# Curriculum Vitæ

## Sahir Rai Bhatnagar

September 13, 2017

# 1  Identification

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| Name: | Sahir Rai Bhatnagar |
| Designations: | Associate of the Society of Actuaries (ASA) |
| Address: | Lady Davis Institute for Medical Research |
|  | Jewish General Hospital |
|  | H483, Clinical Epidemiology |
|  | 3755 Côte Ste. Catherine |
|  | Montréal, Québec H3T 1E2 |
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| E-mail: | sahir.bhatnagar@gmail.com, sahir.bhatnagar@mail.mcgill.ca |
| Homepage: | http://sahirbhatnagar.com/ |
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| Citizenship: | Canadian |
| Languages: | English, French, Hindi |

# 2  Education

| | |
|---:|:---|
| 2013–present | Ph.D. (Biostatistics) |
| | McGill University, Montreal QC, Canada |
| | *Advisors:* Dr. Celia Greenwood and Dr. Yi Yang |
| | *Committee Member:* Dr. Mathieu Blanchette |
| | PhD thesis title: High Dimensional Interactions with an Environment Variable |
| | Queen Elizabeth Scholar |
| 2012–2013 | Master of Science (Biostatistics) |
| | Queen's University, Kingston ON, Canada |
| | *Advisors:* Dr. Paul Peng and Dr. Devon Lin |
| | *Committee Members:* Dr. Dongsheng Tu and Dr. Wenyu Jiang |
| | MSc project title: Absolute risk estimation in a case cohort study of prostate cancer (GPA 3.94/4.3) |
| 2005–2008 | Bachelor of Science (Actuarial Mathematics) |
| | Concordia University, Montreal QC, Canada |

# 3 Awards

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|---|---|
| 2017 | UK Genetics Society Training Grant £1,000 |
| 2016 | McGill University and Genome Quebec Innovation Centre (MUGQIC) Travel Award $1,000 |
| 2016 | Graduate Research Enhancement and Travel (GREAT) Award $1,000 |
| 2016 | Quantitative Biology and Medical Genetics for the World Queen Elizabeth II Scholarship $6,000 |
| 2016 | Best Student Oral Presentation - 28th International Biometric Society Meeting |
| 2016 | SSC Biostatistics Section Travel Award $250 |
| 2015 | Best Poster Presentation - 4th Annual Canadian Human and Statistical Genetics Meeting $1,000 |
| 2014 | Genetic Analysis Workshop 19 Travel Award $1,000 |
| 2013 | McGill Graduate Excellence Award $18,000 |
| 2012 | MSc Queen's Graduate Studies Award $20,000 |

# 4 Professional Examinations

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| 2011 | Associate of the Society of Actuaries (ASA) |

# 5 Experience

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| 2016 – | Data Science Blogger at Plotly |
| 11/2016 – 03/2017 | Queen Elizabeth Scholar - Wellcome Trust Sanger Institute, UK. <br><br> Working with Dr. Eleftheria Zeggini on integration methods for methylation, transcription and protein expression data in osteoarthritis patients undergoing knee replacement surgery. |
| 2015 – | Statistical Consultant, iMD Research |
| 2012 – 2013 | Research Assistant, McGill University <br> Working with Dr. Andrea Benedetti in the Respiratory Epidemiology and Clinical Research Unit at McGill, where our research is focused on methods for correlated data, as well as developing an R package for the clustering of DNA fingerprint data |
| 2008 – 2012 | Actuarial Analyst, Aon Hewitt <br> Preparation and verification of annual reports, financial reports, annual statements, valuation reports, budget projections, and pension costs for clients balance sheets. Responsible for translation of pension plan status to clients |

# 6 Teaching

## 6.1 Graduate Course

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| Fall 2017 | MATH697: Mathematical Statistics <br> Department of Mathematics and Statistics, McGill Univeristy <br> 40 In-class hours <br> 12 graduate students <br> Course Webpage |

