

## Wesley S. Burr, PhD, A.Stat

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CONTACT INFORMATION	Department of Mathematics, Trent University, 1600 West Bank Drive, Peterborough, Ontario Canada K9L 0G2	<i>Cellular:</i> 613-331-2674  <i>E-mail:</i> wesleyburr@trentu.ca <i>Personal:</i> wesley.burr@gmail.com
CITIZENSHIP	Canadian	
RESEARCH INTERESTS	Statistical Modeling, Environmental Health Statistics, Statistical Computing, Time Series Analysis, Spectrum Estimation, Statistics Education	
EDUCATION	<b>Ph.D.</b> (Statistics) Dept. of Mathematics & Statistics, Queen's University, 2012. <b>M.Sc.</b> (Mathematics) Dept. of Mathematics & Statistics, Queen's University, 2007. <b>B.Sc.Eng.</b> (Engineering) School of Applied Science and Engineering, Queen's University, 2005.	
PROFESSIONAL APPOINTMENTS	<b>Sabbatical Leave</b> Jul 2021 - Dec 2021 <b>Associate Professor</b> (with Tenure) Department of Mathematics, Trent University, Jul 2021-present. <b>Assistant Professor</b> Department of Mathematics, Trent University, Jun 2016 - Dec 2018; Renewed Jan 2019 - Jun 2021. <b>Canadian Government Laboratories Visiting Fellow</b> Health Canada, Population Studies Division, 2013-2016. <b>Postdoctoral Fellow</b> Queen's University, Dept. of Mathematics & Statistics, 2013.	
PUBLICATIONS	<b>Manuscripts Under Review</b>  Yeh, K., Castel, S., Stotesbury, T. and Burr, W.S. <i>subMALDI: an open framework R package for processing irregularly-spaced mass spectrometry data</i> . Under review, Journal of Open Source Software.  <b>Published Manuscripts</b>  Castel, S. and Burr, W.S. <i>Assessing Statistical Performance of Time Series Interpolators</i> , in MDPI Engineering Proceedings of the 2021 International Conference on Time Series and Forecasting.  Quinby, F., Kim, S., Pollanen, M., Burr, W.S. and Reynolds, M.G. <i>An Evaluation of Two-Dimensional Digital Input Models for Mathematical Structure: Effects on Working Memory, Cognitive Load, and Efficiency</i> . In Engineering Psychology and cognitive Ergonomics, 2021. Springer, Switzerland.  Burr, W.S., Chevalier, F., Collins, C., Gibbs, A.L., Ng, R. and Wild, C.J. <i>Computational skills by stealth in introductory data science teaching</i> . Teaching Statistics, 43, pp.S34-S51. 2021. <i>Preprint: arXiv:2010.07017. 2020 Oct 8.</i>  Slepkov, A.D., Van Bussel, M.L., Fitze, K.M. and Burr, W.S. <i>A baseline for multiple-choice testing in the university classroom</i> . SAGE Open, 11(2), p.21582440211016838.	

- Blanchette, K., Burr, W.S. and Takahara, G. *An F-Test for Polynomial Frequency Modulation*, ICASSP 2021 - 2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2021, pp. 5010-5014, doi: 10.1109/ICASSP39728.2021.9414209.
- Yeh, K., Burr, W.S., Stock, N.L and Stotesbury, T. *Preliminary analysis of latent fingerprints recovered from underneath bloodstains using matrix-assisted laser desorption/ionization Fourier-transform ion cyclotron resonance mass spectrometry imaging (MALDI FT-ICR MSI)*, 2020: Forensic Chemistry, 20, 100274.
- Starke, C.W.E., Jones, C.L.C., Burr, W.S. and Frost, P.C. *Interactive effects of water temperature and stoichiometric food quality on Daphnia pulex*, Freshwater Biology, 66:2, 256–265.
- Quinby, F., Kim, S., Kang, S., Pollanen, M., Reynolds, M.G. and Burr, W.S. *Markov Transition Matrix Analysis of Mathematical Expression Input Models*. In *Mathematical Software – ICMS 2020*, LNCS 12097, Springer. 2020.
- Quinby, F., Pollanen, M., Reynolds, M.G. and Burr, W.S. *Effects of Digitally Typesetting Mathematics on Working Memory*. In *International Conference on Human-Computer Interaction 2020 July 19* (pp. 69-80). Springer, Cham.
- Kim, S., Pollanen, M., Reynolds, M.G. and Burr, W.S. *Problem Solving as a Path to Comprehension: Mathematical Software and Structured Symbolism*. 2020: Mathematics in Computer Science, 1-15. Springer.
- Smith, R., Kannemayer, M., Adams, E., Tran, V.V., Munshaw, R. and Burr, W.S. *Comparing Jury Focus and Comprehension of Expert Evidence between Adversarial and Court-appointed models in Canadian criminal court context*. 2020: Canadian Society of Forensic Science Journal, 53:2.
- Burr, W.S., Dales, R., Smith-Doiron, M., Jovic, B., Kauri, L.M., Liu, L., Stieb, D. and Shin, H.H. *The Oakville Refinery Closure and Its Influence on Local Hospitalizations: A Natural Experiment*. International Journal of Environmental Research and Public Health. 2018: 15(9), 2029.
- Kim, S., Pollanen, M., Reynolds, M. and Burr, W.S. *Identification of Errors in Mathematical Symbolism and Notation: Implications for Software Design*. International Congress on Mathematical Software, 2018:297–304.
- Burr, W.S., Takahara, G. and Shin, H.H. *Synthetically lagged models*. Statistics & Probability Letters, 2018. DOI: 10.1016/j.spl.2018.07.008.
- Shin, H.H., Burr, W.S., Stieb, D., et al. *Air Health Trend Indicator: Association between Short-Term Exposure to Ground Ozone and Circulatory Hospitalizations in Canada for 17 Years, 1996–2012*. International Journal of Environmental Research and Public Health. 2018. 15(8).
- Weygang, M., Burr, W.S. and Springford, A. *Magnetograms: Digitization and error correction*. Journal of Coupled Systems and Multiscale Dynamics, 2018. 5(2):164–167.
- Szyszkowicz, M. and Burr, W.S. *Use of Chained Two-point Clusters to Examine Associations of Air Pollution with Health Conditions*. International Journal of Occupational Medicine and Environmental Health, 2016. 29.4:613-622.
- Burr, W.S., Takahara, G. and Shin, H.H. *Bias in Estimation of Short-term Population Health Risk from Air Pollution Exposure*. Environmetrics, 2015, (26)4:298-311.

