

Wenqing Hu

CONTACT INFORMATION

112 Rolla Building,
Department of Mathematics and Statistics,
Missouri University of Science and Technology,
(formerly University of Missouri, Rolla)
400W, 12th St., Rolla, MO, 65409-0020, USA.

Mobile: (573) 612-5268
Office: (573) 341-4650
E-mail: huwen@mst.edu
Website: <http://web.mst.edu/~huwen/>

RESEARCH INTERESTS

- *Probability:* Stochastic Analysis, Stochastic Dynamical Systems, (Stochastic) Partial Differential Equations.
- *Statistics:* High-Dimensional Statistics, Statistical Machine Learning, Optimization.

EMPLOYMENT

Missouri University of Science and Technology. Rolla, Missouri, USA.
(formerly **University of Missouri, Rolla**)
Assistant Professor (tenure-track), 07/2016 – present.
University of Minnesota, Twin Cities. Minneapolis, Minnesota, USA.
Postdoctoral Associate, 08/2013 – 06/2016.
Mentor: Professor Vladimír Šverák.

EDUCATION

University of Maryland, College Park. College Park, Maryland, USA.
Ph.D. in Mathematics, 08/2008 – 05/2013.
Dissertation Topic: “Asymptotic Problems in Stochastic Processes and Differential Equations”.
Advisor: Professor Mark Freidlin.
Peking University. Beijing, P.R.China.
B.S. in Mathematics, 09/2004 – 07/2008.
Thesis Topic: “From Markov processes to martingales and independent increment processes”.
Advisor: Professor Yong Liu.

PREPRINTS

- Huizhuo Yuan, Wenqing Hu, Stochastic Recursive Momentum Method for Non-Convex Compositional Optimization. Preprint.
[arXiv:2006.01688\[math.OA\]](https://arxiv.org/abs/2006.01688)
- Wenqing Hu, Zeyi Sun, Jiaojiao Yang, Louis Steinmeister, Kaibo Xu, Joint Control of Manufacturing and Onsite Microgrid System via Novel Neural-Network Integrated Reinforcement Learning Algorithms. Preprint. Submitted.
- Wai-Tong (Louis) Fan, Wenqing Hu, Grigory Terlov, Wave propagation for reaction-diffusion equations on infinite random trees. Preprint.
[arXiv:1907.12962\[math.PR\]](https://arxiv.org/abs/1907.12962)
- Wenqing Hu, Zhanxing Zhu, Haoyi Xiong, Jun Huan, Quasi-potential as an implicit regularizer for the loss function in the stochastic gradient descent. Preprint.
[arXiv:1901.06054\[cs.LG\]](https://arxiv.org/abs/1901.06054).

• Md Monirul Islam, Zeyi Sun, Ruwei Qin, Wenqing Hu, Haoyi Xiong, Kaibo Xu, Flexible energy load identification in intelligent manufacturing for demand response using a neural network integrated particle swarm optimization. *Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science*, online.

DOI: 10.1177/0954406220933652

• Jiaojiao Yang, Wenqing Hu, Chris Junchi Li, On the fast convergence of random perturbations of the gradient flow. *Asymptotic Analysis*, to appear.

arXiv:1706.00837[math.PR].

• Md Monirul Islam, Xiao Zhong, Zeyi Sun, Haoyi Xiong, Wenqing Hu, Real-Time Frequency Regulation Using Aggregated Electric Vehicles in Smart Grid, *Computers & Industrial Engineering*, online.

DOI: 10.1016/j.cie.2019.05.025.

• Wenqing Hu, On the long time behavior of a perturbed conservative system with degeneracy. *Journal of Theoretical Probability*, online.

DOI: 10.1007/s10959-019-00911-2. arXiv:1808.01510[math.PR].

• Wenqing Hu, Michael Salins, Konstantinos Spiliopoulos, Large deviations and averaging for systems of slow-fast stochastic reaction-diffusion equations. *Stochastics and Partial Differential Equations: Analysis and Computations*, online.

DOI: 10.1007/s40072-019-00140-y. arXiv:1710.02618[math.PR].

• Wenqing Hu, Chris Junchi Li, Lei Li, Jian-Guo Liu, On the diffusion approximation of nonconvex stochastic gradient descent. *Annals of Mathematical Science and Applications*, Vol. 4, No. 1 (2019), pp. 3–32.

DOI: <http://dx.doi.org/10.4310/AMSA.2019.v4.n1.a1>. arXiv:1705.07562v2[stat.ML].

