Qi Feng

CURRICULUM VITAE

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RESEARCH INTERESTS — **Stochastic analysis, mathematical finance, machine learning, sub-Riemannian geometry, rough path theory.**

CURRENT POSITION

Huntington Research Assistant Professor
University of Michigan, Ann Arbor. August 2021
Mentor: Erhan Bayraktar.

PREVIOUS POSITION

Assistant Professor, NTT.
University of Southern California. August 2018–May 2021
Mentor: Jin Ma and Jianfeng Zhang.

EDUCATION

Ph.D, Mathematics, University of Connecticut. May 2018
Advisor: Fabrice Baudoin.
M.S., Computational Finance, Purdue University. May 2017
B.S., Mathematics, Tianjin University, Tianjin China. July 2012

PUBLICATIONS

1. *Accelerating convergence of replica exchange stochastic gradient MCMC via variance reduction.* (**W. Deng***, **Q. Feng***, **G. Karagiannis**, **G. Lin**, and **F. Liang**). **Ninth International Conference on Learning Representations. (ICLR, 2021).**
2. *Taylor expansions for solutions of stochastic differential equations driven by rough paths.* **X. Zhang** and **Q. Feng**. **Journal of Stochastic Analysis: Vol.1, No.2 , Article 4. (2020).**
3. *Non-convex Learning via Replica Exchange Stochastic Gradient MCMC.* **W. Deng, Q. Feng*, L. Gao*, F. Liang , G. Lin**. **Thirty-seventh International Conference on Machine Learning, Formerly Vienna, AUSTRIA. (ICML, 2020).**
4. *Density of the signature process of fractional Brownian motion.* **F. Baudoin, Q. Feng** and **C. Ouyang**. **Trans. Amer. Math. Soc. (2020)** Journal link: https://doi.org/10.1090/tran/8165.
5. *Integration by parts and Quasi-invariance for the horizontal Wiener measure of foliated manifold.* **F. Baudoin, Q. Feng** and **M. Gordina. Journal of Functional Analysis. (277), 2019.**
6. *A priori estimates for rough PDEs.***Q. Feng** and **S. Tindel.** (2017) **Stochastic Analysis and Related Topics. pp 117-138. Progress in Probability, vol 72. Birkhäuser, Cham**.
7. *Systemic Risk and Optimal Fee Structure for Central Clearing Counterparty* **Z. Cui, Q. Feng, R. Hu** and **B. Zou**. **Operation Research Letter**, Volume 46, Issue 3, May 2018, Pages 306-311.
8. *Sub-Riemannian Ricci curvature via generalized Gamma z calculus.* **Q. Feng** and **W. Li.** *arXiv:2004.01863.*

9. *Generalized Gamma z calculus via sub-Riemannian density manifold.* **Q. Feng** and **W. Li.** (2019) arXiv:1910.07480. **Revision to Journal of the Institute of Mathematics of Jussieu**.
10. *Harnack inequalities on totally geodesic foliations with transverse Ricci flow.* **Q. Feng**. (2017). arXiv:1712.02275.
11. *Log-Sobolev inequalities on the horizontal path space of a totally geodesic foliation.* **F. Baudoin** and **Q. Feng**. (2015) arXiv:1503.08180.
12. *Entropy dissipation via Information Gamma calculus: Non-reversible stochastic differential equations.* **Q. Feng** and **W. Li.**. Preprint. arXiv:2011.08058 (2020).
13. *Hypoelliptic entropy dissipation for stochastic differential equations.* **Q. Feng** and **W. Li.** Preprint. arXiv:2102.00544, 2021.
14. *Deep Signature FBSDE Algorithm.* **Q. Feng**, **M. Luo** and **Z. Zhang**. *arXiv preprint: 2108.10504v1.* **2021**.
15. *Cubature method for Volterra SDEs and rough volatility models.* **Q. Feng** and **J. Zhang**. *Preprint.*
16. *A Non-linear Zakai-Type Stochastic PDE for Conditional McKean-Vlasov Stochastic Systems* **Q. Feng** and **J. Ma**. *Preprint.*
17. *Density asymptotics for rough volatility models.* **F. Baudoin**, **Q. Feng** and **C. Ouyang**. *Preprint.*

* 15–17 are almost complete, available upon request.

