

Stilian A. Stoev

April 19, 2019

Research Interests

- *Stochastic processes and time series*: The study of their dependence behavior, distributional invariance, and applications. In particular, long-range dependence, self-similarity, and stability.
- *Heavy tails and extremes*: Modeling and estimation in both independent and dependent contexts. *Stable* and *max-stable* distributions and processes: ergodicity, representation, and parameter estimation. Multivariate, spatial and functional extremes, and their applications to environmental, insurance and financial data.
- *Data intensive applications*: Streaming data, random sketches and methods for efficient sequential manipulation of data, structural modeling of high-frequency/large-volume computer network data. Monitoring, modeling, and analysis of multi-gigabit network traffic streams. Online anomaly detection and cybersecurity.
- *Computational risk management*: Obtaining dependence-universal bounds on portfolio risk functionals by using constrained optimization and extreme value theory.

Education

- 2005* Ph.D., Department of Mathematics and Statistics, Boston University, Boston, MA.
- 1998* M.Sc. in Mathematics (major in Probability and Statistics). Faculty of Mathematics and Informatics, Sofia University, Bulgaria.

Professional Experience

- 2017 – present* Professor. Department of Statistics, University of Michigan, Ann Arbor, MI.
- 2011 – 2017* Associate Professor. Department of Statistics, University of Michigan, Ann Arbor, MI.
- Summer 2016* Visiting Professor. University of Franche-Comté, Laboratoire de Mathématiques de Besançon, France. May-June, 2016.
- 2005 – 2011* Assistant Professor. Department of Statistics, University of Michigan, Ann Arbor, MI.
- 2003–2005* Research Assistant. Department of Mathematics and Statistics, Boston University, Boston, MA.
- 2000–2002* Teaching Fellow. Department of Mathematics and Statistics, Boston University, Boston, MA.

1999 Teaching Fellow. Department of Probability and Statistics, Faculty of Mathematics and Informatics, Sofia University, Bulgaria.

Fellowships and Awards

Fall 2003 Statistical and Applied Mathematical Sciences Institute (SAMSI), “Network modeling for the Internet” program. Graduate Fellow.

May 2002 Institute of Pure and Applied Mathematics (IPAM), “Large scale communication networks” program. Graduate Fellow.

June 2001 Mathematical Sciences Research Institute (MSRI), “Modern signal processing” program. Visiting Student.

1999 Presidential University Graduate Fellowship, Boston University.

1998 “TEMPUS” scholarship. Department of Statistical Science, University College of London. Visiting Student.

1994–1998 Bulgarian government grant for university students with excellent aptitude in Mathematics.

1995 “EVRIKA” foundation grant. Winner of the National Mathematics Olympiad for university students.

Grants

2015 – 2018 NSF grant in Statistics (DMS–1830293) *ATD: Collaborative Research: Extremal Dependence and Change-Point Detection Methods for High-Dimensional Data Streams with Applications to Network Cybersecurity*

Amount: \$270,000

Co-PI

2015 – 2018 NSF grant in Statistics (DMS–1462368) *FRG: Collaborative Research: Extreme value theory for spatially indexed functional data*

Amount: \$267,970.00

2015 – 2017 LSA Associate Professor Support Fund *Probability and Statistics for Multivariate Extremes*

Amount: \$30,000.00

Principal Investigator.

2015 The Alfred P. Sloan Foundation, Conference Grant: *EVA 2015: The 9th International Conference on Extreme Value Analysis*

Amount: \$10,000

Principal investigator.

2015 NSF Conference Grant: *EVA 2015: The 9th International Conference on Extreme Value Analysis*

Amount: \$15,000

Principal investigator.

- 2011 – 2014 NSF grant in Statistics (DMS–1106695) *Spatio-Temporal Dependence and Extremes with Applications to Networking and the Environment*
Amount: \$376,910.00
Principal Investigator, co-PI G. Michailidis.
- 2011 National Science Foundation (DMS-1208965) conference grant for *Conference on Long-Range Dependence, Self-Similarity, and Heavy Tails.*
Amount: \$5,000.00.
Principal Investigator.
- 2011 National Security Agency (H98230) conference grant for *Conference on Long-Range Dependence, Self-Similarity, and Heavy Tails.*
Amount: \$13,000.00.
Principal Investigator.
- 2010 – 2012 NSA grant: *Conditional Sampling of Extremes.*
Amount: \$26,491.00 (first year) and \$ 27,029.00 (second year, pending satisfactory completion of the first year).
Principal Investigator.
- 2008 – 2012 NSF grant in Statistics (DMS–0806094) *Extremes: Short and Long-Range Dependence; Modeling and Inference with Applications to Computer Networks and Risk Analysis.*
Amount: \$345,300.00.
Principal Investigator, co-PI G. Michailidis.
- 2006 Rackham Faculty Research Fellowship, University of Michigan. *Extreme value theory, stable processes, and applications to data mining.*
Amount: \$8,000.00. *Principal Investigator.*

