Andrey Sarantsev

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Research Interests

Probability, Statistics, Stochastic Analysis, Biostatistics, Stochastic Finance

Brownian and Lévy particle systems interacting through ranks; Reflected diffusions and jump-diffusions; Concentration of measure for stochastic ordinary and partial differential equations; Systemic risk and financial contagion in banking systems; Statistical analysis of stock and bond markets; Risk theory and ruin probability; Stochastic portfolio theory; Regression analysis of forest dynamics.

Employment

University of Nevada, Reno (UNR)
Department of Mathematics and Statistics
Assistant Professor (tenure-track), 2018–now

University of California, Santa Barbara (UCSB)
Department of Statistics and Applied Probability
Visiting Assistant Professor, 2015–2018
Mentor: Jean-Pierre Fouque
Partially supported by his NSF grant DMS 1409434

Education

University of Washington, Seattle
Ph.D. in Mathematics, 2010–2015
Adviser: Soumik Pal
Thesis: Competing Brownian Particles

Lomonosov Moscow State University, Moscow, Russia
Specialist (Master's equivalent) with Honors in Mathematics, 2005–2010
Undergraduate Mentor: Vladimir Piterbarg

57th mathematics high school
Top math high school in Moscow, Russia, 2001–2005

Published Papers

1. Talagrand Concentration Inequalities for Stochastic Partial Differential Equations (2019).
   With Davar Khoshnevisan. *SPDE Anal. Comp.* **7** (4), 679–698. Available at arXiv:1709.07098.
2. Stationary Distributions and Convergence of Walsh Diffusions (2018).
   With Tomoyuki Ichiba. *Bernoulli* **25** (4A), 2439–2478. Available at arXiv:1706.07127.
3. Dynamic Contagion in a Banking System with Births and Defaults (2019).
   With Tomoyuki Ichiba and Michael Ludkovski.
   Ann. Finance. **15** (4), 489–538. Available at arXiv:1807.08987.
4. Comparison Techniques for Competing Brownian Particles (2019).
   J. Th. Probab. **32** (2), 545–585. Available at arXiv:1305.1653.
5. Brownian Particles with Rank-Dependent Drifts: Out-of-Equilibrium Behavior (2019).
   With Manuel Cabezas, Amir Dembo, Vladas Sidoravicius.
   Comm. Pure Appl. Math. **72** (7), 1424–1458. Available at arXiv:1708.01918.
6. Large Rank-Based Models with Common Noise (2019).
   With Praveen Kolli. *Statistics and Probability Letters* **151**, 29–35. Available at arXiv:1802.06202

7. A Note on Transportation Cost Inequalities for Diffusions with Reflections (2019).
With Soumik Pal. *Electr. Comm. Probab.* **24** (21), 1–11. Available at arXiv:1808.02164.
8. Modeling Systemic Risk with Interbank Flows, Borrowing, and Investing (2018).
With Aditya Maheshwari. *Risks* **6** (4), 1–26. Available at arXiv:1707.03542.
9. Weak Convergence of Obliquely Reflected Diffusions (2018).
Ann. Inst. H. Poincare **54** (3), 1408-1431. Available at arXiv:1509.01778.
10. Multiple Collisions in Systems of Competing Brownian Particles (2018).
With Cameron Bruggeman. *Bernoulli* **24** (1), 156-201. Available at arXiv:1309.2621.
11. Infinite Systems of Competing Brownian Particles (2017).
Ann. Inst. H. Poincare **53** (4), 2279-2315. Available at arXiv:1403.4229.
12. Yet Another Condition for Absence of Collisions for Competing Brownian Particles (2017).
With Tomoyuki Ichiba. *Electr. Comm. Probab.* **22** (8), 1-7. Available at arXiv:1608.07220.
13. Stationary Gap Distributions for Infinite Systems of Competing Brownian Particles (2017).
With Li-Cheng Tsai. *Electr. J. Probab.* **22** (56), 1-20. Available at arXiv:1608.00628.
14. Reflected Brownian Motion in a Convex Polyhedral Cone: Tail Estimates for the
Stationary Distribution (2017). *J. Th. Probab.* **30** (3), 1200-1223. Available at arXiv:1509.01781.
15. Two-Sided Infinite Systems of Competing Brownian Particles (2017).
ESAIM Probab. Stat. **21**, 317-349. Available at arXiv:1509.01859.
16. Explicit Rates of Exponential Convergence for Reflected Jump-Diffusions on the Half-Line (2016).
ALEA Lat. Am. J. Probab. Math. Stat. **13** (2), 1069-1093. Available at arXiv:1509.01783.
17. Penalty Method for Reflected Diffusions on the Half-Line (2016).
With Cameron Bruggeman. *Stochastics* **89** (2), 485-509. Available at arXiv:1509.01776.
18. Diverse Market Models of Competing Brownian Particles with Splits and Mergers (2016).
With Ioannis Karatzas. *Ann. Appl. Probab.* **26** (3), 1329-1361. Available at arXiv:1404.0748.
19. Triple and Simultaneous Collisions of Competing Brownian Particles (2015).
Electr. J. Probab. **20** (29), 1-28. Available at arXiv:1401.6255.
20. On a Class of Diverse Market Models (2014).
Ann. Finance **10** (2), 291-314. Available at arXiv:1301.5941.