TECHNOLOGY SKILLS ***Python***, ***Matlab***, ***Mathematica***, ***Github***.

RESEARCH VISITS

1 **Prof Karl-Theodor Sturm at Universität Bonn.** 18-24 Nov. 2018

2 **MRC collaboration group meeting**. WPI 18-25 Mar. 2016

INVITED TALKS

1. **AMS-SMF-EMS Joint International Meeting.** Grenoble, France. July 2021
   "Special Session on Rough Path and Malliavin Calculus"
2. **AMS Spring Central Sectional Meeting at Cincinnati.** Apr. 2021
   "Probabilistic and diffusion methods in analysis and geometry"
3. **10th Western Conference on Mathematical Finance**. Jan. 2021
4. **Probability Seminar at Urbana-Champaign, UIUC.** Nov. 2020
5. **Probability seminar, University of Texas A&M.** Oct. 2020
6. **Virtual Financial Math Seminar, Florida State University.** Sep. 2020
7. **Bernoulli-IMS One World Symposium 2020** Aug. 2020
   Mathematical Finance session, Youtube Video and zoom discussion.
8. **Bernoulli-IMS One World Symposium 2020** Aug. 2020
   Stochastic Analysis session, Youtube Video and zoom discussion.
9. **UCLA Optimal transport and mean field game seminar.** Apr. 2020.
   UCLA, Zoom.
10. **USC Probability Seminar. USC, Zoom.** (Home talk), Apr. 2020.
11. **Statistics and Data Science Seminar, UIC, Chicago.** Mar. 2020
12. **AMS Section Meeting, Hartford.** Apr. 2019

13. **Institute for Applied Mathematics, Bonn University.** **Oberseminar Stochastik**: *Differential Harnack inequality on totally geodesic foliations under Ricci flow and beyond.* Nov. 2018
14. **Theoretical and Applied Stochastic Analysis. Oaxaca.** *Stochastic and geometric analysis on totally geodesic foliations.* Sep. 2018
15. **Mathematical Finance Colloquium, USC.** Apr. 2018
16. **Stochastic Analysis and Financial Mathematics Common.**WPI. Nov. 2017
17. **Northwestern University, Probability seminar.** ***Talk Title***: *Log-Sobolev inequality on totally geodesic foliations.* Apr. 2016
18. **AMS Sectional meeting**, Las Vegas. Apr. 2015
19. **Purdue University, Probability seminar** Feb. 2015

CONTRIBUTED TALKS

1. **Functional inequalities in Probability. UCONN.** Short talk. Nov. 2018 Monotonicity formulas in sub-Riemannian geometry.
2. **S.I.G.M.A Seminar** A brief introduction to rough paths theory. UCONN. Apr. 2017
3. **Sixteenth Northeastern Probability Seminar. Columbia University.** Short Talk. Nov. 2017
4. **Analysis Learning Seminar, UCONN.** Sep. 2017.
5. **Fifteenth Northeast Probability Seminar**. CUNY. Short talk.
6. **Fourteenth Northeast Probability Seminar.** Short Talk. Courant Institute Nov. 2015
7. **Purdue Secret seminar**, Stochastic analysis on manifolds. Nov. 2015
8. **Summer school on stochastic analysis and Geometry** ***Talk title*** : Brownian motion on Manifold. UIC Aug. 2014

Poster

1. **Dynamics, aging and universality in complex systems** ***Poster***: Stochastic analysis on foliations. Courant Institute. Jun. 2017
2. **Seminar on Stochastic Process 2017(SSP)** ***Poster***: Stochastic analysis on foliations. Univ. of Virginia. Mar. 2017
3. **Seminar on Stochastic Process 2016(SSP)U. of Maryland.** ***Poster***. Log-Sobolev inequality on totally geodesic foliations. Mar. 2016
4. **Analytic tools in Probability and applications**. IMA, University of Minnesota, twin city. ***Poster***. May. 2015
5. **Seminar on Stochastic Process 2015(SSP)**. University of Delaware. ***Poster***. Apr. 2015