Szyszkowicz, M. and Burr, W.S. *Distributed Lag Models: An Analysis of Milan Mortality Data*, J Pollut Eff Contr, June 2014, 2:1. <http://dx.doi.org/10.4174/jpe.1000109>.

Burr, W.S. and Shin, H.H. *Accounting for Temperature when Modeling Population Health Risk Due to Air Pollution*. Proceedings of the 2013 AMMCS, in Springer Proceedings in Mathematics and Statistics, Vol. 117.

Burr, W.S. and Shin, H.H. *Discrete Prolate Spheroidal Sequences as Filters in Generalized Additive Models*. Proceedings of the 2013 AMMCS, in Springer Proceedings in Mathematics and Statistics, Vol. 117.

### **Additional Publications**

Fisher, N., Wild, C., Burr, W.S. *et al.* *Curriculum Frameworks for Introductory Data Science*. September, 2019. ISBN: 978-0-646-80819-2.

Burr, W.S. *Air Pollution and Health: Time Series Tools and Analysis*. PhD thesis, Queen's University, Kingston, ON. 2012.

Burr, W.S. *Oscillations of Jupiter as Detected by Voyager II*. Master's thesis, Queen's University, Kingston, ON. 2007.

### **Software**

`magneto` R package for import, trace and analysis of analog magnetogram images (with B. Ott and M. Weygang). Available from GitHub.

`tsModels` R package for analysis of time series interpolators (with S. Castel). Available from GitHub.

`subMALDI` R package for analysis and alignment of MALDI spectra (with K. Yeh). Available from GitHub.

`CATNAPS` R package for Checking and Tuning National Air Pollution Surveillance (NAPS) Data. Available from GitHub.

`multitaper` R package for computation and analysis of multitaper spectrum estimates. On CRAN.

`AHItools`, `AHIsmooth`, `AHIatm`: R packages for development and analysis of Canadian health and environmental data for the Air Health Indicator (AHI) project.

`slp` R package for extension of `gam` and `mgcv` estimators, allowing use of SLP smoothers for Generalized Additive Models. On CRAN.

`tsinterp` R package for interpolation of stationary time series through univariate (hybrid Wiener) and bivariate techniques. Available from GitHub.

### **SUPERVISION**

#### **Graduate Students**

- Ben Ott: MSc. Statistics, **2021-23** (joint with G. Takahara, Queen's). *Topic TBD*
- Skye Griffith: PhD, Statistics, **2020-24** (joint with G. Takahara, Queen's). *Topic TBD*
- Shannon Jarvis: MSc. Modeling (AMOD), **2020-22**. *Particulate Matter Air Pollution and Public Health*
- Kyung Eun Sung: MSc. Modeling (AMOD), **2019-21** *Prescription Drug Records and Environmental Epidemiology*
- John Christopher Smith: MSc., Modeling (AMOD), **2019-21**. *Environmental Epidemiology and the Opioid Epidemic*

