#### **CURRICULUM VITAE**

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**Current Position:** Professor

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**Employment** 

2006-Present McGill University, Montreal, Canada

Department of Mathematics and Statistics, Professor

2019-Present McGill University, Montreal, Canada

Vice-Dean, Faculty of Science

2015-2019 McGill University, Montreal, Canada

Chair of the Department of Mathematics and Statistics

2011-2018 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 in Mathematics (First Class Hons.)

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

#### **Publications**

https://scholar.google.ca/citations?user=NRlAymQAAAAJ&hl=en

- 1. Rodriguez Duque, D, Moodie EEM, Stephens DA, and Klein MB, Semi-parametric Bayesian Inference for Optimal, Dynamic Treatment Regimes via Dynamic Marginal Structural Models, Accepted for publication, *Biostatistics*, January 2022.
- 2. Cote, M-P, Genest, C and Stephens DA, A Bayesian approach to modeling multivariate multi-level insurance claims in the presence of unsettled claims, *Bayesian Analysis*, **17**(1): 67-93 (2022). DOI: 10.1214/20-BA1243, January 2022.
- 3. Farrell, MJ, Elmasri, M, Stephens, DA and Davies TJ, **Predicting missing links in global host-parasite networks**, *Journal of Animal Ecology*, doi: 10.1111/1365-2656.13666, December 2021.

- 4. Luo Yu, Stephens DA, and Buckeridge DL, **Bayesian Nonparametric Clustering of Continuous- Time Hidden Markov Models for Health Trajectories**, Accepted for Publication, *Canadian Journal of Statistics*, November 2021.
- Brenner BG, Ibanescu R-I, Osman N, Cuadra-Foy E, Oliveira M, Chaillon A, Stephens DA, Hardy I, Routy J-P, Thomas R, Baril J-G, Leblanc R, Tremblay C, Roger M, The Montreal Primary HIV Infection Cohort Study Group. The Role of Phylogenetics in Unravelling Patterns of HIV Transmission towards Epidemic Control: The Quebec Experience (2002–2020). Viruses. 2021; 13(8):1643. https://doi.org/10.3390/v13081643
- 6. Khalili A, and Stephens DA, Sparseness, consistency, and model selection for Markov regime-switching Gaussian autoregressive models, *Statistica Sinica*, 31, 1891-1914, 2021.
- 7. Taguer M, Darbinian E, Wark K, Ter-Cheam A, Stephens DA and Maurice CF, Changes in gut bacterial translation occur before symptom onset and dysbiosis in dextran sodium sulfate-induced murine colitis, 6(6), mSystems, https://doi.org/10.1128/mSystems.00507-21 July 2021.
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- 9. Luo Y, Stephens DA, Verma, A and Buckeridge DL, Bayesian Latent Multi-State Modeling for Non-Equidistant Longitudinal Electronic Health Records, Biometrics, 77(1), 78-90, 2021, doi.org/10.1111/biom.13261
- 10. El Hanchi, A and Stephens, DA, Adaptive Importance Sampling for Finite-Sum Optimization and Sampling with Decreasing Step-Sizes, *Advances in Neural Information Processing Systems*, **33**, 2020.
- 11. McVittie, JM, Wolfson, DB, Stephens, DA, Addona, V, and Buckeridge, DL, Parametric models for combined failure time data from an incident cohort study and a prevalent cohort study with follow-up, *The International Journal of Biostatistics*, 2020, doi: https://doi.org/10.1515/ijb-2020-0042.
- 12. Wang, S. Moodie, EEM; Stephens, DA and Nijjar, J, Adaptive treatment strategies for chronic conditions: Shared-parameter G-estimation for rheumatoid arthritis, *Biostatistics*, July 2020 (In press)
- 13. McGillivray A, Khalili A, and Stephens DA, Estimating networks with hubs for microbiome data, *Journal of Multivariate Analysis*, **179**, 1046-55, June 2020.
- 14. McVittie, JH, Wolfson, DB and Stephens, DA. A note on the applicability of the standard nonparametric maximum likelihood estimator for combined incident and prevalent cohort data. *STAT*; 9: e280.doi.org/10.1002/sta4.280, March 2020.
- 15. Elmasri M, Farrell M, Davies, TJ and Stephens DA, A hierarchical Bayesian model for predicting host-parasite interactions using phylogenetic information, *Annals of Applied Statistics*, **14** (1), 221-240, 2020.
- 16. McVittie, JH, Wolfson, DB and Stephens, DA, Parametric modelling of prevalent cohort data with uncertainty in the measurement of the initial onset date, *Lifetime Data Analysis*, **26**, 389–401, 2020.
- 17. Wallace MP, Moodie EEM, and Stephens DA, **Model selection for G-estimation of dynamic treatment regimes**, *Biometrics*, 75 (4), 1205-1215, December 2019.
- 18. Powell, GA, Verma, A, Luo Yu, Stephens DA, and Buckeridge DL, **Modeling Chronic Obstructive Pulmonary Disease Progression Using Continuous-Time Hidden Markov Models**, *Studies in Health Technology and Informatics*, 264, 920-924, 2019.
- 19. Villandre L, Labbe A, Brenner BG, Ibanescu, RI, Roger M, and Stephens DA, Assessing the role of transmission chains in the spread of HIV-1 among men who have sex with men in Quebec, Canada, *PLoS One* 14 (3), e0213366, 2019.

