

HUI WANG

Associate Professor
Division of Applied Mathematics
Dec 31, 2018

EDUCATION

Ph.D. Columbia University, May 2000
M.S. Tsinghua University, P.R.China, July 1996
B.E. Tsinghua University, P.R.China, July 1994

APPOINTMENT

2006–present. Associate Professor, Division of Applied Mathematics, Brown University.
2000–2006. Assistant Professor, Division of Applied Mathematics, Brown University.
Spring semester, 2004. Visiting Fellow, IMA, University of Minnesota.

COMPLETED RESEARCH

Published Articles

1. Importance sampling for jump diffusions via cross entropy (with Rebecca Rieke and Weifeng Sun), *Journal of Computational Finance*, Vol 22, No.1, 2018.
2. An explicit cross-entropy scheme for mixtures (with X. Zhou). TOMACS, **25**, No. 6, 2015.
3. Importance sampling for a feedforward network (with L. Setayeshgar). TOMACS, **23**, No. 21, 2013.
4. Importance sampling for multiscale diffusions (with P. Dupuis and K. Spiliopoulos). *Multiscale Modeling and Simulation* **10**, 1-27, 2012.
5. An infinite swapping approach to the rare-event sampling problem (with N. Plattner, J. Doll, P. Dupuis, Y. Liu, and J. E. Gubernatis). *J. Chem. Phys.* **135**, 134111, 2011.
6. Rare event simulation for rough energy landscapes (with P. Dupuis and K. Spiliopoulos). *Proceeding of the 2011 Winter Simulation Conference*, 2011.
7. Large deviations for a feedforward network (with L. Setayeshgar). *Adv. Appl. Prob.* **43**, 545-571, 2011.
8. Rare event simulation (with S. Asmussen, P. Dupuis, and R. Rubinstein). *Encyclopedia of Operations Research and Management Science (3rd Edition)*, 2010.
9. Importance sampling for weighted-serve-the-longest-queue (with P. Dupuis and K. Leder). *Math. Oper. Res* **34**, 642-660, 2009.
10. A spatial averaging approach to rare event simulation (with J. Doll, J. Gubernatis, N. Plattner, M. Meuwly, P. Dupuis), *J. Chem. Phys.* **131**, 104107, 2009.

11. Importance sampling for Jackson networks (with P. Dupuis). *QUESTA* **62**, 113-157, 2009.
12. Large deviations for weighted-serve-the-longest-queue policy (with P. Dupuis and K. Leder). "In and out of Equilibrium 2" 229-256, *Progress in Probability* **60**, V. Sidoravicius and M.E. Vares (Editors). X EBP, Brazil, 2008.
13. Large deviations and importance sampling for a tandem network with slowdown. *QUESTA* **57**, 71-83, 2007.
14. Subsolutions of an Isaacs equation and efficient schemes for importance sampling (with P. Dupuis). *Math. Oper. Res.* **32**, 723-757, 2007.
15. Dynamic importance sampling for queuing networks (with P. Dupuis and A.D. Sezer). *Ann. Appl. Prob.* **17**, 1306-1346, 2007.
16. Notes on importance sampling for random variables with regularly varying heavy tails (with P. Dupuis and K. Leder). *ACM Trans. Modeling Comp. Simulation.* **17** (3), Article 14, 2007.
17. Pricing path-dependent options with jump risk via Laplace transform (with S. Kou and G. Petrella). *Kyoto Econ. Review.* **74**, 1-23, 2006.
18. On the convergence from discrete to continuous time in an optimal stopping problem (with P. Dupuis). *Annals of Applied Probability* **15**, 1339-1366, 2005.
19. On the optimality of conditional expectation as a Bregman predictor (with A. Banerjee and X. Guo). *IEEE. Transactions on Information Theory* **51** (7), 2664-2669, 2005.
20. Dynamic importance sampling for uniformly recurrent Markov chains (with P. Dupuis). *Annals of Applied Probability* **15**, 1-38, 2005.
21. A sequential entry problem with forced exits. *Mathematics of Operations Research* **30** (2), 501-520, 2005.
22. Importance sampling, large deviations, and differential games (with P. Dupuis). *Stochastics and Stochastics Reports* **76** (6), 481-508, 2004.
23. Option pricing under a double exponential jump diffusion models (with S.G. Kou). *Management Sciences* **50**, 1178-1192, 2004.
24. Control with partial observations and an explicit solution of Mortensen equation (with V. Benes, I. Karatzas, and D. Ocone). *Applied Mathematics and Optimization* **49**, 217-239, 2004.
25. First passage times of a jump diffusion process (with S. Kou). *Advances in Applied Probability* **35**, 504-531, 2003.
26. A capacity expansion problem featuring exponential jump diffusion processes. *Stochastics and Stochastics Reports* **75**, 259-274, 2003.
27. Optimal stopping with random intervention times (with P. Dupuis). *Advances in Applied Probability* **34**, 141-157, 2002.
28. Some control problems with random intervention times. *Advances in Applied Probability* **33**, 402-422, 2001.
29. On optimal terminal wealth under transaction costs (with J. Cvitanic). *Journal of Mathematical Economics* **35**, 223-231, 2001.
30. Utility maximization with random endowments in incomplete markets (with J. Cvitanic and Schachermayer). *Finance and Stochastics* **5**, No. 2, 259-272, 2001.