- Jianwei Yiu: MSc., Statistics, **2018-20** (joint with G. Takahara, Queen's, and B. Franzak, MacEwen). *Time Series Clustering Algorithms*
- Jordan Kokocinski: MSc., Statistics, **2018-20** (joint with G. Takahara, Queen's). *Time Series Regression and Cross-Covariances*
- Skye Griffith: MSc., Statistics, **2018-20** (joint with G. Takahara, Queen's). *Filter Coefficients in Time Series Regression*
- Kian Blanchette: MSc., Statistics, **2018-20** (joint with G. Takahara, Queen's). *Frequency-Modulated Harmonic F-Tests*
- Stephanie Johnson: MSc., Modeling (AMOD), **2018-20** (joint with M. Pollanen). *Coincidences and Collisions in Big Data*
- Sophie Castel: MSc., Modeling (AMOD), **2018-20**. *Imputation and Interpolation Methods for Spatio-Temporal Processes*
- Francis Quinby: MSc., Modeling (AMOD), **2018-20** (joint with M. Pollanen). *Mathematical Software Design and User Experience*
- Seyeon Kim: MSc., Modeling (AMOD), **2018-19** (joint with M. Pollanen and M. Reynolds). *Eye-Tracking and Mathematical Reasoning Errors*
- Mark Weygang: MSc., Modeling (AMOD), **2016-19** (joint with S. McConnell). *Historic Magnetogram Digitization*
- Carlone Scott: MSc., Modeling (AMOD), **2016-19** (joint with W. Feng and K. Abdella). *Population-Level Ambient Pollution Exposure Proxies*
- Qixing (Steven) Jia: MSc., Modeling (AMOD) Research Paper, **2018**. *Estimating Volatility in Stock Prices*
- Justin Slater: MSc., Statistics, **2015-16** (joint with G. Takahara, Queen's). *Band Selection for Synthetic Lagging*

#### NSERC/Other Undergraduate Summer Research Assistants

- Ali Ahmadzhai: **2021** *Automated Magnetogram Analysis and Display*
- Haley Gilchrist: **2021** *SageMath: Tutorials and Workshops*
- Phoenix Armstrong: **2021** (joint with A. Shafer) *DNA Degredation Simulation Systems*
- Ben Ott: **2020** *Magnetogram Digitization Algorithms*
- Haley Gilchrist: **2020** *Specifications Grading in Statistics*
- Kristen Yeh: **2020** *Computer Systems for Mass Spectrometry Analysis*
- Kristen Yeh: **2019** (joint with T. Stotesbury) *Chemospectra and Blood*
- Melissa Van Bussel: **2018** (joint with A. Slepkov) *Testlets, Correlation and Item-Specific Goodness*
- Kara Fitze: **2018** (joint with A. Slepkov) *Spurious Correlations in Psychometry*
- Melissa Van Bussel: **2017** *Multiple Pollutant Risk Combinations for the Air Health Indicator*

#### Honors Projects, Community Research and Case Studies

- Ben Ott, MATH 4800 Honors Project, **2021**: *Spectral Analysis of Interplanetary Magnetic Fields Produced by the North and South Poles of the Sun*
- Haley Gilchrist, MATH 4800 Honors Project, **2021**: *Specifications Grading in Statistics*
- Cameron Moffat, MATH 4800 Honors Project, **2021**: *Bayesian Regression Models and Permutation Testing*
- Breana Morrison, MATH 4800 Honors Project, **2021**: *Mathematics and Its Integration into Psychology*
- Maya Peters, MATH 4800 Honors Project, **2021**: *Math Stereotype Threat of Young Women*
- Mark Charles, MATH 4800 Honors Project, **2021**: *Bayesian Models for Sports Analytics*

- Haley Gilchrist, MATH 4852 Community Research Project, **2021**: *IDSSP & MDM4U: Data Science for the High School Classroom*
- Ben Ott, MATH 4851 Community Research Project, **2020**: *Developing a Shiny Front-End for Magnetogram Digitization*
- Catherine Dollemont, MATH 4800 Honors Project, **2020**: *Extreme Event Analysis and Flooding*
- Kristen Yeh, FRSC Thesis, **2019–20**: *Blood Removal and DNA Trace Evidence*
- Veronica Thorn, FRSC Thesis, **2019–20**: *DNA Bottlenecks in Populations*
- Kara Fitze, MATH 4851 Community Research Project, **2019**: *IDSSP & MDM4U: Data Science for the High School Classroom*
- Melissa Van Bussel, MATH 4851 Community Research Project, **2018**: *The Importance of Tidy Data: A Real-World Example*
- Melissa Van Bussel, MATH 4800 Honors Project, **2019**: *Time Series Interpolation Algorithms*
- Martha Mai, MATH 4800 Honors Project, **2019**: *Survival Analysis and the Bachelor*
- Lucas Finney, MATH 4800 Honors Project, **2019**: *Digital Music Synthesis and Humanization*
- SSC Case Study, **2018** - Melissa Van Bussel, Kara Fitze, Sophie Castel and Seyeon Kim. *What Predicts the Popularity of TED Talks?*
- Jianwei Liu, MATH 4800 Honors Project, **2018**: *Regression Analysis between Short-Term Air Pollution and Mortality*
- Samantha Leigh, MATH 4800 Honors Project, **2018**: *The Probability Behind Card Counting in Blackjack*
- Michael Bracey, MATH 4800 Honors Project, **2018**: *Statistical and Numerical Approaches to Weather Forecasting*
- Skye Griffith, MATH 4800 Honors Project, **2018**: *Music Data Analysis: Tone & Timbre*
- Liam Lumley-Pontone, MATH 4800 Honors Project, **2018**: *Big Data, Collisions and Coincidences in Mathematics*
- Joshua Knackstedt, MATH 4851 Community Research Project, **2017**: *Cyclists and GreenUP*
- SSC Case Study, **2017** - Melissa Van Bussel, Carlone Scott, Mark Weygang and Ankai Liu. *What is the Impact of Natural Disasters in Canada?*

