

XI GENG

Curriculum Vitae

Senior Lecturer in Probability and Stochastic Processes

ARC DECRA Fellow

School of Mathematics and Statistics

The University of Melbourne

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Personal:

- Born January 1989, Guangzhou, China.

Academic Experience

- September 2023—Present: Senior Lecturer in Probability and Stochastic Processes, The University of Melbourne
- July 2021—July 2024: ARC (Australian Research Council) DECRA (Discovery Early Career Researcher Award) Fellow
- February 2019—September 2023: Lecturer in Probability and Stochastic Processes, The University of Melbourne
- September 2016—January 2019: Postdoctoral Associate, Carnegie Mellon University
- October 2014—August 2016: Research Fellow, University of Oxford

Education:

- October 2011—June 2016: Doctor of Philosophy, Mathematics, University of Oxford
Supervisor: Prof. Zhongmin Qian
- September 2007—June 2011: Bachelor of Science, Mathematics, Sun Yat-Sen University

Research Interests:

- Rough paths theory, The signature transform
- Stochastic differential equations
- Gaussian analysis, the Malliavin calculus
- Stochastic analysis on manifolds

Publications:

- H. Boedihardjo and X. Geng. On the lack of Gaussian tail for rough line integrals along fractional Brownian paths. *Probab. Theory Related Fields*. 2023.

- X. Geng and S. Wang. Non-degeneracy of stochastic line integrals. *Electron. J. Probab.* 28: 1--28, 2023.
- Y. Wang, X. Geng, W. Huang, B. Huang and M. Gong. Generator identification for linear SDEs with additive and multiplicative noise. *NeurIPS*, 2023.
- C. Ouyang, X. Geng and S. Tindel. Precise local estimates for differential equations driven by fractional Brownian motion: hypoelliptic case. *Ann. Probab.* 50 (2): 649--687, 2022.
- H. Boedihardjo and X. Geng. SL₂(R)-developments and signature asymptotics for planar paths with bounded variation. *Rev. Mat. Iberoam.* 2022.
- C. Ouyang, X. Geng and S. Tindel. Precise local estimates for differential equations driven by fractional Brownian motion: elliptic case. *J. Theoret. Probab.* 2022.
- X. Geng and A. Xia. When is the Conway-Maxwell-Poisson distribution infinitely divisible? *Stat. Probab. Lett.* 181, 2022.
- H. Boedihardjo and X. Geng. Lipschitz-stability of controlled rough paths and rough differential equations. *Osaka J. Math* 59 (3): 653--682, 2022.
- X. Geng and G. Iyer. Long time asymptotics of heat kernels and Brownian winding numbers on manifolds with boundary. *Lat. Am. J. Probab. Math. Stat.* 18: 1297-1323, 2021.
- H. Boedihardjo, X. Geng and N. Souris. Path developments and tail asymptotics of signature for pure rough paths. *Adv. Math.* 364, 2020.
- H. Boedihardjo and X. Geng. The tail asymptotics of the Brownian signature. *Trans. Amer. Math. Soc.* 372: 585--614, 2019.
- H. Boedihardjo and X. Geng. A non-vanishing property for the signature of a path. *C. R. Math. Acad. Sci. Paris* 357 (2): 120--129, 2019.
- H. Boedihardjo, X. Geng, X. Liu and Z. Qian. A quasi-sure non-degeneracy property for the Brownian rough path. *Potential Anal.* 51(1): 1--21, 2019.
- X. Geng. Reconstruction for the signature of a rough path. *Proc. Lond. Math. Soc.* 114 (3): 495--526, 2017.
- X. Geng and Z. Qian. Finite dimensional characteristic functions of the Brownian rough path. *Front. Math. China* 12 (4): 859--877, 2017.
- H. Boedihardjo, X. Geng, T. Lyons and D. Yang. The signature of a rough path: uniqueness. *Adv. Math.* 293: 720--737, 2016.
- X. Geng and Z. Qian. On an inversion theorem for Stratonovich's signatures of multidimensional diffusion paths. *Ann. Inst. Henri Poincaré Probab. Stat.* 52 (1): 429--447, 2016.
- H. Boedihardjo, X. Geng and Z. Qian. Quasi-sure existence of Gaussian rough paths and large deviation principles for capacities. *Osaka J. Math.* 53 (4): 941--970, 2016.
- H. Boedihardjo and X. Geng. The uniqueness of signature problem in the non-Markov setting. *Stochastic Process. Appl.* 125 (12): 4674--4701, 2015.
- H. Boedihardjo and X. Geng. Simple piecewise geodesic interpolation of simple and Jordan curves with applications. *Constr. Approx.* 42 (1): 161--180, 2015.
- X. Geng, Z. Qian and D. Yang. G-Brownian motion as rough paths and differential equations driven by G-Brownian motion. *Séminaire de Probabilités XLVI*, Lecture Notes in

Mathematics, 125--193, 2014.