Accepted Papers

1. Exponential Convergence Rate of Ruin Probabilities for Level-Dependent Levy-Driven Risk Processes (2019).
With Pierre-Olivier Goffard. To appear in *J. Appl. Probab.* Available at arXiv:1710.01845.
2. Stable Systems of Competing Levy Particles (2019).
With Clayton Barnes. Available at arXiv:1610.04323.

Other Papers

1. A Note on Bayesian Long-Term S&P 500 Factor Investing (2019).
With Taran Grove and Akram Reshad. Available at arXiv:1905.04603.
2. The Size Effect Revisited (2019).
With Brandon Flores, Taran Grove, and Yi Liu. Available at arXiv:1907.08911.
3. Partisan Lean of States: Electoral College and Popular Vote (2019).
Available at arXiv:1905.04444.
4. Penalty Method for Obliquely Reflected Diffusions (2019).
With Charles Amponsah. Available at arXiv:1509.01777.
5. Stationary Distributions and Convergence for M/M/1 Queues in Interactive Random Environment (2019).
With Yana Belopolskaya, Guodong Pang, and Yurii Suhov. Available at arXiv:1902:03941.
6. Laguerre and Jacobi Analogues of the Warren Process (2017).
Appendix for the paper by Yi Sun. Available at arXiv:1610.01635.

Fellowships and Awards

2010	Academic Excellence Award, McKibben & Merner Fellowship (2-year), for passing Preliminary (Qualifying) Exams at the beginning of the first year of the PhD program
2010	Top Report Award on the 17th International Conference "Lomonosov-2010"
2005–2010	Academic Fellowship, Lomonosov Moscow State University (7 times)
2002, 2005	Honorable Mention, Moscow Mathematical Olympiad

Teaching Experience

Assistant Professor, University of Nevada, Reno

2018–2019	**Instructor**: Probability I, Stochastic Processes
2019	**Mentor:** Undergraduate Research in Quantitative Finance

Visiting Assistant Professor, University of California, Santa Barbara

2015–2018	**Instructor**: Probability I; Applied Stochastic Processes I, II
2017–2018	**Mentor:** Undergraduate Research in Quantitative Finance

Ph.D. Student, University of Washington, Seattle

2012–2015	**Instructor:** Multivariable Calculus, Vector Calculus, Differential Equations, Matrix Algebra, Linear Analysis (PDE, systems of ODE), Probability I
2011, 2013	**Teaching Assistant:** REU Program in Inverse Problems
2011–2012	**Homework Grader:** Real Analysis (graduate level)
2010–2012	**Quiz Sections Instructor:** Multivariable Calculus (Calculus III)

Invited Talks

2019	INFORMS Annual Meeting in Seattle (two talks)
2018	Florida State University; Cornell University; Carnegie Mellon University; California State University, Los Angeles; University of Nevada, Reno; Frontier Probability Days; University of Minnesota, Twin Cities; UCSB (twice); University of Washington, Seattle; AMS Western and Eastern Fall Sectional Meetings
2017	AMS Western, Southweatern, and Central Fall Sectional Meetings; INFORMS Annual Meeting in Houston; Center for Financial Mathematics & Actuarial Research (UCSB) 10th anniversary conference; University of Utah; UCSB; Boston University; 9th Western Conference in Mathematical Finance; Seminar on Stochastic Processes (short talk); University of Maryland, College Park; University of Delaware; AMS Central Spring Sectional Meeting (three talks); University of Washington, Seattle
2016	SIAM Conference in Financial Mathematics; Michigan State University; Carnegie Mellon University; Oregon State University; University of Washington, Seattle (twice); University of Illinois, Chicago; Princeton University; Columbia University; City University of New York
2015	Southern California Probability Symposium; University of Southern California; UCSB
2014	Columbia University; Seminar on Stochastic Processes (short talk); UCSB

Languages and Software

English (fluent), Russian (native); MATLAB, C, Python, R, LaTeX, HTML.

Personal Information

Born October 9, 1989, in Moscow, Russia. Citizenship: Russian.

Updated December 4, 2019