Paul David McNicholas

Department of Mathematics & Statistics, McMaster University, Hamilton, Ontario, Canada, L8S 4L8.

Nationality: Irish/Canadian

Telephone (Work): +1-905-5259140, ext. 23419

E-mail: paulmc@mcmaster.ca

Web: www.paulmcnicholas.io

Employment
- Professor, Department of Mathematics and Statistics, McMaster University. July 2014–Present.
- Associate Chair (Statistics), Dept. of Mathematics and Statistics, McMaster University. July 2021–June 2023.
- Director, MacData Institute, McMaster University. July 2017–June 2022. (Acting Director, May–June 2017).
- Professor, Department of Mathematics and Statistics, University of Guelph. July 2013–June 2014.
- Director, Bioinformatics Graduate Programs, University of Guelph. April 2012–May 2014.
- Associate Chair, Department of Mathematics and Statistics, University of Guelph. Sept. 2010–Nov. 2013.
- Associate Professor, Department of Mathematics and Statistics, University of Guelph. July 2010–June 2013.
- Assistant Professor, Department of Mathematics and Statistics, University of Guelph. July 2007–June 2010.

Other Affiliations and Professional Accreditation
- Faculty Affiliate, Vector Institute, Toronto. October 2019–Present.
- Associate Member, Department of Computing and Software, McMaster University. July 2018–Present.
- P.Stat., Statistical Society of Canada. October 2015–Present.

Academic Degrees
- Sc.D. in Statistics, 2022, Higher Doctorate, Trinity College Dublin.
- Ph.D. in Statistics, 2007, *Topics in Unsupervised Learning*, Department of Statistics, Trinity College Dublin.
- M.Sc. in High Performance Computing, 2007, School of Mathematics, Trinity College Dublin.
- B.A. in Mathematics, 2004, First Class Honours with Gold Medal, School of Mathematics, Trinity College Dublin (M.A., 2007).

Awards & Honours
- Dorothy Killam Fellowship, National Research Council, 2023.
  From nrc.canada.ca: "the Dorothy Killam Fellowships provide support to scholars of exceptional ability."
- John L. Synge Award, Royal Society of Canada, 2021.
  From rsc-src.ca: "To acknowledge outstanding research in any of the branches of the mathematical sciences."
  The John L. Synge Award was first given in 1987 and McNicholas was the 10th recipient.
- Steacie Prize for the Natural Sciences, E.W.R. Steacie Memorial Fund, 2020.
  Awarded to a researcher "40 years of age or less who has made notable contributions to research in Canada" (www.steacieprize.ca). The Steacie Prize has been awarded annually since 1964 and the applicant is the first winner for research in statistics.
- E.W.R. Steacie Memorial Fellowship, NSERC, 2019.
  Up to six fellowships were awarded across science and engineering in Canada each year "to enhance the career development of outstanding and highly promising university faculty who are earning a strong international reputation for original research."
- Member, College of New Scholars, Artists and Scientists, Royal Society of Canada, 2017.
  From rsc-src.ca: "The College of New Scholars, Artists and Scientists is Canada's first national system of multidisciplinary recognition for the emerging generation of Canadian intellectual leadership...The criteria for election is excellence..."
- University Scholar, McMaster University, 2017.
  From McMaster University's official policy, the awarding of the title University Scholar "seeks to recognize faculty members in mid-career who have already distinguished themselves as international scholars".
- Tier 1 Canada Research Chair in Computational Statistics, NSERC, 2015.
  From www.chairs-chaires.gc.ca, Tier 1 Canada Research Chairs "are for outstanding researchers acknowledged by their peers as world leaders in their fields". Renewed 2022.
- Chikio Hayashi Award, International Federation of Classification Societies (IFCS), 2013.
  This international award is given biennially to excellent young researchers (≤ 35 years old) who show great promise in classification, data analysis, or related areas.

- Early Researcher Award, Ontario Ministry of Research & Innovation, 2011.
  This prestigious and highly competitive award is given to outstanding researchers within the first five years of their academic careers. The official guidelines state that "the goal of the program is to improve Ontario's ability to attract and retain the best and brightest research talent".
- Distinguished Professor Teaching Award, University of Guelph Faculty Association, 2011.
  This is a teaching award given to the applicant based on in-class teaching and trainee supervision, but primarily on the latter.
- University Research Chair in Computational Statistics, University of Guelph, 2011.
  The applicant is the first statistician to be awarded the University's highest honour for a (non-retired) researcher. The Chair recognizes achievement and leadership in research.
- Barrington Medal, Statistical and Social Inquiry Society of Ireland, 2006.
  Given "to recognise a promising new researcher in the economic and social sciences in Ireland" (`irisheconomy.ie`). McNicholas was the 120th Barrington Lecturer.

Named and Special Lectures

- *Model-Based Clustering of Three-Way Data*, President's Invited Address, The Classification Society annual meeting, Waterloo, ON, 06/2022.
- *Thoughts on Some Problems in Clustering*, Isobel Loutit Lecture, Statistical Society of Canada annual meeting, Ottawa, ON, 06/2021 (virtual, delayed by one year by the COVID-19 pandemic).
- *Association Rule Analysis of CAO Data*, Barrington Lecture, Statistical and Social Inquiry Society of Ireland, Dublin, Ireland, 11/2006.