- 20. Shokoohi F, Stephens DA, Bourque G, Pastinen T, Greenwood C, and Labbe A, A hidden Markov model for identifying differentially methylated sites in bisulfite sequencing data, *Biometrics*, 75 (1), 210-221, 2019.
- 21. 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, *Biometrical Journal*, 61 (2), 442-453, 2019.
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- 23. Luo Yu, Stephens DA, and Buckeridge DL, Estimating prevalence using indirect information and Bayesian evidence synthesis, *The Canadian Journal of Statistics*, 46 (4), 673-689, 2018.
- 24. Moodie EEM, Saarela O, and Stephens DA, **A doubly robust weighting estimator of the average treatment effect on the treated**, *Stat*, 7, e205, doi:10.1002/sta4.205, October 2018.
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- 27. Shohoudi A, Stephens DA, and Khairy P, **Bayesian adaptive trials for rare cardiovascular conditions**, Future Cardiology, 14 (2), 143-150, February 2018.
- 28. Moodie EEM, Stephens DA, and Wallace MP, **G-estimation**, *Wiley StatsRef*, doi: 10.1002/9781118445112.stat08046, February 2018.
- 29. Moodie EEM and Stephens DA, **Dynamic treatment regimes**, *Wiley StatsRef*, doi: 10.1002/9781118445112.stat08040, February 2018.
- 30. Khalili A, Chen J, and Stephens DA, **Regularization in regime-switching Gaussian autoregressive models**, *The Canadian Journal of Statistics*, 45 (4), 356-374, December 2017.
- 31. Ertefaie A, Asgharian M, and Stephens DA, Variable Selection in Causal Inference using a Simultaneous Penalization Method, The Journal of Causal Inference, doi.org/10.1515/jci-2017-0010, December 2017.
- 32. Moodie EEM and Stephens DA, **Treatment Prediction**, **Balance**, **and Propensity Score Adjustment**, (Research Letter), *Epidemiology*, 28 (5), e51-e53, 2017.
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- 49. Moseley MJ, Wallace MP, Stephens DA, Fielder AR, Smith LC, Stewart CE, and 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*, 16:189, doi: 10.1186/s13063-015-0711-4, April 2015.
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- 53. 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.

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- 56. 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.
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- 64. 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.
- 65. 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.
- 66. 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.
- 67. Moodie EEM and Stephens DA, Marginal Structural Models: Unbiased estimation for longitudinal studies, *International Journal of Public Health*, 56(1), 117-9, February 2011.
- 68. 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.
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- 72. 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.
- 73. Ertefaie A and Stephens DA, Comparing Approaches to Causal Inference for Longitudinal Data: Inverse Probability Weighting versus Propensity Scores, International Journal of Biostatistics: 6(2), 14, doi: 10.2202/1557-4679.1198, January 2010.
- 74. Rich B, Moodie EEM, Stephens DA, and Platt RP, **Model Checking with Residuals for g-estimation of Optimal Dynamic Treatment**, *International Journal of Biostatistics*: 6(2), 12, doi: 10.2202/1557-4679.1210, January 2010.
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# Papers in Revision & Papers Submitted/Under Review:

