

## CURRICULUM VITAE

**Name:** David A. Stephens  
**Nationality:** British, Canadian.  
**Current Position:** James McGill Professor  
**Current Address:** Department of Mathematics and Statistics,  
McGill University, Burnside Hall,  
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### Employment

**2006-Present** **McGill University, Montreal, Canada**  
Department of Mathematics and Statistics, Professor  
**2011 May-Present** **McGill University, Montreal, Canada**  
James McGill Professor  
**1995-2006** **Imperial College London, UK**  
Department of Mathematics, Lecturer/Senior Lecturer  
**1990-1995** **Imperial College London, UK**  
Department of Mathematics, Research Associate  
**1986-1990** **University of Nottingham, UK**  
PhD in Statistics, *Bayesian Edge Detection in Image Processing*  
Supervisor Prof. Adrian F M Smith  
**1983-1986** **University of Nottingham, UK**  
BSc Mathematics (First Class Hons.)

**Research Interests:** Bayesian statistics: methodological and computational methods. Specific areas of interest include bioinformatics and biostatistics, time series analysis.

### Publications

<https://scholar.google.ca/citations?user=NRlAymOAAAAJ&hl=en>

1. Khalili, A, Chen J, and Stephens, DA, **Regularization in regime-switching Gaussian autoregressive models**, to appear, *The Canadian Journal of Statistics*, December 2017.
2. Ertefaie, A, Asgharian, M and Stephens, DA **Variable Selection in Causal Inference using a Simultaneous Penalization Method**, Accepted for publication, *The Journal of Causal Inference*, October 2017.
3. Moodie, EEM and Stephens, DA, **Treatment Prediction, Balance, and Propensity Score Adjustment**, (Research Letter), *Epidemiology*, 28 (5), e51-e53, 2017.
4. Wallace, MP, Moodie, EEM, and Stephens, DA, **Dynamic treatment regimen estimation via regression-based techniques: Introducing R Package DTRreg**. *Journal of Statistical Software*, 80, i02, pp 1-20, doi: 10.18637/jss.v080.i02, August 2017.
5. Wallace, MP, Moodie, EEM, and Stephens, DA, **Model validation and selection for personalized medicine using dynamic weighted ordinary least squares**. *Statistical Methods in Medical Research* 26 (4), pp 1641 – 1653, May 2017

6. Wallace, MP, Moodie, EEM, and Stephens, DA, **An R Package for G-estimation of Structural Nested Mean Models (Research Letter)**, *Epidemiology*, 28(2) e18-20, 2017.
7. Brenner, BG, Ibanescu, R-I; Hardy, I, Stephens, DA, Otis, J, Moodie, EEM, Grossman, Z, Vandamme, A-M, Roger, M; Wainberg, MA, and the Montreal PHI, SPOT cohorts, **Large cluster outbreaks sustain the HIV epidemic among men having sex with men (MSM) in Quebec from 2002 to 2015**. *AIDS*, Accepted for publication, December 2016.
8. Wallace, MP, Stewart, CE, Moseley, MJ, Stephens, DA, Fielder, AR, **Treatment of Amblyopia Using Personalized Dosing Strategies: Statistical Modelling and Clinical Implementation**, *Strabismus*, 24 (4), 161-168, December 2016.
9. Wallace, MP, Moodie EEM and Stephens DA, **Model assessment in dynamic treatment regimen estimation via double robustness**, *Biometrics*, 72: 855–864. doi:10.1111/biom.12468, September 2016.
10. Wallace, MP, Moodie, EEM, and Stephens, DA, **SMART Thinking: a Review of Recent Developments in Sequential Multiple Assignment Randomized Trials**, *Current Epidemiology Reports* 3 (3), 225-232, August 2016.
11. Saarela, O, Belzile, LR and Stephens, DA, **A Bayesian view of doubly robust causal inference**, *Biometrika*, 103(3), pp 667-681, doi:10.1093/biomet/asw025, July 2016.
12. Villandre L, Stephens DA, Labbe A, Günthard HF, Kouyos R and Stadler T, **Assessment of Overlap of Phylogenetic Transmission Clusters and Communities in Simple Sexual Contact Networks: Applications to HIV-1**. *PLoS ONE* 11(2): e0148459. doi:10.1371/journal.pone.0148459, February 2016.
13. Graham, DJ.; McCoy, EJ.; Stephens, DA. **Approximate Bayesian Inference for Doubly Robust Estimation**. *Bayesian Analysis*. 11, no. 1, 47--69. doi:10.1214/14-BA928, February 2016.
14. Vrbik, I., Stephens, DA, Brenner, BG and Roger, M. **The Gap Procedure: for the identification of phylogenetic clusters in HIV-1 sequence data**, *BMC Bioinformatics*, 16 (1), 355, October 2015.
15. Rich B, Moodie EEM, Stephens DA, **Optimal individualized dosing strategies: A pharmacologic approach to developing dynamic treatment regimens for continuous-valued treatments**, *Biometrical Journal*, 10.1002/bimj.201400244, November 2015.
16. Saarela, O, Arjas, E, Stephens, DA, Moodie, EEM, **Predictive Bayesian inference and dynamic treatment regimes**, *Biometrical Journal*, doi: 10.1002/bimj.201400153, August 2015.
17. Rich B, Moodie EEM., Stephens DA, **Influence re-weighted g-estimation**. *International Journal of Biostatistics*, doi: 10.1515/ijb-2015-0015, August 2015.
18. Gough EK, Stephens DA, Moodie EEM, Prendergast AJ, Stoltzfus RJ, Humphrey JH, Manges AR. **Linear growth faltering in infants is associated with *Acidaminococcus sp.* and community-level changes in the gut microbiota.**, *Microbiome*, .13; 3:24. doi: 10.1186/s40168-015-0089-2. June 2015.
19. Ertefaie, A., Asgharian, M. and Stephens, DA, **Double Bias: estimation of causal effects from length-biased samples in the presence of confounding**. *International Journal of Biostatistics*, 11(1):69-89. doi: 10.1515/ijb-2014-0037, May 2015.
20. Moseley MJ, Wallace MP, Stephens DA, Fielder AR, Smith LC, Stewart CE, RODS (Randomized Occlusion Dosing Strategies) Study Cooperative, **Personalized versus standardized dosing strategies for the treatment of childhood amblyopia: study protocol for a randomized controlled trial**. *Trials*. 2015 Apr 25; 16:189. doi: 10.1186/s13063-015-0711-4, April 2015.
21. Weston, D, Russell, RA, Batty, E, Jensen, K, Stephens, DA, Adams, NM, and Freemont, PS, **New quantitative approaches reveal the spatial preference of nuclear compartments in mammalian**

