
Guangwu Liu

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Academic Qualifications

- **Ph.D. (2009)** Industrial Engineering and Logistics Management, The Hong Kong University of Science and Technology
- **B.Sc. (2005)** Applied Mathematics, Tsinghua University, Beijing, China.

Academic Positions

- Professor (July 2018 – present), Associate Professor (July 2015 – June 2018), Assistant Professor (July 2009 – June 2015), Department of Management Sciences, College of Business, City University of Hong Kong

Research Interests

- Stochastic Simulation
- Machine Learning
- Business Analytics
- Financial Engineering and Risk Management

Awards and Honors

- 2012 Outstanding Simulation Publication Award, INFORMS Simulation Society, December 2012
- Early Career Award, The Research Grants Council of Hong Kong, December 2012
- IIE Scholarship, Institute of Industrial Engineering (Hong Kong), April 2009
- Teaching Assistant Excellence Award, Department of IELM, The Hong Kong University of Science and Technology, 2008.

Journal Publications

1. Zhong, Y., L. J. Hong, and **G. Liu**. 2021. Earning and learning with varying cost. *Production and Operations Management*, forthcoming.
2. Zhang, L., **G. Liu**, and S. Wang. 2021. Bootstrap-based budget allocation for nested simulation. *Operations Research*, forthcoming.

3. Hong, L. J., S. Juneja, and **G. Liu**. 2017. Kernel smoothing for nested estimation with application to portfolio risk measurement. *Operations Research*, 65(3), 657-673.
4. Tong, S., and **G. Liu**. 2016. Importance sampling for option Greeks with discontinuous payoffs. *INFORMS Journal on Computing*, 28(2), 223-235.
5. **Liu, G.** 2015. Simulation risk contributions of credit portfolios. *Operations Research*, 63(1), 104-121.
6. Hong, L. J., Z. Hu, and **G. Liu**. 2014. Monte Carlo methods for Value-at-Risk and Conditional Value-at-Risk: A review. *ACM Transactions on Modeling and Computer Simulation*, 24(4), 2-38.
7. **Liu, G.**, and L. J. Hong. 2011. Kernel estimation of the Greeks for options with discontinuous payoffs. *Operations Research*, 59(1), 96-108.
8. Hong, L. J., and **G. Liu**. 2010. Pathwise estimation of probability sensitivities through terminating or steady-state simulations. *Operations Research*, 58, 357-380.
9. **Liu, G.**, and L. J. Hong. 2009. Revisit of stochastic mesh method for pricing American options. *Operations Research Letters*, 37, 411-414.
10. **Liu, G.**, and L. J. Hong. 2009. Kernel estimation of quantile sensitivities. *Naval Research Logistics*, 56, 511-525.
11. Hong, L. J., and **G. Liu**. 2009. Simulating sensitivities of conditional value-at-risk. *Management Science*, 55(2), 281-293.

Refereed Conference Proceedings

1. **Liu, G.**, W. Shi, and K. Zhang. 2019. An upper confidence bound approach to estimating coherent risk measures. *Proceedings of the 2019 Winter Simulation Conference*, 914-925.
2. Zhang, K., **G. Liu**, and S. Wang. 2017. Portfolio risk measurement via stochastic mesh. *Proceedings of the 2017 Winter Simulation Conference*, 1796-1807.
3. Wang, S., **G. Liu**, and K. Zhang. 2017. A misspecification test for simulation metamodels. *Proceedings of the 2017 Winter Simulation Conference*, 1938-1949.
4. Feng, G., **G. Liu**, and L. Sun. 2013. A nonparametric method for pricing and hedging American options. *Proceedings of the 2013 Winter Simulation Conference*, 691-700.