Teaching

University of Michigan

- *STATS 509*: “Statistical Models and Methods for Financial Data,” graduate course, Fall 2016. Instructor.
- *STATS 620*: “Applied Probability and Stochastic Modeling,” graduate course, Winters of 2016 and 2018. Instructor.
- *STATS 621*: “Probability Theory,” graduate course, Winters of 2012, 2013, and 2014. Fall 2014. Instructor.
- *STATS 430*: “Applied Probability,” undergraduate course, Winters of 2011 and 2013. Fall 2014. Instructor.
- *MATH/STATS 425*: “Introduction to Probability,” undergraduate course, Winter 2010, Fall 2012 and Winter 2015. Instructor.
- *STATS 412*: “Introduction to Probability and Statistics,” undergraduate course, Fall 2005, Winter 2007, and Winter 2008. Instructor.

- *STATS 520*: “Mathematical Methods in Statistics,” graduate course, Falls of 2006, 2007, 2008, and 2009. Instructor.
- *STATS 710 & 711*: “Topics in Theoretical Statistics II,” graduate special topics courses, Winters 2006, 2014, and 2018. Instructor.
- *STATS 810*: “Literature Proseminar,” graduate course, Falls 2008 and 2017. Instructor.

Boston University

- *MA381*: “Elementary probability,” undergraduate course, Falls of 2000, 2001, and 2002. Teaching Fellow.
- *MA116*: “Statistics II,” undergraduate course, Spring 2002. Teaching Fellow.
- *MA113*: “Elementary Statistics,” undergraduate course, Summers of 2001 and 2005. Instructor.
- *MA124*: “Calculus II,” undergraduate course, Spring 2001. Teaching Fellow.

Sofia University

- “Probability II,” graduate course, Spring 1999. Teaching Fellow.
- “Probability and Statistics,” undergraduate course, Spring 1997. Teaching Fellow.

Advising

Current Ph.D. Students

- Zheng Gao.
Topic: Multiple testing in fast data streams.
Status: Advanced to candidacy in December 2017.
- Rafail Kartsioukas.
Topic: Anomaly detection in stochastic background with applications to cybersecurity.
Status: Advanced to candidacy in December 2018.
- Andrew Yarger (co-supervised with Tailen Hsing)
Topic: Functional data methods with applications to oceanography.
Status: Expected to advance to candidacy in May 2019.

Past Ph.D. Students

- Shrijita Bhattacharya – Ph. D. Statistics, The University of Michigan, 2018.
Thesis: Outlier Identification in Spatio-Temporal Processes
First position after graduation: Tenure-track assistant professor in the Statistics and Probability Department at Michigan State University.

- Robert Yuen – Ph.D. in Statistics, The University of Michigan, 2015.
Thesis: *Topics on Estimation, Prediction, and Bounding Risk for Multivariate Extremes*
First position after graduation: Research Statistician at Liberty Mutual, Seattle, Washington.
- Pramita Bagchi – Ph.D. in Statistics, The University of Michigan, 2015 (supervised jointly with Moulinath Banerjee).
Thesis: *Non-standard Statistical Inference Under Short and Long Range Dependence*
First position after graduation: Postdoctoral assistant at Ruhr University, Bochum, Germany (supervised by Prof. Dr. Holger Dette).
- Kohinoor Dasgupta – Ph.D. in Statistics, The University of Michigan, 2012. (supervised jointly with Vijay Nair and XuanLong Nguyen).
Thesis: *Inference on Neuronal Networks using Temporal and Graphical Models*.
First position after graduation: Research statistician at Novartis, India.
- Joel Vaughan – Ph.D. in Statistics, The University of Michigan, 2012. (supervised jointly with George Michailidis).
Thesis: *Problems in Spatio-Temporal Modeling Kriging, and Prediction of Computer Network Traffic*.
First position after graduation: Tenure track faculty at the Quinnipiac University, Hamden, Connecticut.
- Yizao Wang – Ph.D. in Statistics, The University of Michigan, 2012.
Thesis: *Topics on Max-stable Processes and The Central Limit Theorem*.
Award: Recipient of the *ProQuest Distinguished Dissertation Award, 2013*.
First position after graduation: Tenure track faculty at the University of Cincinnati, Ohio.
- Kamal Hamidieh – Ph.D. in Statistics, The University of Michigan, 2008 (jointly with George Michailidis). Thesis: *Topics in Statistical Modeling and Estimation of Extremes and Their Dependence*.
First position after graduation: Rice University, Department of Statistics postdoctoral fellow.