## GRANTS AND CONSULTING

### Grants

- *Time Series and Spectral Methods for Imputation, Regression, and Environmental Health*. NSERC Discovery Grant 2017-04741. 2017–2023. Principal investigator. \$84,000.
- *Modern Spectral Methods in Time Series Analysis: Applications in Physical Science, Environmental Science, and Computer Modeling*. Collaborator; CANSSI Collaborative Research Team Project. \$200,000. [Complete]

### Consulting, Contracts and Research-for-Hire

- *Feasibility Assessment of Current and Future Ozone and Particulate Matter Abiotic Stress Effects on Grape Growth, Yield and Yield Quality*. Agriculture and AgriFood Canada grant 3000676046. 2018–19. Principal investigator. \$21,000. [Complete]
- *Three-Pollutant Risk Models for Health and Air Pollution*. Health Canada grant 1000184801a (via CESI/CARA). 2016–2019. Co-investigator. \$180,000. [Complete]
- *Particulate Matter Component Risk Analysis and Concentration*. Health Canada grant 100184225 (via CESI/CARA). 2016–2019. Principal investigator. \$180,000. [Complete]
- *Investigation to Identify the Cause of an Observed Change in Mortality Risk At-*

- tributable to Ozone*. Collaborator; CESI/CARA. \$120,000. [Complete]
- *Investigation of Cyclic Patterns in National and Regional Mortality Risks for the Air Health Indicator (AHI)*. Collaborator; 2011-2013. \$75,000. [Complete]
  - *Investigation of Temperature Influences on Mortality for the Air Health Indicator (AHI)*. 2013. Principal investigator. \$10,000. [Complete]

### **Statistical Consulting and Unofficial Supervision**

This is a list of honors projects and graduate theses for which I have unofficially assisted with: statistical modeling, data analysis, and suggestions for possible solutions. The majority are Biology or Environment students from Trent University.

- Angela Skopyk: **2021** PhD in Applied Bioscience, Ontario Tech
- Hannah Cantwell-Johnson: **2020** FRSC Thesis
- Nathalie Grishaber: **2020** MSc in Biology
- Grant Everleigh: **2020** Geography Thesis
- Ryot Munshaw: **2019** FRSC Thesis
- Taylor Urquhart: **2019** FRSC Thesis
- Marie-Laurence Cossette: **2019** FRSC USRA, Thesis
- Cody Starke: **2019** MSc in ERSC
- Amelia MacDonald: **2019** MSc in Biology
- Brittany Curry-Sharple: **2018** MSc in Sustainability
- Simon Tapper: **2018** PhD in Environmental Science
- Matthew Hayes: **2018** PhD in Canadian Studies
- Tamara Newell-Bell: **2018** FRSC Honors Thesis
- Kedija Abdella: **2018** Assistance with statistical analysis for Diabetic Retinopathy, with journal paper on a community research study run together with H. Strungaru, University of Alberta.
- Alina Lampic: **2018** CHEM Honors Project
- Vi Van Tran: **2017** FRSC Honors Thesis
- Debbie Jenkins: **2017-18** Assistance with modeling for journal article, part of PhD research in Environmental Science and Ecology
- Chris Smith: **2017** Assistance with research study on Sepsis, Peterborough Paramedics Association.
- Ariel Lenske: **2016-17** Masters thesis in Biology
- Robby Marrotte: **2017** Masters thesis in Biology
- Scott Flemming: **2017** Masters thesis in Biology
- Alice Pintaric: **2017** Masters thesis in Biology
- Tianna Burke: **2016-17** Masters thesis in Biology
- Allie Anderson: **2016-17** Masters thesis in Biology
- Emily Adams: **2017** Masters thesis in Biology
- Kashika Jaggin: **2017** FRSC Honors Thesis
- Amanda Orr: **2017** Masters thesis in Biology
- Melissa Brochu: **2017** Masters thesis in Biology
- Daniel Krivenko: **2016** Masters thesis in Biology

