Chang-Han Rhee

CONTACT

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RESEARCH INTERESTS

Applied Probability, Simulation and Statistical Inference for Stochastic Processes, Rare-Event Analysis, Energy Systems, Experimental Design.

ACADEMIC POSITIONS

Centrum Wiskunde & Informatica, Amsterdam, Netherlands 2015–Present
Postdoctoral Researcher in Stochastics
Supervisor: Bert Zwart

Georgia Institute of Technology, Atlanta, GA, USA 2013–2015
Postdoctoral Fellow in Industrial & Systems Engineering and Biomedical Engineering
Supervisor: Enlu Zhou, Peng Qiu

EDUCATION

Stanford University, Stanford, CA, USA 2008–2013
Ph.D. in Computational and Mathematical Engineering
Supervisor: Peter W. Glynn
Thesis title: *Unbiased Estimation with Biased Samplers*

Stanford University, Stanford, CA, USA 2006–2008
M.S. in Computational and Mathematical Engineering [1]

Seoul National University, Seoul, Korea 1998–2006
B.S. in Mathematics and B.S. in Computer Science (Military service: 2002–2005)

AWARDS

- **INFORMS Simulation Society Outstanding Simulation Publication Award, 2016**
- Finalist, George Nicholson Student Paper Competition, 2013
- Best Student Paper Award (MS/OR focused), Winter Simulation Conference, 2012
- Samsung Fellowship, 2008–2012
- Seoul National University Merit Scholarship, 2005–2006
- ACM SIGSIM Travel Award, 2012
- NSF Financial Support for WSC 2012

PUBLICATIONS

[1] "Sample-path large deviation principle for Lévy processes with Weibull increments and many server queue," with M. Bazhba, J. Blanchet, and B. Zwart. `arXiv:1710.04013`. Submitted to *Annals of Applied Probability*.

[2] "Sample-path large deviations for heavy-tailed Lévy processes and random walks," with J. Blanchet and B. Zwart. `arXiv:1606.02795`. Submitted to *Annals or Probability*. (under revision for second round review.)

[3] "Importance sampling of heavy-tailed stocahstic perpetuities" with B. Chen and B. Zwart. `arXiv:1609.03182`. Submitted to *Advances in Applied Probability*. (under revision for second round review.)

[4] "Lyapunov conditions for differentiability of Markov chain expectations: the absolutely continuous case," with P. W. Glynn. `arXiv:1707.03870`. To be submitted to *Mathematics of Operations Research*.

[1] Officially granted in 2013

[5] "Space filling design for non-linear models," with E. Zhou and P. Qiu. To be submitted to *Stochastic Systems*.

[6] "Efficient rare-event simulation for multiple jump events in regularly varying random walks and compound Poisson processes," with B. Chen, J. Blanchet, and B. Zwart. `arXiv:1706.03981`. Submitted to *Mathematics of Operations Research*. (under revision for second round review.)

[7] "Unbiased estimation with square root convergence for SDE models," with P. W. Glynn. *Operations Research*, 63(5): 1026–1043, 2015. **2016 INFORMS Simulation Society Outstanding Simulation Publication Award.** The preprint of this paper was also recognized as a **Finalist in 2013 George Nicholson Student Paper Competition.**

[8] "Exact estimation for Markov chain equilibrium expectations," with P. W. Glynn. *Journal of Applied Probability (Special Jubilee Issue)*, 51A: 377-389, 2014.

[9] "An iterative algorithm for sampling from manifolds," with E. Zhou and P. Qiu, *Proceedings of the 2014 Winter Simulation Conference*, 2014.

[10] "A new approach to unbiased estimation for SDEs," with P. W. Glynn, *Proceedings of the 2012 Winter Simulation Conference*, 2012. **Best MS/OR focused Student Paper.**

Working Papers

[11] "On heavy-tailed simulation estimators," with B. Chen.