Ph.D. Committees

- Alexander Jenö Munk – Ph.D. in Mathematics, 2017, University of Michigan, Ann Arbor.
- Roman Gayduk – Ph.D. in Mathematics, 2017, University of Michigan, Ann Arbor.
- Johannes Goldbach – Ph.D. in Mathematics, 2016, University of Siegen, Germany.
- Dao Nguyen – Ph.D. candidate in Statistics (expected graduation, 2015), University of Michigan.
- Thomas Brown – Ph.D. in Statistics, 2014, University of Michigan.
- Nirupam Chakrabarty – Ph.D. in Statistics, 2014, University of Michigan.

- Frédéric Eyi–Minko – Ph.D. in Mathematics, 2013, University of Poitiers, France.
- Vladimir Dergachev – Ph.D. in Physics, 2009, University of Michigan.
- Harsh Singhal – Ph.D. in Statistics, 2009, University of Michigan.
- Matthew Linn – Ph.D. in Statistics, 2009, University of Michigan.

Undergraduate Students

- Hao Xu and Junyi Zhang – NSF RTG-funded Research (co-supervised with Tailen Hsing). Project: *Interactive statistical computing & visualization of functional data with applications to the Argo data*
- David Gerdes – NSF RTG-funded Summer Research (co-supervised with Prof. Mouninath Banerjee). Project: *Isotonic inference for monotone regression functions under long-range dependence. Statistical algorithms and software.*
- John Nowland – NSF RTG-funded Undergraduate Research (co-supervised with Dr. Michalis Kallitsis, Merit Network). Project: *Contributions to AMON: All Packet Monitoring platform for the analysis of fast network traffic streams.*
- Evan Pesch – NSF RTG-funded Undergraduate Research (co-supervised with Dr. Michalis Kallitsis, Merit Network). Project: *Contributions to AMON: All Packet Monitoring platform for the analysis of fast network traffic streams.*
- Han Wu – Undergraduate Honors in Statistics (co-advised with Prof. Tailen Hsing), The University of Michigan, 2018. Thesis: *Argo Data Mean Field Modeling.*
- Wu Han – Undergraduate Honors in Statistics (co-advised with Prof. Tailen Hsing), The University of Michigan, 2018. Thesis: *Analyzing Argo Data.*
- Weifeng Hu – Undergraduate Research Opportunities Program (UROP): Fall 2015 – Winter 2016. Project: *Statistics and Visualization of Multi-Gigabit Network Traffic Streams.*
- Matthew P. Conlen – Undergraduate Research Opportunities Program (UROP): Fall 2009 – Winter 2010. Project: *Global Statistical Models and Visualization of Computer Network Traffic.*
- Smrithi Srinivasan – Undergraduate Honors, The University of Michigan, 2008. Thesis: *Modeling Extremes with Applications to Insurance Claims Data.*

Patent

Method and Apparatus for Estimating Dominance Norms of a Plurality of Signals, filed on November, 2006 under Serial No. 11/556,075. Jointly with Marios Hadjieleftheriou (AT&T), George Kollios (Boston University), and Murad S. Taqqu (Boston University).

Publications

Refereed Journals

- [P1] S. Stoev, V. Pipiras & M.S. Taqqu (2002) “Estimation of the self-similarity parameter in linear fractional stable motion” *Signal Processing*, 82, 1873–1901.
- [P2] S. Stoev & M.S. Taqqu (2004) “Simulation methods for linear fractional stable motion and FARIMA using the Fast Fourier Transform” *Fractals*, 12(1), 95–121.
- [P3] S. Stoev & M.S. Taqqu (2004) “Stochastic properties of the linear multifractional stable motion” *Advances in Applied Probability*, 36, 1085–1115.
- [P4] S. Stoev & M.S. Taqqu (2005) “Asymptotic self-similarity and wavelet estimation for long-range dependent FARIMA time series with stable innovations” *Journal of Time Series Analysis*, 26(2), 211–249.
- [P5] S. Stoev & M.S. Taqqu (2005) “Path properties of the linear multifractional stable motion” *Fractals*, 13(2), 157–178.
- [P6] S. Stoev, M.S. Taqqu, C. Park & J.S. Marron (2005) “On the wavelet spectrum diagnostic for Hurst parameter estimation in the analysis of Internet traffic” *Computer Networks*, 48, 423–445.
- [P7] S. Stoev & M.S. Taqqu (2005) “Weak convergence to the tangent process of the linear multifractional stable motion” *Pliska Studia Mathematica Bulgarica*, 17, 271–294.
- [P8] S. Stoev & M.S. Taqqu (2006) “How rich is the class of multifractional Brownian motions?” *Stochastic Processes and Their Applications*, 116(2), 200–221.
- [P9] S. Stoev, M.S. Taqqu, C. Park, G. Michailidis & J.S. Marron (2006) “LASS: a tool for the local analysis of self-similarity” *Computational Statistics and Data Analysis*, 50, 2447–2471.
- [P10] S. Stoev & M.S. Taqqu (2005) “Extremal stochastic integrals: a parallel between max-stable processes and α -stable processes” *Extremes*, 8, 237–266.
- [P11] C. Park, F. Godtlielsen, S. Stoev, M.S. Taqqu & J.S. Marron (2007) “Visualization and inference based on wavelet coefficients SiZer and SiNos” *Journal of Computational and Graphical Statistics*, 51, 5994–6012.
- [P12] S. Stoev & M.S. Taqqu (2007) “Limit theorems for sums of heavy-tailed terms with random dependent weights” *Methodology and Computing in Applied Probability*, 9(1), 55–87.
- [P13] S. Stoev & M.S. Taqqu (2007) “Limit theorems for maxima of heavy-tailed terms with random dependent weights” *Pliska Studia Mathematica Bulgarica*, 18, 361–378.
- [P14] P.-L. Conti, L. De Giovanni, S. Stoev & M.S. Taqqu (2008) “Confidence intervals for the long memory parameter based on wavelets and resampling” *Statistica Sinica*, 18(2), 559–579.
- [P15] S. Stoev (2008) “On the ergodicity and mixing of max-stable processes” *Stochastic Processes and their Applications*, 118(9), 1679–1705.
- [P16] M. Meerschaert & S. Stoev (2009) “Extremal limit theorems for observations separated by random waiting times” *Journal of Statistical Planning and Inference*, 139(7), 2175–2188.