## 6.2   Short courses and Tutorials

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|---|---|
| 2017/03/28 | Introduction to the R package `casebase` for fitting smooth-in-time prognostic risk functions for survival data and visualizing incidence density using population time plots. Guest lecturer for BIOS 602 - Epidemiology Regression Models II. Department of Epidemiology, Biostatistics and Occupational Health, McGill University. |
| 2017/01/27 | 7 Interactive Plots from the Pharmaceutical Industry |
| 2016/05/21 | GitHub for Data Scientists without the Terminal |
| 2016/04/15 | Loops and Simulations in R. Department of Epidemiology, Biostatistics and Occupational Health, McGill University. Sponsored by Epidemiology, Biostatistics and Occupational Health Student Society (EBOSS). |
| 2016/03/23 | Introduction to the R package `casebase` for fitting smooth-in-time prognostic risk functions for survival data and visualizing incidence density using population time plots. Guest lecturer for BIOS 602 - Epidemiology Regression Models II. Department of Epidemiology, Biostatistics and Occupational Health, McGill University. |
| 2015/07/29 | Atelier sur le logiciel en R: Un introduction à la programmation en R. GERAD: Groupe d'études et de recherche en analyse, Université de Montréal. Sponsored by HEC Montréal. |
| 2015/05/28 | Reproducible Research: An introduction to `knitr`. Department of Epidemiology, Biostatistics and Occupational Health, McGill University. Sponsored by the CRM Statistics Laboratory and the Montreal Biostatistics Seminar Series. |
| 2013/05/13 | Introduction to LaTeX. Queen's University, Department of Mathematics and Statistics. |

## 6.3   Teaching Assistant

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| 2014 | Teaching Assistant, McGill University<br>Inferential Statistics (EPIB 607) |
| 2012–2013 | Teaching Assistant, Queen's University<br>Tutorial leader in calculus (MATH 121)<br>Term and exam marker for numerical methods and actuarial mathematics |

# 7   Other Contributions

## 7.1   Reviewer of Journal Articles

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| | International Journal of Epidemiology |

## 7.2   Administrative Responsibilities and Committees

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| 2015– | International Genetic Epidemiology Society Communications Committee Member |
| 2014–2015 | Post-Graduate Students' Society (PGSS) Councillor |

## 7.3   Professional Associations

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| 2011– | Society of Actuaries |
| 2013– | Statistical Society of Canada |
| 2016– | International Genetic Epidemiology Society |

### 7.4 Volunteer Service

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| 2010–Present | Math Teacher, Aditya Youth Trust Fund |
| | Teaching mathematics to a group of elementary and high school students who are financially under resourced. Motivate and inspire students to place a high value on education while promoting wholesome social involvement, and to encourage them to achieve their maximum potential |
| 2011–2013 | MAB - Mackay Rehabilitation Center |
| | Working with elderly patients diagnosed with Retinitis Pigmentosa. Accompaniment to perform everyday tasks that would be difficult to do independently such as grocery shopping, banking transactions, and outdoor activities |

# 8 Publications

## 8.1 Published/In Press

1. Klein Oros K, Oualkacha K, Lafond M, Bhatnagar SR, Tonin PN, Greenwood CMT (2016). Gene coexpression analyses differentiate networks associated with diverse cancers harbouring TP53 missense or null mutations. *Frontiers in Genetics, section Statistical Genetics and Methodology.* Aug 3;7:137. DOI 10.3389/fgene.2016.00137

2. Sun J., Bhatnagar SR, Oualkacha K, Ciampi A, Greenwood CMT (2016) Joint analysis of multiple blood pressure phenotypes in GAW19 data by using a multivariate rare-variant association test. *BMC Proceedings.* 2016, 10(Suppl 7):14. DOI 10.1186/s12919-016-0048-3

3. Bhatnagar SR, Greenwood CMT, Labbe A (2016) Assessing transmission ratio distortion in extended families: a comparison of analysis methods. *BMC Proceedings.* 2016, 10(Suppl 7):12. DOI 10.1186/s12919-016-0030-0

4. Wang Y, Murphy O, Turgeon M, Wang ZY, Bhatnagar SR, Schulz J, and Moodie EEM (2015) The perils of Quasi-likelihood Information Criteria. *Stat.* Feb 1;4(1):246-54. DOI: 10.1002/sta4.95

5. Bhatnagar SR, Atherton J, Benedetti A (2015). Comparing alternating logistic regressions to other approaches to modelling correlated binary data. *Journal of Statistical Computation and Simulation.* Jul 3;85(10):2059-71. DOI 10.1080/00949655.2014.916707

## 8.2 Submitted

1. Bhatnagar SR, Yang Y, Khundrakpam B, Evans A, Blanchette M, Bouchard L, Greenwood CMT. An analytic approach for interpretable predictive models in high dimensional data, in the presence of interactions with exposures. DOI 10.1101/102475. Submitted (2017/01).

2. Steinberg J, Brooks R, Southam L, Bhatnagar SR, Roumeliotis T, Hatzikotoulas K, Zengini E, Wilkinson JM, Choudhary J, McCaskie AW, Zeggini E. Widespread Epigenomic, Transcriptomic and Proteomic Differences Between Osteophytic and Articular Patient Chondrocytes in Osteoarthritis. Submitted (2017/07).