• Wenqing Hu, Chris Junchi Li, A convergence analysis of perturbed compositional gradient flow: averaging principle and normal deviations. *Discrete and Continuous Dynamical Systems, Series A*, **38**, 10, October 2018, pp. 4951–4977.

DOI: 10.3934/dcds.2018216. arXiv:1709.00515[math.PR].

• Haoyi Xiong, Wei Cheng, Wenqing Hu, Jiang Bian, Zhishan Guo, DBSDA: Lowering the Error Bound of Linear Discriminant Analysis via De-Biasing. *IEEE Transactions on Neural Networks and Learning Systems*, **30**, 3, pp. 707–717, March 2019.

DOI: 10.1109/TNNLS.2018.2846783.

• Wenqing Hu, Vladimír Šverák, Dynamics of geodesic flows with random forcing on Lie groups with left-invariant metrics. *Journal of Nonlinear Science*. **28**, 6, pp. 2249–2274, December 2018.

DOI: 10.1007/s00332-018-9446-1. arXiv:1510.05279[math.AP].

• Wenqing Hu, Itô's formula, the stochastic exponential and change of measure on general time scales. *Abstract and Applied Analysis*, Vol. 2017, Article ID 9140138, 2017.

DOI: 10.1155/2017/9140138. arXiv:1609.05967[math.PR].

- Wenqing Hu, Konstantinos Spiliopoulos, Hypocoelliptic multiscale Langevin diffusions: Large deviations, invariant measures and small mass asymptotics. *Electronic Journal of Probability*, 2017, Vol. 22, article no. 55, pp. 1–38.

DOI: 10.1214/17-EJP72. arXiv:1506.06181[math.PR].

- Tarek Elgindi, Wenqing Hu, Vladimír Šverák, On 2-dimensional incompressible Euler equations with partial damping. *Communications in Mathematical Physics*, **355**, 1, October 2017, pp. 145–159.

DOI: 10.1007/s00220-017-2877-y. arXiv:1511.02530[math.AP].

- Wenqing Hu, Lucas Tcheuko, Random perturbations of dynamical systems with reflecting boundary and corresponding PDE with a small parameter. *Asymptotic Analysis*, **87**, No. 1–2, 2014, pp. 43–56.

DOI: 10.3233/ASY-131197. arXiv:1203.5092[math.PR].

- Mark Freidlin, Wenqing Hu, Wave front propagation for a reaction-diffusion equation in narrow random channels. *Nonlinearity*, **26**, 8, 2013, pp. 2333–2356.

DOI: 10.1088/0951-7715/26/8/2333. arXiv:1303.6943[math.PR].

- Mark Freidlin, Wenqing Hu, On second order elliptic equations with a small parameter. *Communications in Partial Differential Equations*, **38**, 10, 2013, pp. 1712–1736.

DOI: 10.1080/03605302.2013.812658. arXiv:1203.5096[math.PR].

- Mark Freidlin, Wenqing Hu, On diffusion in narrow random channels. *Journal of Statistical Physics*, **152**, 2013, pp. 136–158.

DOI: 10.1007/s10955-013-0763-3. arXiv:1210.5226[math.PR].

- Wenqing Hu, On metastability in nearly-elastic systems. *Asymptotic Analysis*, **79**, 1–2, 2012, pp. 65–86.

DOI: 10.3233/ASY-2011-1090. arXiv:1202.0577[math.PR].

- Mark Freidlin, Wenqing Hu, Alexander Wentzell, Small mass asymptotic for the motion with vanishing friction. *Stochastic Processes and their Applications*, **123** (2013), pp. 45–75.

DOI: 10.1016/j.spa.2012.08.013. arXiv:1201.1242[math.PR].

- Mark Freidlin, Wenqing Hu, Smoluchowski–Kramers approximation in the case of variable friction. *Journal of Mathematical Sciences*, **79**, 1, November 2011, translated from *Problems in Mathematical Analysis*, **61**, October 2011 (in Russian).

DOI: 10.1007/s10958-011-0589-y. arXiv:1203.0603[math.PR].

- Mark Freidlin, Wenqing Hu, On perturbations of generalized Landau–Lifshitz dynamics. *Journal of Statistical Physics*, **144**, 2011, pp. 978–1008.

DOI: 10.1007/s10955-011-0289-5. arXiv:1203.0602[math.PR].

- Mark Freidlin, Wenqing Hu, On stochasticity in nearly-elastic systems. *Stochastics and Dynamics*, **12**, 3, 2012.