- [P17] S. Stoev & G. Michailidis (2010) “On the estimation of the heavy-tail exponent in time series using the max-spectrum” *Applied Stochastic Models in Business and Industry*, 26(3), 224–253 (print). Published online on 31 March 2009. DOI: 10.1002/asmb.764.
- [P18] K. Hamidieh, S. Stoev, & G. Michailidis (2009) “On the estimation of the extremal index based on scaling and resampling” *Journal of Computational and Graphical Statistics*, 18(3), 731–755.
- [P19] Y. Wang & S. Stoev (2010) “On the association of sum- and max-stable processes” *Statistics and Probability Letters*, 80, 480–488.
- [20] Y. Wang & S. Stoev (2010) “On the structure and representations of max-stable processes” *Advances in Applied Probability*, 42(3), 855–877.
- [P21] A. Ruzmaikin, J. Feynman, & S. Stoev (2011) “Distribution and clustering of fast coronal mass ejections” *Journal of Geophysical Research*, 116.
- [P22] S. Stoev, G. Michailidis, & M.S. Taquq (2011) “Estimating heavy-tail exponents through max self-similarity” *IEEE Transactions on Information Theory*, 57(3), 1615–1635.
- [P23] Y. Wang & S. Stoev (2011) “Conditional sampling for spectrally discrete max-stable random fields” *Advances in Applied Probability*, 43(2), 463–481.
- [P24] Y. Wang, S. Stoev, & P. Roy (2012) “Decomposability for stable processes” *Stochastic Processes and their Applications*, 122(3), 1093–1109.
- [P25] Y. Wang, P. Roy, & S. Stoev (2013) “Ergodic properties of sum- and max-stable stationary random fields via null and positive group actions” *Annals of Probability*, 41(1), 206–228.
- [P26] J. Vaughan, S. Stoev, & G. Michailidis (2013) “Network-wide statistical modeling, prediction, and monitoring of computer traffic” *Technometrics*, 55(1), 79–93.
- [P27] M.G. Kallitsis, S. Stoev, & G. Michailidis (2013), “Fast algorithms for optimal link selection in large-scale network monitoring” *IEEE Transactions on Signal Processing*, 61(8), 2088–2103.
- [P28] M.M. Meerschaert, H.-P. Scheffler & S. Stoev (2013) “Extreme value theory with operator norming” *Extremes*, 16(4), 407–428.
- [P29] K. Hamidieh, S. Stoev, & G. Michailidis (2013) “Intensity Based Estimation of Value-at-Risk” *Appl. Stoch. Models Bus. Ind.*, 29(3), 171–186.
- [P30] S. Stoev (2013) “Tail behavior of Hölder norms of stochastic processes and weak convergence of maxima in Hölder spaces” *Serdica Mathematical Journal*, 39, 189–214.
- [P31] R.A. Yuen & S. Stoev (2014) “CRPS M-estimation for max-stable models” *Extremes*, 17(3), 387–410.
- [P32] R.A. Yuen & S. Stoev, “Upper bounds on Value-at-Risk for the maximum portfolio loss” *Extremes*, 17(4), 585–614.
- [P33] E.L. Ionides, D. Nguyen, Y. Atchadé, S. Stoev and and A. King, “Inference for dynamic and latent variable models via iterated perturbed Bayes maps” *Proc. Natl. Acad. Sci. USA*, 112(3), 719–724.

