Stanislav Minsker

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updated in October 2019

Professional experience

August 2015 – present: Assistant Professor, Department of Mathematics, University of Southern California.

June 2014 – August 2015: Quantitative Analytics team, Wells Fargo Securities.

August 2012 – August 2014: Visiting Assistant Professor, Department of Mathematics, Duke University.

Education

2007 - 2012 **Ph.D. in Mathematics**, *Georgia Institute of Technology*, Atlanta, Georgia.
Thesis title: *Non-asymptotic bounds for prediction problems and density estimation.* Advisor: Dr. V. I. Koltchinskii.

2002-2007 **B.S. in Mathematics**, *Novosibirsk State University*, Novosibirsk, Russia, *With Honors*.
Thesis title: *Invariance principle for the sequence of time series.* Advisor: Dr. I.S. Borisov.

Professional interests

Statistical Learning Theory: robust estimation, estimation under structural constraints, scalable algorithms, active learning, manifold learning.

Nonparametric statistics: functional data analysis, nonparametric Bayesian statistics.

Probability theory: concentration inequalities, limit theorems for empirical processes.

Mathematical finance.

Peer Reviewed Publications

Unless the publication is marked with (*), the order of authors is alphabetical. For publications marked with (*), the order of authors reflects the order in the published version.

[20] S. Minsker, joint with T. Mathieu. *Excess risk bounds in robust empirical risk minimization (2019).* Preprint. ArXiv:1910.07485.

[19] S. Minsker. *Uniform bounds for robust mean estimators (2019).* Under review. ArXiv:1812.03523.

[18] S. Minsker, joint with Yuan Ke, Zhao Ren, Qiang Sun and Wen-Xin Zhou. *User-Friendly Covariance Estimation for Heavy-Tailed Distributions: A Survey and Recent Results (2018).* Statistical Science 2019, Vol. 34, No. 3, 454-471. ArXiv:1811.01520.

[17] S. Minsker, joint with X. Wei. *Moment inequalities for matrix-valued U-statistics of order 2 (2018).* Under review (2nd round) in the Electronic Journal of Probability. ArXiv:1801.05921.

[16] S. Minsker, joint with X. Wei. *Robust modifications of U-statistics and applications to covariance estimation problems (2018).* Accepted for publication in the Bernoulli journal. ArXiv:1801.05565.

[15] S. Minsker, joint with X. Wei. *Estimation of the covariance structure of heavy-tailed distributions (2017).* Conference on Neural Information Processing Systems (NeurIPS) 2017; accepted for a spotlight presentation. ArXiv:1708.00502.

[14] S. Minsker. *Sub-Gaussian estimators of the mean of a random matrix with heavy-tailed entries (2018).* Annals of Statistics, Vol. 46, Num. 6A, pages 2871-2903. ArXiv:1605.07129.

[13] S. Minsker. *Distributed statistical estimation and rates of convergence in normal approximation (2018).* Under review in the Electronic Journal of Statistics. ArXiv:1704.02658.

[12] S. Minsker, joint with L. Goldstein and X. Wei. *Structured signal recovery from non-linear and heavy-tailed measurements (2018).* IEEE Transactions on Information Theory, Vol. 64, Iss. 8, pages 5513 - 5530. ArXiv:1609.01025.

[11] S. Minsker. *On some extensions of Bernstein's inequality for self-adjoint-operators. (2017)* Statistics & Probability Letters, 127. p. 111-119. ArXiv:1112.5448.

[10] S. Minsker, joint with M. Maggioni and N. Strawn. *Multiscale dictionary learning: non-asymptotic bounds and robustness (2016).* Journal of Machine Learning Research, 17(2):1-51. ArXiv:1401.5833.

[9] S. Minsker. *Geometric median and robust estimation in Banach spaces (2015).* Bernoulli, 21(4), 2308-2335. ArXiv:1308.1334.

