Mingbin (Ben) Feng

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http://www.math.uwaterloo.ca/~mbfeng/

Experience

Assistant Professor, University of Waterloo Department of Statistics and Actuarial Science	Oct. 2016 - present
Visiting Internship Postgraduate Student, HKUST Department of Industrial Engineering and Logistics Management	Jun. 2014 - Sep. 2014
Actuarial Intern, AXIS Capital Inc., New York	Jun. 2012 - Sep. 2012
Education	
Northwestern University Ph.D. in Industrial Engineering and Management Sciences	Sen 2011 - Oct 2016
- Thesis title: Green Simulation: Reusing the Output of Simulation Exp	eriment
Northwestern University Master of Science in Industrial Engineering and Management Sciences	Sep. 2011 - Mar. 2013
University of Waterloo, Canada Master of Mathematics in Actuarial Science	May. 2010 - Aug. 2011
- Thesis title: Coherent Distortion Risk Measures in Portfolio Selection BMath in Double Honors Actuarial Science and Operations Research	Sep. 2007 - Apr. 2010
Professional Designations	
Associate of the Society of Actuaries (ASA)	2012-present
Member of INFORMS	2014-present
Member of the Simulation Society of INFORMS	2015-present

Software Distribution (student collaborations underlined)

Li, H., Feng, M., Jiang, M., & Gan, G. (2020). vamc: A Monte Carlo Valuation Framework for Variable Annuities . CRAN. https://cran.r-project.org/web/packages/vamc/index.html.

Publications (student collaborations underlined)

Dang, O., Feng, M., & Hardy, M.R. (2020). *Efficient Nested Simulation for Conditional Tail Expectation of Variable Annuities.* North American Actuarial Journal (NAAJ), Volume 24, Issue 2: Predictive Analytics, Pages 187-210.

Feng, M., <u>Tan Z.</u>, & <u>Zheng</u>, J. (2020). *Efficient Simulation Designs for Valuation of Large Variable Annuity Portfolios.* North American Actuarial Journal (NAAJ), Volume 24, Issue 2: Predictive Analytics, Pages 275-289. Feng, M. & Staum, J. (2020). *Green Simulation with Database Monte Carlo*. Accepted by ACM Transactions on Modeling and Computer Simulation (TOMACS) in Nov 2020.

Feng, M., & Song, E. (2020). *Optimal Nested Simulation Experiment Design via Likelihood Ratio Method.* Submitted to Operations Research in Jun 2020.

Feng, M. & Jiang, G.X. (2020). *Reusing Simulation Outputs of Repeated Experiments via Likelihood Ratio Regression.* Proceedings of the 2020 Winter Simulation Conference (WSC), Virtual.

Feng, M. & Liu, K. (2020). Path Generation Methods for Valuation of Large Variable Annuities Portfolio Using Quasi-monte Carlo Simulation. Proceedings of the 2020 Winter Simulation Conference (WSC), Virtual.

Zheng, H., Xie, W. & Feng, M. (2020). Green Simulation Assisted Reinforcement Learning with Model Risk for Biomanufacturing Learning and Control. Proceedings of the 2020 Winter Simulation Conference (WSC), Virtual.

Dang, O., Feng, M., & Hardy, M.R. (2020). Dynamic Importance Allocated Nested Simulation for Variable Annuity Risk Measurement. Submitted to Annals of Actuarial Science in Nov 2020.

Fan, W., Feng, M., Hong, Jeff., Zhang, L. (2020). Value of Data: A Robust Linear Programming Perspective. Manuscript in preparation.

Dang, O., Feng, M., & Hardy, M.R. (2019). *Efficient Nested Simulation of Tail Risk Measures.* Proceedings of the 2019 Winter Simulation Conference (WSC), National Harbor, MD, USA, 2019, pp. 938-949.

Feng, M., & Song, E. (2019). Efficient Input Uncertainty Quantification via Green Simulation Using Sample Path Likelihood Ratios. Proceedings of the 2019 Winter Simulation Conference (WSC), National Harbor, MD, USA, 2019, pp. 3693-3704.

