Derek Bingham

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Education

Ph.D.	Statistics	Simon Fraser University	1999
M.Sc.	Statistics	Carleton University	1994
B.Sc.	Applied Mathematics	Concordia University	1991

Academic Experience

2013-present	Professor	Dept. of Stat. and Act. Sci., Simon Fraser University
2007-2013	Associate Professor	Dept. of Stat. and Act. Sci., Simon Fraser University
2003-2007	Assistant Professor	Dept. of Stat. and Act. Sci., Simon Fraser University
1999-2003	Assistant Professor	Department of Statistics, University of Michigan
2002-present	Faculty Affiliate	Los Alamos National Lab

Research Interests

The focus of my research has been the design and analysis of experiments. New theoretical and algorithmic methodology has been developed for applications with randomization restrictions, robust parameter design and computer experiments. This also includes contributions to Bayesian design and variable selection in industrial applications.

Recent work has included experiment design and model selection for investigation of large-scale computer simulators. The main focus has been the incorporation of both physical and computer model data to develop better predictive models, as well as integration and optimization issues. Large data set results have recently been achieved.

Awards
- 2013 CRM-SSC Prize in Statistics
- 2006 Jack Youden Prize for best expository paper published in *Technometrics*
- 2003-2013 Canada Research Chair (tier II) – Industrial Statistics

Recent Research Funding

2008-2015	NSERC[1] Discovery Grant	$24,000 per annum
2008-2011	NSERC[1] Accelerator Grant	$40,000 per annum
2010-2012	Co-I Predictive Science Academic Alliance Program[2]	$17,000,000 total ($30,000 per annum)
2003-2008	NSERC[1] Discovery Grant	$19,000 per annum
2005-2007	NPCDS[3] Project Grant – Principle Investigator	$60,000 per annum
2006	NPCDS Training Initiative	$13,000
2003	Principle Investigator, CFI + BCKDF[4] Grant	$240,000
2003	SFU Start-up Grant	$50,000
2003	NPCDS – Phase I Start-up grant	$20,000
2001-2003	NSF[5] Directorate of Math. Sci. DMS Grant (P.I.)	$42,797 per annum

[1]Natural Sciences and Engineering Research Council of Canada
[2] Department of Energy (USA)
[3]National Programme on Complex Data Structures
[4]Canadian Foundation for Innovation + British Columbia Knowledge Development Fund
[5]National Science Foundation (USA)

Research Contributions

Accepted Refereed Publications in Journals ([*]with student or post-doc)

1. [*]Goh, J., Bingham, D., Holloway, J.P., Doss, F., Kuranz, C.C., [*]Grosskopf, M.J. and [*]Rutter, E. (2013), "Computer Model Calibration and Prediction Using Outputs From Multi Fidelity Simulators", to appear in *Technometrics*.
2. Kuranz, C.C., Drake, R.P., Krauland, C.M., Marion, D.C., Grosskopf, M.J., Rutter, E., Torralva, D., Holloway, J.P., D. Bingham, [*]Goh, J., Boehly, T.R. and Sorce, A. (2013), "Initial Conditions of Radiative Shock Experiments", to appear in *Physics of Plasmas*.
3. [*]Protola, M., Sain, S., and Bingham, D. (2013), "Fast Calibration of Complex Computer Models", to appear in *Technometrics*.
4. Chakraborty, A., Mallick, B.K., McClarren, R.G., Kuranz, C.C., Bingham, D., Grosskopf, M.J., Rutter, E., Stripling E., Drake, R.P. (2013), "Spline-based Emulators for Radiative Shock Experiments with Measurement Error", to appear in *JASA*.
5. [*]Linkletter, C., [*]Ranjan, P., [*]Lin, C., Bingham, D., Brenneman, W., Lockhart, R., and Loughin, T. (2012), "Compliance Testing for Random Effects Models with Joint Acceptance Criteria", *Technometrics*, 3, 243-255.
6. Bingham, D. and Nair, V.N. (2012), "Noise Variable Settings in Robust Design Experiments", *Technometrics*, 3, 388-397.
7. Adams, M., Higdon, D., Bingham and 13 others (2012), *National Academies of Science* Report on "Mathematical Science Foundations of Verification, Validation, and Uncertainty Quantification".

8. *Kaufman, C., Bingham, D., Habib, S., Heitman, K. and Friedman, J. (2011), "Efficient Emulators of Computer Experiments Using Compactly Supported Correlation Functions with an Application to Cosmology", *Annals of Applied Statistics,* 5, 2470-2492.