DOI: 10.1142/S0219493711500201. arXiv:1203.5468[math.PR].

CONFERENCE
PUBLICATIONS

- Jingfeng Wu, Wenqing Hu, Haoyi Xiong, Jun Huan, Vladimir Braverman, Zhanxing Zhu, On the Noisy Gradient Descent that Generalizes as SGD. *ICML 2020 (37th International Conference on Machine Learning)*, virtual conference due to COVID-19, July 12-18, 2020.

- Huizhuo Yuan, Xiangru Lian, Li, Chris Junchi Li, Ji Liu, Wenqing Hu, Efficient Smooth Non-Convex Stochastic Compositional Optimization via Stochastic Recursive Gradient Descent. *NeurIPS 2019 (Thirty-third Conference on Neural Information Processing Systems)*, Vancouver, Canada, December 8-14, 2019.

- Wenqing Hu, Chris Junchi Li, Xiang Zhou, On the Global Convergence of Continuous-Time Stochastic Heavy-Ball Method for Nonconvex Optimization. *IEEE Big Data 2019 (2019 IEEE International Conference on Big Data)*, Los Angeles, California, USA, December 9-12, 2019.

- Md Monirul Islam, Zeyi Sun, Wenqing Hu, Cihan H Dagli, A Framework of Integrating Manufacturing Plants in Smart Grid Operation: Manufacturing Flexible Load Identification. *ICPR 2019 (the 25th International Conference on Production Research)*, Chicago, Illinois, USA, August 10-14, 2019.

- Wenqing Hu, Zeyi Sun, Yunchao Zhang, Yu Li, Joint Manufacturing and Onsite Microgrid System Control Using Markov Decision Process and Neural Network Integrated Reinforcement Learning. *ICPR 2019 (the 25th International Conference on Production Research)*, Chicago, Illinois, USA, August 10-14, 2019. In press at *Procedia Manufacturing*.

- Haoyi Xiong, Wei Cheng, Wenqing Hu, Jiang Bian, Yanjie Fu, Zhishan Guo, De-Biasing Covariance Regularized Fisher's Linear Discriminant Analysis with Faster Asymptotic Rate. *IJCAI-ECAI-18 (The 27th International Joint Conference on Artificial Intelligence and the 23rd European Conference on Artificial Intelligence)*, Stockholm, Sweden, July 13-19, 2018.

DOI: <https://doi.org/10.24963/ijcai.2018/401>

- Jiang Bian, Haoyi Xiong, Wei Cheng, Yanjie Fu, Wenqing Hu, Zhishan Guo, Multi-Party Sparse Discriminant Learning. *ICDM 2017 (2017 IEEE International Conference on Data Mining)*, New Orleans, Louisiana, USA, November 8-21, 2017.

DOI: 10.1109/ICDM.2017.86.

- Haoyi Xiong, Wei Cheng, Jiang Bian, Wenqing Hu, Zhishan Guo, AWDA: An Adaptive Wishart Discriminant Analysis. *ICDM 2017 (2017 IEEE International Conference on Data Mining)*, New Orleans, Louisiana, USA, November 8-21, 2017.

DOI: 10.1109/ICDM.2017.62.

- Pengfei Wang, Guannan Liu, Yanjie Fu, Wenqing Hu, Charu Aggarwal, Human Mobility Synchronization and Trip Purpose Detection with Mixture of Hawkes Processes. *KDD 2017 (Knowledge, Discovery and Data mining)*, Halifax, Nova Scotia-Canada, August 13-17, 2017. Accepted paper ID=fp1019.

DOI: 10.1145/3097983.3098067.

AWARDS AND
GRANTS

- Simons Foundation Collaboration Grants for Mathematicians, 2020-2025. Amount=\$42000.
- Miner Alumni Association's Class of '42 Excellence in Teaching Award. June 20, 2018. Amount=\$2000.
- NSF sponsored AMS Travel Support to the International Congress of Mathematicians (ICM) in Rio de Janeiro, Brazil, in August of 2018. Amount=\$3300.
- University of Missouri Research Board. June 1, 2017–May 31, 2018. Topic: Multiscale Stochastic Differential Equations. Amount=\$5000.
- AMS–Simons Travel Grant. July 1, 2015–June 30, 2017. Amount=\$4000.
- Patrick and Marguerite Sung Fellowship in Mathematics. College of Computer, Mathematical and Natural Sciences, University of Maryland, College Park, Spring 2012.
- Block–Grant Graduate Student Fellowship. Department of Mathematics, University of Maryland, College Park, Fall 2008–Spring 2010.