3. Kronfli N, Bhatnagar SR, Moodie EEM, Hull MW, Klein MB, for the Canadian Co-infection Cohort Investigators. The early effects of hepatitis C (HCV) treatment on trends in cause-specific mortality in HIV-HCV co-infection. Submitted (2017/08).

4. Nadig A, Flanagan T, White K, Bhatnagar SR. Results of a RCT on a transition support program for adults with ASD: Effects on Self Determination and Quality of Life. Submitted (2017/09).

# 9 Presentations

* indicates the person that gave the presentation

## 9.1 Contributed Conference Presentations

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|---|---|
| 2017/09/13 | Abou Khalil M*, Bhatnagar SR, Vasilevsky CA, Morin N, Ghitulescu G, Feldman L, Longtin Y, Boutros M: Development and validation of a clinical risk calculator for fulminant Clostridium difficile colitis. Resident Research Retreat, Canadian Surgical Forum, Victoria, British Columbia, Canada. |
| 2017/07/24 | Kronfli N*, Bhatnagar SR, Moodie EEM, Hull M, Klein MB: Trends in Cause-Specific Mortality in HIV-hepatitis C (HCV) co-infected patients in Canada (2003–2016): Possible Beneficial impact of HCV therapy. 9th IAS Conference on HIV Science, Paris, France. |
| 2017/06/12 | Bhatnagar SR*, Yang Y, Jolicoeur-Martineau A, Wazana A, Greenwood CMT: Variable Selection in Nonlinear Interactions with the Group Lasso. 45th Annual Meeting of the Statistical Society of Canada, Winnipeg, Canada. |
| 2016/11/18 | Bhatnagar SR: Genomic Visualisations for Biologists in R. Plotcon 2016, New York City, NY. YouTube video of presentation. |
| 2016/11/03 | Bhatnagar SR*, Yang Y, Khundrakpam B, Evans A, Blanchette M, Bouchard L, Greenwood CMT: An analytic approach for interpretable predictive models in high dimensional data, in the presence of interactions with exposures. 25th Annual International Genetic Epidemiology Society Meeting, Toronto, Canada. |
| 2016/09/09 | Hamadani FT*, Bhatnagar SR, Balvardi S, Trepanier M, Grushka J, Deckelbaum D, Court O, Fata P: Burnout and Career Satisfaction Among Canadian General Surgeons: Results of the CAGS National Burnout Study. Canadian Surgery Forum, Toronto, Canada. |
| 2016/07/10 | Bhatnagar SR*, Yang Y, Blanchette M, Greenwood CMT: Strong Heredity Models in High Dimensional Data. 28th International Biometrics Conference, Victoria, Canada. |
| 2016/04/18 | Bhatnagar SR*, Yang Y, Blanchette M, Greenwood CMT: A Model for Interpretable High-Dimensional Interactions. 5th Annual Canadian Human and Statistical Genetics Meeting, Halifax, Canada. |
| 2015/04/19 | Bhatnagar SR*, Houde A, Voisin G, Bouchard L, Blanchette M, Greenwood CMT: DNA methylation and Expression to predict childhood obesity. 4th Annual Canadian Human and Statistical Genetics Meeting, Vancouver, Canada. |

## 9.2   Poster Presentations

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| 2017/10/22 | Abou Khalil M*, Bhatnagar SR, Vasilevsky CA, Morin N, Ghitulescu G, Feldman L, Longtin Y, Boutros M: A Nomogram for Prediction of Mortality in Patients who Undergo Surgery for Fulminant Clostridium Difficile Colitis: Results from the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) Database. American College of Surgeons' 2017 Clinical Congress, San Diego, CA, USA. |
| 2017/09/10 | Bhatnagar SR*, Oualkacha K, Yang Y, Forest M, Greenwood CMT: Estimation for High-Dimensional Multivariate Linear Mixed Models in Structured Populations. 2017 International Genetic Epidemiology Society Meeting, Cambridge, UK. |
| 2017/05/13 | Nadig A*, Flanagan T, Bhatnagar SR, White K: Results of a RCT on a Transition Support Program for Adults with ASD: Effects on Quality of Life and Self-Determination. 2017 International Meeting for Autism Research, San Francisco, California, USA. |
| 2016/05/12 | Hull M*, Bhatnagar SR, Moodie EEM, Klein M: Trends in causes of mortality in the Canadian Co-infection cohort (CCC) 2005 – 2015. 25th Annual Canadian Conference on HIV/AIDS Research, Winnipeg, Canada. |
| 2016/04/17 | Bhatnagar SR*, Yang Y, Blanchette M, Greenwood CMT: A Model for Interpretable High Dimensional Interactions. 5th Annual Canadian Human and Statistical Genetics Meeting, Halifax, Canada. |
| 2015/04/19 | Bhatnagar SR*, Houde A, Voisin G, Bouchard L, Blanchette M, Greenwood CMT: Integrating DNA Methylation and Gene Expression data in Placenta Tissue to Predict Childhood Obesity. 4th Annual Canadian Human and Statistical Genetics Meeting, Vancouver, Canada. *$1,000 Award for Best Poster* |
| 2014/08/24 | Bhatnagar SR*, Greenwood CMT, Labbe A: Transmission Ratio Distortion in Extended Families. Genetic Analysis Workshop 19, Vienna, Austria. |
| 2014/08/25 | Sun J, Bhatnagar SR*, Oualkacha K, Ciampi A, Greenwood CMT: Joint analysis of multiple blood pressure phenotypes in GAW19 data by using a multivariate rare-variant association test. Genetic Analysis Workshop 19, Vienna, Austria. |
| 2014/05/26 | Bhatnagar SR*, McGregor K*, Turgeon M*: Effect of economy on TV time use. 42nd Annual Meeting of the Statistical Society of Canada, Toronto, Ontario. |