9. *Wolters, M.A. and Bingham, D. (2011), "Simulated Annealing Model Search for Subset Selection in Screening Experiments", *Technometrics*, 53, 225–237.

10. *Ranjan, P., *Lu, W., Bingham, D., Reese, S., Williams, B. J., *Chou, C-C., Doss, F., Grosskopf, M. and Holloway, J. P. (2011), "Follow-up Experiment Designs for Computer Models and Physical Processes", (Special issue on Design of Experiments by Angela Dean, Dibyen Majumdar and William Li), *Journal of Statistical Theory and Practice*, 5(1), 119-136.

11. Holloway, J.P., Bingham, D., Chou, C-C., Doss, F., Drake, P., Fryxell, B., Grosskopf, M., van der Holst, B., Mallick, B., McClarren, R.G., Mukherjee, A., Nair, V.N.N, Powell, K., Ryub, D., Sokolovc , I., Toth, G. and Zhang,. Z. (2011), "Predictive Modeling of a Radiative Shock System", *Reliability Engineering & System Safety*, 96, 1184-1193.

12. McClarren, R.G., Ryub, D., Drake, P., Grosskopf, M., Bingham, D., Chou, C-C., Fryxell, B., van der Holst, B., Holloway, J.P., Kuranz, C.C., Mallick, B., Rutter, E. and Torralva, B. (2011), "A Physics Informed Emulator for Laser-Driven Radiating Shock Simulations", *Reliability Engineering & System Safety*, 96, 1194-1207.

13. Drake, R.P., Doss, F., McClarren, R.G., Adams, M.L., Amato, N., Bingham, D , Chou, C.C., DiStefano, C., Fidkowsky, K., Fryxell, B., Gombosi, T.I., Grosskopf, M.J., Holloway, J.P., van der Holst, B., Huntington, C.M., Karni, S., Krauland, C.M., Kuranz, C.C., Larsen, E., vanLeer, B., Mallick, B., Marion, D., Martin, Morel, J.E., Myra, E., Nair, V., Powell, K., Raushberger, L., Roe, P., Rutter, E., Sokolov, I., Stout, Q., Torralva, B., Toth, G., Thornton, K. and Visco A. (2011), "Radiative Effects in Radiative Shocks in Shock Tubes", *High Energy Density Physics* 7, 130-140.

14. *Lin, C.D., Bingham, D., Tang, B. and Sitter, R.R. (2010), "A New and Flexible Method for Constructing Designs for Computer Experiments", *Annals of Statistics*, Vol. 38, 1460-1477.

15. *Ranjan, P. Bingham, D. and Dean (2010), "Existence and Construction of Randomization Defining Contrast Subspaces for Factorial Designs", *Annals of Statistics*, Vol. 38, 3580-3599.

16. *Ranjan, P., Bingham, D. and Mukerjee, R. (2010), ``Stars and Regular Fractional Factorial Designs with Randomization Restrictions'', *Statistica Sinica*, 20(4), 1637 - 1653.

17. Murphy, S.A. and Bingham, D. (2009), "Screening Experiments for Developing Adaptive Treatment Strategies", *JASA*, , Vol. 104, 391-408.

18. Bingham, D., Sitter, R.R. and Tang, B (2009), "Orthogonal and Nearly Orthogonal Designs for Computer Experiments", *Biometrika*, 96, 51-65.

19. *Ranjan, P., Bingham, D. and Michailidis, G. (2008), "Sequential Experiment Design for Contour Estimation from Complex Computer Codes", *Technometrics*, Vol. 50, No. 4: 527–541.

20. *Lawrence, E., Bingham, D., Liu, C. and Nair, V. N. N. (2008), "Bayesian Inference for Ordinal Data Using Multivariate Probit Models", *Technometrics,* Vol. 50, No. 2: 182–191.

21. Bingham, D., Sitter, R., Kelly, E., Moore, L. and Olivas, M. (2008), "Designs with Multi-Level Randomization", *Statistica Sinica*,18, 493-513.

22. Bingham, D. and Chipman, H. (2007), "Incorporating Prior Information in Optimal Design for Model Selection", *Technometrics*, 49, 155-163.

23. *Linkletter, C., Bingham, D., Hengartner, N., Higdon, D and Ye, K. (2006), "Variable Selection for Gaussian Process Models in Computer Experiments", *Technometrics*, 48, 478-490. Winner of the **2006 Jack Youden Prize** for best expository paper published in *Technometrics*.