- [P34] Z. Kabluchko & S. Stoev (2016), “Stochastic integral representations and classification of sum- and max-infinitely divisible processes”, *Bernoulli*, 22(1), 107–142.
- [P35] P. Bagchi, M. Banerjee, & S. Stoev (2016) “Inference for monotone trends under dependence”. *Journal of the American Statistical Association (JASA). Theory and Methods*, 111(516), 1634–1647.
- [P36] M. Kallitsis, S. Stoev, Sh. Bhattacharya and G. Michailidis (2016) “AMON: An open source architecture for online monitoring, statistical analysis and forensics of multi-gigabit streams.”, *IEEE Journal on Selected Areas in Communication*, 34(6), 1834–1848 Special issue on *Measuring and Troubleshooting the Internet: Algorithms, Tools and Applications*, edited by M. Dusi, A. Finamore, KC Claffy and D. Veitch
- [P37] H.-P. Scheffler and S. Stoev (2017) Implicit extremes and implicit max-stable laws. *Extremes* 20(2), 265–299 (2017)
- [P38] Cl. Dombry, M. Ribatet, 20(2), 265–299 (2017) S. Stoev (2018) Probabilities of concurrent extremes. In print for *JASA*, 2018. Published online: <https://doi.org/10.1080/01621459.2017.1356318>
- [P39] S. Stoev and S. Bhattacharya (2018) Inference on the endpoint of human lifespan and its inherent statistical difficulty. Discussion on the paper by Holger Rootzén and Dmitrii Zholud. To appear in *Extremes*, 2018.
- [P40] J. French, P. Kokoszka, S. Stoev, and L. Hall (2018) Quantifying the risk of heat waves using extreme value theory and spatio-temporal functional data. In print for CSDA.
- [P41] P. Kokoszka, S. Stoev, B. Zheng, and H. Miao (2018) Risk analysis of cumulative intraday return curves. To appear in the *Journal of Time Series Econometrics (DGJTSE)*.
- [P42] S. Stoev and Y. Wang (2018) Exchangeable random partitions from max-infinitely divisible distributions. To appear in *Statistics and Probability Letters*.
- [P43] Sh. Bhattacharya, M. Kallitsis and S. Stoev (2019) Trimming the Hill estimator: robustness, optimality and adaptivity. To appear in *Electronic Journal of Statistics*.
- [P44] P. Kokoszka, S. Stoev, and Q. Xiong (2019) Principal components analysis of regularly varying functions. To appear in *Bernoulli*.

Submitted and Working Papers

- [S1] Z. Gao and S. Stoev (2018) Fundamental Limits of Exact Support Recovery in High Dimensions. Submitted to *Bernoulli*.
- [S2] R.A. Yuen, S. Stoev, and D. Cooley (2018) Distributionally Robust Inference for Extreme Value-at-Risk. Submitted to *Insurance: Mathematics and Economics*
- [S3] Z. Gao, J. Terhorst, C. van Hout, and S. Stoev (2019) U-PASS: unified power analysis and forensics for qualitative traits in genetic association studies. Submitted to *Bioinformatics*. <https://www.biorxiv.org/content/10.1101/605766v2> See also the accompanying ShinyApp on: <https://power.stat.lsa.umich.edu/u-pass/>
- [W1] Z. Gao, M. Kallitsis, and S. Stoev (2018) Online detection of statistical anomalies in fast network traffic data streams. Working paper.

- [W2] S. Bhattacharya, S. Stoev, and P. Kokoszka (2018) Spatial impact of extreme heat waves. Working paper.

Book Contract

- [B] *Max-Stable Processes and Applications*, Springer. Joint contract with Clément Dombry and Zakhar Kabluchko.

Book Chapters and Refereed Conference Proceedings

- [C1] S. Stoev & M.S. Taqqu (2003) “Wavelet estimation of the Hurst parameter in stable processes” in: *Processes with Long Range Correlations: Theory and Applications*, G. Rangarajan and M. Ding editors, Springer Verlag, Berlin, 2003, Lecture Notes in Physics No. 621, 61–87.
- [C2] J.-M. Bardet, G. Lang, G. Oppenheim, A. Philippe, M.S. Taqqu & S. Stoev (2003) “Semi-parametric estimation of the long-range dependence parameter: A survey” in: *Theory and Applications of Long-range Dependence*, P. Doukhan, G. Oppenheim, and M.S. Taqqu, editors, Birkhäuser, Boston, 2003, 579–623.
- [C3] S. Stoev, M. Hadjieleftheriou, G. Kollios & M.S. Taqqu (2007) “Norm, point, and distance estimation over multiple signals using max-stable distributions” in *Proceedings of the 23rd International Conference on Data Engineering (ICDE '07)*, Istanbul, Turkey, April 2007. DOI: 10.1109/ICDE.2007.368959, 1006–1015. *Acceptance rate: 18.5%*.
- [C4] S. Stoev (2010) “Max-stable processes: Representations, ergodic properties and statistical applications” in: *Dependence, with Applications in Statistics and Econometrics*, P. Doukhan, G. Lang, D. Surgailis and G. Teyssi re, editors, Springer, New York, Lecture Notes in Statistics, Vol. 200.
- [C5] S. Stoev, G. Michailidis, and J. Vaughan (2010) “On global modeling of backbone network traffic” *INFOCOM, 2010 Proceedings IEEE of the 29th Conference on Computer Communications*, San Diego, CA. DOI: 10.1109/INFCOM.2010.5462246, *Acceptance rate: 17%*.
- [C6] S. Stoev (2012) “Spatial extremes: Models and prediction”, *Encyclopedia of Environmetrics 2*, John Wiley & Sons.
- [C7] M. Kallitsis, Sh. Bhattacharaya, S. Stoev, and G. Michailidis (2016) Adaptive statistical detection of false data injection attacks in smart grids. *2016 IEEE Global Conference on Signal and Information Processing (GlobalSIP)*

