Shuyang (Ray) Bai

CONTACT INFORMATION	Brooks Hall 408, 310 Hefty Dr. Athens, GA 30602 Email: bsy9142@uga.edu Phone: +1-706-369-4012

RESEARCH INTERESTS

Long-range dependence, heavy tails, limit theorems for sums and extremes, time series, resampling, online sampling

WORK EXPERIENCE

Assistant Professor
Department of Statistics, University of Georgia, Athens, GA.   08/2016- now

EDUCATION

Boston University, Boston, MA,   09/2011-05/2016

Ph.D. in Mathematics
- Advisor: Murad S. Taqqu

Bejing Normal University, Beijing, China,   09/2007-07/2011

B.S. in Mathematics and Applied Mathematics

MANUSCRIPTS

1. Shuyang Bai, Rui Xie, Ping Ma "Optimal sampling designs for online estimation of streamingmulti-dimensional time series". (2020). Submitted.

PUBLICATIONS

1. Shuyang Bai "Limit theorems for conservative flows on multiple stochastic integrals" arXiv preprint arXiv:2005.07789 (2021). To appear in *Journal of Theoretical Probability*.

2. Shuyang Bai "Representations of Hermite processes using local time of intersecting stationary stable regenerative sets" *Journal of Applied Probability* 57.4 (2020): 1234-1251.

3. Shuyang Bai, Takashi Owada, Yizao Wang "A functional non-central limit theorem for multi-stable processes with long-range dependence" *Stochastic Processes and their Applications* 30.9 (2020): 5768-5801.

4. Shuyang Bai, Murad S. Taqqu "Limit theorems for long-memory flows on Wiener chaos *Bernoulli* 26.2 (2020): 1473-1503.

5. Rui Xie, Zengyan Wang, Shuyang Bai, Ping Ma, Wenxuan Zhong, "Decentralized Leverage Score Sampling for Streaming Multidimensional Time Series" *The 22nd International Conference on Artificial Intelligence and Statistics (AISTATS 2019)* (2019): 2301-2311.

6. Shuyang Bai, Murad S. Taqqu "Sensitivity of the Hermite rank" *Stochastic Processes and their Applications* 129.3 (2019): 822-840.

7. Fumiya Akashi, Shuyang Bai, Murad S. Taqqu "Robust regression on stationary time series: a self-normalized resampling approach" *Journal of Time Series Analysis* 39.3 (2018): 417-432.

8. Shuyang Bai, Murad S. Taqqu. "How the instability of ranks in non-central limit theorems affects large-sample inference under long memory" *Statistical Science* 33.1 (2018): 96-116.

9. Shuyang Bai, Murad S. Taqqu. "On the validity of resampling methods under long memory" *The Annals of Statistics* 45.6 (2017): 2365-2399.

10. Shuyang Bai, Murad S. Taqqu. "The behavior of the generalized Rosenblatt process at extreme parameter values". *The Annals of Probability* 45.2 (2017): 1278-1324.

11. Shuyang Bai, and Murad S. Taqqu. "The impact of diagonals of polynomial forms on limit theorems with long memory". *Bernoulli* 23.1 (2017):710-742.

12. Shuyang Bai, Murad S. Taqqu. "The universality of homogeneous polynomial forms and critical limits". *Journal of Theoretical Probability* 29.4 (2016): 1710-1727.

13. Shuyang Bai, Murad S. Taqqu, Ting Zhang "A unified approach to self-normalized block sampling". *Stochastic Processes and their Applications* 126.8 (2016): 2465-2493.

14. Shuyang Bai, Murad S. Taqqu " Short-range dependent processes subordinated to the Gaussian may not be strong mixing". *Statistics & Probability Letters* 110 (2016): 198-200.

15. Shuyang Bai, Mamikon S. Ginovyan, Murad S. Taqqu "Limit theorems for quadratic forms of Lévy-driven continuous-time linear processes". *Stochastic Processes and their Applications* 126.4 (2016): 1036-1065.

16. Shuyang Bai, Mamikon S. Ginovyan, Murad S. Taqqu. "Functional limit theorems for Toeplitz quadratic functionals of continuous-time Gaussian stationary processes". *Statistics & Probability Letters* 104 (2015): 58-67.

17. Shuyang Bai and Murad S. Taqqu. "Convergence of long-memory discrete k-th order Volterra processe". *Stochastic Processes and their Applications* 125.5 (2015): 2026-2053.

18. Shuyang Bai and Murad S. Taqqu. "Structure of the third moment of the generalized Rosenblatt distribution". *Statistics & Probability Letters* 94 (2014): 2473-2485.