Invited Conference, Workshop and Seminar Talks:

- AMS Sectional Meeting, Topics in Stochastic Analysis/Rough Paths/SPDE and Applications in Machine Learning Session, USA, March 2024.
- Probability seminar, University of Illinois at Chicago and Purdue University, West Lafayette and Chicago, USA, March 2024.
- AustMS Annual Meeting, Probability and Mathematical Statistics Session, Brisbane, Australia, December 2023.
- Workshop on Structural Aspects of Signatures and Rough Paths, Oslo, Norway, August 2023.
- Probability Seminar, University of Warwick and University College London, Coventry and London, UK, June 2023.
- BIRS workshop on New Trends in Stochastic Analysis, Oaxaca, Mexico, May 2023.
- Symposium on Rough Path Theory. Creswick, Australia, February 2023.
- AustMS Annual Meeting, SDE Session, Probability and Statistics Session, Sydney, Australia, December 2022.
- Workshop on SDEs and Their Applications, Melbourne, Australia, September 2022.
- AMS Annual Meeting, Stochastic Analysis and Malliavin's Calculus Session, Grenoble, France, July 2022.
- IMS Annual Meeting, Rough Path Theory Session, London, UK, June 2022.
- The 65th Annual Meeting of the Australian Mathematical Society, Keynote Speaker, New Castle, Australia, December 2021.
- Summer School on Rough Path theory, Guangzhou, China, August 2021.
- Data Analysis Seminar, Alan Turing Institute, London, UK, February 2021.
- Symposium on Stochastic Partial Differential Equations, Canberra, Australia, February 2021.
- Conference on New Directions in Rough Path Theory, Oberwolfach, Germany, December 2020.
- The 7th Wellington Workshop on Probability and Mathematical Statistics, Wellington, New Zealand, December 2019.
- IMS-China International Conference on Statistics and Probability, Dalian, China, July 2019.
- Stochastic Analysis Seminar, University of Oxford, Oxford, UK, June 2019.
- Probability Seminar, Imperial College, London, UK, June 2019.
- Workshop on Theoretical and Applied Stochastic Analysis, Oaxaca, Mexico, September 2018.
- Probability Seminar, University of Melbourne, Melbourne, Australia, February 2018.
- Probability Seminar, Purdue University, West Lafayette, USA, February 2018.
- Probability Seminar, Fudan University, Shanghai, China, December 2017.
- Toulouse Workshop on Rough paths, Toulouse, France, October 2017.
- Conference on Stochastic Analysis and Its Applications to Mathematical Finance, Zhuhai, China, June 2017.

- Statistics Seminar, University of Illinois at Chicago, Chicago, USA, November 2017.
- Statistics Seminar, University of Illinois at Chicago, Chicago, USA, April 2017.
- Probability Seminar, Purdue University, West Lafayette, USA, November 2016.
- Probability Seminar, University of Luxembourg, Luxembourg, May 2016.
- Conference on Rough Paths, Regularity Structures and Related Topics, Oberwolfach, Germany, May 2016.
- 38th Conference on Stochastic Processes and Their Applications, Oxford, UK, July 2015.
- Conference on Random Dynamical Systems and Ergodicity, Loughborough, UK, July 2015.
- 3rd Annual ERC Berlin-Oxford Young Researchers Meeting on Stochastic Analysis and Applications, Berlin, Germany, January 2015.
- 2nd Annual ERC Berlin-Oxford Young Researchers Meeting on Stochastic Analysis and Applications, Oxford, UK, July 2014.
- Workshop on Probability and Its Applications, Oxford, UK, March 2014.
- 1st Annual ERC Berlin-Oxford Young Researchers Meeting on Stochastic Analysis and Applications, Berlin, December 2013.
- Stochastic Analysis Seminar, Shandong University, China, March 2013.

Teaching:

- Semester 2 2022: Advanced Probability.
- Semester 1 2021: Stochastic Calculus with Applications.
- Semester 2 2020: Probability.
- Semester 1 2020: Advanced Probability.
- Semester 2 2019: Probability.
- Spring 2018: Matrix Algebra with Applications.
- Fall 2017: Stochastic Calculus.
- Spring 2017: Differential Equations.
- Fall 2016: Stochastic Calculus.
- Michaelmas 2015: Martingales Through Measure Theory, Class Tutor.
- Hilary 2014: Differentiable Manifolds and de Rham Cohomology, Instructor, Oxford-Stanford Exchange Program.
- Michaelmas 2013: Metric Spaces and Complex Analysis, Class Tutor, Oxford-Williams Exchange Program.
- Trinity 2013: Gaussian Measures and Stochastic Partial Differential Equations, Guest Lecturer.
- Trinity 2013: Analysis and Linear Algebra, Class Tutor.
- Hilary 2013: Analysis and Linear Algebra, Teaching Assistant.
- Michaelmas 2011: Complex Analysis, Teaching Assistant.

Academic Service:

- April 2020—present, Associate Editor, *Stochastic Analysis and Applications*.