31. Connections between bounded variation control and Dynkin games (with I. Karatzas). *Optimal Control and Partial Differential Equations* 353-362, 2001. Volume in honour Professor Alain Bensoussan's 60th Birthday. IOS Press, Amsterdam.
32. Utility maximization with discretionary stopping (with I. Karatzas). *SIAM J. on Control and Optimization* **39**, No. 1, 306-329, 2000.
33. Discretization of deflated bond prices (with P. Glasserman). *Advances in Applied Probability* **32**, 540-563, 2000.
34. A barrier option of American type (with I. Karatzas). *Applied Mathematics and Optimization* **42**, 259-280, 2000.
35. A finite-fuel control problem with discretionary stopping (with I. Karatzas, D. Ocone, and M. Zervos). *Stochastics and Stochastics Reports* **71**, 1-50, 2000.
36. A minimization problem arising from prescribing scalar curvature functions (with L. Ma). *Math. Z.* **222**, 1-6, 1996.

Submitted

- Large deviations for a Jackson network with preemptive priority policy (with Weifeng Sun).

BOOK:

- *Monte Carlo Simulation with Applications to Finance*. Taylor-Francis, Florida. June 2012.

RESEARCH IN PROGRESS:

- Importance sampling for option pricing (with L. Setayeshgar).

INVITED LECTURES:

- Probability seminar, Columbia University, Jan 25, 2001
- Fifth SIAM Conference on Control and Its Application, San Diego, July 12, 2001
- Summer school in Columbia University, July 21, 2001
- 11th INFORMS Applied Probability Conference, Columbia University, July 25-27, 2001
- AMS meeting, Columbus, OHIO, Sept 22-23, 2001 (cancelled)
- Workshop on Incomplete Markets, Carnegie Mellon University, May 23-25, 2002
- 15th International Symposium on Mathematical Theory of Networks and Systems, University of Notre Dame, August 12-16, 2002
- Probability Seminar, Columbia University, Nov 15, 2002
- Statistics seminar, New York University, April 11, 2003
- AMS-IMS-SIAM Summer Research Conference, Snowbird resort, Utah, June 22-26, 2003.
- Stochastics and Finance seminar, Boston University, Nov 5, 2003.

- Complex System seminar, University of Minnesota, Jan 22, 2004.
- Workshop on Rare Events in Communication Networks. EURANDOM, Netherlands. Feb 2-5, 2005.
- Workshop on Large Deviations and Rare Events in Networks. Fields Institute, Canada. July 4-5, 2005.
- Conference on Stochastic Control and Numerics. University of Wisconsin-Milwaukee, Sept 15-17, 2005.
- Probability Seminar, Columbia University. Nov 11, 2005.
- 6th International Workshop on Rare Event Simulation, Bamberg, Germany, Oct 8-10, 2006.
- SIAM Conference on Control and Its Application (CT07), San Francisco, June 29-July 1, 2007.
- MTNS, Virginia Tech, VA, July 27 – Aug 1, 2008.
- INFORMS, Washington DC, October, 2008.
- DOE Applied Mathematics Meeting, Berkeley, CA, May 3-5, 2010.
- 8th Rare Event Simulation Workshop, Cambridge, UK, June 21-23, 2010.
- Probability seminar, Boston University, Boston, MA, Nov 8, 2010.
- Probability seminar, City University of Hong Kong, Hong Kong, P.R.China, Oct 28, 2014.

SERVICES:

For Brown University:

- Undergraduate program committee, 2001-2009, 2011-2013.
- Freshman advising committee, 2001-2006, 2015-2016, 2018

For the Division:

- Co-organizer of the stochastic seminar, 2001-2008.
- Graduate program committee, 2006-2007.
- Search committees, 2006-2007.
- Sheridan Faculty Liaison, 2006-2009.
- Graduate program committee, 2009-2010.