INVITED TALKS/
PRESENTATIONS/
LECTURES

- Duke–Kunshan University.
Kunshan, Soochow, China. 07/14/2020–08/13/2020.

Zu–Chongzhi Lectures at Duke–Kunshan University: Introductory Lectures on Machine Learning, Nonlinear Optimization and Reinforcement Learning. Lectures delivered online.

- Analysis Seminar,
Department of Mathematics and Statistics, Missouri University of Science and Technology (formerly University of Missouri, Rolla).
Rolla, Missouri, USA. 10/21/2019.

Talk Title: Wave propagation for reaction-diffusion equations on infinite random trees.

- Department Colloquia,
Department of Statistics, University of Missouri.
Columbia, Missouri, USA. 10/14/2019.

Talk Title: Some Probabilistic Understandings of the Effects of Noise in the Stochastic Gradient Descent.

- Probability and Related Fields Seminar,
Department of Mathematics, Indiana University Bloomington.
Bloomington, Indiana, USA. 10/07/2019.

Talk Title: Wave propagation for reaction-diffusion equations on infinite random trees.

- Probability Seminar,
Department of Mathematics, University of Maryland, College Park.
College Park, Maryland, USA. 08/30/2019.

Talk Title: Wave propagation for reaction-diffusion equations on infinite random trees.

- Seminar at the School of Data Science,

- City University of Hong Kong.
Hong Kong, China. 07/03/2019.
- Talk Title:* Some Probabilistic Understandings of the Effects of Noise in the Stochastic Gradient Descent.
- Seminar on Pure Mathematics,
Department of Mathematics, The Hong Kong University of Science and Technology.
Hong Kong, China. 07/02/2019.
- Talk Title:* On 2d incompressible Euler equations with partial damping and some related model problems.
- Seminar of Department of Mathematics,
Department of Mathematics, Universidad de Macau (University of Macau).
Macau, China. 06/27/2019.
- Talk Title:* Some Probabilistic Understandings of the Effects of Noise in the Stochastic Gradient Descent.
- Invited Lecture Series at the Faculty of Science and Technology.
Department of Mathematics, Universidad de Macau (University of Macau).
Macau, China. 06/24/2019 – 06/26/2019.
- Invited Lectures:* Lectures on Nonlinear Optimization in Machine Learning. 3 lectures, 2 hours each. Lecture notes are available on my personal webpage.
- Applied Computational Intelligence Laboratory.
Department of Electrical and Computer Engineering, Missouri University of Science and Technology (formerly University of Missouri, Rolla).
Rolla, Missouri, USA. 04/30/2019.
- Talk Title:* Stochastic Approximations, Diffusion Limit and Small Random Perturbations of Dynamical Systems – a probabilistic approach to machine learning.
- Analysis Seminar.
Department of Mathematics and Statistics, Missouri University of Science and Technology (formerly University of Missouri, Rolla).
Rolla, Missouri, USA. 04/15/2019.
- Talk Title:* Stochastic Approximations, Diffusion Limit and Small Random Perturbations of Dynamical Systems – a probabilistic approach to machine learning.
- Analysis Seminar.
Department of Mathematics and Statistics, Missouri University of Science and Technology (formerly University of Missouri, Rolla).
Rolla, Missouri, USA. 03/18/2019.
- Talk Title:* On 2d incompressible Euler equations with partial damping and some related model problems.
- Department Colloquium.
Department of Mathematics, Louisiana State University.
Baton Rouge, Louisiana, USA. 01/25/2019.

Talk Title: Stochastic Approximations, Diffusion Limit and Small Random Perturbations of Dynamical Systems – a probabilistic approach to machine learning.

• Duke–Kunshan University.
Kunshan, Soochow, China. 01/08/2019.

Talk Title: Stochastic Approximations, Diffusion Limit and Small Random Perturbations of Dynamical Systems.

• PDE Seminar.
Department of Mathematics, Vanderbilt University.
Nashville, Tennessee, USA. 11/16/2018.

Talk Title: On 2d incompressible Euler equations with partial damping and some related model problems.

• The 4th Annual Meeting of SIAM Central States Session.
University of Oklahoma.
Norman, Oklahoma, USA. 10/06/2018.

Talk Title: On the long–time behavior of a perturbed conservative system with degeneracy.