[8*] S. Minsker, Y. Zhao and G. Cheng. *Active clinical trials for personalized medicine (2015).* Journal of the American Statistical Association, vol. 111, number 514, p. 875-887. ArXiv:1404.2971.

[7*] S. Minsker, S. Srivastava, L. Lin, and D. Dunson. *Robust and scalable Bayes via a median of subset posterior measures. (2017).* Journal of Machine Learning Research, 18(124):1-40. ArXiv:1403.2660.

[6] S. Minsker, joint with V. Koltchinskii. L_1 *- penalization in functional linear regression with Subgaussian design (2014).* Journal de l'École Polytechnique – Mathématiques, 1 (2014), p. 269-330. *.pdf.

[5] S. Minsker, joint with M. Maggioni and N. Strawn. *Multiscale dictionary and manifold learning: non-asymptotic bounds for the Geometric Multi-Resolution Analysis. (2014).* In Proceedings of the International Traveling Workshop on Interactions between Sparse Models and Technology (iTwist 2014).

[4*] S. Minsker, S. Srivastava, L. Lin, and D. Dunson. *Scalable and robust Bayesian inference via the median posterior. (2014).* Proceedings of the International Conference on Machine Learning (ICML 2014).

[3] S. Minsker. *Learning extreme values and associated level sets of a regression function via selective sampling. (2013)* In Proceedings of the Conference on Learning Theory (COLT 2013), p. 105-121.

[2] S. Minsker. *Plug-in approach to Active Learning (2012).* Journal of Machine Learning Research 13, p. 67-90.

[1] S. Minsker, joint with V. Koltchinskii. *Sparse recovery in convex hulls of infinite dictionaries. (2010)* In Proceedings of the Conference on Learning Theory (COLT 2010), p. 420-432.

External Funding

Oct 2019 - Sep 2022 **NSF CIF-1908905,** *"Towards Robust Statistical Learning: Theory and Algorithms,"* Communications and Information Foundations. **PI: Stanislav Minsker.** Amount: $351,330.

May 2019 (submitted/under review) HDR TRIPODS Phase I: The Data, Decisions, and Discovery Institute. Role: Senior Personnel (PI: Dr. Suvrajeet Sen). Budget: $1,500,000.

Feb 2018 ICM Travel grant from the American Mathematical Society. Amount: $3,300.

Sep 2017 - Aug 2020 **NSF DMS-1712956,** *"Bridging the Gap Between Theory and Applications: Robust and Scalable Statistical Estimation,"* Division of Mathematical Sciences. **PI: Stanislav Minsker.** Amount: $99,987.

Dec 2016 (awarded) - July 2017 Borchard Foundation, conference grant: *"A French/American Collaborative Colloquium on Probability and Statistics: Concentration Inequalities, High Dimensional Statistics, and Stein's Method,"* Co-PIs: J. Bartroff, L. Goldstein, S. Minsker. Amount: $30,000.

Dec 2016 (awarded) - Aug 2018 American Institute of Mathematics, conference grant: *"Stein's Method and Applications in High-dimensional Statistics,"* Co-PIs: J. Bartroff, L. Goldstein, S. Minsker, G. Reinert. Amount: $30,000 (approximately).

Honors and Awards

Fall 2010 Algorithms and Randomness Center Fellowship, Georgia Institute of Technology.

Past and Upcoming Conferences and Presentations

October 2019 Stochastics and Statistics Seminar at MIT **(Invited speaker)**.

September 2019 Workshop on High-Dimensional Covariance Operators and their Applications, Humboldt University of Berlin **(Invited speaker)**.

April 2019 SOCAMS 2019, Caltech **(Invited Plenary speaker).**

February 2019 Information Theory and ApplicationsWorkshop, San Diego **(Invited talk)**.

January 2019 Statistics and Data Science Symposium, UC San Diego **(Invited talk)**.

December 2018 Séminaire de Statistique CREST-CMAP, École Polytechnique, France **(Invited talk)**.

