

Curriculum Vitae

Name: Maria Veretennikova

Date of birth: 29.05.1988

Email: maria.veretennikova<at> warwick.ac.uk

Skype: maria.veretennikova

Current status: Postdoctoral Research Fellow

Academic and industrial positions

01/09/2020-present: Postdoctoral Research Fellow, University of Warwick, Coventry, United Kingdom, supervisor - David A. Rand

01/09/16 -31/08/2020: Assistant Professor, National Research University Higher School of Economics, Department of Statistics and Data Analysis, Moscow, Russia

08/06/2020-31/07/2020: Lead Research Engineer, Artificial Intelligence Team, Theory Lab, Huawei, Moscow, Russia

15/08/15-15/05/16: Visiting Assistant Professor, Michigan State University, East Lansing, MI, USA

Education

01/10/11-20/12/14: **Ph. D.** in Mathematics and Statistics, Controlled Continuous Time Random Walks and their position-dependent extensions, Mathematics and Statistics Doctoral Training Centre MASDOC, University of Warwick, United Kingdom, fully funded by EPSRC, supervisors: Prof. Vassili N. Kolokoltsov, Dr. Dario Spano. Viva presented on 21/11/2014

2011-2014: Warwick Postgraduate Interdisciplinary Science Transferable skills course

2010-2011: MASDOC MSc in Mathematics and Statistics with distinction, University of Warwick, UK

2006-2010: Honours First Class, Master of Mathematics Degree, University of Leeds, UK

Research interests: Machine learning applications for biology and medicine, optimal control and reinforcement learning, fractional calculus, Markov processes

Grants involved in and funding

2017-2019 Russian Science Foundation, Some topical problems of the applied stochastic analysis, project leader S. A. Molchanov, grant number 17-11-01098

2020-now: Cancer Research UK fully-funded Postdoctoral Research Fellowship

Awards

Best Lecturer 2020 and

Best Lecturer 2019 - both at the National Research University Higher School of Economics, Department of Statistics and Data Analysis, Moscow, Russia

Honourable Presentation - Summer School on information, control and optimisation at Voronovo, Moscow, Russia, 2018

Best poster award and plenary talk awarded - Modern Problems in Theoretical and Applied Probability conference, Russia, Novosibirsk, Sobolev Institute, Modern Problems in Theoretical and Applied Probability conference 2016

Teaching

Novosibirsk University, Russia:

Stochastic Processes and their Applications, seminar leader for an intensive short graduate course, August 2021

National Research University Higher School of Economics, Russia:

Selected lectures in **machine learning**: 3rd year BSc, Spring 2020
Research Seminar, 2nd year Masters, Fall 2019, Winter 2020
Data Mining, 2nd year Masters, Fall 2019, winter 2019
Data Mining, 4th year BSc, Fall 2019

Selected lectures in machine learning: 3rd year BSc, Spring 2019
Data Mining, Research Seminar, 2nd year Masters, Fall 2018, Winter 2019
Data Mining, 2nd year Masters, Fall 2018
Data Mining, 4th year BSc, Fall 2018

Selected lectures in machine learning: 3rd year BSc, Spring 2018
Research Seminar, 2nd year Masters, winter 2018
Data Mining, 2nd year Masters, Fall 2017
Data Mining, 4th year BSc, Fall 2017

Statistical Learning Theory, 4th year BSc, Fall 2016

Michigan State University, USA:

Statistical Analysis STT442, Spring Semester 2016
Probability STT441, Fall Semester 2015, Spring Semester 2016
Statistical Methods, STT200, Fall Semester 2015

University of Warwick, UK:

Discrete mathematics group supervisions, Term 1, 2012
Support class for ST403 Brownian Motion, Term 1, 2011

Student project and thesis supervisions:

2019-2020:
MSc 2nd year - 3 students, BSc 4th year - 2 students

2018-2019:
MSc 2nd year - 1 student, MSc 1st year, - 1 student, BSc 4th year - 1 student, BSc 3rd year - 1 student

2017-2018:
MSc 2nd year - 1 student, BSc 4th year - 2 students, BSc 4th year- 1 student, BSc 3rd year - 1

student, BSc 2nd year- 1 student. BSc group project supervision: 2 groups - 3 students each

2016-2017:

BSc 3rd year - 1 student, BSc 2nd year - 1 student

Talks at conferences, seminars and schools:

