

22 March 2010

CURRICULUM VITAE

Name: David A. Stephens
Nationality: British
Current Position: Full Professor (Tenured)
Current Address: Department of Mathematics and Statistics,
McGill University, Burnside Hall,
805 Sherbrooke Street, Montreal, QC, H3A 2K6, Canada.

Previous Employment:
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, computational biology, time series analysis.

Publications (to 2010)

1. Ertefaie, A and Stephens DA, **Comparing Approaches to Causal Inference for Longitudinal Data: Inverse Probability Weighting versus Propensity Scores**, *The International Journal of Biostatistics*: Vol. 6 : Iss. 2, Article 14, DOI: 10.2202/1557-4679.1198. January 2010
2. Rich, B, Moodie, EEM, Stephens DA and Platt, RP, **Model Checking with Residuals for g-estimation of Optimal Dynamic Treatment**, *The International Journal of Biostatistics*: Vol. 6 : Iss. 2, Article 12. DOI: 10.2202/1557-4679.1210. January 2010.
3. Yip, W, Stephens DA and Olhede SC, **The Explicit Chaotic Representation of the Powers of Increments of Levy Processes**, accepted for publication, *Stochastics*, December 2009
4. Moodie, EEM and Stephens, DA, **Estimation of Dose-Response Functions for Longitudinal Data Using the Generalized Propensity Score**, accepted for publication, *Statistical Methods in Medical Research*, April 2009.
5. 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
6. 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.
7. Yip, W, Stephens DA and Olhede SC, **Hedging Strategies and minimal variance portfolios for European and exotic options in a Levy market**, accepted for publication, *Mathematical Finance*, December 2008.
8. Graham, DJ and Stephens, DA, **Decomposing the impact of deprivation on child pedestrian casualties in England**, *Accident Analysis & Prevention*, 40 (4) , 1351-64, 2008
9. 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.
10. 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.
11. Jasra, A, Stephens, DA and Holmes, CC, **Population-based Reversible Jump Markov chain Monte Carlo**, , *Biometrika*, **94**(4):787-807, 2007.
12. Jasra, A, Stephens, DA and Holmes, CC, **On Population-based Simulation for Static Inference**, *Statistics and Computing*, **17**(3), 263-279, 2007.
13. Gander, MPS and Stephens, DA, **Inference for Stochastic Volatility Models Driven by Levy Processes**, *Biometrika*, **94**(3), 627-646, 2007.
14. 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
15. 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

22 March 2010

16. 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
17. Moodie, EEM, Richardson, TS and Stephens, DA, **Demystifying Optimal Dynamic Treatment Regimes**, *Biometrics*, 63, 447. 455, 2007.
18. Stephens DA and Crowder MJ, **Bayesian analysis of quasi-life tables**, 2006, *Lifetime Data Analysis*, Vol: 12, 117 . 141.
19. 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**, 2006, *Heart*, Vol 92 (6): 840-842 JUN
20. 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*, 2006, Vol 101, No 1, 18 . 29
21. 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.
22. Jasra, A, Stephens, DA , Gallagher, KL and Holmes, CC, **Bayesian Mixture Modelling in Geochronology via Markov chain Monte Carlo**, 2006, *Mathematical Geology*, 38 (3): 269-300 APR.
23. 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*, 2005, 102 (47): Pages 16939-16944 NOV 22
24. Jasra A, Holmes CC, Stephens DA, **Markov chain Monte Carlo methods and the label switching problem in Bayesian mixture modeling**, *Statistical Science*, 2005, Vol: 20, Pages: 50 - 67, ISSN: Pages 0883-4237
25. Stewart CE, Fielder AR, Stephens DA, [et al](#), **Treatment of unilateral amblyopia: factors influencing visual outcome**, *Investigative Ophthalmology & Visual Science*, 2005, Vol: 46, Pages: 3152 - 3160, ISSN: 0146-0404
26. Stephens DA, Crowder M, **Bayesian analysis of discrete time warranty data**, *Journal of the Royal Statistical Society Series C - Applied Statistics*, 2004, Vol: 53, Pages: 195 - 217, ISSN: 0035-9254
27. Stephens DA, Crowder MJ, Dellaportas P, **Quantification of automobile insurance liability: a Bayesian failure time approach**, *Insurance Mathematics & Economics*, 2004, Vol: 34, Pages: 1 - 21, ISSN: 0167-6687
28. McCoy EJ, Stephens DA, **Bayesian time series analysis of periodic behaviour and spectral structure**, *International Journal of Forecasting*, 2004, Vol: 20, Pages: 713 - 730, ISSN: 0169-2070
29. Olhede SC, McCoy EJ, Stephens DA, **Large-sample properties of the periodogram estimator of seasonally persistent processes**, *Biometrika*, 2004, Vol: 91, Pages: 613 - 628, ISSN: 0006-3444
30. Stewart CE, Moseley MJ, Fielder AR, Stephens DA, **Refractive adaptation in amblyopia: quantification of effect and implications for practice**, *British Journal of Ophthalmology*, 2004, Vol: 88, Pages: 1552 - 1556, ISSN: 0007-1161
31. 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*, 2004, Vol: 45, Pages: 3048 - 3054, ISSN: 0146-0404
32. 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*, 2004, Vol: 45, Pages: N/A - N/A, ISSN: 0146-0404
33. Kong WM, Martin NM, Smith KL, [et al](#) , **Triiodothyronine stimulates food intake via the hypothalamic ventromedial nucleus independent of changes in energy expenditure**, *Endocrinology*, 2004, Vol: 145, Pages: 5252 - 5258, ISSN: 0013-7227
34. Mikhail GW [et al](#), **Clinical and haemodynamic effects of sildenafil in pulmonary hypertension: acute and mid-term effects**, *European Heart Journal*, 2004, 25 (5): 431-436.
35. Crowder M, Stephens D, **On the analysis of quasi-life tables**, *Lifetime Data Analysis*, 2003, Vol: 9, Pages: 345 355, ISSN: 1380-7870
36. 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*, 2003, Vol: 17, Pages: 1688 - 1690, ISSN: 0892-6638
37. Stewart CE, Fielder AR, Stephens DA, [et al](#) , **Design of the Monitored Occlusion Treatment of Amblyopia Study (MOTAS)**, *British Journal of Ophthalmology*, 2002, Vol: 86, Pages: 915 - 919, ISSN: 0007-1161
38. 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*, 2000, Vol: 31, Pages: 445 - 459, ISSN: 1073-5623
39. Rahman NJ, Wakefield JC, Stephens DA, [et al](#) , **The Bayesian analysis of a pivotal pharmacokinetic study**, *Statistical Methods in Medical Research*, 1999, Vol: 8, Pages: 195 - 216, ISSN: 0962-2802
40. Walker SG, Stephens DA, **A multivariate family of distributions on $(0, \infty)^p$** , 1999, *Biometrika*, Vol: 86, Pages: 703 - 709, ISSN: 0006-3444
41. Stephens DA, Fisch RD, **Bayesian analysis of quantitative trait locus data using reversible jump Markov chain Monte Carlo**, *Biometrics*, 1998, Vol: 54, Pages: 1334 - 1347, ISSN: 0006-341X