INVITED TALKS

- Castel, S.T. and Burr, W.S. *Assessing Statistical Performance of Time Series Interpolators*. Plenary talk, 7th International conference on Time Series and Forecasting (ITISE2021), Gran Canaria, Spain. July 19-21, 2021. (Virtual)
- Burr, W.S. *Case Studies in Data Science Education: Limits and Scope*. In special session “Building the Pipeline”, Statistical Society of Canada annual meeting, Calgary, Canada. May 26–30, 2019.
- Burr, W.S. *Geometric and Statistical Methods for Aggregating Predictors in Pollutant Risk Models*, ISES/ISEE 2018, Ottawa, Canada. August 27–30, 2018.
- Burr, W.S. and Shin, H.H. *Particulate Matter Observations: Imputation and Correction*, The International Environmetrics Society Conference, Guanajuato, Mexico. July 16–21, 2018.
- Burr, W.S. *Lag-Adjusted Models for Air Pollution Time Series*, The International Environmetrics Society (joint with GRASPA 2017) Conference on Climate and Environment, Bergamo, Italy. July 24–26, 2017.
- Burr, W.S. *Time Series Models and the Problem of Air Pollution*, Dept. of Physics & Astronomy Departmental Colloquium; Dept. of Mathematics Seminar Series, 2017.
- Burr, W.S. and Shin, H.H. *The Air Health Indicator: Short-Term Health Risk and the Synthetic Lag Model*, Dept. of Mathematics & Statistics, Carleton University, Apr. 8, 2016.
- Burr, W.S. *Time Series, Spectral Analysis and Environmental Epidemiology*. Dept. of Statistics, University of Manitoba. Feb. 4, 2016.
- Burr, W.S. and Shin, H.H. *A Natural Intervention Study on an Oil Refinery Closure*. Dept. of Mathematics & Statistics, Carleton University, Jan. 15, 2015.
- Takahara, G. and Burr, W.S. *Developing an Air Health Indicator*. Dept. of Mathematics & Statistics, University of Ottawa, Dec. 6, 2012.
- Burr, W.S. *Estimation of Acute Health Effects due to Air Pollution*. Departmental colloquia for the School of Population Health, University of Queensland (Nov. 13, 2012) and the School of Population Health, University of Western Australia (Nov. 20, 2012).
- Takahara, G. and Burr, W.S. *Developing an Air Health Indicator using Spectral Decomposition of GAMs*. Health Canada weekly Seminar Series, Tunney’s Pasture, Ottawa, ON, Apr. 20, 2012.
- Burr, W.S. *Modeling Health Outcomes due to Short-Term Air Pollution Exposure*. Departmental Colloquium for the Dept. of of Statistics & Actuarial Science, University of Waterloo, Nov. 10, 2011.

CONFERENCE  
ACTIVITY  
(INCL. STUDENT  
JOINT WORK).  
PRESENTER  
HIGHLIGHTED.

- Blanchette, K.**, Burr, W.S. and Takahara, G. *An F-Test for Polynomial Frequency Modulation*, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). June 6-11, 2021.
- Tiessen, M.**, Fruehwald, H., Burr, W.S., Easton, E.B. and Stotesbury, T. *Forensic electrochemistry: Application of differential pulse voltammetry in the analysis of time since deposition of bloodstains created on glassy carbon electrodes*, Canadian Society of Forensic Science annual meeting, 2021. Virtual (COVID-19).

- Quinby, F.**, Kim, S., Pollanen, M., Reynolds, M. and Burr, W.S. *An Evaluation of Two-Dimensional Digital Input Models for Mathematical Structure: Effects on Working Memory, Cognitive Load and Efficiency*, Engineering Psychology and Cognitive Ergonomics: 18th International Conference (EPCE 2021), held as part of the 23rd HCI International Conference, HCI 2021. July 24-29, 2021. Virtual.
- Smith, J.C.** and Burr, W.S. *Leveraging paramedic data for temporal monitoring and modelling of opioid and other intoxicant use*, 12th Annual EMS Research Day, Dalhousie University Division of EMS, October, 2020 **and** East Coast Research Series, Dalhousie University Department of Emergency Medicine, May, 2021, (both online, COVID-19).
- Smith, J.C.** and Burr, W.S. *Leveraging paramedic data to investigate the effect of COVID-19 on community Opioid Overdoses*, 999 EMS Research Forum Annual Conference 2020. (online, COVID-19), October, 2020.
- Smith, J.C.** and Burr, W.S. *Ineffectiveness of paramedic naloxone administration as a metric for community opioid overdoses*, Australian College of Paramedicine International Conference 2020. (online, COVID-19), October, 2020.
- Quinby, F.**, Kim, S., Pollanen, M., Reynolds, M. and Burr, W.S. *Effects of digitally typesetting mathematics on working memory*, Engineering Psychology and Cognitive Ergonomics: 17th International Conference (EPCE 2020), held as part of the 22nd HCI International Conference, HCI 2020. July 19-24, 2020. Copenhagen, Denmark (and Virtual).
- Quinby, F., Kim, S., Pollanen, M., Kang, S., Reynolds, M. and **Burr, W.S.** *Markov Transition Matrix Analysis of Mathematical Expression Input Models*, International Congress on Mathematical Software (ICMS) 2020. July 13-17, 2020. Braunschweig, Germany.
- Yeh, K.**, Burr, W.S., Stock, N.L and Stotesbury, T. *Matrix-assisted laser desorption/ionization (MALDI) Fourier transform-ion cyclotron resonance (FT-ICR) mass spectrometry imaging (MSI) of chemically recovered fingerprints*, Canadian Society of Forensic Science annual meeting, 2020. Oshawa, Canada.
- Castel, S.**, Van Bussel, M., and Burr, W.S. *Imputation of Missing Values in Time Series*, Statistical Society of Canada Yearly Meeting, 2019. Calgary, Canada.
- Kim, S.**, Reynolds, M., Pollanen, M. and Burr, W.S. *Problem Solving as a Path to Comprehension: Mathematical Software and Structured Symbolism*, International Conference on Mathematical Software, 2018. South Bend, Notre Dame, USA.
- Shin, H.H.**, Kalayci, H, Haque, L, Smith-Doiron, M, Jovic, B, Burr, W.S. and Stieb, D. *Mortality and Hospitalization Linked to Fine Particulate Matter in Canada: Is There a Trend in Risk between 2001 and 2012?*, ISEE/ISES. 2018. Ottawa, ON.
- Takahara, G.** and Burr, W.S. *Correlated Responses in Air Pollution Regression Models*, ISES/ISEE 2018, Ottawa, Canada. August 27–30, 2018.
- Van Bussel, M.**, Castel, S. and Burr, W.S. *Time Series Interpolation Algorithms: An Application to Real-World Data*, Statistical Society of Canada Yearly Meeting, 2018. Montreal, Canada.
- Burr, W.S.** *The Unreasonable Effectiveness of the Multitaper Method*, Closing Workshop, CANSSI Collaborative Team Project. Queen’s University, Kingston, Canada. August 25, 2018.