December 2018 CMStatistics Conference, Pisa, Italy **(Invited talk)**.

August 2018 TTI-Chicago Summer Workshop: Computational Efficiency & High-Dimensional Robust Statistics.

August 2018 International Congress of Mathematicians, Rio de Janeiro, Brazil **(Short oral communication).**

August 2018	Stein's method and applications in high-dimensional statistics, American Institute of Mathematics, San Jose, California **(Serve as one of the organizers + talk).**
June 2018	Stochastic Processes and Applications, Gothenburg, Sweden **(Invited talk).**
May 2018	Workshop on the Recent Developments in Statistical Theory and Methods Based on Distributed Computing, BIRS, Oaxaca, Mexico **(Invited talk)**.
March 2018	Workshop on Statistical Inference for Structured High-dimensional Models, Oberwolfach, Germany **(Invited talk).**
March 2018	Workshop on Structural Inference in Statistics: Adaptation and Efficiency, Berlin, Germany **(Invited talk).**
February 2018	Graduate student seminar at the CSU Channel Islands **(Invited expository talk).**
December 2017	Conference on Neural Information Processing Systems (NeurIPS 2017), Long Beach, CA **(Poster presentation).**
December 2017	Meeting in Mathematical Statistics. Lumini, France **(Invited to attend/abstract selected for presentation).**
December 2017	Probability and Statistics seminar, University of Nice, France **(Invited talk).**
August 2017	Joint Statistical Meetings (JSM 2017), Baltimore, MD **(Invited talk).**
July 2017	Colloquium on Concentration Inequalities, High Dimensional Statistics, and Stein's Method. Missillac, France **(Served as one of the organizers + talk).**
July 2017	University of Grenoble, Statistics seminar, Grenoble, France **(Invited talk).**
June 2017	SOCAMS 2017, UC Irvine **(Abstract selected for presentation).**
May 2017	High Dimensional Probability Conference (HDP 8), BIRS, Oaxaca, Mexico (talk).
March 2017	Georgia Institute of Technology, Stochastics Seminar **(Invited talk).**
February 2017	UCLA, Department of Statistics Seminar **(Invited talk).**
February 2017	SAMSI, Workshop on the Interface of Statistics and Optimization **(Invited talk).**
February 2017	Claremont Center for the Mathematical Sciences, Colloquium Series **(Invited talk).**
November 2016	USC Marshall School of Business, **(Invited talk).**
September 2016	SAMSI, Workshop on Distributed and Parallel Data Analysis **(Invited talk).**
September 2016	IMA Workshop "Transdisciplinary Foundations of Data Science" **(Poster session).**
July 2016	ICERM Workshop on Stochastic Numerical Algorithms **(Invited talk).**
June 2016	Workshop on generic chaining, Harvard University.
May 2016	UCLA, department of Biostatistics **(Invited talk).**
April 2016	University of Texas at Austin **(Invited talk).**
February 2016	Texas A&M University **(Invited talk).**
November 2015	Johns Hopkins University **(Invited talk).**
May 2014	The National Consortium for Data Science (NCDS) Data Innovation Showcase.
March 2014	SAMSI-CRM Workshop on Geometric Aspects of High-dimensional Inference.
February 2014	University of Maryland, College Park, Statistics Seminar **(Invited talk).**
October 2013	Purdue University, Machine Learning Seminar **(Invited talk).**
October 2013	Purdue University, Mathematical Statistics Seminar **(Invited talk).**
October 2013	University of Central Florida **(Invited Colloquium Talk).**
September 2013	Duke University iiD (Information Initiative at Duke) seminar.

July 2013	Duke University Workshop on Sensing and Analysis of High-Dimensional Data.
June 2013	2013 Conference on Learning Theory, Princeton University **(Abstract selected for presentation)**.
May 2012	High-dimensional data analysis Workshop, Oberwolfach, Germany **(Abstract selected for presentation)**.
August 2011	Limit Theorems in Probability Theory and Their Applications, Novosibirsk, Russia.
April 2011	ARC 4 (Algorithms and Randomness Center) workshop.
December 2010	2010 Meeting on Mathematical Statistics, Lumini, France.
April 2010	SIAM Student Seminar, Georgia Institute of Technology.