• 2018 Anhui Normal University Summer Lecture Series.
School of Mathematics and Statistics, Anhui Normal University.
Wuhu, Anhui, China. 06/27/2018 – 07/08/2018.

Invited Lectures: Lectures on Nonlinear Optimization in Machine Learning. 4 lectures, 2 hours each. Lecture notes are available on my personal webpage.

• PDE Seminar.
School of Mathematics and Statistics, Huazhong University of Science and Technology.
Wuhan, Hubei, China. 06/23/2018.

Talk Title: A random perturbation approach to some stochastic approximation algorithms in optimization.

• Stochastic Analysis Seminar.
College of Mathematics, Sichuan University.
Chengdu, Sichuan, China. 06/22/2018.

Talk Title: A random perturbation approach to some stochastic approximation algorithms in optimization.

• Information and Software Engineering Academic Forum.
Department of Computer Science, University of Electronic Science and Technology of China.
Chengdu, Sichuan, China. 06/21/2018.

Talk Title: A random perturbation approach to some stochastic approximation algorithms in optimization.

• Randomized Numerical Linear Algebra Seminar.
College of Mathematics and Statistics, Chongqing University.
Chongqing, China. 06/19/2018.

Talk Title: A random perturbation approach to some stochastic approximation algorithms in optimization.

- Probability Seminar.
School of Mathematical Sciences, Beijing Normal University.
Beijing, China. 06/12/2018.

Talk Title: Hypocoelliptic multiscale Langevin diffusions and slow-fast stochastic reaction diffusion equations.

- Probability Seminar.
School of Mathematical Sciences, Peking University.
Beijing, China. 06/11/2018.

Talk Title: A random perturbation approach to some stochastic approximation algorithms in optimization.

- Invited Lecture “Scientific Frontiers of the 21st Century”,
Beijing Institute of Technology, Beijing, China. 06/08/2018.

Talk Title: A random perturbation approach to some stochastic approximation algorithms in optimization.

- Baidu Big Data Lab in Beijing, Baidu, Inc. Beijing, China. 06/07/2018.

Talk Title: A random perturbation approach to some stochastic approximation algorithms in optimization.

- Stochastic Analysis Seminar.
School of Mathematical Sciences, Peking University.
Beijing, China. 06/05/2018.

Talk Title: On 2-d incompressible Euler equations with partial damping.

- Shanghai Center for Quantitative Life Sciences. Shanghai University.
Shanghai, China. 05/27/2018.

Talk Title: A random perturbation approach to some stochastic approximation algorithms in optimization.

- Probability Seminar.
Department of Mathematics, University of Wisconsin-Madison.
Madison, Wisconsin, USA. 03/15/2018.

Talk Title: A random perturbation approach to some stochastic approximation algorithms in optimization.

- Analysis Seminar.
Department of Mathematics and Statistics, Missouri University of Science and Technology (formerly University of Missouri, Rolla).
Rolla, Missouri, USA. 03/12/2017.

Talk Title: A random perturbation approach to some stochastic approximation algorithms in optimization.

• Analysis Seminar.
Department of Mathematics and Statistics, Missouri University of Science and Technology (formerly University of Missouri, Rolla).
Rolla, Missouri, USA. 12/04/2017.

Talk Title: Large deviations and averaging for systems of slow–fast stochastic reaction–diffusion equations.

• Differential Equation Seminar.
Department of Mathematics, University of Missouri (Mizzou).
Columbia, Missouri, USA. 11/02/2017.

Talk Title: On the fast convergence of random perturbations of the gradient flow.

• Analysis Seminar.
Department of Mathematics and Statistics, Missouri University of Science and Technology (formerly University of Missouri, Rolla).
Rolla, Missouri, USA. 09/25/2017.

Talk Title: On the fast convergence of random perturbations of the gradient flow.

• Probability Seminar.
Department of Mathematics, University of Illinois–Urbana Champaign.
Urbana Champaign, Illinois, USA. 09/12/2017.

Talk Title: On the fast convergence of random perturbations of the gradient flow.

• Department of Computer Science, Missouri University of Science and Technology (formerly University of Missouri, Rolla).
Rolla, Missouri, USA. Spring 2017.

Invited Lectures: Lectures on the Nature of Statistical Learning Theory. 5 lectures, 1 hour each. Lecture notes are available on my personal webpage.

• Mathematical Association of America–Missouri S&T Chapter.
Missouri University of Science and Technology (formerly University of Missouri, Rolla).
Rolla, Missouri, USA. 12/01/2016.

Talk title: From Brownian motion to stochastic calculus, and beyond.