- Burr, W.S.**, Griffith, S. and Van Bussel, M. *Integration of Extensive Technology in a Canadian Service Statistics Course*, International Conference on Teaching Statistics (ICOTS10), 2018. Kyoto, Japan.
- Burr, W.S.**, Van Bussel, M., Fitze, K. and Slepko, A. *Psychometrics of Testlets*, Statistical Society of Canada Yearly Meeting, 2018. Montreal, Canada.
- Van Bussel, M.**, Burr, W.S. and Shin, H.H. *Metrics for the Air Health Indicator Project*, Canadian Statistics Student Conference (CSSC), 2018. Montreal, Canada.
- Kim, S.**, Burr, W.S., Pollanen, M. and Reynolds, M. *Identification of Errors in Mathematical Symbolism and Notation*, Canadian Statistics Student Conference (CSSC), 2018. Montreal, Canada.
- Weygang, M.**, McConnell, S. and Burr, W.S. *Feature and Outlier Detection in Magnetograms*, AMMCS 2017 International Conference. Kitchener-Waterloo, Canada.
- Scott, C.** and Burr, W.S. *Population-Level Ambient Pollution Exposure Proxies*, AMMCS 2017 International Conference. Kitchener-Waterloo, Canada.
- Burr, W.S.** *Phase as Lag: Synthetic Lag Models for Risk Estimation in Population Health*, Joint Statistical Meetings, 2016. Chicago, USA. *Topic-contributed session talk.*
- Burr, W.S.**, Dales, R., Smith-Dorion, M., Jovic, B., Kauri, L.-M., Liu, L., Stieb, D. and Shin, H.H. *Health Impacts of the Oakville Refinery Closure*. Health Canada Science Forum, January, 2015. *Talk and Poster Presentation.*
- Shin, H.H., **Mahmud, M.**, Burr, W.S., Smith-Dorion, M., Jovic, B., Takahara, G., Stieb, D., Jessiman, B. and Burnett, R. *Air Health Indicator Update*. Health Canada Science Forum, January, 2015. *Poster Presentation.*
- Shin, H.H., **Mahmud, M.**, Burr, W.S., Smith-Dorion, M., Jovic, B., Takahara, G., Stieb, D., Jessiman, B. and Burnett, R. *Air Health Indicator*. Statistical Society of Canada Yearly Meeting, 2014. Also presented at Health Canada Science Forum, December, 2013. *Poster Presentation.*
- Burr, W.S.** and Shin, H.H. *Discrete Prolate Spheroidal Sequences as Filters in Generalized Additive Models*. SS-MSEPSW session for AMMCS-2013. Kitchener-Waterloo, Canada.
- Burr, W.S.** and Shin, H.H. *Accounting for Temperature when Modeling Population Health Risk Due to Air Pollution*. SS-SAEEM session for AMMCS-2013. Kitchener-Waterloo, Canada.
- Burr, W.S.** and Shin, H.H. *Temperature and Mortality: a Canadian perspective*. Statistical Society of Canada Yearly Meeting, 2013.
- Burr, W.S.**, Takahara, G. and Shin, H.H. *Towards Developing an Air Health Indicator through Spectral Decomposition of GAMs*. Statistical Society of Canada Yearly Meeting, 2012 (award-winning presentation)
- Riebert, D.L.**, Springford, A., Burr, W.S. and Thomson, D.J. *Is There Structure in High-Frequency Variation of Great Lakes Water Levels?* Statistical Society of Canada Yearly Meeting, 2012.
- Burr, W.S.** *Adapting Generalized Additive Models for Improved Risk Estimation in Air Health Applications*. Statistical Society of Ottawa Research Day, 2011. (award-winning presentation)