- fibroblasts**, *Journal of the Royal Society Interface*, 12(104), pii: 20140894. doi: 10.1098/rsif.2014.0894, March 2015.
22. Caron, F., Holmes, CC Griffin, JE, and Stephens DA, **Two-sample Bayesian nonparametric hypothesis testing**, *Bayesian Analysis*. Published online. doi: 10.1214/14-BA914. <http://projecteuclid.org/euclid.ba/1422884976>, February 2015.
  23. Saarela, O, Stephens, DA, Moodie, EEM and Klein, MB, **On Bayesian estimation of marginal structural models (with Discussion)**, *Biometrics*. 71(2):279-88 doi: 10.1111/biom.12269, June 2015.
  24. Graham, DJ, McCoy, EJ and Stephens, DA, **Quantifying Causal Effects of Road Network Capacity Expansions on Traffic Volume and Density via a Mixed Model Propensity Score Estimator**, *Journal of the American Statistical Association*, 109:508, 1440-1449, DOI: 10.1080/01621459.2014.95687, December 2014
  25. Hanley, JA, Saarela O, Stephens, DA, and Thalabard, J-C, **hGH isoforms differential immunoassays applied to blood samples from athletes: Decision limits for anti-doping testing**, *Growth Hormone & IGF Research*, 24(5), 205–215. doi: 10.1016/j.ghir.2014.06.001, October 2014.
  26. Ertefaie, A., Asgharian, M. and Stephens, DA. **Propensity score estimation in the presence of length-biased sampling: a non-parametric adjustment approach**. *Stat*, 3: 83–94. doi: 10.1002/sta4.46, Mar 2014.
  27. Rich B, Moodie EEM, and Stephens DA. **Simulating sequential multiple assignment randomized trials to generate optimal personalized warfarin dosing strategies**. *Clinical Trials*. 11 (4), 435-444, May 2014.
  28. Moodie EEM, Stephens DA, and Klein MB. **A marginal structural model for multiple-outcome survival data: assessing the impact of injection drug use on several causes of death in the Canadian Co-infection Cohort**, *Statistics in Medicine* doi: 10.1002/sim.6043. PMID: 24272681, November 2013.
  29. Wallace MP, Stewart CE, Moseley MJ, Stephens DA, Fielder AR; Monitored Occlusion Treatment Amblyopia Study (MOTAS) Cooperatives; Randomized Occlusion Treatment Amblyopia Study (ROTAS) Cooperative. **Compliance with occlusion therapy for childhood amblyopia**. *Investigations in Ophthalmology and Visual Science*. 17; 54(9):6158-66. doi: 10.1167/iovs.13-11861, 2013.
  30. Stewart CE, Wallace MP, Stephens DA, Fielder AR, Moseley MJ; MOTAS Cooperative. **The effect of amblyopia treatment on stereoacuity**. *Journal of American Association for Pediatric Ophthalmology and Strabismus*, 17(2):166-73. doi: 10.1016/j.jaapos.2012.10.021, April 2013
  31. Vincent C, Stephens DA, Loo VG, Edens TJ, Behr MA, Dewar K, Manges AR, **Reductions in intestinal Clostridiales precede the development of nosocomial *Clostridium difficile* infection**. *Microbiome*. 2013 Jun 28;1(1):18. doi: 10.1186/2049-2618-1-18.
  32. Graham, DJ, McCoy EJ, and Stephens, DA **Quantifying the effect of area deprivation on child pedestrian casualties by using longitudinal mixed models to adjust for confounding, interference and spatial dependence**, *Journal of the Royal Statistical Society, Series A* 176, Part 4, pp.931-950, 2013.
  33. Astle, WJ, De Iorio, M, Richardson, S, Stephens, DA and Ebbels, TE, **A Bayesian Model of NMR Spectra for the Deconvolution and Quantification of Metabolites in Complex Biological Mixtures**, *Journal of the American Statistical Association*, doi: 10.1080/01621459.2012.695661, 2012.
  34. Weston DJ, Adams NM, Russell RA, Stephens DA, Freemont PS **Analysis of Spatial Point Patterns in Nuclear Biology**. PLoS ONE 7(5): e36841. doi:10.1371/journal.pone.0036841, May 2012
  35. Brenner, BG, Roger, M, Stephens, DA, Moisi, D, Hardy, I, Weinberg, J, Turgel, JR, Charest, H, Koopman, J, Wainberg, MA, and the Montreal PHI Cohort Study Group, **Transmission Clustering**