22 March 2010

42. 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, 1998, Vol: 12, Pages: 811 - 815, ISSN: 0903-1936
43. 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, 1997, Vol: 46, Pages: 477 - 492, ISSN: 0035-9254
44. Smith CAB, Stephens DA, **Estimating linkage heterogeneity**, Annals of Human Genetics, 1996, Vol: 60, Pages: 161 - 169, ISSN: 0003-4800
45. Dellaportas P, Stephens DA, **Bayesian-analysis of errors-in-variables regression-models**, Biometrics, 1995, Vol: 51, Pages: 1085 - 1095, ISSN: 0006-341X
46. Smith CAB, Stephens DA, **Estimating multipoint recombination fractions**, Annals of Human Genetics, 1995, Vol: 59, Pages: 307 - 321, ISSN: 0003-4800
47. Stephens DA, **Bayesian retrospective multiple-changepoint identification**, Applied Statistics-Journal of the Royal Statistical Society Series C, 1994, Vol: 43, Pages: 159 - 178, ISSN: 0035-9254
48. Buck CE, Litton CD, Stephens DA, **Detecting a change in the shape of a prehistoric corbelled tomb**, The Statistician, 1993, Vol: 42, Pages: 483 - 490, ISSN: 0039-0526
49. Stephens DA Smith AFM, **Bayesian-inference in multipoint gene-mapping**, Annals of Human Genetics, 1993, Vol: 57, Pages: 65 - 82, ISSN: 0003-4800
50. Stephens, DA , Smith, AFM, **Sampling-Resampling Techniques for the Computation of Posterior Densities in Normal Means problems**, *Test*, 1(1), 1992 1 . 18..

Papers in Revision & Papers submitted/under Review: Please see <http://www.math.mcgill.ca/~dstephens/>

Books: 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

Umande, PP and Stephens, DA, **Spatial Point Process Analysis of Promyelocytic leukemia nuclear bodies**, in Nuclear Architecture, eds Adams, NM and Freemont, P, Springer, to appear 2010

Stephens, DA, **Complexity in Systems Level Biology and Genetics: Statistical Perspectives**, Handbook of Complexity, Springer, (2008).

De Iorio, M., Ebbels, TMD and Stephens, DA, **Statistical Techniques in Metabolic Profiling**, to appear in Handbook of Statistical Genetics 3rd Edition, (2007).

Stephens DA, **Statistical approaches to genetic mapping**, In: Green PJ, Hjort NL, Richardson S, editor, Highly structured stochastic systems, Oxford, Oxford University Press, (2003), Pages: 386 - 392, ISBN: 0-1985-1055-1

Wakefield, JC and Stephens, DA, **Bayesian errors-in-variables modeling**, in Bayesian Analysis of Generalised Linear Models, eds. Dey D. K. *et al.* (2000).

