

Stanislav Minsker

email: minsker@usc.edu

<https://stasminsker.github.io>

Google Scholar: <https://goo.gl/vHvDxq>

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)*. Under review. [ArXiv:1910.07485](https://arxiv.org/abs/1910.07485).
- [19] S. Minsker. *Uniform bounds for robust mean estimators (2019)*. Under review. [ArXiv:1812.03523](https://arxiv.org/abs/1812.03523).
- [18] S. Minsker, joint with X. Wei. *Moment inequalities for matrix-valued U-statistics of order 2 (2019)*. Electronic Journal of Probability 24, No. 133, 1?32. [ArXiv:1801.05921](https://arxiv.org/abs/1801.05921).

- [17] 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](#).
- [16] S. Minsker, joint with X. Wei. *Robust modifications of U-statistics and applications to covariance estimation problems (2019)*. Bernoulli 26, No. 1, 694-727. [ArXiv:1801.05565](#).
- [15]¹ 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)*. Accepted for publication 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

March 2020	2020 Conference on Information Sciences and Systems, Princeton, NJ Invited speaker .
Oct 2019 - Sep 2022	NSF CIF-1908905 , " <i>Towards Robust Statistical Learning: Theory and Algorithms</i> ," 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 , " <i>Bridging the Gap Between Theory and Applications: Robust and Scalable Statistical Estimation</i> ," Division of Mathematical Sciences. PI: Stanislav Minsker . Amount: \$99,987.
Dec 2016 (awarded) - July 2017	Borchard Foundation, conference grant: " <i>A French/American Collaborative Colloquium on Probability and Statistics: Concentration Inequalities, High Dimensional Statistics, and Stein's Method</i> ," Co-PIs: J. Bartroff, L. Goldstein, S. Minsker. Amount: \$30,000.
Dec 2016 (awarded) - Aug 2018	American Institute of Mathematics, conference grant: " <i>Stein's Method and Applications in High-dimensional Statistics</i> ," 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.
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Past and Upcoming Conferences and Presentations

March 2020	2020 Conference on Information Sciences and Systems, Princeton, NJ (Invited speaker) .
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 Applications Workshop, 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, Master's, Applied Mathematics.
graduated in
Spring 2018

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.