- Drives the Onward Spread of the HIV Epidemic Among Men Who Have Sex With Men in Quebec**, *Journal of Infectious Diseases*, 204: 1115-1119, 2011
36. Crowder, MJ and Stephens, DA, **On inference from Markov chain macro-data using transforms**, *Journal of Statistical Planning and Inference*, 141, 9: 3201-3216, September 2011
  37. Jasra, A, Stephens, DA, Doucet, A, and Tsagaris, T, **Inference for Levy-Driven Stochastic Volatility Models Via Adaptive Sequential Monte Carlo**, *Scandinavian Journal of Statistics*, 38: 1–22, 2011.
  38. Moodie EEM and Stephens DA, **Marginal Structural Models: Unbiased estimation for longitudinal studies**. *International Journal of Public Health*, 56(1):117-9, February 2011.
  39. Moodie EEM and Stephens DA, **Using Directed Acyclic Graphs to detect limitations of traditional regression in longitudinal studies**. *International Journal of Public Health*, 55(6):701-3, December 2010.
  40. Yip, W, Stephens DA and Olhede SC, **Hedging Strategies and minimal variance portfolios for European and exotic options in a Levy market**, *Mathematical Finance*, 20(4), 617–646, October 2010
  41. Sagoo, P., Perucha, E., Sawitzki, B., Tomiuk, S, Stephens, DA, et al. **Development of cross-platform biomarkers to detect renal transplant tolerance in man**. *Journal of Clinical Investigation*. 120(6):1848–1861, doi: 10.1172/JCI39922, 2010.
  42. Yip, W, Stephens DA and Olhede SC, **The Explicit Chaotic Representation of the Powers of Increments of Levy Processes**, *Stochastics*, Vol 82: 3, 257-290, 10.1080/17442501003625263, June 2010
  43. Moodie, EEM and Stephens, DA, **Estimation of Dose-Response Functions for Longitudinal Data Using the Generalized Propensity Score**, *Statistical Methods in Medical Research*, doi: 10.1177/0962280209340213, published online May 2010
  44. Ertefaie, A and Stephens DA, **Comparing Approaches to Causal Inference for Longitudinal Data: Inverse Probability Weighting versus Propensity Scores**, *International Journal of Biostatistics*: Vol. 6(2), Article 14, DOI: 10.2202/1557-4679.1198. January 2010
  45. Rich, B, Moodie, EEM, Stephens DA and Platt, RP, **Model Checking with Residuals for g-estimation of Optimal Dynamic Treatment**, *International Journal of Biostatistics*: Vol. 6: Iss. 2, Article 12. DOI: 10.2202/1557-4679.1210. January 2010.
  46. Metcalf, CJE, Stephens, DA, Rees, M, Louda SM, and Keeler, KH, **Using Bayesian inference to understand the allocation of resources between sexual and asexual reproduction**, *Journal of the Royal Statistical Society Series C*, 58(2), 143-170(28), May 2009
  47. Russell, RA, Adams, NM, Stephens, DA, Batty, E, Jensen, K and Freemont, PS, **Segmentation of Fluorescence Microscopy Images for Quantitative Analysis of Cell Nuclear Architecture**, *Biophysical Journal*, 22;96(8):3379-89, April 2009.
  48. Graham, DJ and Stephens, DA, **Decomposing the impact of deprivation on child pedestrian casualties in England**, *Accident Analysis & Prevention*, 40 (4) , 1351-64, 2008
  49. Jasra, A, Doucet, A, Stephens, DA and Holmes, CC, **Interacting sequential Monte Carlo samplers for trans-dimensional simulation**, *Computational Statistics & Data Analysis*, 52, 1765-1791, 2008.
  50. Stewart, CE, Stephens, DA, Fielder, AR and Moseley, MJ, **Randomized Trial of Objectively Monitored Patching Regimens for Amblyopia Treatment**, *British Medical Journal*, BMJ, doi: 10.1136/ bmj.39301.460150.55, 2007.
  51. Jasra, A, Stephens, DA and Holmes, CC, **Population-based Reversible Jump Markov chain Monte Carlo**, *Biometrika*, 94(4):787-807, 2007.
  52. Jasra, A, Stephens, DA and Holmes, CC, **On Population-based Simulation for Static Inference**, *Statistics and Computing*, 17(3), 263-279, 2007.

53. Gander, MPS and Stephens, DA, **Inference for Stochastic Volatility Models Driven by Levy Processes**, *Biometrika*, **94**(3), 627-646, 2007.
54. Shiels C, Adams NM, Islam SA, Stephens DA, Freemont PS , **Quantitative analysis of cell nucleus organisation**. *PLoS Computational Biology*, 3(7):e138. doi:10.1371/journal.pcbi.0030138, 2007
55. Stewart, CE, Stephens, DA, Fielder, AR and Moseley, MJ, **Modeling Dose-Response in Amblyopia: Toward a Child-Specific Treatment Plan** *Investigations in Ophthalmology and Visual Science*, 2007 48: 2589-2594
56. Gander, MPS and Stephens DA, **Stochastic Volatility Modelling with General Marginal Distributions: Inference, Prediction and Model Selection**, *Journal of Statistical Planning and Inference* 137, 3068 – 3081, 2007
57. Moodie, EEM, Richardson, TS and Stephens, DA, **Demystifying Optimal Dynamic Treatment Regimes**, *Biometrics*, 63, 447–455, 2007.
58. Stephens DA and Crowder MJ, **Bayesian analysis of quasi-life tables**, *Lifetime Data Analysis*, Vol: 12, 117 – 141, 2006,
59. Giatrakos N, Kinali M, Stephens DA, Dawson D, Muntoni F, Nihoyannopoulos P, **Cardiac tissue velocities and strain rate in the early detection of myocardial dysfunction of asymptomatic boys with Duchenne's muscular dystrophy: relationship to clinical outcome**, *Heart*, Vol 92 (6): 840-842 JUN 2006
60. Heard, NA, Holmes CC, Stephens DA, **A quantitative study of gene regulation involved in the immune response of anopheline mosquitoes: an application of Bayesian hierarchical clustering of curves**, *Journal of the American Statistical Association*, Vol 101, No 1, 18 – 29, 2006.
61. McManus, KJ., Stephens, DA., Adams, NM., Islam, SA., Freemont, PS. and Hendzel, MJ. **The transcriptional regulator CBP has defined spatial associations within interphase nuclei**, *PLoS Computational Biology*, 2(10): e139, 2006.
62. Jasra, A, Stephens, DA , Gallagher, KL and Holmes, CC, **Bayesian Mixture Modelling in Geochronology via Markov chain Monte Carlo**, *Mathematical Geology*, 38 (3): 269-300 APR. 2006,
63. Heard, NA, Holmes CC, Stephens DA, Hand, DJ and Dimopoulos, G, **Bayesian co-clustering of gene expression profiles from multiple parallel immune defence Challenges**, *Proceedings of the National Academy of Sciences of the United States of America*, 102 (47): Pages 16939-16944 NOV 22 2005.
64. Jasra A, Holmes CC, Stephens DA, **Markov chain Monte Carlo methods and the label switching problem in Bayesian mixture modeling**, *Statistical Science*, Vol: 20, Pages: 50 - 67, ISSN: Pages 0883-4237, 2005,
65. Stewart CE, Fielder AR, Stephens DA, et al., **Treatment of unilateral amblyopia: factors influencing visual outcome**, *Investigative Ophthalmology & Visual Science*, Vol: 46, Pages: 3152 - 3160, ISSN: 0146-0404 2005
66. Stephens DA, Crowder M, **Bayesian analysis of discrete time warranty data**, *Journal of the Royal Statistical Society Series C - Applied Statistics*, Vol: 53, Pages: 195 - 217, ISSN: 0035-9254 2004.
67. Stephens DA, Crowder MJ, Dellaportas P, **Quantification of automobile insurance liability: a Bayesian failure time approach**, *Insurance Mathematics & Economics*, Vol: 34, Pages: 1 - 21, ISSN: 0167-6687, 2004
68. McCoy EJ, Stephens DA, **Bayesian time series analysis of periodic behaviour and spectral structure**, *International Journal of Forecasting*, Vol: 20, Pages: 713 - 730, ISSN: 0169-2070, 2004
69. Olhede SC, McCoy EJ, Stephens DA, **Large-sample properties of the periodogram estimator of seasonally persistent processes**, *Biometrika*, Vol: 91, Pages: 613 - 628, ISSN: 0006-3444, 2004