Technical Reports

- T1. S. Stoev & G. Michailidis (2006) *On the estimation of the heavy-tail exponent in time series using the max-spectrum*. Department of Statistics, the University of Michigan, Technical Report 447.
- T2. S. Stoev & M.S. Taqqu (2006) *Max-stable sketches: estimation of ℓ_α -norms, dominance norms and point queries for non-negative signals*. Department of Statistics, the University of Michigan, Technical Report 433.
- T3. K. Hamidieh, S. Stoev & G. Michailidis (2007) *On the estimation of the extremal index based on scaling and resampling*. Department of Statistics, the University of Michigan, Technical Report 462.

- T4.** S. Stoev, G. Michailidis & J. Vaughan (2009) *Global modeling and prediction of computer network traffic*. Department of Statistics, the University of Michigan, Technical Report 490.
- T5.** J. Vaughan, S. Stoev, & G. Michailidis (2010) *Network-wide statistical modeling and prediction of computer traffic*. Department of Statistics, the University of Michigan, Technical Report 501.
- T6.** Y. Wang & S. Stoev (2010) *Conditional sampling for max-stable random fields*. Department of Statistics, the University of Michigan, Technical Report 509.
- T7.** S. Stoev (2011) *Functional limit theorems for maxima in Hölder spaces*. Department of Statistics, the University of Michigan, Technical Report 518.
- T8.** R.A. Yuen & S. Stoev (2013) *CRPS M-estimation for max-stable models*. Department of Statistics, the University of Michigan, Technical Report 533.
- T9.** R.A. Yuen & S. Stoev, *Upper bounds on Value-at-Risk for the maximum portfolio loss*. Department of Statistics, the University of Michigan, Technical Report 534.

Talks

- October 2018* American Mathematical Society, Fall Central Sectional Meeting, Ann Arbor, Michigan. Invited talk: *Intrinsic Random Tangent Fields*.
- August 2018* Joint Statistical Meeting, Vancouver, Canada. Invited Contributed Talk: *Areal extremes: An analysis of the areal impact of heatwaves in coterminous US*.
- July 2017* Joint Statistical Meeting, Baltimore. Invited Contributed Talk: *A Framework for the Online Monitoring and Analysis of Multi-Gigabit Network Streams*.
- September 2016* Colloquium: *Probabilities of concurrent extremes*, Statistics Department, The University of Michigan, Ann Arbor, Sep 16, 2016.
- June 2016* Invited talk: *Probabilities of concurrent extremes*, Institute of Mathematical Statistics – Asian Pacific Ring Meeting, Hong Kong, China, June 27-30, 2016.
- June 2016* Colloquium: *Probabilities of concurrent extremes*, University of Franche-Comte, Besançon, France, June 6, 2016.
- September 2015* Invited participant: Workshop on the *The Mathematics and Statistics of Quantitative Risk Management*, Oberwolfach, Germany, September 20–26, 2015.
- March 2015* Invited talk: *Implicit Extremes and Implicit Max-Stable Laws*, Sectional AMS Meeting, East Lansing, March 14-15, 2015
- November 2014* Invited talk: *Implicit Extremes and Implicit Max-Stable Laws*, Workshop on Extreme Value Theory, Besançon, France, November 3-5, 2014
- July 2014* Invited talk: *Minimal Spectral Representations of Infinitely Divisible and Max-Infinitely Divisible Processes* IMS-ASC 2014 joint meeting, Sydney, Australia, July 7-10, 2014.