- S1. Luo Y, Stephens DA, Graham DJ, McCoy EJ, **Bayesian doubly robust causal inference via loss functions**, in submission at *Biometrika*, <a href="https://arxiv.org/abs/2103.04086">https://arxiv.org/abs/2103.04086</a>, February 2022.
- S2. Stephens DA, Nobre WS, Moodie EEM and Schmidt, **AM, Bayesian causal inference using regression on the propensity score**, in resubmission after Major Revision, *Bayesian Analysis*, January 2022
- S3. Shokoohi F, Stephens DA, and Greenwood CMT, **Identifying Differential Methylation in Cancer Epigenetics via a Bayesian Functional Regression Model,** March 2021. <u>bioRxiv https://www.biorxiv.org/content/10.1101/2021.03.21.436232v2</u>

- S4. Saarela, O, Moodie, EEM and Stephens, DA, The Role of Exchangeability in Causal Inference, in submission after Major Revision, *Statistical Science*, January 2022.
- S5. El Hanchi, A and Stephens, DA, **Stochastic Reweighted Gradient Descent**, <a href="https://arxiv.org/pdf/2103.12293.pdf">https://arxiv.org/pdf/2103.12293.pdf</a>, May 2021
- S6. Turchetta, A Moodie EEM, Stephens DA, Lambert, SD, **Bayesian Sample Size Calculations for SMART Studies**, in revision after Minor Revision, *Biometrics*, August 2021.
- S7. Alie, R, Stephens, DA and AM Schmidt, **On Data Augmentation in Point Process Models Based on Thinning** arXiv preprint arXiv:2203.06743, 2022 <a href="https://arxiv.org/pdf/2203.06743.pdf">https://arxiv.org/pdf/2203.06743.pdf</a>

# **Discussions:**

- 1. Moodie EEM, and Stephens DA, Commentary on "The Statistician in Medicine" by Professor Sir Austin Bradford Hill, *Statistics in Medicine* **40** (1), 37-41.
- 2. Moodie EEM, and Stephens DA, Comment: Clarifying Endogeneous Data Structures and Consequent Modelling Choices Using Causal Graphs, discussion of 'Linear mixed models with endogenous covariates: Modeling sequential treatment effects with application to a mobile health study', by Qian et al, *Statistical Science*, 35(3), 391-393, 2020.
- 3. 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), 1530 1534, September 2017.
- 4. Stephens DA, Discussion of "Deductive derivation and Turing-computerization of semiparametric efficient estimation" by Frangakis et al., *Biometrics*, 71 (4), 880-880, 2015.

# **Books:**

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

#### **Chapters in Books**

- 1. De Iorio M, Ebbels TMD, and Stephens DA, **Statistical Methods in Metabolomics**, *Handbook of Statistical Genetics*, 3<sup>rd</sup> Edition, 2019
- 2. 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.), Chapter 2, 13—34, Springer, Singapore, September 2016.
- 3. 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 Kosorok MR and Moodie EEM), Chapter 7, 89-117, ASA-SIAM Series on Statistics and Applied Mathematics, <a href="http://dx.doi.org/10.1137/1.9781611974188.ch7">http://dx.doi.org/10.1137/1.9781611974188.ch7</a>, December 2015.
- 4. 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.
- 5. 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, 12(2), 291 321, doi: 10.1007/978-3-642-25746-9\_9, Springer, 2012.
- 6. Umande PP and Stephens DA, Spatial Point Process Analysis of Promyelocytic leukemia nuclear bodies, in *Advances in Nuclear Architecture* (eds Adams NM and Freemont P), Springer, Chapter 2, 59 85, 2011.
- 7. Russell RA, 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, 173-187, 2011.
- 8. Stephens DA, Complexity in Systems Level Biology and Genetics: Statistical Perspectives, *Handbook of Complexity*, Springer, 2009.
- 9. 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.
- 10. Stephens DA, **Statistical approaches to genetic mapping**, in *Highly structured stochastic systems* (eds Green PJ, Hjort NL, and Richardson S), Oxford, Oxford University Press, 386 392, ISBN: 0-1985-1055-1, 2003.
- 11. Wakefield JC and Stephens DA, **Bayesian errors-in-variables modeling**, in *Bayesian Analysis of Generalised Linear Models* (eds Dey DK et al.), 2000.
- 12. Smith CAB and Stephens DA, **Simple likelihood and probability calculations for linkage analysis**, in *Genetic Mapping of Disease Genes*, Academic Press, London, 1997.
- 13. 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 Berry DA and Stangl DK), Marcel Dekker, New York, 1995.
- 14. Stephens DA and Dellaportas P, **Bayesian Analysis of Generalised Linear Models with Covariate Measurement Error**, in *Bayesian Statistics 4* (eds Bernardo JM et al.), Clarendon Press, Oxford, UK, 813-820, 1994.
- 15. Stephens DA and Smith AFM, **Bayesian Edge-Detection in Images via Changepoint Methods**, *Computing Intensive Methods in Statistics* (eds Hardie W and Simar J), Physica-Verlag, Heidelberg, 1 29, 1993.