- **2021**, August: Probabilistic Summer School 2021, Novosibirsk, Russia, TimeTeller for precision medicine and pLNA for generating synthetic gene expression data (research talk)
- **2021**, August: Probabilistic Summer School 2021, Novosibirsk, Russia, Stochastic modelling of EEG data (research talk)
- **2020**, November: SBIDER seminar, University of Warwick, TimeTeller: a machine learning technique for circadian clock data analysis (research talk)
- **2020**, November: Lomonosov2020 conference, Moscow State University, Russia, Fractional HJB solution with reinforcement learning (research talk)
- **2020**, October: NRU HSE online, Machine learning and mathematical modelling for medicine, international open lecture for medical doctors and researchers (mixed research/educational talk)
- **2020**, January: Mathematical Institute, National Academy of Sciences of Belarus, invited by the academician I. V. Bernik. Special Probability Theory seminar. Probability theory for deep learning: Variational autoencoders and more, Minsk, Belarus, (educational talk)
- **2018** August: Stochastic Processes and their Applications workshop, Bielefeld, Germany, invited by M. Roeckner, (research talk)
- **2018** June: IPU and HSE Summer School on information, control and optimisation at Voronovo, Moscow, Russia, **“Worthy presentation” prize, (research talk)**
- **2017** December: Steklov Institute, Russian Academy of Sciences, Laboratory of Statistical Methods, conference on Probability Theory and Mathematical Physics, Saint Petersburg, (research talk)
- **2017** December: LSA winter meeting, HSE, Snegiri, Moscow, Russia, (research talk)
- **2017** November : Yaroslavl, Russia, Data Driven Autumn, MNIL “Discrete and computational geometry” Delonay Centre, *open lecture* part 2, (educational talk)
- **2017** November: Yaroslavl, Russia, Data Driven Autumn, MNIL “Discrete and computational geometry” Delonay Centre, *open lecture* part 1, (educational talk)
- **2017** March: Moscow, Russia, IITP, Structural Learning Theory seminar, (research talk)
- **2017** October: RUDN and MSU conference “Analytical and Computational Methods in Probability Theory and its Applications”, Moscow, Russia, (research talk)
- **2016** December: LSA winter meeting, HSE, Snegiri, Moscow, Russia, (research talk)
- **2016** August: Novosibirsk, Russia, Sobolev Institute, “Modern Problems in Theoretical and Applied Probability” conference, (research talk)
- 2014 Bilbao, Spain, BCAM FCPNLO workshop, Fractional calculus, (research talk)
- 2013 Bilbao, Spain, BCAM FCPNLO workshop, Fractional calculus, (research talk)
- 2013 Rennes, France, PDMP school, Markov Decision Processes, (research talk)
- 2012 Cambridge, UK, CCA-MASDOC conference, Applied Mathematics, Statistics and Analysis, (research talk)
- 2012 Manchester, UK, SIAM National SCC conference, Industrial and Applied Mathematics
- 2012 Dijon, France, MODE SMAI conference, Optimisation and Decision, (research talk)

Other recently attended events

- **2021 March: *Session Chair***, Stochastic Processes and Their Friends, Leeds, UK, online
- **2020 July:** Deep learning reinforcement learning summer school, Montreal, Canada, online

- **2019 August:** Data Study Groups collaborative hackathon - Challenge: Applying AI and machine learning to reveal the molecular basis of heart disease, Bristol and Alan Turing Institute, Bristol, United Kingdom (Our group's **white paper** is available at: https://www.turing.ac.uk/sites/default/files/2020-11/dsg_applying-ai-and-machine-learning.pdf)
- **2019 July:** International summer school "DeepLearn2019", Warsaw, Poland
- **2019 June:** International summer School "Probabilistic AI", Trondheim, Norway
- **2019 January:** The 5th International Winter School on Big Data "BigDat2019", Cambridge, UK
- **2018 January:** NRU HSE Qualification advancement program "Modern machine learning and methodology of teaching data analysis", HSE Voronovo, Moscow, Russia
- **2017 September:** Big Data Conference, Moscow, Russia
- **2017 July:** The 6th International Conference on Analysis of Images, Social Networks and Texts (AIST), Moscow, Russia
- **2017, spring:** regular Neural Networks seminar, Yandex, Moscow
- **2016 autumn:** regular Data Analysis seminar, Moscow State University, Department of Computational Mathematics and Combinatorics, Moscow
- **2016 November:** The Intensive School "Active and passive methods of the brain mapping", HSE, Moscow, Russia

Posters presented:

2019: Probabilistic AI summer school, Trondheim, Norway
 2018: Summer School, HSE Voronovo, Moscow, Russia
 2018: Stochastic Processes and their Applications workshop, Bielefeld, Germany
 2016: Novosibirsk, Russia, Sobolev Institute, Probability Theory and Applications conference in honour of Prof. Borovkov - **best poster award**