- January 2014* Invited talk: *Extreme Value Theory with Operator Norming*, Joint Mathematical Meetings, session on heavy tails and extremes organized by John Nolan, Baltimore, Maryland.
- January 2013* Invited talk: *Minimal Spectral Representations of Infinitely Divisible and Max-Infinitely Divisible Processes* at the workshop “Heavy Tailed Distributions and Extreme Value Theory”, Indian Statistical Institute, Kolkata, India.
- November 2012* Invited speaker in the workshop: *Spatial Extreme Value Theory and Properties of Max-Stable Processes*, Poitiers, France.
- June 2012* Invited talk: *Extreme Value Theory with Operator Norming: Simulation and Statistics*, First Congress of the International Society for Non-Parametric Statistics (ISNPS), Chalkidiki, Greece.
- January 2012* Invited participant in the workshop *The Mathematics and Statistics of Quantitative Risk Management*, MFO, Oberwolfach, Germany.
- June 2011* *Decomposability of Max-Stable Processes*. Invited talk at the 7th Conference on Extreme Value Analysis in Lyon, France.
- April 2011* Michigan State University, Probability Seminar: *Decomposability for Stable Processes*.
- April 2011* Rice University, Department of Statistics: *Prediction for Spectrally Discrete Max-stable Random Fields*.
- March 2011* Department of Statistics, University of Wisconsin at Madison, Madison, WI: *Max-stable processes and random fields: Representations, models, and prediction*.
- October 2010* Department of Statistics Seminar: *Max-stable Processes and Random Fields: Representations, Structure, and Prediction*, University of Michigan, Ann Arbor, MI.
- August 2010* Invited participant: *Extreme events in climate and weather an interdisciplinary workshop*, Banff International Research Station (B.I.R.S.), Banff, Canada.
- May 2010* Departamento de Estadística Seminar: *On the estimation of the heavy-tail exponent and the extremal index in time series*, Universidad Carlos III de Madrid, Spain.
- April 2010* Invited speaker at the research workshop: *Spatio-temporal approaches for risk modelling*, Centre International de Recontres Mathématiques (C.I.R.M.) in Luminy, France.
- March 2010* INFOCOM (contributed talk): *On Global Modeling of Network Traffic*, The 29th IEEE Conference on Computer Communications, San Diego, CA.
- March 2010* Columbia University Probability Seminar: *Max-stable processes: ergodicity, classification, and some new results on their path properties*, Department of Statistics, Columbia University, New York City.

- July 2009* The 15th INFORMS Applied Probability Society Conference (invited talk): *On the structure of max-stable processes*, Cornell University, Ithaca, New York.
- June 2009* Graybill VIII & the 6th Extreme Value Analysis conference (invited talk): *On the structure of max-stable processes*, Fort Collins, Colorado.
- July 2008* Center for Statistics and its Applications Seminar: *Max-stable processes and fields: representations, ergodic properties and some statistical applications*, University of Lisbon, Portugal.
- July 2008* International Workshop on Applied Probability (IWAP) (invited talk): *Statistical summaries for large, streaming data sets: max-stable and order random sketches*, Compiègne, France.
- July 2008* International Society for Business and Industrial Statistics (ISBIS) (invited talk): *On the estimation of the heavy-tail exponent in time series using the max-spectrum*, Prague, the Czech Republic.
- March 2008* Invited speaker at the research workshop: *The Mathematics and Statistics of Quantitative Risk Management*, Oberwolfach, Germany.
- January 2008* Invited speaker at the research workshop: *EXTREMES: Events, Models and Mathematical Theory*, Statistical and Applied Mathematical Sciences Institute (SAMSI), RTP, North Carolina.
- January 2008* Department of Statistics Seminar: *Max-stable processes: representations, ergodic properties, and some statistical applications*, University of Michigan, Ann Arbor, MI.
- November 2007* Mathematics Department Colloquium: *On the ergodicity and mixing of max-stable processes*, Tulane University, New Orleans, LA.
- August 2007* International Statistical Institute (ISI) meeting (invited talk): *On the ergodicity and mixing of max-stable processes*, Lisbon, Portugal.
- August 2007* Joint Statistical Meeting (JSM) (invited talk): *On the estimation of the heavy-tail exponent in time series using the max-spectrum*, Salt Lake City, Utah.
- July 2007* The 5th Extreme Value Analysis (EVA) Conference (invited talk): *On the ergodicity and mixing of max-stable processes*, Bern, Switzerland.
- March 2007* Probability Seminar: *Two applications of max-stable distributions: Random sketches and Heavy-tail exponent estimation*, Department of Mathematics and Statistics, Boston University, Boston, MA.
- October 2006* Department of Statistics and Probability Colloquium: *Estimating heavy-tail exponents through max self-similarity*, Michigan State University, East Lansing, MI.

- May 2006 International Workshop on Applied Probability (IWAP) (invited talk): *Extremal stochastic integrals: a parallel between max-stable processes and α -stable processes*, University of Connecticut, Storrs, CT.
- May 2006 Probability Theory Summer Seminar: *Extremal stochastic integrals: a parallel between max-stable processes and α -stable processes*, Department of Statistics, University of Michigan, Ann Arbor, MI.
- December 2005 Theoretical Computer Science Seminar: *Max-stable Random Sketches: Estimation of Distances, Norms and Dominance Norms*, University of Michigan College of Engineering, Ann Arbor, MI.
- June 2004 The XIth International Summer Conference on Probability and Statistics (invited talk): *Stochastic and path properties of the Linear Multifractional Stable Motion*, Sozopol, Bulgaria.
- May 2004 International Indian Statistical Association (contributed talk): *Asymptotic self-similarity and wavelet estimation for long-range dependent FARIMA time series with stable innovations*, 5th biennial conference on Statistics, Probability and related areas, Athens, GA.
- April 2004 Worcester Polytechnic Institute Colloquium: *Simulation methods for linear fractional stable motion and FARIMA using the Fast Fourier Transform*, Worcester, MA.
- December 2003 NISS-SAMSI Postdoc/Graduate Seminar: *Stochastic properties of the linear multifractional stable motion*, Statistical and Applied Mathematical Sciences Institute (SAMSI), RTP, North Carolina.
- November 2001 Teaching Fellow Seminar: *Modern Signal Processing (summer school at MSRI)*, Department of Mathematics and Statistics, Boston University, Boston, MA.