• Kappa Mu Epsilon National Mathematics Honor Society S&T Chapter.
Missouri University of Science and Technology (formerly University of Missouri, Rolla).
Rolla, Missouri, USA. 10/12/2016.

Talk title: From Brownian motion to stochastic calculus, and beyond.

• Time Scales Seminar.
Department of Mathematics and Statistics, Missouri University of Science and Technology (formerly University of Missouri, Rolla).
Rolla, Missouri, USA. 10/05/2016.

Talk title: Itô’s formula, the stochastic exponential and change of measure on general time scales.

• The 2nd Annual Meeting of SIAM Central States Section.

- University of Arkansas at Little Rock.
Little Rock, Arkansas, USA. 10/01/2016.
- Talk title:* On 2-d incompressible Euler equations with partial damping.
- Computational and Applied Mathematical Sciences Seminar.
Department of Mathematics and Statistics, Missouri University of Science and Technology (formerly University of Missouri, Rolla).
Rolla, Missouri, USA. 09/27/2016.
- Talk title:* Hypocoelliptic multiscale Langevin diffusions: Large deviations, invariant measures and small mass asymptotics.
- Stochastics Seminar.
School of Mathematics, Georgia Institute of Technology.
Atlanta, Georgia, USA. 04/07/2016.
- Talk title:* Dynamics of geodesic flows with random forcing on Lie groups with left-invariant metrics.
- Department Colloquium.
Department of Mathematics and Statistics, Missouri University of Science and Technology (formerly University of Missouri, Rolla).
Rolla, Missouri, USA. 02/19/2016.
- Talk title:* Stochastically Perturbed Geodesic Flows on Lie Groups.
- Probability Seminar.
School of Mathematics, University of Minnesota, Twin Cities.
Minneapolis, Minnesota, USA. 01/29/2016.
- Talk title:* Dynamics of geodesic flows with random forcing on Lie groups with left-invariant metrics.
- 2015 Peking University Youth Probability Forum.
Peking University, Beijing, China. 07/09/2015 – 07/17/2015.
- Invited Lectures:* Lectures on Stochastic Fluid Mechanics. 5 lectures, 2 hours each. Lecture notes are available on my personal webpage.
- 2015 Peking University Youth Probability Forum.
Peking University, Beijing, China. 07/08/2015.
- Talk title:* Random motion along co-adjoint orbits.
- AMS 2015 Spring Sectional Meeting.
Georgetown University. Special Session on Asymptotic Problems for Stochastic Processes and PDEs.
Washington D.C., USA. 03/08/2015.
- Talk title:* Random motion along co-adjoint orbits.
- Cincinnati Symposium on Probability Theory and Applications.
Department of Mathematical Sciences, University of Cincinnati.
Cincinnati, Ohio, USA. 09/20/2014.
- Poster Presentation:* Second order elliptic equations with a small parameter.

- Workshop “Recent Advances in PDEs and Fluids”.
Department of Mathematics, Stanford University.
Palo Alto, California, USA. 08/17/2013.

Talk title: On diffusion and wave front propagation in narrow random channels.

- The 9th Cornell Probability Summer School.
Department of Mathematics, Cornell University.
Ithaca, New York, USA. 07/25/2013.

Talk title: On diffusion and wave front propagation in narrow random channels.

- Conference on Asymptotic Problems in Stochastic Processes and PDEs in honor of Professor Freidlin’s birthday.
Department of Mathematics, University of Maryland, College Park.
College Park, Maryland, USA. 05/21/2013.

Talk title: On diffusion and wave front propagation in narrow random channels.

- PDE Seminar.
School of Mathematics, University of Minnesota, Twin Cities.
Minneapolis, Minnesota, USA. 12/12/2012.

Talk title: Second order elliptic equations with a small parameter.

- Applied PDE Research Interaction Team.
Department of Mathematics, University of Maryland, College Park.
College Park, Maryland, USA. 12/03/2012.

Talk title: Second order elliptic equations with a small parameter.

- The 8th Cornell Probability Summer School.
Department of Mathematics, Cornell University.
Ithaca, New York, USA. 07/26/2012.

Talk title: Small mass asymptotic for the motion with variable and vanishing friction.

- Organizing the Student Probability Seminar.
Department of Mathematics, University of Maryland, College Park.
College Park, Maryland, USA. Summer 2012.

Giving series of talks on stochastic partial differential equations.