Eckman, D & Feng, M. (2018). *Green Simulation Optimization Using Likelihood Ratio Estimators.* Proceedings of the 2018 Winter Simulation Conference (WSC), Gothenburg, Sweden, 2018, pp. 2049-2060.

Dong, J., Feng, M., & Nelson, B.L. (2018). *Unbiased Metamodeling via Likelihood Ratios*. Proceedings of the 2018 Winter Simulation Conference (WSC), Gothenburg, Sweden, 2018, pp. 1778-1789.

Feng, M., Maggiar, A., Staum, J., Wächter, A. (2018). Uniform Convergence of Sample Average Approximation with Adaptive Importance Sampling. Proceedings of the 2018 Winter Simulation Conference (WSC), Gothenburg, Sweden, 2018, pp. 1646-1657.

Feng, M., Mitchell, J. E., Pang, J. S., Shen, X., & Wächter, A. (2018). Complementarity Formulations of ℓ_0 -norm Optimization Problems. Pacific Journal of Optimization, Volume 14, Number 2, pg. 273-305.

Feng, M. & Staum, J. (2017). Green Simulation: Reusing the Output of Repeated Experiments. ACM Transactions on Modeling and Computer Simulation (TOMACS), Volume 27 Issue 4, Article No. 23.

Staum, J., Feng, M., & Liu, M. (2016). Systemic Risk Components in a Network Model of Contagion. IIE Transactions, 48(6), 501-510.

Feng, M. & Staum, J. (2016). *Green Simulation with Database Monte Carlo*. Proceedings of the 2016 Winter Simulation Conference (WSC), Washington, DC, 2016, pp. 1108-1118.

Feng, M. & Staum, J. (2015). *Green Simulation Designs for Repeated Experiments*. Proceedings of the 2015 Winter Simulation Conference (WSC), Huntington Beach, CA, 2015, pp. 403-413.

Feng, M., Wächter, A., & Staum, J. (2015). *Practical Algorithms for Value-at-Risk Portfolio Optimization Problems.* Quantitative Finance Letters, 3(1), 1-9.

Feng, M., & Tan, K. S. (2012). Coherent Distortion Risk Measures in Portfolio Selection. Systems Engineering Procedia, 4, 25-34.

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Research Student Supervisions		
Jessica Ou Dang (Ph.D.) – Efficient nested simulation procedures for tail risk esti	Fall 2016 - present imations in Variable Annuities.	
 - 3 journal and proceedings publications, 1 manuscript and 1 manuscript in preparation. 	submitted to Annals of Actuarial Science,	
Jiazhen Chen (Master's & Ph.D.)	Fall 2018 - present	
– Master's essay: Online Risk Monitoring Using Logisti	c Regression.	
Xintong Li (Master's & Ph.D.)	Fall 2019 - present	
– Master's essay: Approximating Nested Simulation Models with Machine Learning Methods.		
Hsiao-Cheng Dung (Ph.D.)	Fall 2020 - present	
Ren Jie (Ph.D.)	Winter 2021	
 Yifei Song (Master's) 2016-2017 Master's essay: The Optimal Strategy in a Semi-static Model for Pricing Guaranteed Minimum Benefit Riders under Different Withdrawal Rate Assumptions 		
Zhenni Tan (Master's)	2016-2017	
– Master's essay: The Impact of Clustering Method for Pricing a Large Portfolio of VA Policies		
Jiayi Zheng (Master's)	2016-2017	
– Master's essay: Efficient Greek Estimation for Variable Annuities using Monte Carlo Simulation		
 Mingyi (Iris) Jiang (Undergraduate) President's Research Award (2020) Mitacs Research Training Award (2020) Maintained and updated R library "vamc" 	Part-time & Full-time, Jan 2020 - preset	
 Developed new convergence results on kernel estimate pricing. 	ors in Monte Carlo Simulation for American	
Ziyu (Cheryl) Chi (Undergraduate) – Survey of portfolio optimization.	Full-time, May 2020 - Aug 2020	
Jaser Zhu (Undergraduate)	Full-time, Sep 2019 - Dec 2019	

 Developed new convergence results on kernel estimators in Monte Carlo Simulation for American pricing.