For the Professional Community:

- Refereeing papers for journals including: Annals of Probability, Annals of Applied Probability, Applied Probability, Applied Mathematics and Optimization, Mathematics of Operations research, SIAM Journal on Control and Optimization, Mathematical Finance, Finance and Stochastics, Stochastic Analysis and Its Applications, Stochastics and Stochastics Reports.

GRANT SUPPORT:

- NSF grant DMS-0103669 (2001-2004). Research on stochastic optimization and applications.
- NSF grant DMS-0404806 (2004-2007). Research on stochastic processes and applications.

- NSF grant DMS-0706003 (2007-2010). Importance sampling and the subsolutions of an associated Isaacs Equation.
- DOE grant DE-SC0002413 (2009-2011). Large deviations methods for the analysis and design of Monte Carlo schemes in physics and chemistry.
- NSF grant DMS-1008331 (2010-2013). Fast simulation, large deviations, and associated Hamilton-Jacobi-Bellman equations

TEACHING:

- APMA 1690. *Computational Probability and Statistics*, Fall 2018, Enrollment: 104.
- APMA 1655. *Statistical Inference (I)*, Fall 2017. Enrollment: 70.
- APMA 2640. *Theory of Probability (II)*, Spring 2017. Enrollment: 21.
- APMA 2630. *Theory of Probability (I)*, Fall 2016. Enrollment: 21
- APMA 1200. *Operations Research: Probabilistic Models*, Spring 2016. Enrollment: 119.
- APMA 2630. *Theory of Probability (I)*, Fall 2015. Enrollment: 21.
- APMA 1720. *Monte Carlo Simulation with Applications to Finance*, Spring 2015. Enrollment: 103.
- APMA 2630. *Theory of Probability (I)*, Fall 2013. Enrollment: 18.
- APMA 1720. *Monte Carlo Simulation with Applications to Finance*. Spring 2013, Enrollment: 71.
- APMA 0650. *Essential Statistics*. Spring 2012, Enrollment: 156.
- APMA 0340. *Methods of Applied Mathematics (II)*. Fall 2011, Enrollment: 25.
- APMA 1720. *Monte Carlo Simulation with Applications to Finance*. Spring 2011, Enrollment: 58.
- AM264. *Theory of Probability (II)*. Spring 2010, Enrollment: 20.
- AM263. *Theory of Probability (I)*. Fall 2009, Enrollment: 24.
- AM172. *Monte Carlo Simulation with Applications to Finance*. Spring 2009, Enrollment: 51.
- AM120. *Operations Research: Probabilistic Models*. Spring 2008, Enrollment: 45.
- AM165. *Statistical Inference (I)*, Fall 2007, Enrollment: 120.
- AM166. *Statistical Inference (II)*, Spring 2007, Enrollment: 20.
- AM165. *Statistical Inference (I)*, Fall 2006, Enrollment: 120.
- AM226. *Introduction to Stochastic control theory*, Spring 2006, Enrollment: 13.
- AM121. *Operations Research: Deterministic Model*, Fall 2005, Enrollment: 40.
- AM264. *Theory of Probability (II)*, Spring 2005, Enrollment: 8.
- AM121. *Operations Research: Deterministic Model*, Fall 2004, Enrollment: 20.
- AM226. *Introduction to Stochastic Control Theory*, Fall 2003, Enrollment: 5.
- AM266. *Stochastic Differential Equations*, Spring 2003, Enrollment: 15
- AM121. *Operations Research: Deterministic Model*, Fall 2002. Enrollment: 20
- AM264. *Theory of Probability (II)*, Spring 2002. Enrollment: 12
- AM033. *Methods of Applied Mathematics*, Fall 2001. Enrollment: 40
- AM266. *Stochastic Differential Equations*, Spring 2001. Enrollment: 3.
- AM035. *Methods of Applied Mathematics*, Fall 2000. Enrollment: 25.

THESIS ADVISING:

- Hui-Ming Pai (with P. Dupuis), completed 2003.
- Ali Devin Sezer (with P.Dupuis), completed 2006.
- Kevin Leder, completed 2008.
- Shawn Ban, undergraduate honor thesis 2007-2008.
- Kieran Fitzgerald, undergraduate honor thesis, completed 2011.
- Leila Setayeshgar, completed 2012.
- Xiang Zhou (postdoc), completed 2012.
- Rebecca Rieke, undergraduate honor thesis, completed December 2014.
- Shiyong Luo, undergraduate honor thesis, completed 2016.
- Stefen Minic, undergraduate honor thesis, completed May 2017
- Weifeng Sun, Ph.D., expected to graduate March 2019.
- Violet Davis, undergraduate honor thesis, completed May 2018.

HONORS: Elected Manning Assistant Professor of Applied Mathematics, 2004.