statistics (in Japanese)*. ■, 2020

Mathematical notes on data analysis

Ksenia N. Kzyurova. *Calibration of mathematical computer models.* ■, 2019

Ksenia N. Kzyurova. *On log-transformation of a computer model data. Emulation of a positive continuous simulator.* ■, 2019

Ksenia N. Kzyurova. *On scoring rules.* ■, 2019

Ksenia N. Kzyurova. *On linear model of coregionalization.* ■, 2019

Ksenia N. Kzyurova. *Probabilistic hazard assessment using the computer model of a volcano pyroclastic flow whose output is zero-inflated.* ■, 2020

Developed teaching courses

Ksenia N. Kzyurova. *Stochastic processes for analysis of data from mathematical models.* 2019

Ksenia N. Kzyurova. *Bayesian metaphysics for experimental data.* 2020

Ksenia N. Kzyurova. *Data analysis within subjective and objective inference.* 2020

Teaching appointments

Research and teaching assistant

Duke university, Department of statistical science

Durham, NC, USA

August 2012 — August 2017

Courses assisted with:

Bayesian and modern statistics (STA 601) ($\times 3$),
Introduction to mathematical statistics (STA 611),
Data analysis/statistical inference (STA 101).

Research assistant and teaching instructor

ITMO university, Department of mathematics

St.-Petersburg, Russia

September 2009 — June 2012

Courses taught:

Functional analysis,
Mathematical analysis.

Awards

US National Science Foundation (NSF) travel grant awards to participate in

Model uncertainty: mathematical and statistical, SAMSI workshop, Durham, NC, awarded in August 2018,

Rosbypalooza: Climate meets statistics workshop, Chicago, IL, awarded in July 2016,

Uncertainties in the Geosciences: a workshop on hazard analysis, Buffalo, NY, awarded in January 2016,

OBayes-15 conference, Valencia, Spain, awarded in May 2015;

SIAM student travel award to participate in *Uncertainty Quantification (UQ16)* conference, Lausanne, Switzerland, awarded in December 2015.

Research grant from the city government of St.-Petersburg, Russia; competitive award for outstanding research proposals, awarded in November 2011.

Best MSc students research work, ITMO university, June 2011.

Selected research presentations

On emulation of zero-inflated output of a computer model. *Seminar at Statistical and Mathematical Modeling Working Group*, Brown University School of Public Health, Providence, RI, USA, October 26, 2018

Emulation of computer models with multivariate output. *SIAM conference on Uncertainty Quantification (UQ18)*, Garden Grove, California (CA), USA, April 16-19, 2018

Bayesian inverse problem in the framework of the linked emulator of a system of computer models. *Seminar at the Department of Statistical Science, Duke University*, Durham, NC, USA, September 12, 2016

Coupling computer models through linking their statistical emulators. *Los Alamos National Laboratory (LANL) Statistical Sciences Seminar*, Los Alamos, NM, USA, May 11, 2016

Coupling computer models through linking their statistical emulators. *SIAM conference on Uncertainty Quantification (UQ16)*, Lausanne, Switzerland, April 5-8, 2016

Linking statistical emulators. 11th International Workshop on Objective Bayes Methodology (OBayes-15), June 1-5, 2015. Valencia, Spain

Professional activities

Objective Bayes group of International society for Bayesian analysis (ISBA) *Life-time member*;

Reviewer for *Environmetrics*, 2017, Mathematics and Statistics, 2022;

Student mentor for PhD students, 2016 - 2017, Department of statistical science, Duke university;

VIP Consultant March 20-22, 2015 ASA DataFest 2015, Duke University, Durham, NC, USA;

Member of Uncertainty in complex models (UCM).

Previous memberships: American statistical association (ASA), Royal statistical society (RSS), Society for industrial and applied mathematics (SIAM), Institute of mathematical statistics (IMS), Uncertainty quantification (SIAG/UQ, GAMM AG UQ).

Previous and current cooperation partners

Los Alamos National Laboratory, CCS-6 Statistical Sciences Division, Los Alamos, NM, USA;

Marquette University, Department of Mathematics, Statistics and Computer Science, Milwaukee, WI, USA;

State University of New York at Buffalo, Department of Geological Sciences, Department of Mechanical and Aerospace Engineering, Department of Materials Design and Innovation, Buffalo, NY, USA.

Programming

R, Matlab, Mathematica, Java, C/C++, HTML/CSS

Hobbies

Dancing (Ballet school diploma with honours by the Ministry of Culture of Russian Federation), playing the piano (two diplomas with honours by the Ministry of Culture of Russian Federation, including Rimsky-Korsakov music school in St.-Petersburg, Russia), Taiji (obtained grade B in physical education from the Academic gymnasium of St.-Petersburg state university, Russia).

Other activities

American Red Cross donor

Languages

Russian (native), English (fluent)