Hengxin (Hanson) Li (Undergraduate)

Part-time, Jan 2018 - Dec 2018

– Developed R library "vamc"

Jiaxin (Tony) Liu

Part-time Undergraduate Research Student, Fall 2016

- Survey Study on Portfolio Selection

Conference Presentations

Uniform Convergence Of Sample Average Approximation With Adaptive Multiple Importance Sampling

– 2018 Winter Simulation Conference, Gothenburg, Sweden. Invited.

Unbiased Metamodeling via Likelihood Ratios

- 2018 Winter Simulation Conference, Gothenburg, Sweden. Invited.

Green Simulation Optimization Using Likelihood Ratio Estimators

- 2018 Winter Simulation Conference, Gothenburg, Sweden

Efficient Simulation Designs for Risk Management of Large Variable Annuity Portfolios

- Sun Yat-Sen University, Guangzhou, Guangdong, China. <u>Invited</u>.
- 2018 INFORMS International Conference, Taipei, Taiwan, China. <u>Invited</u>.

Efficient Nested Simulation for Risk Management of Variable Annuities

- 2018 INFORMS Annual Meeting, Houston, TX. Invited.
- 2018 Joint Statistical Meetings (JSM), Vancouver, BC, Canada. <u>Invited</u>.

Green Simulation with Database Monte Carlo

- 2016 Winter Simulation Conference, Arlington, VA

Green Simulation Designs for Repeated Experiments

- 2015 Winter Simulation Conference, Huntington Beach, CA
- 2015 INFORMS Annual Meeting, Philadelphia, PA. Invited.

Complementarity Formulations of ℓ_0 -norm Optimization Problems

- INFORMS 2013 Annual Meeting, Minneapolis, MN. Sponsored Session.

Coherent Distortion Risk Measures in Portfolio Selection

- 46th Actuarial Research Conference (2011), Society of Actuaries, University of Connecticut

Research Grants

Discovery Grants Program – Individual

2018-2023

- Principal Investigator
- Funding Agency: The Natural Sciences and Engineering Research Council of Canada (NSERC)

 Title: Efficiently Reusing Monte Carlo Simulation Output in Repeated Experiments for Financial and Actuarial Applications

Centers of Actuarial Excellence (CAE) Grant – Group	2018-2023
– One of 13 investigators	
– Funding Agency: The Society of Actuaries (SOA)	
– Title: Maintaining Financial Stability in an Era of Changing Climate an	d Demographics
Mitacs Research Training Award (RTA) IT21998 – Principal Investigator	Aug 2020 – Dec 2020
 Title: Efficient Nested Simulation for Pricing and Risk Management for Variable Annuities 	Exotic Options and
Mitacs Accelerate IT12278 – Principal Investigator	Sep 2018 – Dec 2018
– Industry partner: Besurance Corporation	
– Title: Accessible Data Platform for Dynamic experience study of Lifesty	le Underwriting
Honors	

Royal E. Cabell Terminal Year Fellowship

 Outstanding terminal-year Ph.D. candidate in McCormick School of Engineering
 2015

 Society of Actuaries Hickman Scholarship

 Outstanding Ph.D. candidate pursuing actuarial professional destination
 2012-2015

 The Arthur P. Hurter Award at Northwestern University

 The best first year graduate student in Industrial Engineering and Management Sciences
 2012

Ph.D. Entrance Scholarship in Financial Engineering

Entering graduate students with research interest in financial engineering $\ldots \ldots \ldots \ldots \ldots 2011$

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	Service
	Departmental Graduate Liaison Committee, Northwestern University
	Mathematical Bootcamp for Incoming Students, Northwestern University
	Volunteer of the Society of Actuaries