- Burr, W.S.** *Cross-Spectral Method for Gapfilling Time Series*. Statistical Society of Canada Yearly Meeting, 2011.
- Burr, W.S.**, Moghtaderi, A., Takahara, G., Shin, Hwashin H. *Estimation and Extraction of Harmonic Features from Pollution and Mortality Time Series*. Statistical Society of Canada Yearly Meeting, 2011.
- Burr, W.S.** and Thomson, D.J. *New Results in Jovian Mode Observations*. Fall Meeting 2010, American Geophysical Union. *Poster presentation*.
- Burr, W.S.** *Reconstructing Solar Flux using Dual-Site Records*. 7<sup>th</sup> Canadian Solar Workshop, Oct 2010.
- Burr, W.S.** *Interpolation of Gaps in Time Series*. SOGSSD 2010, May 2010.
- Burr, W.S.** *Evolution of the Solar Wind*. 6<sup>th</sup> Canadian Solar Workshop, Oct 2009.
- Burr, W.S.** *Voyager II and the Jupiter Intercept*. 5<sup>th</sup> Canadian Solar Workshop, Oct 2008. *Poster presentation*.
- Burr, W.S.** and Thomson, D.J. *Periodic Oscillations in the Jovian Magnetosphere* URSI675, URSI General Meeting, Ottawa, June, 2007.

#### AWARDS

##### External

- Statistical Society of Canada Student Research Presentation Award, 2012
- Statistical Society of Canada Student Travel Award, 2012
- Statistical Society of Ottawa PhD Student Presentation Award, 2011
- Queen Elizabeth II Scholarship in Science and Technology, 2010
- Finalist, Qualcomm Cognitive Radio Competition, 2010
- Ontario Graduate Scholarship (OGS), 2006
- Queen Elizabeth II *Aiming for the Top* Scholarship, 2001-2005

##### Queen's University

- Conference Travel Award, 2010 & 2011
- Keyser Prize, 2010
- Queen's Graduate Award, 2005 & 2007-2011
- Annie Bentley Lillie Award (First in Class), 2005
- Keyser Fellowship (Best Undergraduate Thesis Award), 2005
- NSERC Undergraduate Student Research Award, 2004 & 2005
- Dean's Scholar, 2001-2005
- The Marsha Lampman Alumni Association Award, 2001-2005

##### Trent University

- Merit Award (Teaching), 2018-19
- Symons Award for Excellence in Teaching, 2018-19

#### PROFESSIONAL MEMBERSHIPS

Statistical Society of Canada, Member (2009-present), granted **A.Stat.** certification Oct. 2012. Statistical Education Section. Data Science and Analytics Section.

Statistics Education Section, SSC: Treasurer, 2018–2021. President-Elect, 2021-22.

The International Environmetrics Society (TIES): Member (2017-present); Outreach Committee (2020-22).

TEACHING  
EXPERIENCE

**Trent University**, Peterborough, ON Canada

**Associate Professor**

**June 2021 to Present**

**Assistant Professor**

**June 2016 to June 2021**

2023WI MATH 3561H: Statistics III: Advanced Statistics (38 students)  
2023WI MATH 2560H: Applied Statistics I (43 students)  
2022FA MATH 4851H: Community-Based Research Project (2 students)  
2022FA MATH 4570H: Stochastic Processes (Reading Course, 5 students)  
2022WI AMOD 5320H: Financial Time Series (18 students)  
2022WI MATH 4560H: Time Series Analysis (5 students)  
2022WI MATH 3560H: Linear Models (11 students)  
2022WI MATH 2560H: Applied Statistics I (45 students)  
2021FA On Sabbatical  
2021SU MATH 4560H: Time Series Analysis (Reading Course, 1 student)  
2021WI MATH 1052H: Non-Calculus Statistics II (440 students)  
2021WI MATH 2560H: Applied Statistics I (34 students)  
2021WI MATH 3560H: Linear Models (Reading Course, 1 student)  
2021WI MATH 4570H: Stochastic Processes (Reading Course, 1 student)  
2021WI MATH 4852H: Community-Based Research Project (1 student)  
2021WI AMOD 5310H: Environmental Epidemiology (3 students)  
2021WI AMOD 5320H: Computational Statistics (2 students)  
2021WI AMOD 5320H: Adv. Linear Models (1 student)  
2020FA MATH 1051H: Non-Calculus Statistics I (385 students)  
2020FA MATH 4561H: Sampling & Design of Experiments (15 students)  
2020FA MATH 4560H: Time Series Analysis (Reading Course, 5 students)  
2020FA MATH 3770H: Complex Analysis (Reading Course, 1 student)  
2020FA MATH 4851H: Community-Based Research Project (1 student)  
2020FA MATH 5320H: Statistical Aspects of Modeling (1 student)  
2020FA AMOD 5310H: Sampling & Design of Experiments (2 students)  
2020WI MATH 3560H: Statistics II: Linear Models (15 students)  
2020WI MATH 2560H: Statistics I: Applied Statistics (38 students)  
2019FA MATH 1051H: Non-Calculus Statistics I (334 students)  
2019FA MATH 4851H: Community-Based Research Project (1 student)  
2019SU MATH 1051H: Non-Calculus Statistics I (Reading Course, 1 student)