[12] "Rare event simulation for cascading failures in power grids," with T. Nesti, N. Vasmel, and B. Zwart

[13] "Sample-path large deviations for heavy-tailed Markov additive processes" with B. Chen and B. Zwart

[14] "Quasi-variational problems in heavy-tailed large deviations theory," with B. Zwart and J. Blanchet

[15] "Lyapunov conditions for differentiability of Markov chain expectations: the contracting case," with P. W. Glynn.

Services

Program Committee:
- 2016 Winter Simulation Conference (Analysis and Methodology Track)
- 2017 International Conference on Machine Learning (Reviewer)

Referee:
- Operations Research, Mathematics of Operations Research, Bernoulli, Advances in Applied Probability, IIE Transactions, Journal of Simulation, Proceedings of the Winter Simulation Conference, Proceedings of the 2016 MCQMC

Talks

Sample path LDP for heavy-tailed processes

- Mark Kac Lecture, Utrecht, November 2017
- Applied Probability Society Conference, Evanston, July 2017
- Extreme Value Analysis Conference, Delft, June 2017
- INFORMS Annual Meeting, Nashville, November 2016
- IBM Watson, September 2016
- Lévy 2016 Summer School, July 2016

Efficient rare-event simulation for multiple jump events heavy-tailed processes

- INFORMS Annual Meeting, Houston, October 2017 (scheduled)

Perfect estimation with imperfect samplers

- ORIE department, Cornell University, April 2017
- Operations Research Seminar, Tinbergen Institute, December 2016
- Computational Statistics Seminar, Oxford University, November 2016
- Retrospective Monte Carlo Workshop, University of Warwick, July 2016
- Applied Mathematics Department, Ecole Polytechnique, Paris, June 2016
- IMS-ISBA Joint Meeting MCMSki 2016, Lenzerheide, January 2016
- Scientific Meeting, Centrum Wiskunde & Informatica, November 2015
- OR department, Naval Postgraduate School, August 2015
- IE department, Seoul National University, December 2014
- IME department, Pohang University of Science and Technology, December 2014
- SME department, Sungkyunkwan University, December 2014
- Applied Probability Seminar, Georgia Tech, September 2014
- ISE department, Virginia Tech, March 2014
- ISysE department, Korean Advanced Institute of Sceince and Technology, December 2013
- INFORMS Annual Meeting, Minneapolis, October 2013
- ICME Colloquium, Stanford University, February 2013
- Winter Simulation Conference, Berlin, December 2012

Sensitivity analysis for Markov chains

- Queueing Colloquium, Centrum Wiskunde & Informatica, May 2016
- INFORMS Annual Meeting, San Francisco, November 2014
- SIAM Seminars on Current Research in Engineering & Applied Mathematics, Stanford, March 2012

An iterative algorithm for sampling from manifolds

- Winter Simulation Conference, Savannah, December 2014

Unbiased MLMC for rare event simulation of stochastic recursions

- MCQMC 2016, Stanford University, August 2016

Perfect estimation and response-surface-filling design

- ISysE department, Korean Advanced Institute of Sceince and Technology, March 2015
- IME department, Pohang University of Science and Technology, February 2015
- ISE department, University of Illinois at Urbana-Champaign, February 2015

Teaching Experience

Stanford University, Stanford, CA, USA

Instructor Summer 2011

Taught math refresher course for the incoming students at Stanford Engineering School.
Duties: Developing course contents and giving lectures.

- CME 001: Math Refresher Course, Probability and Statistics Session

Teaching Assistant Autumn 2012, Spring 2012

Duties: Holding office hours, writing problem sets, final exams and their solutions, grading, and giving supplementary lectures and review sessions

- CME 100: Vector Calculus
- MS&E 322: Stochastic Calculus and Control

Course Assistant Winter 2007

Duties: Holding office hours, helping writing exams, and grading.

- MS&E 121: Introduction to Stochastic Modeling

Professional Experience

Gamevil Inc., Seoul, Korea 2003–2005

Software Engineer (Alternative military service)

- Worked on: Developing software libraries for mobile games. Developing mobile games. Administering online game server and user database.

Wisefree Inc., Seoul, Korea 2002–2003

Software Engineer (Alternative military service)

- Worked on: Developing intranet system for LG Siltron and Korean national police.