24. *Mease, D. and Bingham, D. (2006), "Latin Hyper-Rectangle Sampling for Computer Experiments", *Technometrics*, 48, 467-477.

25. *Loeppky, J. L., Bingham, D. and Sitter R.R., (2006), "Constructing Non-Regular Robust Parameter Designs", *JSPI*, 136, 3710-3729.
26. Bingham, D. and Mukerjee, R. (2006), "Detailed Word-Length Pattern of Regular Fractional Factorial Split-Plot Designs in Terms of Complementary Sets", *Discrete Mathematics*, 305, 1522-1533.
27. *Hung, Y.C., Michailidis, G. and Bingham, D. (2005), "A Framework for Designing Efficient Simulations for Complex Queuing Models", to appear in *Performance Evaluation*.
28. Bingham, D. and Sitter, R.R. (2003), "Fractional Factorial Split-Plot Designs for Robust Parameter Experiments," *Technometrics*, 45, 80-89.
29. Bingham, D.R., *Schoen, E.D., and Sitter, R.R. (2003), "Allocating Degrees of Freedom in Fractional Factorial Experiments with Nested Error Structure," *JRSS, Series C*, 53, 325-339.
30. Bingham, D.R. and Li, W. (2002), "A Class of Optimal Robust Parameter Designs," *Journal of Quality Technology*, 34, 87-99.
31. Bingham, D.R. and Sitter, R.R. (2001), "Design Issues in Fractional Factorial Split-Plot Experiments," *Journal of Quality Technology*, 33, 2-15.
32. Bingham, D.R. & Swartz, T.B. (2000), "Equitable Handicapping in Golf," *American Statistician*, 54, 170-177.
33. Bingham, D.R. & Sitter, R.R. (1999), "Some Theoretical Results for Fractional Factorial Split-Plot Designs," *Annals of Statistics*, 27, 1240-1255.
34. Bingham, D.R. & Sitter, R.R. (1999), "Minimum Aberration Two-Level Fractional Factorial Split-Plot Designs," *Technometrics*, 41, 62-70.

Other Refereed Contributions

35. Bingham, D. (2007), "Analysis of Variance", *Encyclopaedia of Statistics Quality and Reliability*, Ruggeri, F., Kennet, R. and Faltin, F., eds..
36. *Zhong, W., Hu, S. J. and Bingham, D. (2003), "Selecting Process Parameters and Machine Tolerances for Optimal System Performance", *International Conference on Frontiers of Design and Manufacturing*, 5th S.M.Wu Symposium on Manufacturing Science, ASME.
37. *Hung, Y.C., Michailidis, G. and Bingham, D. (2003), "Developing Efficient Simulation Methodology for Complex Queuing Networks" *Proceedings of the 2003 Winter Simulation Conference*, Chick, S., Sanchez, P. J., Ferrin, D., and Morrice, D. J. eds..
38. *Cundy, A.L., Schultze, J.F., Hemez, F.M., Doebling, S.W., Hylok, J., Bingham, D. (2002) "Parameter Sampling and Meta-model Generation for non-linear Finite Element Simulations", PSAM6 (*Probabilistic Safety Assessment and Management*)
39. *Cundy, A.L., Schultze, J.F., Hemez, F.M., Doebling, Bingham, D., (2002) "Variable Screening in Meta-model Design for Large Structural Dynamics Simulations", IMAC XX (*International Modal Analysis Conference*).
40. Bingham, D. R. (2001), Discussion of "Factor Screening and Response Surface Exploration", by Cheng, S.W. and Wu, C.F.J., *Statistica Sinica*.
41. Bingham, D.R., de Silva, B.M. and Swartz, T.B. (1998) "Issues in Cricket and Golf", *Fourth Mathematics and Computers in Sport Conference Proceedings* (ed. N. de Mestre and K. Kumar), Bond University, Australia, 189-195.