## 9.3   Seminar Presentations

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| 2017/07/12 | Bhatnagar SR, Forest M, Keller-Baruch J: Statistics vs. Machine Learning: Why cant we be friends? Lady Davis Institute, Montreal Jewish General Hospital. |
| 2016/05/19 | Bhatnagar SR: Methods for High Dimensional Interactions Ludmer Centre for Neuroinformatics and Mental Health, Montreal Neurological Institute. |
| 2015/08/12 | Bhatnagar SR: Introduction to knitr and R Markdown. Montréal UseR Group, Notman House, Montréal. |
| 2015/03/12 | Bhatnagar SR: Imputing the Epigenome. Lady Davis Institute, Montreal Jewish General Hospital. |
| 2015/03/05 | Bhatnagar SR: Making sense of Methylation & Expression data in Cordblood and Placenta Tissues. Lady Davis Institute, Montreal Jewish General Hospital. |
| 2014/04/07 | Bhatnagar SR: Estimation and Accuracy after Model Selection by Bradley Efron. Department of Mathematics and Statistics, McGill University. |
| 2014/01/23 | Bhatnagar SR: Reproducible Research and Biostatistics. Biostatistics Reading Group, McGill University. |
| 2014/08/07 | Bhatnagar SR*, Greenwood CMT, Labbe A: Transmission Ratio Distortion in Extended Families. Lady Davis Institute, Montreal Jewish General Hospital. |
| 2013/08/30 | Bhatnagar SR: Absolute Risk Estimation in a Case Cohort Study of Prostate Cancer. Department of Mathematics and Statistics, Queen's University. |
| 2013/03/06 | Bhatnagar SR: Colorectal Cancer Screening in Visible Minorities in Canada. Department of Public Health Sciences, Queen's University. |
| 2012/11/27 | Bhatnagar SR: Computational Methods for the Case-Cohort Design. Department of Public Health Sciences, Queen's University. |

# 10   Software

## 10.1   R Packages

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| acm4r | https://cran.r-project.org/package=acm4r<br>Fragment lengths or molecular weights from pairs of lanes are compared, and a number of matching bands are calculated using the Align-and-Count Method. |
| eclust | https://cran.r-project.org/package=eclust<br>A Statistical Software Tool for the Analysis of High-Dimensional Interactions. It's main functionality is to fit statistical models for analyzing interactions between a high dimensional dataset (e.g. genomics, brain imaging), the environment and a response. |
| casebase | http://sahirbhatnagar.com/casebase/<br>A statistical software tool to fit smooth-in-time parametric hazard functions using case-base sampling. This approach allows the explicit inclusion of the time variable into the model, which enables the user to fit a wide class of parametric hazard functions. For example, including time linearly recovers the Gompertz hazard, whereas including time logarithmically recovers the Weibull hazard; not including time at all corresponds to the exponential hazard. This is joint work with Maxime Turgeon, Olli Saarela and James Hanley. |
| manhattanly | https://cran.r-project.org/package=manhattanly<br>Create interactive Q-Q and manhattan plots that are usable from the R console, in the 'RStudio' viewer pane, in 'R Markdown' documents, and in 'Shiny' apps. |

# 11   Technical Skills

R

SAS

LaTeX

Microsoft Office suite

Unix/Linux operating system, Bash Shell Script

Git, GitHub

Jekyll, HTML

# References

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