Anna Melnykova

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Born on 28 February 1994 in Kiev, Ukraine.
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Currently I am a PhD student in University of Cergy-Pontoise (in co-direction with University of Grenoble Alpes). My thesis is devoted to statistical methods for stochastic diffusions with a degenerate variance coefficient. In particular, I work on parametric inference for fully- and partially observed processes, approximation schemes and hypothesis testing.

Language proficiency:
English (fluent)
French (advanced)
German (advanced)
Russian, **Ukrainian** (native)

Programming language proficiency:
R: `RCpp`, `RMarkdown`
Python: `numpy`, `scipy`, `pelican`
Notions of **Julia**, **MatLab** and **Mathematica**
LaTeX, Markdown, `vim`

Education

2017–2020	PhD candidate in Mathematics	Université de Cergy-Pontoise 🇫🇷

Subject: Statistics for Neuroscience.
Supervisors: Eva Löcherbach (Sorbonne Université), Adeline Samson (Université Grenoble Alpes)

2016–2017	M.Sc. in Statistics	Université Grenoble Alpes 🇫🇷

Thesis: Parametric estimation techniques in hypoelliptic ergodic diffusions.
Supervisor: Adeline Samson (Université Grenoble Alpes)

2014–2016	M.Sc. in Mathematics	National Technical University of Ukraine 🇺🇦

Thesis: Asymptotic behaviour of solutions of SDEs.
Supervisor: Oleg Klesov (NTUU "KPI")

2015–2016	Exchange student in Financial Mathematics	University of Ulm 🇩🇪

During my stay I was also employed by University of Ulm as a teacher assistant (*"Studentische Hilfskraft"*) at the undergraduate course *"Höhere Mathematik I für Physiker"*.

Scholarships & Grants

2019	"Research in Pairs" grant from Oberwolfach research center *Jointly with Irene Tubikanec (JKU Linz, Austria)*	
2018	Travel grant to a Master Class organized by Henri Lebesgue Centre in Angers	200 Euro
2018	"Young Researcher" grant for participation in CEMRACS research session	2500 Euro
2016	IDEX Academical Excellence Scholarship for international Master students	5000 Euro
2015	Baden-Württemberg Stiftung Scholarship for exchange students	2400 Euro

Schools & Formations during PhD

2018	Masterclass on Ergodicity of Stochastic Processes	Angers, France
	Markov processes • Coupling Methods • Functional Inequalities • Gibbs sampling • Quasi-Stationary Distributions	
2018	Health Data Challenge	Aussois, France
	Matrix factorization • deconvolution methods • tumor heterogeneity in cancer research	
2018	CEMRACS 2018 (summer school + 5 weeks research session)	Luminy, France
	Horizontal gene transfer in bacteria populations • Numerical simulation of birth and death process • Hamilton-Jacobi PDE • Asymptotic-preserving numerical scheme	
2017	Winter School on Deterministic and Stochastic models in Neuroscience	Toulouse, France
	Mean field models • neural field equations • numerical methods • kinetic models of neuronal networks	

Talks

Conferences

Aug. 2019	Conference on Stochastic Analysis and Applications **(invited)**	Risør, Norway
	Statistical testing of the covariance matrix rank in multidimensional neuronal models	
June 2019	DynStoch 2019	Delft, Netherlands
	Statistical testing of the covariance matrix rank in multidimensional neuronal models	
June 2019	51èmes Journées de Statistique	Nancy, France
	Statistical testing of the covariance matrix rank in multidimensional neuronal models	
Sept. 2018	Stochastic Equations, Limit Theorems and Statistics of Stochastic Processes	Kiev, Ukraine
	Statistical challenges in Neuroscience	
June 2018	DynStoch 2018	Porto, Portugal
	Parametric inference for multidimensional hypoelliptic diffusion	
May 2018	50èmes Journées de Statistique	Paris Saclay, France
	Parametric inference for multidimensional hypoelliptic diffusion	

Seminars & Working groups:

Nov. 2019	Seminar of LJAD team	Nice, France
	Concentration inequalities for a covariance rank estimation in multidimensional neuronal models	
Sep. 2019	Seminar of SAMM team, Sorbonne Université	Paris, France
	Parameter estimation in hypoelliptic ergodic diffusion with full observations	
April 2019	Seminaire du departement DATA	Grenoble, France
	Statistical testing of the covariance matrix rank in multidimensional neuronal models	
Nov. 2018	Demi-journée des doctorants	Grenoble, France
	Parametric inference for multidimensional hypoelliptic diffusion	
Nov. 2018	Groupe de Travail Math-Bio	Grenoble, France
	Horizontal Gene Transfer: numerical comparison between stochastic and deterministic approach	

Various:

March-May 2019	2 lectures at Probability Reading Group	LJK, Grenoble
	1st: *Construction of the Lebesgue Integral*	
	2d: *Ergodicity for dynamical systems*	

Scientific stays

Jan. 2020	2 weeks stay to work with Irene Tubikanec	Oberwolfach, Germany
Oct. 2019	2 weeks stay to work with Susanne Ditlevsen	Copenhagen, Denmark
2019	Several short stays to work with Patricia Reynaud-Bouret	Nice, France

Teaching

2018-2020	*Méthodes statistiques pour la biologie*	L3 in UFR IM2AG	36h/an, TP
2018-2019	*Statistique et Probabilité Inférentielles*	L2 in UFR Science et Économie	20h, TD

Various organizational activities

2019	*Congrès MATh.en.JEANS 2019*	Grenoble, France
	Member of local [volunteering] organizing committee	

Publications

Accepted:

2019 V. Calvez, S.F. Iglesias, H. Hivert, S. Méléard, **A. Melnykova**, S. Nordmann *"Horizontal gene transfer: numerical comparison between stochastic and deterministic approaches"* (to appear in "ESAIM: Proceedings and Surveys")

Submitted:

2019 **A. Melnykova** *"Parametric inference for multidimensional hypoelliptic ergodic diffusion with full observations"*

In preparation:

2019 **A. Melnykova**, P. Reynaud-Bouret, A. Samson *"Concentration inequalities for an estimator of covariance matrix rank in neuronal models"*

2020 J. Chevallier, **A. Melnykova**, I. Tubikanec *"The construction of numerical splitting schemes for the hypoelliptic diffusion arising as a limit of Hawkes processes with Erlang kernels."*

2020 S. Ditlevsen, **A. Melnykova**, A. Samson *"Estimation in a multi-class systems of interacting neurons"*