#### **Interviews**

1. Dellaportas, P and Stephens, DA, Interview with Professor Adrian FM Smith. *International Statistical Review*, 88: 265-279. https://doi.org/10.1111/insr.12395, 2020.

# **Graduate Supervision Completed through January 2021**

# PhD Supervision:

- 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 Mancia (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)
- 23. Yu Luo (2019, joint with David Buckeridge)
- 24. James McVittie (2021, joint with David Wolfson)
- 25. Vivian Meng (2021)

### **Masters Supervision**

- 1. Mike Bottone (MPhil, 2010, co supervised with Ajay Jasra)
- 2. Sudipta Sadhukhan (MSc, 2011)
- 3. Tigran Atoyan (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. Shouao Wang (MSc, 2017, joint with Erica Moodie)
- 12. James McVittie (MSc, 2017, joint with David Wolfson)
- 13. Yiu-Sing Lau (MSc, 2018)
- 14. Mengtian Zhang (MSc, 2018)
- 15. Magid Sabbagh (MA, 2019, joint with Christian Genest)
- 16. Zayd Omar (MSc, 2019, joint with Alexandra Schmidt)
- 17. Jiajun Mai (MSc, 2019)
- 18. Elio Abi Younes (MSc, 2020)
- 19. Ayoub El hanchi (MSc, 2020)
- 20. David Fleischer (MSc, 2020, joint with Yi Yang)
- 21. Hovzep Mazakian (MSc, 2021, joint with Masoud Asgharian)
- 22. Sameera Sheikh-Jilani (MSc, 2021, joint with Russ Steele)
- 23. Alicia ter-Cheam (MSc, 2021)

#### **Current Students at McGill:**

- Shomoita Alam (PhD, Year 6, joint with Yi Yang)
- Daniel Duque-Rodriguez (PhD, Year 5, joint with Erica Moodie)
- Armando Turchetta (PhD Year 4, joint with Erica Moodie)
- Renaud Alie (PhD Year 4, joint with Alexandra Schmidt)
- Jiajun Mai (PhD, Year 4)
- Elio Abi Younes (PhD, Year 3)
- David Fleischer (PhD, Year 2, joint with Yi Yang)
- Hovzep Mazakian (PhD, Year 2, joint with Masoud Asgharian)
- Magid Sabbagh (PhD, Year 2)
- Haoyu Wu (PhD, Year 2, joint with Erica Moodie)
- Peiyuan Huang (Masters, Year 2)
- Olivia Shi (Masters, Year 2, joint with Christian Genest)
- Lucas Bennett (Masters, Year 1)