70. Stewart CE, Moseley MJ, Fielder AR, Stephens DA, **Refractive adaptation in amblyopia: quantification of effect and implications for practice**, *British Journal of Ophthalmology*, Vol: 88, Pages: 1552 - 1556, ISSN: 0007-1161, 2004.
71. Stewart CE, Moseley MJ, Stephens DA, et al., **Treatment dose-response in amblyopia therapy: the Monitored Occlusion Treatment of Amblyopia Study (MOTAS)**, *Investigative Ophthalmology & Visual Science*, Vol: 45, Pages: 3048 - 3054, ISSN: 0146-0404 2004
72. Stewart CE, Moseley MJ, Fielder AR, Stephens DA, **Optimization of the, dose-response of occlusion therapy for amblyopia: the ROTAS study (E-abstract 2579)**, *Investigative Ophthalmology & Visual Science*, Vol: 45, ISSN: 0146-0404, 2004.
73. Kong WM, Martin NM, Smith KL, et al., **Triiodothyronine stimulates food intake via the hypothalamic ventromedial nucleus independent of changes in energy expenditure**, *Endocrinology*, Vol: 145, Pages: 5252 - 5258, ISSN: 0013-7227, 2004
74. Mikhail GW et al. **Clinical and haemodynamic effects of sildenafil in pulmonary hypertension: acute and mid-term effects**, *European Heart Journal*, 25 (5): 431-436, 2004.
75. Crowder M, Stephens D, **On the analysis of quasi-life tables**, *Lifetime Data Analysis*, Vol: 9, Pages: 345 - 355, ISSN: 1380-7870, 2003
76. Kong WM, Stanley S, Gardiner J, et al., **A role for arcuate cocaine and amphetamine regulated transcript in hyperphagia, thermogenesis, and cold adaptation**, *FASEB Journal*, Vol: 17, Pages: 1688 -1690, ISSN: 0892-6638, 2003
77. Stewart CE, Fielder AR, Stephens DA, et al., **Design of the Monitored Occlusion Treatment of Amblyopia Study (MOTAS)**, *British Journal of Ophthalmology*, Vol: 86, Pages: 915 - 919, ISSN: 0007-1161, 2002.
78. Moskovic R, Jordinson C, Stephens DA, et al., **A Bayesian analysis of the influence of neutron irradiation on embrittlement in ferritic submerged arc weld metal**, *Metallurgical and Materials Transactions a-Physical Metallurgy and Materials Science*, Vol: 31, Pages: 445 - 459, ISSN: 1073-5623, 2000.
79. Rahman NJ, Wakefield JC, Stephens DA, et al., **The Bayesian analysis of a pivotal pharmacokinetic study**, *Statistical Methods in Medical Research*, Vol: 8, 195 - 216, 1999.
80. Walker SG, Stephens DA, **A multivariate family of distributions on  $(0, \infty)^p$** , *Biometrika*, Vol: 86, Pages: 703 - 709, ISSN: 0006-3444, 1999
81. Stephens DA, Fisch RD, **Bayesian analysis of quantitative trait locus data using reversible jump Markov chain Monte Carlo**, *Biometrics*, 54, 1334 - 1347, ISSN: 0006-341X , 1998
82. Sullivan P, Stephens DA, Ansari T, et al , **Variation in the measurements of basement membrane thickness and inflammatory cell number in bronchial biopsies**, *European Respiratory Journal*, Vol: 12, Pages: 811 - 815, ISSN: 0903-1936, 1998
83. Stephens DA, Smith AFM, Moskovic R, **Charpy impact energy data: a Markov chain Monte Carlo analysis**, *Journal of the Royal Statistical Society Series C-Applied Statistics*, Vol: 46, Pages: 477 - 492, ISSN: 0035-9254, 1997
84. Smith CAB, Stephens DA, **Estimating linkage heterogeneity**, *Annals of Human Genetics*, Vol: 60, Pages: 161 - 169, ISSN: 0003-4800, 1996
85. Dellaportas P, Stephens DA, **Bayesian-analysis of errors-in-variables regression models**, *Biometrics*, Vol: 51, Pages: 1085 - 1095, ISSN: 0006-341X , 1995
86. Smith CAB, Stephens DA, **Estimating multipoint recombination fractions**, *Annals of Human Genetics*, Vol: 59, Pages: 307 - 321, ISSN: 0003-4800, 1995.