Teaching

Fall 2015, 2017	Developed and taught the graduate-level course "Mathematical Foundations of Statistical Learning Theory" (Math 547), USC.
Spring 2016, 2017, 2019	Instructor for the graduate-level course "Introduction to Time Series" (Math 545), USC.
Fall 2019, Fall 2016	Instructor for the graduate-level course "Introduction to Mathematical Statistics" (Math 541b), USC.
Spring 2019, Fall 2017	Instructor for the undergraduate-level course "Mathematical Statistics" (Math 408), USC.
Fall 2013	Instructor for the mini-course "Introduction to Statistical Learning Theory", Duke University.
Summer 2011	Instructor for the "Introduction to Probability and Statistics" course, Georgia Institute of Technology.
Summer 2009	Instructor for the "Introductory Statistics and Applications" course, Georgia Institute of Technology.

Students supervised

Shunan Yao, since March 2018	Ph.D., Mathematics, USC (in progress; co-supervised by X. Tong).
Lang Wang, since January 2018	Ph.D., Mathematics, USC (in progress).
Xiaohan Wei, March 2016 - July 2019	Ph.D. (graduated), Electrical Engineering, USC (co-supervised by M. Neely). Currently a Research Scientist at Facebook.
Jianwei Xiao, graduated in Fall 2016	Master's, Applied Mathematics. Currently is a Programming Analyst at Sears Holding.
Ranran Chen, graduated in Spring 2018	Master's, Applied Mathematics.

Service on the Qualifying Exams and Ph.D. Thesis Committees

2019 Jiajun Luo, USC Math (oral exam).

2019 Frank Hong, USC School of Philosophy (oral exam committee).

2019 Xiaohan Wei, USC Department of Electrical Engineering (thesis committee co-chair).

2018 Chao Deng, USC Computational Biology and Bioinformatics (thesis committee member; advisor: Andrew D. Smith).

2018 Jie Ruan (oral exam).

2018 Bowen Gang, USC Math (oral exam).

2017 Emre Demirkaya, USC Math (oral exam).

2017 Narae Lee, USC Math (oral exam).

2016 Jian Wang, USC Math (oral exam).

2016 Michael Hankin, USC Math (oral exam).

Professional Service

Organizer of the Probability and Statistics seminar, Spring 2016 - present, USC.

Organizer of the Invited session on High-dimensional Robustness at the 10th World Congress in Probability and Statistics, August 2020.

Organizing committee member (jointly with C. Butucea, V. Spokoiny and C. Pouet) for the 2020-2022 program "Meetings in Mathematical Statistics," a sequence of 3 conferences in CIRM, France.

Co-organizer of SOCAMS (Southern California Applied Mathematics Symposium) conference: 2016 – organizing committee member, 2018 – scientific committee member.

Co-organizer of the Statistical and Applied Mathematical Sciences Institute (SAMSI) working group: "Statistical Inference for Large Matrices under Complexity Constraints" (Fall – Spring 2013).

Reviewer for multiple journals in probability theory, mathematical statistics, machine learning, and general science, including Nature, the Journal of Machine Learning Research, the Annals of Statistics, Electronic Journal of Statistics, Machine Learning (Springer), Bernoulli Journal, Statistics and Probability Letters, Applied and Computational Harmonic analysis, European Journal of Statistics; peer-reviewed proceedings of the machine learning conferences: NeurIPS, COLT, ICML (multiple years).

Review panel member on the SBIR/STTR Phase I: Big Data; Advanced Data Analytics, National Science Foundation.

External reviewer for the Israel Science Foundation (ISF).

Technical skills

Development in C++, Matlab.

Practical knowledge of risk-neutral pricing theory and financial markets.