ATTENDED CONFERENCES

1. **9th Western Conference on Mathematical Finance** USC. Nov.2018
2. **Conference GeoProb 2017**. Univ. of Luxembourg Jul. 2017
3. **The 8th internatioanl conference on stochastic analysis and its applications**, BIT, Beijing, China Jun. 2016
4. **5th Western Conference on Mathematical Finance** UT Austin. Nov.2015
5. **New Challenge in PDE**, two week workshop at MSRI Oct. 2015
6. **37th Midwest Probability Colloquium** Oct. 2015

SUMMER SCHOOL

1 **CIME-CIRM**, Levico Terme, Italy.
New Trends on Analysis and Geometry in Metric Spaces — Jun. 2017

2 **Northwesern University, Probability Summer School**. — Jul. 2017

3 **Summer School in Geometric Analysis**
Northwestern University. — Jul. 2015

4 **MRC: American Mathematical Society Summer School, Financial Mathematics.** Utah, Snow Bird. — Jun. 2015

5 **MSRI summer school**
Topic: Stochastic partial differential equations. — Jul. 2014

6 **Rocky Mountain Summer school in Wyoming University**
Stochastic equations for complex systems. — Jun. 2014

TEACHING

Teaching in UM

1. **Instructor**: MATH423, Sec. 004. Mathematics of Finance. — Fall 2021

Teaching in USC

2. **Instructor**: MATH408, Sec. 39635. Mathematical Statistics. — Spring 2020
3. **Instructor**: MATH125, Sec. 39978. Calculus I. — Fall 2019
4. **Instructor**: MATH118, Sec. 39978. Business Calculus. — Fall 2019
5. **Instructor**: MATH408, Sec. 39978. Mathematical Statistics. — Spring 2019
6. **Instructor**: MATH408, Sec.39635. Mathematical Statistics. — Spring 2019
7. **Instructor**: MATH114, Sec. 39410. Foundations of Statistics. — Fall 2018

Teaching in UCONN.

8. TA : Mathematics for business and economics, MATH1070Q.
9. TA: Math3160, Probability. — Fall 2017
10. **Instructor**: Math3160, Probability.
11. TA: Math3160, Probability. — Spring 2017

Teaching in Purdue.

12. TA: Differential equations and linear algebra. MA 262 — Fall 2014
13. Recitation Instructor: Calculus I. MA 166. — Spring 2014
14. Recitation Instructor: Calculus II. MA 165. — Fall 2013

REFEREE

1. NeurIPS 2021.
2. SIAM Journal on Control and Optimization.
3. Indagationes Mathematicae
4. GSI2019 (4th conference on Geometric Science of Information).
5. Journal of Dynamical and Control Systems.

HONORS and AWARDS	Research Fellowship from Fabrice Baudoin, NSF-DMS 15-11-328.	Spring 2017
	Research Fellowship from Fabrice Baudoin, NSF-DMS 15-11-328.	Summer 2017
	Doctoral Dissertation Fellowships, UCONN Graduate School.	Spring 2017
	Predoctoral Fellowship from Dept. of Math, UCONN.	Spring 2017
	Research Fellowship from Fabrice Baudoin, NSF-DMS 15-11-328.	Fall 2016
	MRC collaboration group meeting. WPI. Funding provided by the AMS and the MRC grant from NSF. Grant No. 1321794	Mar. 2016
	Research Fellowship from Fabrice Baudoin, NSF-DMS 15-11-328.	Spring 2016
	Research Fellowship from Fabrice Baudoin, NSF-DMS 15-11-328.	Fall 2015
	Graduate School Summer Research Grant (SRG), Purdue University.	Summer 2015
	AMS graduate student travel award, AMS Sectional meeting at Las Vegas.	Apr. 2015
	T.T. Moh Scholarship, Purdue University	Fall 2012
	Prize: Meritorious Winner of MCM (Mathematics Contest in Modeling)	Mar. 2010
EXTRA-CURRICULAR ACTIVITIES	Participated in the Indianapolis Marathon, full marathon	Oct. 2013
	Participated in the 2013 TNF 50K cross country race, ranking 44.	May. 2013
	Participated in The Washington D,C Marathon, full Marathon.	Mar. 2013
	Participated in The Indianapolis Marathon, full Marathon.	Oct. 2012
	Participated in The 2011 Beijing Hyundai Marathon, full Marathon	Oct. 2011