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87. Stephens DA, **Bayesian retrospective multiple-change point identification**, *Journal of the Royal Statistical Society Series C-Applied Statistics*, Vol: 43, 159 - 178, ISSN: 0035-9254, 1994.
88. Buck CE, Litton CD, Stephens DA, **Detecting a change in the shape of a prehistoric corbelled tomb**, *The Statistician*, Vol: 42, Pages: 483 - 490, ISSN: 0039-0526, 1993.
89. Stephens DA and Smith AFM, **Bayesian inference in multipoint gene-mapping**, *Annals of Human Genetics*, Vol: 57, Pages: 65 - 82, ISSN: 0003-4800, 1993.
90. Stephens, DA and Smith, AFM, **Sampling - Resampling Techniques for the Computation of Posterior Densities in Normal Means problems**, *Test*, 1(1), 1 - 18, 1992,

#### **Papers in Revision & Papers submitted/under Review:**

- S1. Saarela, O, Moodie, EEM and Stephens, DA, **The Role of Exchangeability in Causal Inference**, in revision for *Statistical Science*, November 2013.
- S2. McGillvray, A, Khalili, A and Stephens, DA, **Estimating networks with hubs for microbiome data**, submitted, October 2016.
- S3. Villandre L, Labbe A, Brenner, B, Roger, M and Stephens, DA, **DM-PhyClus: A Bayesian phylogenetic algorithm for infectious disease transmission cluster inference**, submitted to *BMC Bioinformatics*, September 2017.
- S4. Villandre L, Labbe A, Ibanescu, R-I, Brenner, B, Roger, M and Stephens, DA, **Transmission clusters in the HIV-1 epidemic among men who have sex with men in Montreal, Quebec, Canada**, submitted to *Epidemics*, September 2017.
- S5. Elmasri, M, Farrell, M and Stephens, DA, **A hierarchical Bayesian model for predicting host-parasite interactions using phylogenetic information**, submitted to the *Journal of the American Statistical Association*, September 2017.
- S6. Moodie, EEM, Stephens DA, Alam S, Zhang M-J, Logan, B, Arora M, Spellman S, and Krakow EF, **A cure-rate model for Q-learning: Estimating an adaptive immunosuppressant treatment strategy for allogeneic hematopoietic cell transplant patients**, submitted to *Biometrical Journal*, September 2017.
- S7. Alam S, Moodie, EEM and Stephens DA, **Should a Propensity Score Model be Super? The Utility of Machine Learning Procedures for Causal Adjustment**, submitted to *Statistics in Medicine*, September 2017.
- S8. Wallace, MP, Moodie, EEM, and Stephens, DA, **Generalized G-estimation and Model Selection**, in revision, *Biometrics* (Major Revision decision, August 2017)
- S9. Luo, Yu, Stephens, DA and Buckeridge, DL **A Bayesian Hierarchical Model for Estimating the Prevalence of Treated Attention Deficit Hyperactivity Disorder**, submitted to *The Canadian Journal of Statistics*, June 2017.

#### **Discussions:**

1. Wallace MP, Moodie EEM, and Stephens DA, Discussion of 'Personalized dose finding using outcome weighted learning' by Kosorok et al. *Journal of the American Statistical Association*, 111 (516), pp 1530 - 1534, September 2017,
2. Stephens DA, Discussion of "Deductive derivation and Turing-computerization of semiparametric efficient estimation" by Frangakis et al. *Biometrics* 71 (4), 880-880

#### **Books:**

1. Damien, P, Dellaportas, P, Polson, NG, Stephens, DA, **Bayesian Theory and Applications**, Oxford University Press, 2012.
2. Adams NM, Crowder MJ, Hand DJ, Stephens, DA, **Methods and models in statistics: in honour of Professor John Nelder, FRS**, London, Imperial College Press, 2004, ISBN: 1-8609-4463-9

### Chapters in Books

1. Khalili, A, Chen J, and Stephens, DA, **Regularization in regime-switching Gaussian autoregressive models**, in *Advanced Statistical Methods in Data Science* (eds Chen D-G et al.), Ch2, pp 13–34, Springer Singapore, September 2016.
2. Stephens, DA, **G-estimation for dynamic treatment regimes in the longitudinal setting**, in *Adaptive Treatment Strategies in Practice: Planning Trials and Analyzing Data for Personalized Medicine* (Eds Michael R Kosorok and Erica EM Moodie), Chapter 7, 89-117, ASA-SIAM Series on Statistics and Applied Mathematics, <http://dx.doi.org/10.1137/1.9781611974188.ch7>, December 2015.
3. Griffin, JE and Stephens, DA, **Advances in Markov chain Monte Carlo**, in *Bayesian Theory and Applications* (Eds Damien, P, et al.), Oxford University Press, 2012.
4. Powers, LJ, Neslehova, J and Stephens, DA, **American Options in an infinite activity Lévy market: Monte Carlo and deterministic approaches using a diffusion approximation**, in *Numerical Methods in Finance*, eds Carmona, RA, Del Moral, P Hu, P and Oudjane, N, Springer Proceedings in Mathematics, Volume 12, Part 2, 291-321, DOI: 10.1007/978-3-642-25746-9\_9, Springer, 2012.
5. Umande, PP and Stephens, DA, **Spatial Point Process Analysis of Promeleocytic leukemia nuclear bodies**, in *Advances in Nuclear Architecture*, eds Adams, NM and Freemont, P, Springer, Chapter 2, pp 59 - 85, 2011
6. Russell, R. A., Adams, NM, Stephens, DA, Batty, E, Jensen, K and Freemont, PS, **Methodology for Quantitative Analysis of 3-D Nuclear Architecture**, in *Advances in Nuclear Architecture*, eds Adams, NM and Freemont, P, Springer, Chapter 2, pp 173-187, 2011
7. Stephens, DA, **Complexity in Systems Level Biology and Genetics: Statistical Perspectives**, *Handbook of Complexity*, Springer, 2009.
8. De Iorio, M., Ebbels, TMD and Stephens, DA, **Statistical Techniques in Metabolic Profiling**, to appear in *Handbook of Statistical Genetics* 3<sup>rd</sup> Edition, 2007.
9. Stephens DA, **Statistical approaches to genetic mapping**, In: Green PJ, Hjort NL, Richardson S, editor, *Highly structured stochastic systems*, Oxford, Oxford University Press, 386 - 392, ISBN: 0-1985-1055-1, 2003.
10. Wakefield, JC and Stephens, DA, **Bayesian errors-in-variables modeling**, in *Bayesian Analysis of Generalised Linear Models*, eds. Dey D. K. et. al., 2000.
11. Smith C. A. B. and Stephens, DA, **Simple likelihood and probability calculations for linkage analysis**, in *Genetic Mapping of Disease Genes*, (Academic Press, London), 1997.
12. Guttman, I., Dellaportas, P., Stephens, DA and Smith, AFM. **A Comparative Study in Perinatal Mortality using a Two Component Mixture Model**, in *Bayesian Biostatistics*, eds. D. A. Berry and D. K. Stangl, (Marcel Dekker, New York), 1995.
13. Stephens, DA and Dellaportas, P., **Bayesian Analysis of Generalised Linear Models with Covariate Measurement Error**, in *Bayesian Statistics 4*, eds. Bernardo, J.M. et al. (Clarendon Press, Oxford UK), 813-820, 1994.
14. Stephens, DA and Smith, AFM, **Bayesian Edge-Detection in Images via Changepoint Methods**, *Computing Intensive Methods in Statistics*, eds. W. Hardie and J. Simar, (Physica-Verlag, Heidelberg:) 1 – 29, 1993.