2019WI MATH 4561H: Sampling & Design of Experiments  
 2019WI MATH 2560H: Applied Statistics I  
 2018FA MATH 4851H: Community-Based Research Project (1 student)  
 2018FA MATH 2570H: Probability II, Stochastic Processes (26 students)  
 2018FA MATH 1051H: Non-Calculus Statistics I (314 students)  
 2018SU MATH 4904H: Probability & Measure (Reading Course, 2 students)  
 2018SU MATH 4903H: Bayesian Statistics (Reading Course, 6 students)  
 2018SU AMOD 5310H: Linear Models (Reading Course, 1 student)  
 2018WI AMOD 5310H: Advanced Statistical Methods (Reading Course, 1 student)  
 2018WI MATH 2560H: Applied Statistics I (31 students)  
 2018WI MATH 3560H: Linear Models (14 students)  
 2017FA AMOD 5240H: Statistical Aspects of Modeling (30 students)  
 2017FA MATH 3570H: Probability II, Stochastic Processes (Reading Course, 4 students)  
 2017FA MATH 1051H: Non-Calculus Statistics I (261 students)  
 2017SS MATH 4560H: Time Series Analysis (8 students)  
 2017WI MATH 1052H: Non-Calculus Statistics II (202 students)  
 2016FA MATH 4570H: Stochastic Processes II (Reading Course, 1 student)  
 2016FA MATH 2560H: Applied Statistics I (24 students)  
 2016FA MATH 4560H: Topics in Statistics (11 students)

**Queen's University at Kingston**, Kingston, ON Canada

**Postdoctoral Fellow**

**January 2013 to June 2013**

2012-13 APSC 171J: Calculus I (remedial).

**Graduate Teaching Fellow**

**September 2006 to April 2012**

2011-12 STAT 464/864: Time Series Analysis and Spectrum Estimation

2009-10 MATH 227: Vector Analysis

2008-09 APSC 174J: Linear Algebra for Engineers (Remedial)

2007-08 APSC 174: Linear Algebra for Engineers

2007-08 MATH 335: Methods of Applied Mathematics II

2006-07 (Interim Instructor) APSC 174: Linear Algebra for Engineers

SERVICE TO  
PROFESSION

**Co-Organizer** *20w2230 - Multitaper Spectral Analysis*, workshop, Banff International Research Station for Mathematical Innovation and Discovery. ~~September, 2020.~~ July, 2022.

**President-Elect** Statistics Education Section, Statistical Society of Canada, 2021-22.

**Organizer and Chair** *Symposium on Data Science and Governance in National Science Agencies* (with N. Newlands, AAFC), July 2021.

**Treasurer** Statistics Education Section, Statistical Society of Canada, 2018-21.

**Representative** Canadian representative on the *International Data Science in Schools* curriculum development team.

**Reviewer** Environmental Science, Journal of Teaching and Learning, Environmetrics

**Organizer** *Symposium on Multitaper Spectrum Estimation, Prolate Spheroidal Wave Functions, Quadratic-Inverse, and Related Problems*, as part of AMMCS-2013. August, 2013.

**Organizer** 6th Annual *Canadian Solar Workshop*. October, 2009.

DEPARTMENTAL  
SERVICE

**Trent University**, Peterborough, ON Canada

**Webmaster** *Departmental Webmaster and IT representative*, 2016, 2017, 2018, 2019, 2020, 2021.

**Scheduling** *Departmental Coordinator*, 2017, 2018, 2019, 2020, 2021.

**Head Search Committee** *Committee Member* 2016, 2019.

**Hiring** *Hiring Committee*, 2016, 2017, 2018 (TT), 2019, 2020, 2021.

**Queen's University at Kingston**, Kingston, ON Canada

**Organizer and Founder** *Statistical Methods Seminar*, 2010-2012. Queen's University Dept. of Mathematics & Statistics weekly departmental seminar on applied statistics and methodology.

**Organizing Committee** 40<sup>th</sup> Anniversary of Jeffery Hall Conference, Queen's University, 2010.

**Tenure, Renewal, and Promotion (TRP) Committee** Graduate student representative, Dept. of Mathematics & Statistics, 2007 and 2010.

**Appointments Committee** Graduate student representative, Dept. of Mathematics & Statistics, 2009.

**Computing Committee** Graduate student representative, Dept. of Mathematics & Statistics, 2007 and 2009.

UNIVERSITY  
SERVICE

**REB** *Member*, Research Ethics Board, July 2020-June 2021

**AMOD** *Stream Co-ordinator*, Financial Analytics, 2018-21.

**AMOD** *Executive Member*, 2017-21.

**Director Search Committee** *Chair*, AMOD Director Search 2020.

**Program Proposal Committee** Member and author of proposal for new BSc in *Financial Analytics*. 2018-20.

**Head Search Committee** *Dean's Representative*, Biology Department. 2019.