- Organizing the Student Probability/Combinatorics Seminar.
Department of Mathematics, University of Maryland, College Park.
College Park, Maryland, USA. Fall 2011, Spring 2012.

Giving series of talks: Basic theory; The second moment method (I), (II), (III); The local lemma (I), (II), (III); Martingales and tight concentration (I), (II), (III).

- Student Analysis/PDE/Probability Seminar.
Department of Mathematics, University of Maryland, College Park.
College Park, Maryland, USA. 12/08/2010.

Talk title: An introduction to Schramm–Löwner evolutions.

- Student Analysis/PDE/Probability Seminar.
Department of Mathematics, University of Maryland, College Park.
College Park, Maryland, USA.

03/24/2010.

Talk title: Probabilistic approach to some PDE problems.

ACADEMIC
SERVICE/
MEMBERSHIP

- I serve as a reviewer of *Mathematical Reviews* (MathSciNet, Reviewer Number: 092509).
- I served as referee for the following journals/conferences: *Nonlinearity*, *Transactions of the American Mathematical Society*, *Discrete and Continuous Dynamical Systems–Series A* (3 times), *Journal of Nonlinear Science*, *Stochastic Processes and their Applications* (3 times), *Journal of Differential Equations* (3 times), *Punjab University Journal of Mathematics*, *Journal of Theoretical Probability* (2 times), *Journal of Mathematics and Statistics*, *Acta Mathematica Scientia*, *IEEE Transactions on Parallel and Distributed Systems*, *IEEE Transactions on Image Processing* (2 times), *Asymptotic Analysis*, *SIAM Journal on Mathematical Analysis*, *Neural Information and Processing Systems*.
- I serve as the Program Committee Vice Chair for *IEEE Big Data Conference in 2019* in charge of the Big Data Science and Foundations area.
- I serve as the Program Committee Member for *AAAI 2021 (35th AAAI Conference on Artificial Intelligence)*.

TEACHING

At Missouri University of Science and Technology (formerly University of Missouri, Rolla):

- Spring 2020. Nonlinear Optimization in Machine Learning (MATH 6001). Sections 106 and 107 (distant section).
- Spring 2020. Elementary Differential Equations (MATH 3304). Section 111.
- Fall 2019. Elementary Differential Equations (MATH 3304). Section 103.
- Fall 2019. Introduction to Complex Variables (MATH 5351). Section 101.
- Spring 2019. Nonlinear Optimization in Machine Learning (MATH 6001B). Section 1A.
- Fall 2018. Introduction to Complex Variables (MATH 5351). Section 1A.
- Fall 2018. Instructor. Elementary Differential Equations (MATH 3304). Section 1C.
- Spring 2018. Instructor. Elementary Differential Equations (MATH 3304). Section 1L.
- Fall 2017. Instructor. Introduction to Complex Variable (MATH 5351). Section 1A.
- Fall 2017. Instructor. Elementary Differential Equations (MATH 3304). Section 1D.
- Spring 2017. Instructor. Elementary Differential Equations (MATH 3304). Section 1A.
- Fall 2016. Instructor. Elementary Differential Equations (MATH 3304). Sections 1B and 1E.

At University of Minnesota, Twin Cities:

- Spring 2016. Instructor. Applied Linear Algebra (MATH 4242).
- Fall 2015. Instructor. Introduction to Stochastic Processes (MATH 5652).
- Fall 2015. Instructor. Basic Theory of Probability and Statistics (MATH 5651).
- Spring 2015. Instructor. Basic Theory of Probability and Statistics (MATH 5651).
- Fall 2014. Instructor. Basic Theory of Probability and Statistics (MATH 5651).
- Fall 2013. Instructor. Advanced Calculus I (MATH 4603).

At University of Maryland, College Park:

- Spring 2013. Teaching Assistant (leading discussion), Calculus III (MATH 241). Instructor of the course: Professor Manoussos Grillakis.
- Fall 2012. Grader, Real Analysis I (MATH 630).
- Summer 2012. Grader, Linear Algebra (MATH 246).
- Fall 2011. Teaching Assistant (leading discussion), Linear Algebra for Scientists and Engineers (MATH 461). Instructor of the course: Professor Antoine Mellet.
- Summer 2011. Grader, Advanced Calculus I (MATH 410).
- Summer 2010. Grader, Advanced Calculus II (MATH 411).
- Fall 2009. Grader, Advanced Calculus I (MATH 410); Grader, Probability I (STAT 600).
- Summer 2009. Tutor, PDE for Scientists and Engineers (MATH 462); Tutor, Complex Analysis for Scientists and Engineers (MATH 463); Tutor, Introduction to Numerical Analysis (AMSC 466); Tutor, Advanced Calculus II (MATH 411).
- Spring 2009. Grader, Probability (STAT 410).
- Fall 2008. Grader, Abstract Algebra (MATH 401).