### Graduate Supervision

**PhD Supervision: Completed through October 2016:** I have supervised/co-supervised the following students to completion of PhD; Topics included Statistical Finance and Time series analysis, Statistical Genetics, Bayesian computation (MCMC and Sequential Monte Carlo), Survival Analysis.

1. Reem Al-Jaralla (2001)
2. John Gay (2002)
3. Nokuthaba Sibanda (2003)
4. Wantanee Surapatoolkorn (2004)
5. Matthew Gander (2004)
6. Ajay Jasra (2005, joint with Chris Holmes)
7. Georgia Tsiliki (2007, joint with Maria De Iorio)
8. Kitty Platanioti (2008, joint with Emma McCoy)
9. Philip Umande (2008, joint with Niall Adams)
10. Tso-Jung Yen (2008, joint with Nick Heard)
11. Wing Yip (2008, joint with Sofia Olhede)
12. Richard Russell (2010, joint with Niall Adams and Paul Freemont)
13. Chris Oduneye (2011, joint with Ajay Jasra)
14. Ashkan Ertefaie (2011, joint with Masoud Asgharian)
15. Amaan Mehrabian (2011)
16. Ben Rich (2012, joint with Erica Moodie)
17. Dan Graham (2012, joint with Emma McCoy, Imperial College)
18. Shujie Li (2013, joint with James Hanley)
19. Elena Rivera Mancía (2013, joint with Johanna Neslehova)
20. Annaliza McGillivray (2016, joint with Abbas Khalili)
21. Luc Villandre (2017, joint with Aurelie Labbe)
22. Mohamad Elmasri (2017)

### **Masters Supervision**

1. Mike Bottone (MPhil, 2010, co supervised with Ajay Jasra)
2. Sudipta Sadhukhan (MSc, 2011)
3. Tigran Atoyán (MSc, 2011)
4. Quan Zhou (MSc, 2012)
5. Erin Lundy (MSc, 2012, joint with David Wolfson)
6. Huijun Chen (MSc, 2012, joint with Christian Genest)
7. Vanessa Bergeron-Laperriere (MSc, 2014)
8. Wendy Weng (MSc, 2015)
9. Isabelle Grenier (MSc, 2016, joint with Abbas Khalili)
10. Hao Zhang (MSc, 2016, joint with Erica Moodie)
11. James McVittie (MSc, 2017, joint with David Wolfson)

### **Current Students: At McGill:**

- Vivian Meng (PhD, Year 3)
- Yu Luo (PhD, Year 4, joint with David Buckeridge)

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- Yiu-Sing Lau (Masters, Year 3)
- Mengtian Zhang (Masters, Year 2)
- David Fleischer (Masters, Year 1, joint with Yi Yang)
- Magid Sabbagh (Masters, Year 1, joint with Christian Genest)
- Zayd Omar (Masters, Year 1, joint with Alexandra Schmidt)

#### Postdoctoral Supervision

- Vahid Partovi Nia (2009-2011): Current position Ecole Polytechnique, Montreal, Assistant Professor.
- Will Astle (2011-2012, joint with Aurelie Labbe): Current position University of Cambridge, UK research associate.
- Olli Saarela (2011-2012, joint with Erica Moodie): Current position University of Toronto, Biostatistics, Assistant Professor.
- Irene Vrbik (2014-2016), Current position postdoctoral fellow, University of British Columbia, Okanagan.
- Michael Wallace (2014-2016, joint with Erica Moodie) Current position University of Waterloo, Statistics and Actuarial Science, Assistant Professor.
- Farhad Shokoohi (2015-2016, joint with Aurelie Labbe) Current position Concordia University, Assistant Professor (non tenure-track).
- Leila Golparvar (2015-, joint with Robert Platt)

#### Teaching Experience

##### **Undergraduate:**

*Year 1: Probability and Statistics I (1998-2000)*

*Year 2: Probability and Statistics II (1996-2005)*

*Year 3: Biostatistics (2003-2005)*

*Advanced Statistical Theory (2003-2005)*

*Ancillary: Statistics to Engineering Students*

**Non-calculus statistics (MATH 204) (2007-10, 2013)**

##### **Postgraduate:**

*MSc Bioinformatics (2001-2005) (Course Convenor for Mathematics module)*

**Mathematical Statistics I MATH 556 (2006-8, 2014)**

**Mathematical Statistics II MATH 557 (2008, 2010)**

**Honours Regression and Analysis of Variance MATH 423/533 (2014-6)**

**Generalized Linear Models MATH 523 (2011-13)**

**Introduction to Time Series Analysis MATH 545 (2012)**

**Time Series Analysis MATH 681 (2007, 2009, 2011)**

**Computation Intensive Statistics MATH 680 (2010, 2015)**

**Statistical Learning and Modern Multivariate Analysis MATH 783 (2011)**

**Reading Course: Bayesian Nonparametrics (2008, 2010)**

**Reading Course: Continuous time finance (2010)**

**Reading Course: Time Series Analysis (2010)**

**Reading Course: Multivariate Analysis (2011)**

**Reading Course: Asymptotic Statistics (2013)**

### Grants

(all figures in CAD/GBP, approximate)