Service

Committees and Administration

- Joint IMS/Bernoulli Society Publications Management Committee – Bernoulli representative (2018–present)
- Statistics Department – Co-director of the doctoral program (Fall 2017–present)
- Statistics Department – Interim director of the doctoral program (Fall 2016)
- Statistics Department graduate curriculum – Member (2015–present)
- Quantitative Finance and Risk Management (joint Master’s degree program of the Mathematics and Statistics departments) – Statistics representative (2014–present)
- Statistics Department graduate admissions – Member (2014–present)
- LSAIT Faculty Advisory Committee – member (2013–present).
- Statistics Department computing committee – Chair (2012–2017).

- Undergraduate advisor (2012–2013).
- Served on several department committees: the *undergraduate* and *graduate curriculum*, the *executive*, and the *library* committees.
- Cognate Faculty for STATS 412: *Introduction to Probability and Statistics* for undergraduate students in engineering.
- Participated in redesigning the graduate program in *Probability Theory* in the Department of Statistics at the University of Michigan.
- Participated in securing NSF SCREMS grant and acquiring a high-end parallel computing system at the Department of Statistics, University of Michigan.

Conference Organization

- (2019) *The 11th International Conference on Extreme Value Analysis: EVA 2019*, Zagreb, Croatia. Scientific Committee member.
- (2018) *Long-range dependence, Self-similarity, and Extremes*, BIRS–CMO Workshop, Oaxaca, Mexico (jointly with R. Kulik, G. Samorodnitsky, Y. Shen and Y. Wang).
- (2017) *The 10th International Conference on Extreme Value Analysis: EVA 2017*, Delft, Netherlands. Scientific Committee member.
- (2016) *Dependence, Stability and Extremes Workshop*, The Fields Institute, Toronto, Canada, May 2-6, 2016. <http://www.fields.utoronto.ca/programs/scientific/15-16/dependence/> Co-organizer.
- (2015) *The 9th International Conference on Extreme Value Analysis: EVA 2015*, Ann Arbor, June 15-19, 2015. <http://sites.lsa.umich.edu/eva2015/> Local organizer (jointly with Tailen Hsing).
- (2013) *Joint Statistical Meeting, Montreal, 2013*: Organizer and chair of an allocated invited session entitled: “Spatial Extremes, Max–Stable Processes, and Beyond”.
- (2012) *International Conference on Long-Range Dependence, Self-Similarity, and Heavy Tails* in honor of Professor Murad S. Taquq, Research Triangle Park, North Carolina, April 19 – 21, 2012. <http://lrd2012.web.unc.edu>. Organized jointly with Vlasos Pipiras.

Professional Affiliations and Societies

- Michigan Institute for Data Science (MIDAS), affiliated faculty.
- STATMOS – Research Network for Statistical Methods for Atmospheric and Oceanic Science, Member.
- The Institute of Mathematical Statistics (IMS) & the American Statistical Association (ASA). Member.
- The American Mathematical Society (AMS). Member.

Editorial Work

- Associate Editor for the journal *Extremes* (2015 –).
- Associate Editor for the *Bernoulli Journal* (2010 – 2014).
- *AMS Mathematical Reviews*
- National Science Foundation
- Natural Sciences and Engineering Research Council of Canada
- Swiss National Science Foundation
- Villum Foundation
- Refereed over 60 papers for over 20 journals, including:

The Annals of Probability, The Annals of Applied Probability, Stochastic Processes and their Applications, The Annals of Statistics, The Annals of Applied Statistics, Journal of Theoretical Probability, Extremes, Letters in Probability and Statistics, Journal of Time Series Analysis, Bernoulli, Journal of Statistical Planning and Inference, Metron, Technometrics, Journal of Computational and Harmonic Analysis, Computational Statistics and Data Analysis, Signal Processing, Computer Networks, Journal of Statistical Software, Stochastic Models, Journal of Geophysical Research, IEEE Transactions on Communications, IEEE Transactions on Signal Processing, Physica Series A, Methodology and Computing in Applied Probability, The Electronic Journal of Probability, Statistica Sinica.

Languages

Bulgarian (native), English (fluent) and Russian (fluent).