GRADUATE ADVISING

I am advising the following PhD students toward their PhD thesis and doctoral degree.

At Missouri University of Science and Technology (formerly University of Missouri, Rolla):

- Steimeister, Louis K. First year PhD student working on reinforcement learning and quantitative finance. Expected Graduation: August 2024.

I am advising the following master students toward their master's thesis and master's degree.

- Vandergriffe, Austin. Master student working on the asymptotic properties of neural networks. Expected Graduation: August 2020.

I serve as a member of the Ph.D. thesis defense committee for the following doctoral students.

At Missouri University of Science and Technology (formerly University of Missouri, Rolla):

- October 30, 2019. Hassan, Jabar. Doctoral Thesis: New reproducing kernel Hilbert spaces on plane regions, their properties, and applications to partial differential equations. Major Advisor: Professor David Grow.

- August 9, 2019. Keshawani, Rajkamal. Doctoral Thesis: Biofuel Supply Chain Restructuring - An Economic Viability and Environmental Sustainability Investigation for Enhancing Second Generation Biofuel Adoption. Major Advisor: Professor Zeyi Sun (Department of Engineering Management).

I serve as a member of the Master's thesis defense committee for the following master students.

At Missouri University of Science and Technology (formerly University of Missouri, Rolla):

- May 6, 2019. Steinmeister, Louis K. Master Thesis: Less is More: Beating the Market with Recurrent Reinforcement Learning. Major Advisor: Professors V. A. Samaranyake and Donald C. Wunsch II (Department of Electrical and Computer Engineering).

UNDERGRADUATE
ADVISING

I advised the following students on their senior projects – typically an expository paper on a subject chosen by the student.

At Missouri University of Science and Technology (formerly University of Missouri, Rolla):

- Spring 2018. MATH 3304H-1L. Elementary Differential Equations–Honors Program. Term Paper Title: Lotka–Volterra models of Predator–Prey Relationships. Student: Tyler Blaszak, ID=12539004.

At University of Minnesota, Twin Cities:

- Spring 2016. Senior project for independent study (MATH 4997W). Adviser for Wu, Zhouman and Li, Weiqian. Topic: VaR (Value at Risk) estimation and extreme value theory.

- Spring 2016. Senior project for independent study (MATH 4995). Adviser for Yang, Wenjing. Topic: An overview of linear model selection methods.

- Fall 2015. Senior project for independent study (MATH 4997W). Adviser for Xu, Yitong and Sun, Xi. Topic: A review of the Capital Asset Pricing Model.

- Fall 2013. Senior project for independent study (MATH 4997W). Adviser for Lin, Htet Naing and Htet, Maung Soe. Topic: A review of the theory of Markov chains.

I supervised the following undergraduate teams participating the Mathematical Contest in Modeling (MCM).

At University of Minnesota, Twin Cities:

- MCM 2016. Team number: 42730. Team members: Hou, Yucheng; Zhu, Xiaoyi; Song, Qixin. Topic: An ODE model for the temperature dynamics of bathtub system with a person sitting in – the evolution of temperature for different configurations and feedback control mechanism. Result: Honorable Mention.

- MCM 2015. Team number: 42027. Team members: Liu, Jiaoyue; Wang, Xiaoqing; Teng, Da. Topic: The model based on SEIR for Ebola.

DEPARTMENT/
UNIVERSITY
SERVICE

- Department Committee, Department of Mathematics and Statistics, Missouri University of Science and Technology (formerly University of Missouri, Rolla). Department Policy Committee, 09/2017–12/2019. Department Website Committee, 08/2019–now.
- Associate Investigator, Intelligent Systems Center (ISC), Missouri S&T, 07/2020–now.

PROFESSIONAL
SKILLS/
CERTIFICATIONS

- Programming Language: C, C++, Python, MATLAB, R.
- Operating System: Windows 7/Vista/10, Linux (Ubuntu 16.04).
- Professional Certificate: Society of Actuaries (SOA) Exams (P=Probability, Taken September 2015, Status=Pass; FM=Financial Mathematics, Taken June 2016, Status=Pass).
- Language: English (Proficient), Chinese (Native).

Last updated: August 28, 2020.