1. CIHR: Project Grant - 2016 1st Live Pilot **Developing Longitudinal Indicators for Population-Scale Monitoring of Health Care Trajectories** (Co Principal Investigator, with five others, 180000 July 2016-June 2019)
2. MITACS Accelerate, **Predicting Premia in the Canadian Auto-insurance market** (industry partner TD Assurance, Montreal), 15000 Jan-May 2016.
3. FRQNT - Programme bilatéral de recherche collaborative Québec-Flandre, **Modèle de simulation fondé sur des données phylogénétiques, épidémiologiques et démographiques pour informer des stratégies de contrôle concernant les virus de l'hépatite C et du VIH-1 dans les populations vulnérables au Québec et en Belgique**, 2 x 111760 = 223420, Jan 2016 – Dec 2017 (co Principal Investigator with Bluma Brenner, Jewish General Hospital, Montreal; my portion is supposedly 50% of the total).
4. NSERC: Discovery Grant, **Bayesian methods for confounding adjustment and causality**. (5 x 34750 = 173750, 2013-2018) (Bin D, Rating : Outstanding, Outstanding, Outstanding).
5. NSERC Discovery Accelerator Supplement (3 x 40000 = 120000, 2013-2016).
6. CIHR: Open Operating Grant **Computational methods phylogenetics clustering for HIV/HCV viral DNA sequences**. (Principal Investigator: 293000, 2013-2016, joint with 4 others).
7. FQRNT: **Outils et méthodes statistiques pour déchiffrer les réseaux génétiques régulateurs de traits et maladies complexes** (April 2011-March 2014, 159000), joint with 2 others.
8. NIH, US: **HIV Risk Dynamics, Genetic Patterns, and Control** (July 2008-June 2013, 2434265 USD estimated total, 10% Salary 27K CAD), with 8 others, Prof. James Koopman (University of Michigan) PI.
9. FQRNT **Méthodes statistiques pour les études multiniveaux** (April 2008-March 2011, 146800), joint with 8 others.
10. NSERC Discovery Grant, **Bayesian Methods in Bioinformatics and Finance** (April 2007-March 2012 \$110,000).
11. NSERC Discovery Accelerator Supplement (April 2007-March 2012, 120000)
12. Biotechnology and Biological Sciences Research Council, UK, **Bayesian methods for modelling and integrating metabolic data** (January 2008-December 2011 550,000/1,200,000), with Sylvia Richardson, Jeremy Nicholson, Maria De Iorio and Tim E. Ebbels.
13. Medical Research Council, UK Capacity Building PhD studentships, **Bayesian methods in Metabonomics** (October 2005-September 2009, 120,000/240,000), with Maria De Iorio and Tim E. Ebbels.

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14. Medical Research Council, UK Capacity Building PhD studentship, **Computational analysis of the spatial distribution of mammalian cell nuclei** (October 2005-September 2009, 120,000/240,000) with Professor Paul Freemont and two others
15. Biotechnology and Biological Sciences Research Council, UK PhD studentship program **Simulation-based analysis of the spatial distribution of mammalian cell nuclei** (October 2005-September 2008, 80,000/160,000) with Professor Paul Freemont and two others
16. Fight for Sight Charity: **Occlusion therapy in Amblyopia: A Randomized Trial** (October 2001-03, 110,000/220,000) joint with Alistair Fielder, Merrick Moseley
17. Wellcome Trust : **Statistical Methods in Bioinformatics** (March 2002-04, 150,000/300,000), joint with David Hand, Chris Holmes

### Conference Organization and Participation

#### Conferences Organized

- **December 2017: CRM conference on Risk in the Health Sciences** (co-organized with Erica EM Moodie and Alex Schmidt)
- **July 2016: CRM conference and one month workshop in causal inference and genetics** (co-organized with Erica EM Moodie).
- **June 2011: Hierarchical models and Markov chain Monte Carlo: Conference in Honour of Professor AFM Smith**, (co-organized with five others), Crete, Greece.
- **May 2011: Statistical Methods in HIV** (co-organized with Erica EM Moodie), CRM Montreal, 37 Participants
- **June 2010: Summer School in Statistics and Probability** (co-organized with colleagues in the Department) 22 participants at senior undergraduate and junior graduate level.
- **May 2009: BIRS 5-day Workshop Causal Inference in Statistics and the Quantitative Sciences** (co-organized with Erica EM Moodie) 42 Participants at Banff International Research Station.
- **October 2008: One-day Workshop “MCMC: Theory and Applications”** CRM Montreal Six speakers at Université Sherbrooke
- **December 2005: Workshop on Stochastic Volatility, Institute for Mathematical Sciences, Imperial College London.** This one-day conference involved around 40 participants, and eight top researchers in the field of statistical aspects of stochastic volatility modelling in finance.
- **March 2004: Meeting in Honour of Professor John Nelder on the occasion of his 80<sup>th</sup> Birthday Imperial College London** Two day meeting involving 70 participants and ten speakers of international renown, including Sir David Cox, Professor Brian Ripley, Professor Rosemary Bailey and Professor Yudi Pawitan.

#### Workshops/Invited Short Courses Given:

- *Propensity Score Models and Methods*, Summer Institutes in Clinical Research, University of Washington, Department of Biostatistics, School of Public Health, US (2014-2017)
- A Introduction to Causal Inference, University of Toronto, Department of Biostatistics, Dalla Lana School of Public Health (May 2016),
- *Propensity Score Models, Methods and Adjustment*, Statistical Society of Canada Meeting, Halifax Nova Scotia (2015).

