Frederick John Hickernell

Professional Preparation

Institution	Location	Major	Degree	Year
Pomona College	Claremont, CA	mathematics & physics	BA	1977
Massachusetts Institute of Technology	Cambridge, MA	mathematics	PhD	1981

Appointments

2017–present	Director, Center for Interdisciplinary Scientific Computation, Illinois Institute of Technology
2005–present	Professor, Illinois Institute of Technology
2005–2017	Chair of Applied Mathematics, Illinois Institute of Technology
1995–2005	Associate Professor & Professor of Mathematics, Hong Kong Baptist University
1989–2002	Head of Mathematics, Hong Kong Baptist College/University
1985–1995	Lecturer & Senior Lecturer of Mathematics, Hong Kong Baptist College

Products (for citation counts see scholar.google.com (Fred J. Hickernell))

Five Products Closely Related to the Proposal

[1] S.-C. T. Choi, Y. Ding, F. J. Hickernell, L. Jiang, Ll. A. Jiménez Rugama, D. Li, J. Rathinavel, X. Tong, K. Zhang, Y. Zhang, and X. Zhou, *GAIL: Guaranteed Automatic Integration Library (versions 1.0–2.2)*, MATLAB software, gailgithub.github.io/GAIL_Dev/, 2013–2017.

[2] S.-C. T. Choi, Y. Ding, F. J. Hickernell, and X. Tong, *Local adaption for approximation and minimization of univariate functions*, J. Complexity **40** (2017), 17–33, DOI 10.1016/j.jco.2016.11.005.

[3] N. Clancy, Y. Ding, C. Hamilton, F. J. Hickernell, and Y. Zhang, *The cost of deterministic, adaptive, automatic algorithms: Cones, not balls*, J. Complexity **30** (2014), 21–45, DOI 10.1016/j.jco.2013.09.002.

[4] F. J. Hickernell, L. Jiang, Y. Liu, and A. B. Owen, *Guaranteed conservative fixed width confidence intervals via Monte Carlo sampling*, Monte Carlo and Quasi-Monte Carlo Methods 2012 (J. Dick, F. Y. Kuo, G. W. Peters, and I. H. Sloan, eds.), Springer-Verlag, Berlin, 2014, pp. 105–128.

[5] F. J. Hickernell, Ll. A. Jiménez Rugama, and D. Li, *Adaptive quasi-Monte Carlo methods for cubature*, Contemporary Computational Mathematics — a celebration of the 80th birthday of Ian Sloan (J. Dick, F. Y. Kuo, and H. Woźniakowski, eds.), Springer-Verlag, 2018+, to appear, arXiv:1702.01491 [math.NA].

Five Other Significant Products

[6] G. E. Fasshauer, F. J. Hickernell, and H. Woźniakowski, *On dimension-independent rates of convergence for function approximation with Gaussian kernels*, SIAM J. Numer. Anal. **50** (2012), 247–271, DOI 10.1137/10080138X.

[7] F. J. Hickernell, *A generalized discrepancy and quadrature error bound*, Math. Comp. **67** (1998), 299–322, DOI 10.1090/S0025-5718-98-00894-1.

[8] F. J. Hickernell, *The trio identity for quasi-Monte Carlo error analysis*, Monte Carlo and Quasi-Monte Carlo Methods: MCQMC, Stanford, USA, August 2016 (P. Glynn and A. Owen, eds.), Springer Proceedings in Mathematics and Statistics, Springer-Verlag, Berlin, 2018+, to appear, arXiv:1702.01487.

[9] F. J. Hickernell and M. Q. Liu, *Uniform designs limit aliasing*, Biometrika **89** (2002), 893–904, DOI 10.1093/biomet/89.4.893.

[10] B. Niu, F. J. Hickernell, T. Müller-Gronbach, and K. Ritter, *Deterministic multi-level algorithms for infinite-dimensional integration on* $\mathbb{R}^{\mathbb{N}}$, J. Complexity **27** (2011), 331–351, DOI 10.1016/j.jco.2010.08.001.

Synergistic Activities

[1] My research has included dozens of high school, BSc, MS, MPhil and PhD students as well as post-doctoral scholars. My mentoring has included summer research experiences for students funded by NSF support as well as other sources of financial support. Not only have students gained experience in discovery of new mathematics, they have been required to organize and communicate their discoveries in research group meetings, conference presentations, and publications. Students and post-docs that I have mentored have gone on to further study, academic positions, and various positions in commerce industry.

For over twelve years I was department chair at Illinois Tech before stepping down in 2017. During that time I hired and encouraged eight new tenure track assistant professors: three were women, six earned tenure and promotion to associate professor, and six successfully competed for external funding. Two of the women hires, who have received tenure and been promoted to associate professor and have received external funding, were in statistics, an area where our department previously lacked strength. In May, 2017, I was appointed director of a newly created Center for Interdisciplinary Scientific Computation (CISC), and charged with raising the profile of our scientific computation research and education at Illinois Tech. CISC is connecting faculty from science, engineering, business, and human sciences.

[2] Associate Editor, *International Journal of Numerical Analysis and Modeling* (2003–present), *Journal of Complexity* (1999–present), *Journal of Mathematical Research with Applications* (2010–present), *Mathematics of Computation*, 2008–2017, *SIAM Journal on Numerical Analysis*, 2005–present.

[3] Organizer, Program Committee Member, and/or Steering Committee Member for a number of international conferences, including the *Third through Eleventh International Conferences on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing*, biennially 1998–present. Program Leader for the Statistical and Applied Mathematical Sciences Institute (SAMSI) 2017–18 Program on Quasi-Monte Carlo and High-Dimensional Sampling Methods for Applied Mathematics (QMC).

[4] Worked with developers to promote the inclusion of software for generating low discrepancy sequences in the MATLAB Statistics Toolbox, since R2008a, and in routine G05YNF of the NAG library, since 2009.

[5] Fellow of the Institute of Mathematical Statistics (elected 2007). Recipient of the 2016 Joseph F. Traub Prize for Achievement in Information-Based Complexity.