# **Postdoctoral Supervision**

- Vahid Partovi Nia (2009-2011). Current position: Assistant Professor at Ecole Polytechnique, Montreal.
- Will Astle (2011-2012, joint with Aurelie Labbe). Current position: Research Associate at University of Cambridge, UK.
- Olli Saarela (2011-2012, joint with Erica Moodie). Current position: Associate Professor in the Department of Biostatistics, University of Toronto.
- Irene Vrbik (2014-2016). Current position: Assistant Professor, University of British Columbia, Okanagan.
- Michael Wallace (2014-2016, joint with Erica Moodie). Current position: Assistant Professor, Department of Statistics and Actuarial Science, University of Waterloo.
- Farhad Shokoohi (2015-2016, joint with Aurelie Labbe). Current position: Assistant Professor University of Las Vegas, United States.
- Leila Golparvar (2015-present, joint with Robert Platt; on leave 2016-17 and 2018-19). Current position: senior analyst, Statistics Canada, Ottawa.
- Levon Nurbekyan (2018-2019, joint with Adam Oberman) Current position: postdoctoral fellow, Department of Mathematics, UCLA.
- Yu Luo (2019-2020, joint with David Buckeridge). Current position: postdoctoral fellow, Imperial College London.

# **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)

Probability (Math 323, Fall 2018, Fall 2021)

#### **Graduate:**

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

Mathematical Statistics I MATH 556 (2006-8, 2014, 2019)

Mathematical Statistics II MATH 557 (2008, 2010, 2017)

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, 2017)

Topics in Statistics: Introduction to Causal Inference (2018, 2021)

Topics in Statistics: Bayesian Inference and Computation (2019, 2020)

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: Causal Inference (2020)

Reading Course: Mathematical Theory of Bayesian Statistics (2020)

Reading Course: Diffusion-based Monte Carlo, Gradient Flow, and Optimal Transport (2020)

Reading Course: Bayesian Nonparametrics (2008, 2010)

Reading Course: Continuous Time Finance (2010)

Reading Course: Time Series Analysis (2010, 2017, 2018)

Reading Course: Asymptotic Statistics (2013) Reading Course: Multivariate Analysis (2011)

#### **Grants**

- 1. IVADO Fundamental Research, **Statistical modelling of health trajectories and interventions** (CAD \$216,000, Sep 2020-August 2022, Principal Investigator with 4 others).
- 2. NSERC: Discovery Grant, **Bayesian methods for partially specified models** (5 x CAD \$57,000 = CAD \$285,000, 2018-2023)
- 3. FRQNT: Team Grant, **Méthodes d'inférence causale et la prise de décision dans un cadre bayésien**, (3 x 51K = \$153,000, 2018-2021, Principal Investigator, joint with four others)
- 4. Healthy Brains for Health Lives (McGill CFREF): Innovative Ideas Program, **Optimal Transportation and Bayesian methods for Machine Learning** (2 x 76K = \$152,000 CAD, co-Principal Investigator with Adam Oberman)
- CIHR: Project Grant, Developing Longitudinal Indicators for Population-Scale Monitoring of Health Care Trajectories (Co Principal Investigator, with five others, CAD \$180,000 Jul 2016-Jun 2019)
- MITACS Accelerate: Predicting Premia in the Canadian Auto-insurance market (industry partner TD Assurance, Montreal), CAD \$15,000 Jan-May 2016
- 7. 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 CAD \$111,760 = CAD \$223,420, Jan 2016 Dec 2017 (co Principal Investigator with Bluma Brenner, Jewish General Hospital, Montreal; my portion is 50% of the total)
- 8. NSERC: Discovery Grant, Bayesian methods for confounding adjustment and causality  $(5 \times CAD \$34,750 = CAD \$173,750, 2013-2018)$
- 9. NSERC: Discovery Accelerator Supplement (3 x CAD \$40,000 = CAD \$120,000, 2013-2016)