#### Older courses:

- *Bayesian Statistical Methods* (Qinetiq PLC, 2002)

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- *Use of Statistics in Research* (Imperial College London 2003-2004)
- *Statistical Analysis of Microarray Data* (International Biometric Society Conference (IBS-EMR), Corfu, Greece (2005))
- *Bioinformatics and Statistical Genetics* (MSc, University of Athens, Department of Statistics)
- *Statistical Analysis using R* (Imperial College London, 2006)
- *Statistical Modelling and Inference in Finance and Econometrics* (GSA Capital, London, 2005-6)
- *Statistical Analysis of Microarray Data using R* (Imperial College London, 2006)
- Courses in Statistical Methods for GSEPS graduate school at Imperial College

### Recent Invited Seminars/Conference Talks (2006/2017)

- Invited speaker: Statistical Society of Canada Annual Meeting, Winnipeg MB, “G-estimation and Model Selection” (June 2017)
- Invited speaker: iLike Workshop, Lancaster, UK. “Hidden Markov models and methylation sequencing: Modelling and computation strategies” (June 2016)
- Invited speaker: Statistical Society of Canada Annual Meeting, Brock ON, “Hidden Markov Models for Identifying Differentially Methylated Regions: Investigation of the BLK gene region” (May 2016)
- Invited speaker: High-dimensional Data Analysis IV Workshop (BIRS, Banff, AB -August 2014): “Bayesian methods for reconstructing metabolomics spectra”
- Invited speaker: International Biometric Society World Meeting (Florence, Italy, July 2014): “Bayesian methods for reconstructing metabolomic spectra”
- Invited speaker: Statistical Society of Canada Meeting (Toronto), May 2014: “New Directions in Causal Inference”
- Invited speaker: UK Causal Inference Meeting (Cambridge, UK), April 2014: “Bayesian Methods in Causal Inference – A Lack of Success Story”
- Joint Statistical Meetings (JSM – August 2013): *Marginal Structural Competing Risk Models Analysis of the Canadian HIV/HCV Co-infection Cohort Data* (Montreal, Quebec – international meeting of the statistical professional societies).
- BIRS workshop on high-throughput genetics (Banff, Alberta), August 2013: “*Statistical Analysis of Methylation Profiles via Biosulphite Sequencing Investigation of the BLK gene region*”
- CIHR Human Genetics Workshop (L’esterel, Quebec) April 2013: “Computational and statistical approaches for understanding nuclear organization.”
- High-dimensional Data Analysis III Workshop (UBC, Vancouver, BC), May 2013: “Causal adjustment procedures for high-dimensional confounders”
- Statistics 2011 (Concordia, Montreal) July 2011:
  - “Particle MCMC methods”
  - “Bayesian phylogenetic methods for HIV surveillance in Quebec”
- Statistical Society of Canada Meeting (Acadia), May 2011: “Particle MCMC methods”
- Statistical Society of Canada Meeting (Quebec City), May 2010: “Markov chain Monte Carlo for Markov chain macro data”
- Department of Mathematics and Statistics, Université Laval, March 2010: “Propensity Score methods in Causal Inference: beyond the binary treatment case”
- Canadian Mathematical Society, Winter Conference, Windsor, December 2009: Invited speaker, Mathematical Statistics session “Bayesian nonparametric two-sample testing”

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- Department of Statistics, University of Toronto, February 2009: “Bayesian methods in causal inference: using the Generalized Propensity Score”
- Department of Mathematics, Imperial College London, December 2008: “Bayesian perspectives in causal inference”
- MD Anderson Cancer Center, Houston, TX, US (September 2007)
- CRM Colloque, Université de Montreal, Montreal, Canada. (September 2007)
- Invited Fellow, Bayesian Nonparametric Regression Workshop, Isaac Newton Institute, Cambridge, UK (August 2007)
- *MCMC and Bioinformatics, Bridging the Gap*. BIRS Workshop, Banff, Canada (July 2007)
- *Statistical Genomics in Canada*. BIRS Workshop, Banff, Canada (July 2007)
- Joint Statistical Meeting: Session on Developments in Computation in Bioinformatics, Seattle, Washington, US. (August 2006)
- Workshop on Developments in Computation in Bioinformatics: Department of Statistics, University of British Columbia, Canada (August 2006)
- Conference on Developments in Bayesian Computation, Department of Statistics, University of Warwick, UK (August 2006)
- Contributed Talk, IBS Meeting in Montreal, Canada (July 2006)

#### Professional activities

- **Associate Editor, *Bayesian Analysis*** (October 2016-present)
- **Editor-in-Chief, *The Canadian Journal of Statistics*** (January 2013-December 2015)
- **Associate Editor, *The Canadian Journal of Statistics*** (January 2007-December 2012, January 2016-present)
- **Editor, *STAT*** (August 2012-present)
- **Editor, *International Journal of Biostatistics*** (from April 2010)
- **Statistics Society of Canada: Provincial Representative Quebec** 2008-2011
- **NSERC Discovery Grant Committee Member Statistical Sciences (GSC-14/1508)** July 2008-June 2012 **Statistics co-chair for 2011 and 2012.**

#### Administrative duties and other contributions

At McGill

- **Chair, Department of Mathematics and Statistics** (June 2015-present)
- **Senate, McGill University** (July 2015-present)
- **University Tenure Committee** (2014-present)
- **Chair’s Advisory Committee, Department of Mathematics and Statistics** (September 2006 -2015)
- **Graduate Affairs Committee, Department of Mathematics and Statistics** (September 2006-2008, May 2013-May 2015)
- **Statistics Working Group, Department of Mathematics and Statistics** (from November 2006)
- **Chair, Probability Search Committee** (November 2006-March 2007, September 2007-March 2008, October 2008-March 2009)
- **Chair, Statistics Search Committee** (September 2008-March 2009)
- **Chair, Statistics Search Committee** (September 2014-March 2015)
- **Departmental Planning Committee** (June 2007-April 2008)

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- **Provost's Advisory Committee, Dean of Engineering** (Fall 2009)
- **Gairdner Day presentation in Faculty of Science outreach day** (Fall 2009)
- **Freshman Interest Group leader** (Fall 2010, Fall 2011, Fall 2012)

#### **At Imperial College**

- Department Undergraduate Course Committee (1 Year)
- Department Examinations Committee (2 years)
- Department Examination Liaison Panel (8 years)
- Statistics Section Research Assessment Exercise (RAE) Panel (1/2 year)
- Bioinformatics MSc Management Committee (5 years)
- Mathematics Department Database Manager (2000-2003).
- Postgraduate Admissions Tutor (Statistics Section) (1998-2004)
- Postgraduate Course Committee (2000-2004)
- Advanced Lectures in Statistics (Statistics Section): (2003-4) Course Organizer