2014: Dynamic games and optimisation workshop, University of Warwick, UK
 2014: LMS London, UK
 2013: Partial Differential Equations Summer School, Milano, Italy
 2013: CCA-MASDOC meeting, Cambridge, UK

Other summer, winter schools and research activities:

2011: A short course: Introduction into stochastic processes, Leeds, United Kingdom
 2010: Summer school: Problems in hydrodynamics, Cergy-Pontoise University, Paris, France
 2009: Summer school for students: Contemporary Mathematics, Dubna, Russia

Research study groups 2010-2013: Geophysical Data Assimilation with Prof. A. Stuart 2010; Brain Imaging with Prof. J. Aston 2011; Modelling cloaking with Prof. J. Ockendon 2012; Oxford OCCAM Maths in Chemistry, July 2013.

Teamwork:

2020-now: collaborations with D. Rand, R. Dallmann, L. Usselman, G. Minas, V. Vasilyev, UK

2019-now: collaboration with I. Kaftanov, Lomonosov Moscow State University, Russia

2018-now: collaboration with A. Yu. Veretennikov, NRU HSE, Russia, University of Leeds, UK

2016-2020: supervising students' projects in statistics and data analysis, HSE, Moscow, Russia

2015-2018: collaboration with A. Sikorskii, Michigan State University, University of Arizona, USA

2012-2013: SIAM University of Warwick Student Chapter secretary; research study groups listed above, mentoring younger MASDOC students, UK

IT: Programming in MATLAB, R, Python – all used for published or submitted research publications and in teaching.

Languages: English (fluent), Russian (fluent), French (advanced, qualified), Spanish (beginner).

Personal qualities: Hardworking, dedicated, determined, attentive to detail, independent, enjoy solving complex problems, learning and teaching

Research interests

Machine learning applications in biology and medicine; optimal control. Subtopics include optimal drug administration for chronotherapy, brain data analysis, systems for circadian clocks

Continuous Time Random Walks and their scaling limits, fractional differential equations, Markov processes and applications, anomalous diffusion models - standard and with control; reinforcement learning

References are available upon request from:

1. Prof. Vassili Kolokoltsov, v.kolokoltsov <at> [warwick.ac.uk](mailto:v.kolokoltsov@warwick.ac.uk), former PhD supervisor, UK
2. Prof Vladimir Mkhitarian, vmkhitarian <at> [hse.ru](mailto:vmkhitarian@hse.ru), former supervisor at HSE, Russia (statistics)
3. Dr. Alla Sikorskii, sikorska <at> [msu.edu](mailto:sikorska@msu.edu), former collaborator at MSU, USA (statistics and medicine)

Current research in progress is related to:

Circadian rhythm modelling, gene expression dynamics and biomarkers for cancer development

Reinforcement learning for controlled Continuous Time Random Walks and their limits

Markov processes

List of publications

A. Veretennikov, M. Veretennikova, [On the notion of Markov-up processes](#), The 5th International Conference on stochastic methods, Nov. 2020, conference proceedings

Veretennikova M., Veretennikov A., [On convergence rate for homogenous Markov chains](#), *Doklady Journal of the Russian Academy of Sciences, Mathematics*, 2020

Extended preprint: Veretennikov A., Veretennikova M., [On convergence rate for homogenous Markov chains](#)/ Cornell University. Series "Working papers by Cornell University". 2019.

Veretennikova M., Sikorskii A., Boivin M. J. [Parameters of stochastic models for electroencephalogram data as biomarkers for child's neurodevelopment after cerebral malaria](#), *Journal of Statistical Distributions and Applications, USA*. 2018. Vol.5:8. P.1-12.

Veretennikova M., Sikorskii A., Boivin M. [Data mining in predicting neuro-developmental scores from EEG data in coma due to cerebral malaria](#), Proceedings of the International Scientific Conference "Analytical and numeric methods in probability theory and its applications", pp. 380-383, 2017, RUDN.

Veretennikova M., [Kolokoltsov V.](#), [The fractional Hamilton-Jacobi-Bellman equation](#), *Journal of Applied Nonlinear Dynamics*. 2017. Vol.6. No.1. P.45-56.

Veretennikova M., [Kolokoltsov V.](#), [A fractional Hamilton Jacobi Bellman equation for scaled limits of controlled Continuous Time Random Walks](#), *Communications in Applied and Industrial Mathematics*. 2015. Vol. 6. No.1. P.1-18.

Veretennikova M., [Kolokoltsov V.](#), [Well-posedness and regularity of the Cauchy problem for nonlinear fractional in time and space equations](#), *Fractional Differential Calculus Journal*. 2014. Vol. 4. No.1