- 10. CIHR: Open Operating Grant, Computational methods phylogenetics clustering for HIV/HCV viral DNA sequences (Principal Investigator: CAD \$293,000, 2013-2016, joint with 4 others)
- 11. FQRNT: Outils et méthodes statistiques pour déchiffrer les réseaux génétiques régulatoires de traits et maladies complexes (Apr 2011-Mar 2014, CAD \$159,000), joint with 2 others
- 12. NIH, US: **HIV Risk Dynamics, Genetic Patterns, and Control** (Jul 2008-Jun 2013, USD \$243,4265 estimated total, 10% salary CAD \$27,000), with 8 others; Prof. James Koopman (University of Michigan), PI
- 13. FQRNT: **Méthodes statistiques pour les études multiniveaux** (Apr 2008-Mar 2011, CAD \$146,800), joint with 8 others
- 14. NSERC: Discovery Grant, **Bayesian Methods in Bioinformatics and Finance** (Apr 2007-Mar 2012, CAD \$110,000)
- 15. NSERC: Discovery Accelerator Supplement (Apr 2007-Mar 2012, CAD \$120,000)
- 16. Biotechnology and Biological Sciences Research Council, UK: **Bayesian methods for modelling and integrating metabolic data** (Jan 2008-Dec 2011, GBP £550,000/CAD \$1,200,000), with Sylvia Richardson, Jeremy Nicholson, Maria De Iorio and Tim E Ebbels
- 17. Medical Research Council, UK: Capacity Building PhD studentships, **Bayesian methods in Metabonomics** (Oct 2005-Sep 2009, GBP £120,000/CAD \$240,000), with Maria De Iorio and Tim E Ebbels
- 18. Medical Research Council, UK: Capacity Building PhD studentship, **Computational analysis of the spatial distribution of mammalian cell nuclei** (Oct 2005-Sep 2009, GBP £120,000/CAD \$240,000), with Professor Paul Freemont and two others
- 19. Biotechnology and Biological Sciences Research Council, UK: PhD studentship program, Simulation-based analysis of the spatial distribution of mammalian cell nuclei (Oct 2005-Sep 2008, GBP £80,000/ CAD \$160,000), with Professor Paul Freemont and two others
- 20. Fight for Sight Charity: **Occlusion therapy in Amblyopia**: **A Randomized Trial** (Oct 2001-03, GBP £110,000/CAD \$220,000), joint with Alistair Fielder and Merrick Moseley
- 21. Wellcome Trust: **Statistical Methods in Bioinformatics** (Mar 2002-04, GBP £150,000/CAD \$300,000), joint with David Hand and Chris Holmes

#### **Conference Organization and Participation**

# **Conferences Organized**

- June 2018: Four-week short programme "Causal inference in the presence of dependence and network structure: modelling strategies and model selection" at the CRM, June 11-July 6, 2018. The CRM contributed \$52,000 towards the meeting. Financial support was also provided by CANSSI (\$12,000) and PIMS (\$4,500).
- December 2017: CRM conference on Risk in the Health Sciences (co-organized with Erica EM Moodie, Dan Graham, and Nick Jewell)
- July 2016: CRM conference and one-month workshop in causal inference and genetics (coorganized 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 (coorganized 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. This two-day meeting involved 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 Method, Models and Adjustment, Summer Institutes in Clinical & Epidemiological Research, University of Washington, Department of Biostatistics, School of Public Health, USA (2014-2021)
- An 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)
- 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, 2005-2006)
- 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 (2006/2021)

- Keynote speaker: Statistics 2021, Concordia University, Montreal, "Bayesian inference for partially specified models" (July 2021).
- Keynote speaker: SMAC 2021: Statistiques, philosophie et santé, Cancéropôle Grand Sud-Ouest, Universite de Bordeaux "Bayesian methods in health data analysis" (June 2021)
- Invited speaker: Statistical Society of Canada Annual Meeting, Montreal QC, "Phylogenetic and Phylodynamic analysis of HIV infection in Montreal" (June 2018)
- 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:
  - o "Particle MCMC methods"
  - o "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"
- 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-December 2021)
- 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 (April 2010-present)
- Statistical 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.
- Canadian Statistical Sciences Institute (CANSSI): CRM representative on the scientific advisory board (2017-2021)

#### Administrative duties and other contributions

#### At McGill

- Vice-Dean, Faculty of Science (March 2019-present)
- Provost's Advisory Committee, Dean of Management (Fall 2020-Spring 2021)
- Provost's Advisory Committee, Dean of Libraries (Fall 2019)
- Chair, Department of Mathematics and Statistics (June 2015-March 2019)
- Senate, McGill University (July 2015-August 2021)
- University Tenure Committee (2014-2017)
- 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)
- 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