19. Shuyang Bai and Murad S. Taqqu. "Generalized Hermite processes, discrete chaos and limit theorems". *Stochastic Processes and their Applications* 124.4 (2014): 144-152.

20. Shuyang Bai and Murad S. Taqqu. "Multivariate limits of multilinear polynomial-form processes with long memory". *Statistics & Probability Letters* 83.11 (2013): 2473-2485.

21. Shuyang Bai and Murad S. Taqqu. "Multivariate limit theorems in the context of long-range dependence". *Journal of Time Series Analysis* 34.6 (2013): 717-743.

PRESENTATIONS

1. Talk: "Leverage Score Sampling for Multidimensional Streaming Time Series", 2019 Joint Statistical Meetings (JSM), Denver, 08/2019.

2. Poster: "Online Decentralized Leverage Score Sampling for Streaming Multidimensional Time Series", The 22nd International Conference on Artificial Intelligence and Statistics (AISTAT 2019), Naha, Japan, 04/2019.

3. Talk: "A non-central limit theorem on heavy-tailed chaos", AMS Sectional Meeting, Auburn University, Auburn, 03/2019.

4. Talk: "A non-central limit theorem on heavy-tailed chaos", Research Seminar in Probability and Statistics, Tulane University, New Orleans, 03/2019.

5. Talk: "Leverage subsampling for vector autoregression", 12th International Conference on Computational and Financial Econometrics (CFE 2018), University of Pisa, Italy, 12/2018.

6. Talk: "A non-central limit theorem on heavy-tailed chaos" AMS Sectional Meeting, University of Michigan, Ann Arbor, 10/2018.

7. Talk: "Leverage subsampling for vector autoregression", Georgia Statistics Day, University of Georgia, Athens, 10/2018.

8. Talk: "Instability of ranks and inference under long memory", Workshop on Self-Similarity, Long-Range Dependence and Extremes, Banff International Research Station & Casa Matematica Oaxaca, Mexico, 06/2018.

9. Talk: "Resampling under Long Memory". Statistics Seminar, Department of Statistics, Purdue University, West Lafayette, 02/2018.

10. Talk: "The Long Memory Phenomenon". Statistics Seminar, Department of Mathematics and Statistics, Georgia State University, Atlanta, 09/2017.

11. Talk: "Self-Normalized Resampling of Time Series", The 1st International Conference on Econometrics and Statistics, Hong Kong University of Science and Technology, Hong Kong, 06/2017.

12. Talk: "Block Dependence and Resampling under Long Memory". Statistics Seminar, Chinese University of Hong Kong, Hong Kong. 06/2017.

13. Talk: "Between-Block Dependence under Long Memory". AMS Sectional Meeting, Indiana University, Bloomington, 04/2017.

14. Talk: "Block Dependence under Long Memory". Statistics Seminar, School of Industrial & Systems Engineering, Georgia Institute of Technology, Atlanta, 04/2017.

15. Talk: "Resampling under Long Memory". Stochastics Seminar, Department of Mathematics, The University of Tennessee, Knoxville, 03/2017.

16. Talk: "Self-Normalized Resampling of Long-Memory Time Series". The 10th ICSA International Conference, Shanghai Jiao Tong University, China, 12/2016.

17. Poster: "Self-Normalized Resampling of Long-Memory Time Series". Conference in Honor of Murray Rosenblatt, University of California San Diego, San Diego, 10/2016.

18. Talk: "The long Memory Phenomenon". Ying Xu Lab, Department of Biochemistry and Molecule Biology, University of Georgia, Athens, 09/2016.

19. Poster: "Self-Normalized Resampling of Time Series". The IMS 18th Meeting of New Researchers in Statistics and Probability, University of Wisconsin Madison, Madison, 07/2016.

20. Talk: "Self-Normalized Resampling of Long-Memory Time Series". Seminar, Department of Statistics, Southwestern University of Finance and Economics, China, 05/2016.

21. Poster: "Self-Normalized Resampling of Long-Memory Time Series". Workshop on Dependence, Stability, and Extremes, The Fields Institute, Toronto, 05/2016.

22. Talk: "Long Memory and Mon-Standard Limit Theorems". Applied Math Seminar, University of Massachusetts Lowell, Lowell, 02/2016.

23. Talk: "Self-Normalized Resampling for Time Series". Boston University Statistics and Probability Seminar, Boston University, Boston, 12/2015.