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).

Guttmann, 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).

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), 1994, 813-820.

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:) 1993 , 1 . 29.

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) (2006-8)

Postgraduate:

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

22 March 2010

Mathematical Statistics I MATH 556 (2006-8)
Mathematical Statistics II MATH 557 (2008)

Time Series Analysis MATH 681 (2007,2009)
Reading Course: Bayesian Non-Parametrics (2008)

Courses in Statistical Methods for GSEPS graduate school at Imperial College

PhD Supervision:

Completed through September 2008: I have supervised/co-supervised eleven students to completion of PhD (2001-2008); Topics included Statistical Finance and Time series analysis, Statistical Genetics, Bayesian computation (Markov chain Monte Carlo 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)

Current Students: At McGill:

- Amaan Mehrabian (PhD Year 4)
- Ashkan Ertefaie (PhD Year 4, joint with Masoud Asgharian)
- Ben Rich (PhD Year 4, joint with Erica Moodie)
- Maria Elena Rivera Mancina (Year 2)
- Marc-Andre Rousseau (Masters Year 2)
- Tigran Atoyán (Masters, Year 2)

Current Students: At Imperial College:

- Dan Graham (Second Year, joint with Emma McCoy)
- Mike Bottone (Masters, submitted 2010)

Recent Grants: (all figures in GBP/CAD, approximate)

1. Wellcome Trust : **Statistical Methods in Bioinformatics** (March 2002-04, 150,000/300,000), joint with David Hand, Chris Holmes
2. Fight for Sight Charity: **Occlusion therapy in Amblyopia: A Randomized Trial** (October 2001-03, 110,000/220,000) joint with Alistair Fielder, Merrick Moseley
3. 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
4. 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
5. 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.
6. NSERC Discovery Grant, **Bayesian Methods in Bioinformatics and Finance** (April 2007-March 2012 \$110,000).
7. 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.
8. NSERC Accelerator Grant (April 2007-March 2012, 120000)
9. FQRNT **Méthodes statistiques pour les études multiniveaux** (April 2009-March 2012, 146800), joint with 8 others.

22 March 2010

10. 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.

PROFESSIONAL ACTIVITIES:

- **Associate Editor, Canadian Journal of Statistics** (from January 2007)
- **Statistics Society of Canada: Provincial Representative Quebec** Elected May 2008
- **NSERC Discovery Grant Committee Member Statistical Sciences (GSC-14/1508)** July 2008-June 2011

ADMINISTRATIVE DUTIES:

At McGill

- **Chair's Advisory Committee, Department of Mathematics and Statistics** (September 2006-present)
- **Graduate Affairs Committee, Department of Mathematics and Statistics** (September 2006-2008)
- **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)
- **Departmental Planning Committee** (June 2007-April 2008)
- **Provost's Advisory Committee, Dean of Engineering** (Fall 2009)
- **Gardner Day presentation in Faculty of Science outreach day** (Fall 2009)

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)**

Previous: At Imperial College

- **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

OTHER ACTIVITIES:

Conferences Organized:

- **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 Universite 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 80th 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:

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

22 March 2010

Recent Invited Seminars/Conference Talks (2006/2010)

I have presented various aspects of my recent work during recent years at the following locations:

- o Department of Mathematics and Statistics, Université Laval, March 2010: *Propensity Score methods in Causal Inference: beyond the binary treatment case+*
- o Canadian Mathematical Society, Winter Conference, Windsor, December 2009: Invited speaker, Mathematical Statistics session *Bayesian nonparametric two-sample testing+*
- o Department of Statistics, University of Toronto, February 2009: *Bayesian methods in causal inference: using the Generalized Propensity Score+*
- o Department of Mathematics, Imperial College London, December 2008: *Bayesian perspectives in causal inference+*
- o MD Anderson Cancer Center, Houston, TX, US (September 2007)
- o CRM Colloque, Université de Montréal, Montréal, Canada. (September 2007)
- o Invited Fellow, Bayesian Nonparametric Regression Workshop, Isaac Newton Institute, Cambridge, UK (August 2007)
- o *MCMC and Bioinformatics, Bridging the Gap*. BIRS Workshop, Banff, Canada (July 2007)
- o *Statistical Genomics in Canada*. BIRS Workshop, Banff, Canada (July 2007)
- o Joint Statistical Meeting: Session on Developments in Computation in Bioinformatics, Seattle, Washington, US. (August 2006)
- o Workshop on Developments in Computation in Bioinformatics: Department of Statistics, University of British Columbia, Canada (August 2006)
- o Conference on Developments in Bayesian Computation, Department of Statistics, University of Warwick, UK (August 2006)
- o Contributed Talk, IBS Meeting in Montreal, Canada (July 2006)

Referees:

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Professor Jon Wakefield

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