5. **Liu, G.** 2011. A reflection-based variance reduction technique for sum of random variables. *Proceedings of the 2011 Winter Simulation Conference*, 3795-3804.
6. Hong, L. J., and **G. Liu.** 2011. Monte Carlo estimation of value-at-risk, conditional value-at-risk and their sensitivities. *Proceedings of the 2011 Winter Simulation Conference*, 95-107.
7. **Liu, G.** 2010. Importance sampling for risk contributions of credit portfolios. *Proceedings of the 2010 Winter Simulation Conference*, 2771-2781.
8. **Liu, G.,** and L. J. Hong. 2008. Revisit of stochastic mesh method for pricing American options. *Proceedings of the 2008 Winter Simulation Conference*, 594-601.
9. **Liu, G.,** and L. J. Hong. 2007. Kernel estimation for quantile sensitivities. *Proceedings of the 2007 Winter Simulation Conference*, 941-948.

Research Grants

1. “Machine learning methods for portfolio risk measurement” (**PI**), Hong Kong Research Grants Council, General Research Fund (GRF), 2020-2021.
2. “Measuring the performance of simulation metamodels” (**PI**), Hong Kong Research Grants Council, General Research Fund (GRF), 2018-2019.
3. “A likelihood ratio method for nested simulation” (**PI**), Hong Kong Research Grants Council, General Research Fund (GRF), 2017-2018.
4. “Operations-driven analytics for multifunctional call centres’ outbound services: Automated workforce performance evaluation” (**Co-I**, **PI**: Dr. Geoffrey Tso), Hong Kong Research Grants Council, General Research Fund (GRF), 2017-2018.
5. “Joint chance constrained programming: A gradient perspective” (**PI**), Hong Kong Research Grants Council, General Research Fund (GRF), 2016-2017.
6. “An optimal stopping approach to portfolio risk measurement” (**PI**), Hong Kong Research Grants Council, General Research Fund (GRF), 2014-2016.
7. “A change-of-variable approach to conditional Monte Carlo” (**PI**), Hong Kong Research Grants Council, General Research Fund (GRF), 2013-2015.
8. “A kernel method for pricing and hedging American path-dependent options” (**PI**),

Hong Kong Research Grants Council, Early Career Scheme (ECS), 2012-2014.

9. “Fast simulation of capital allocation for credit portfolios” (PI), Hong Kong Research Grants Council, General Research Fund (GRF), 2011-2013.
10. “A conditional Monte Carlo method for simulating conditional expectations” (PI), Hong Kong Research Grants Council, General Research Fund (GRF), 2010-2012.
11. “Fast simulation of American option pricing” (PI), City University of Hong Kong, CityU Start-Up Grant, 2009-2011.

Courses Taught

- MS3235 Operational Risk Management
- MS4226 Risk Management Models
- EF5343 Corporate Risk Management Policies
- MS6211 Statistical Modeling for Risk Management
- FB8913 Multi-Disciplinary Research Workshop
- MS8945 Stochastic Operations Research
- CB2201 Quantitative Methods (core course for College of Business)

Services to University, College, and Department

1. PhD Director, College of Business, November 2017 - present
2. Committee on Research Degrees Candidature (CRDC) of the University, member, January 2019 – present
3. Committee on Taught Postgraduate Programmes (CTTP) of the University, member, November 2018 – present
4. Departmental Staffing Committee (DSC), member, July 2018 – present
5. Departmental Performance Appraisal Committee (DPAC), member, July 2018 - present
6. Departmental Research Degree Program Coordinator, 2013-2017
7. Deputy coordinator at departmental level for RAE 2014
8. Departmental Research Committee: member, 2011-2012; chair, 2013-2018
9. College Research Committee: member, 2010-2012
10. HKSAR Government Scholarship Scheme: panel member, October 2012, October 2014
11. College of Business Student Advising Scheme: advisor, 2012-13, 2015-17
12. Departmental General Education Committee: member, 2011-present

Professional Services

1. Associate Editor, Naval Research Logistics, January 2018 - present
2. Associate Editor, Asia-Pacific Journal of Operational Research, September 2014 - present
3. Program Committee Member, The 2014 Winter Simulation Conference, Savannah, GA, USA
4. Editorial Board Member, International Journal of Simulation and Process Modelling, August 2014 – present
5. Treasurer, The 4th POMS-HK International Conference, January 2013