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. Autoregression Modeling of Forest Dynamics (2019).
   With Olga Rumyantseva and Nikolay Strigul.
   MDPI Forests **10** (12), 1074. Available at arXiv:1911.09182.
2. Exponential Convergence Rate of Ruin Probabilities for Level-Dependent Lévy-Driven Risk Processes (2019). With Pierre-Olivier Goffard. *J. Appl. Probab.* **56** (4), 1244–1268.
   Available at arXiv:1710.01845.
3. Talagrand Concentration Inequalities for Stochastic Partial Differential Equations (2019).
   With Davar Khoshnevisan. *SPDE Anal. Comp.* **7** (4), 679–698. Available at arXiv:1709.07098.
4. Stationary Distributions and Convergence of Walsh Diffusions (2018).
   With Tomoyuki Ichiba. *Bernoulli* **25** (4A), 2439–2478. Available at arXiv:1706.07127.
5. 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.

6. Comparison Techniques for Competing Brownian Particles (2019).
J. Th. Probab. **32** (2), 545–585. Available at arXiv:1305.1653.
7. 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.
8. Large Rank-Based Models with Common Noise (2019).
With Praveen Kolli. *Stat. Probab. Let.* **151**, 29–35. Available at arXiv:1802.06202
9. 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.
10. Modeling Systemic Risk with Interbank Flows, Borrowing, and Investing (2018).
With Aditya Maheshwari. *Risks* **6** (4), 1–26. Available at arXiv:1707.03542.
11. Weak Convergence of Obliquely Reflected Diffusions (2018).
Ann. Inst. H. Poincare **54** (3), 1408-1431. Available at arXiv:1509.01778.
12. Multiple Collisions in Systems of Competing Brownian Particles (2018).
With Cameron Bruggeman. *Bernoulli* **24** (1), 156-201. Available at arXiv:1309.2621.
13. Infinite Systems of Competing Brownian Particles (2017).
Ann. Inst. H. Poincare **53** (4), 2279-2315. Available at arXiv:1403.4229.
14. 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.
15. 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.
16. 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.
17. Two-Sided Infinite Systems of Competing Brownian Particles (2017).
ESAIM Probab. Stat. **21**, 317-349. Available at arXiv:1509.01859.
18. 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.
19. Penalty Method for Reflected Diffusions on the Half-Line (2016).
With Cameron Bruggeman. *Stochastics* **89** (2), 485-509. Available at arXiv:1509.01776.
20. 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.
21. Triple and Simultaneous Collisions of Competing Brownian Particles (2015).
Electr. J. Probab. **20** (29), 1-28. Available at arXiv:1401.6255.
22. On a Class of Diverse Market Models (2014).
Ann. Finance **10** (2), 291-314. Available at arXiv:1301.5941.

Accepted Papers

1. Stationary Distributions and Convergence for M/M/1 Queues in Interactive Random Environment (2019). With Yana Belopolskaya, Guodong Pang, and Yurii Suhov. To appear in *Brazilian J. Probab. Stat.* Available at arXiv:1902:03941.
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. 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 Theory, Stochastic Processes
2019	**Mentor:** Undergraduate Research in Quantitative Finance

Visiting Assistant Professor, University of California, Santa Barbara

2015–2018	**Instructor**: Probability Theory, Stochastic Processes
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)

Research Talks

2020	University of Montana; JMM in Denver (two talks)
2019	ASA Sectional Meeting ; INFORMS Annual Meeting in Seattle (two talks)
2018	Florida State University in Tallahassee; Cornell University; Carnegie Mellon University; California State University in Los Angeles; University of Nevada in Reno; Frontier Probability Days; University of Minnesota in Twin Cities; University of California in Santa Barbara (twice); University of Washington in 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; University of California in Santa Barbara; Boston University; 9th Western Conference in Mathematical Finance; Seminar on Stochastic Processes (short talk); University of Maryland in College Park; University of Delaware; AMS Central Spring Sectional Meeting (three talks); University of Washington in Seattle
2016	SIAM Conference in Financial Mathematics; Michigan State University in East Lansing; Carnegie Mellon University; Oregon State University in Corvallis; University of Washington in Seattle (twice); University of Illinois in Chicago; Princeton University; Columbia University; City University of New York, Graduate School
2015	Southern California Probability Symposium; University of Southern California; University of California in Santa Barbara
2014	Columbia University; Seminar on Stochastic Processes (short talk); University of California in Santa Barbara

Languages and Software

Languages: English (fluent), Russian (native);
Coding: MATLAB, C, Python, R;
Editors: LaTeX, HTML.

Personal Information

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

Updated January 8, 2020