Submitted for Publication ([*]with student or post-doc)

42. [*]Goh, J and Bingham, D., "Bayesian Variable Selection for Non-regular Split-Plot Designs", under revision for *Technometrics*.
43. [*]Lekivetz, R., Sitter, R., Bingham, D., Hamada, M., Moore, L., and Wendelberger, J., "On Algorithms for Obtaining Orthogonal and Near-Orthogonal Arrays", under revision for the *Journal of Quality Technology.*
44. [*]Kleiber, W., Sain, S., [*]Heaton, M., Wiltberger, M., Reese, S. and Bingham, D., "Computer Model Calibration with High and Low Fidelity Model Output for Spatio-Temporal Data", under revision for the *Annals of Applied Statistics.*

Unrefereed Publications ([*]with student or post-doc)

45. [*]Linkletter, C., Bingham, D., Sitter, R., Ye, K., Hengartner, N. and Higdon, D. (2003), "Comparing Designs of Experiments for Screening and Prediction in Computer Experiments", *Technical Report LA-UR-03-8524*, Los Alamos National Laboratory.
46. Bingham, D.R. & Li, W. (2001), "A Class of Optimal Robust Parameter Designs", *Tech. Report 2001/2, Super-computing Institute for Digital Simulation and Advanced Computation*, University of Minnesota.

Seminars and Conference Presentations

I have given 20 invited talks over the past 6 years. Some recent highlights are:
• Plenary speaker - *SIAM Conference on Uncertainty Quantification*, 2012
• Technometrics invited speaker – 2011 *Fall Technical Conference*
• Invited speaker – 2011 *Statistical Society of Canada Annual Meeting*
• Newton Institute Programme on the *Design of Experiments* August, 2011
• Plenary speaker - *Uncertainty in Computer Models Conference (Sheffield, UK)*, 2010

Editorial

• 2012-present AE for the SIAM Journal of Uncertainty Quantification
• 2013-present AE for the Electronic Journal of Statistics
• 2012 AE for Technometrics special issue for the US Department of Energy Conference on Data Analysis
• 2010-2012 Editor for CRC Handbook in the Design and Analysis of Experiments
• 2004-2008 Technometrics, AE
• 2005-2008 Journal of the Royal Statistical Society, Series C, AE
• 2001-2003 Journal of Quality Technology Editorial Review Committee

Meeting Organization

- Co-organizer of the US Department of Energy Conference on Data Analysis (2012)
- Co-organizer of the UK Uncertainty in Computer Models Conference (2012)
- Co-organizer of the Newton Institute (Cambridge, UK) Programme on Accelerating Industrial Productivity via Deterministic Computer Experiments and Stochastic Simulation Experiments (2011)
- Co-Direction of the Theme of the Year (*Application of Statistics to Numerical Models*) at NCAR (2007)
- Summer School on the Design and Analysis of Computer Experiments (2006)
- SAMSI Program on The Development Assessment and Utilization of Complex Computer Models (2006) – Thematic Year Organizing Committee
- NPCDS Workshop Organizer (2004): Design and Analysis of Computer Experiments for Complex Systems
- Mentor Programme Organizer (2003), Design and Analysis of Experiments Workshop (DAE)
- Co-Program Chair (2002), ASA/IMS Spring Research Conference on Statistics in Industry and Technology
- Organizing Committee (2002), Design and Analysis of Experiments Workshop (DAE)

Service to the Statistical Community

- 2012-2015 NSERC Mathematics and Statistics Evaluation Group (EG 1508)
- 2012 Canadian Statistical Institute Development Committee
- 2012-present SSC representative to the Pacific Institute of Mathematical Sciences
- 2010-2012 US National Academies of Science Panel on Mathematical Science Foundations of Verification, Validation, and Uncertainty Quantification
- 2011-present SSC representative to PIMS
- 2004-2011 SSC Research Committee
- 2006-2010 ASA Committee on Energy Statistics – Energy Information Administration
- 2003-2005 ASA Section on the Physical and Engineering Sciences, Secretary Treasurer
- 2002-2004 Spring Research Conference Management Committee
- 2004 Pacific Institute Of Mathematical Sciences Post-Doc Review Panel

Service to SFU

- 2012-present Dean of Graduate Studies' Graduate Student Supervisory Practice Group
- 2012 Dean of Graduate Search Committee
- 2009-2011 Chair of the Faculty of Science Graduate Studies Committee (now Associate Dean position)
- 2009-2011 Graduate Program Chair –Department of Statistics and Actuarial Science
- 2009, 2005 Statistics Department Tenure and Promotion Committee

Other Service

- 2012 UBC Science Fair Judge
- 2010 Douglas College Math Competition speaker
- 2008 South Surrey Science Fair Judge
- 2007 Taste of Pi speaker to high school students
- 2006 Pacific Inst. Of Math Sci. Graduate Math Modeling Camp