24. Talk: "Limit Theorems for Polynomial-Form Moving Average" CRM-PIMS Summer School in Probability, McGill University, Montreal, 06/2015

25. Poster: "Fractional Processes on Wiener Chaos and Non-Central Limit Theorems". Information Theory and Concentration Phenomena, Institute for Mathematics and and its Applications, University of Minnesota Twin Cities, Minneapolis, 04/2015

26. Talk: "Self-similar processes on Wiener Chaos". Boston University Statistics and Probability Seminar, Boston University, Boston, 12/2014.

27. Poster: "Fractional processes on Wiener Chaos and Non-Central Limit Theorems". Cincinnati Symposium on Probability Theory and Applications, University of Cincinnati, Cincinnati, 09/2014

28. Talk "Wiener chaos and Limit Theorems Under Strong Dependence" Boston University Student Statistics and Probability Seminar, Boston University, Boston, 03/2014.

29. Poster: "Fractional processes on Wiener Chaos and Non-Central Limit Theorems". Multifractal Analysis: From Theory to Applications and Back (5-day workshop), Banff International Research Station, Canada, 02/2014.

30. Talk: "Long-Range Dependence Meets Short-Range Dependence: Multivariate Limit Theorems". Satellite Summer School to the 7th International Conference on Lévy Processes, 07/2013.

31. Talk: "Limit Theorems Under Independence, Weak Dependence, and Long-Range Dependence". Boston University Student Statistics and Probability Seminar, Boston University, Boston, 09/2012.

HONORS AND
AWARDS

1. Office of the Provost International Travel Funds, University of Georgia, 2016, 2018.

2. Travel Award, The 18th IMS New Researchers Conference, 2016.

3. Itô Travel Award, International Mathematical Union, 2015.

4. Dean's Fellowship, Boston University, 2011.

5. Outstanding Undergraduate Thesis Award, Beijing Normal University, 2011.

TEACHING
EXPERIENCE

- Mathematical Analysis (2-week bootcamp for beginning graduate students)
- Mathematical Statistics (undergraduate/graduate)
- Probability (undergraduate and graduate)
- Stochastic Processes (graduate)
- Undergraduate Directed Study in Mathematical Analysis

| CONFERENCE ORGANIZATION | • Organized Invited Session "Recent advances in analysis of dependent data". The 4th International Conference on Econometrics and Statistics (EcoSta 2020), Yonsei University, Seoul, South Korea, 07/2020 (canceled due to Covid-19). |

REVIEW SERVICE

Referee for the following journals:

- *Advances in Complex Systems*
- *Bernoulli*
- *Brazilian Journal of Probability and Statistics*
- *Computational Statistics and Data Analysis*
- *Electronic Journal of Statistics*
- *Fields Institute Communications Series*
- *IEEE Intelligent Systems*
- *Journal of Applied Probability*
- *Journal of Financial Econometrics*
- *Journal of Theoretical Probability*
- *Journal of the American Statistical Association*
- *Journal of Korean Statistical Society*
- *Physica A*
- *Scandinavian Journal of Statistics*
- *Statistics & Probability Letters*
- *Stochastic Analysis and Applications*
- *Stochastic Processes and their Applications*
- *The Annals of Probability*
- *The Annals of Statistics*

Invited reviewer for *Mathematical Reviews*

Proposal reviewer for National Science Foundation

GRADUATE STUDENT ADVISORY	PhD Advisory Committee of

- Shenjie Min (2020 -)
- Xiao Di (2020 -)
- Honghe Jin (2019 -)
- Binglin Li (2019 -)
- Qihu Zhang (2019 -)
- Huimin Hu (2019 -)
- Wenhao Pan (2018)
- Yan Du (2018 -)
- Weifeng Wang (2018 -)
- Murilo Massaru Da Silva (2017 -)
- Jiankun Zhu (2016 - 2019)
- Adel Bedoui (2016 - 2017)

Master Advisory Committee of

- Yasemin Inceoglu (2018)
- Ho Suk Choi (2018)
- Cun Wang (2017)
- Sooyoung Kim (2017)

DEPARTMENT SERVICES

- Department Advisory Committee (2020 -)
- Undergraduate Program Committee (2020-)
- Graduate Admission Committee (2016 - 2018)
- Colloquium Organization Committee (2017 spring, fall)
- Graduate Exam (Theory) Committee (2017 -)
- Research Development Committee (2018, 2019 (Chair) -)

UNIVERSITY SERVICES

- University Council Member (2018 -)

SKILLS

Languages: English (fluent), Mandarin Chinese (native).
Computer: R, Matlab, IDL, SAS, C, LaTex, Linux, Microsoft Office, Google Docs.