Monographs

Note: current and former trainees (students and postdoctoral fellows) are typed in bold face in all publications herein.

[1] McNicholas, P.D. and **Tait, P.A.** (2019), *Data Science with Julia*. Boca Raton: Chapman & Hall/CRC Press.

[2] McNicholas, P.D. (2016), *Mixture Model-Based Classification*. Boca Raton: Chapman & Hall/CRC Press.

Newspaper Op-Ed

[3] McNicholas, P.D. 'Talking about my disorder helped my son — and me', *Toronto Star*, A19, March 25, 2023.

Peer-Reviewed Articles: Published and Available Online

[4] Zhang, X., Murphy, O.A. and McNicholas, P.D., 'Balanced longitudinal data clustering with a copula kernel mixture model', *Canadian Journal of Statistics*. To appear.

[5] **Neal, M.R.**, **Sochaniwsky, A.A.** and McNicholas, P.D., 'Hidden Markov models for multivariate panel data', *Statistics and Computing*. To appear.

[6] **Sochaniwsky, A.A.**, **Gallaugher, M.P.B.**, **Tang, Y.** and McNicholas, P.D., 'Flexible clustering with a sparse mixture of generalized hyperbolic distributions', *Journal of Classification*. To appear.

[7] **Gabour, M.C.**, You, T., Fleming, R., McNicholas, P.D. and Gona, P.N., 'The association of physical activity duration and intensity on emotional intelligence in 10–13 year-old children', *Sports Medicine and Health Science*. Available online.

[8] **Gallaugher, M.P.B.** and McNicholas, P.D. (2024) 'Clustering and semi-supervised classification for clickstream data via mixture models', *The Canadian Journal of Statistics* **52**(3), 678–695.

[9] **Clark, K.M.** and McNicholas, P.D. (2024), 'Finding outliers in Gaussian model-based clustering', *Journal of Classification* **41**(2), 313–337.

[10] **Počuča, N.**, **Gallaugher, M.P.B.**, **Clark, K.M.** and McNicholas, P.D. (2023), 'Visual assessment of matrix-variate normality', *Australian and New Zealand Journal of Statistics* **65**(2), 152-165.

[11] **Gallaugher, M.P.B.**, Biernacki, C. and McNicholas, P.D. (2023), 'Parameter-wise co-clustering for high-dimensional data', *Computational Statistics* **38**, 1597–1619.

[12] Silva, A., Qin, X., Rothstein, S.J., McNicholas, P.D. and **Subedi, S.** (2023), 'Finite mixtures of matrix variate Poisson-log normal distributions for three-way count data', *Bioinformatics* **39**(5), btad167.

[13] **Dang, U.J.**, **Gallaugher, M.P.B.**, **Browne, R.P.**, McNicholas, P.D. (2023), 'Model-based clustering and classification using mixtures of multivariate skewed power exponential distributions', *Journal of Classification* **40**(1), 145–167.

[14] Phillips, J.D., **Athey, T.B.T.**, McNicholas, P.D. and Hanner, R.H. (2023), 'VLF: An R package for the analysis of very low frequency variants in DNA sequences', *Biodiversity Data Journal* **11**: e96480.

[15] **Gallaugher, M.P.B.**, **Tomarchio, S.D.**, McNicholas, P.D. and Punzo, A. (2022), 'Model-based clustering via skewed matrix-variate cluster-weighted models', *Journal of Statistical Computation and Simulation* **31**(2), 413–421.

[16] **Gallaugher, M.P.B.**, **Tomarchio, S.D.**, Punzo, A. and McNicholas, P.D. (2022), 'Mixtures of contaminated matrix variate normal distributions', *Journal of Computational and Graphical Statistics* **31**(2), 413-421.

[17] **Gallaugher, M.P.B.**, **Tomarchio, S.D.**, McNicholas, P.D. and Punzo, A. (2022), 'Multivariate cluster weighted models using skewed distributions', *Advances in Data Analysis and Classification* **16**(1), 93-124.

[18] **Browne, R.P.**, McNicholas, P.D. and Findlay, C.J. (2022), 'A partial EM algorithm for model-based clustering with highly diverse missing data patterns', *Stat* **11**(1), e437.

[19] Georgiades, S., **Tait, P.A.**, McNicholas, P.D., Eric Duku, E., Zwaigenbaum, L., Smith, I.M., Bennett, T., Elsabbagh, M., Kerns, C.M., Mirenda, P., Ungar, W.J., Vaillancourt, T., Volden, J., Waddell, C., Zaidman-Zait, A., Gentles, S. and Szatmari, P.M. (2022), 'Trajectories of symptom severity in children with autism: Variability and turning points through the transition to school', *Journal of Autism and Developmental Disorders* **52**(1), 392–401.

[20] **Tomarchio, S.D.**, McNicholas, P.D. and Punzo, A. (2021), 'Matrix normal cluster-weighted models', *Journal of Classification* **38**(3), 556–575.

[21] Vrkljan, B., Beauchamp, M.K., Gardner, P., Fang, Q., Kuspinar, A., McNicholas, P.D., Newbold, K.B., Richardson, J., Scott, D., Zargoush, M. and Gruppuso, V. (2021),'Re-engaging in aging and mobility research in the COVID-19 era: Early lessons from pivoting a large-scale, interdisciplinary study amidst a pandemic', *Canadian Journal on Aging* **40**(4), 669-675.

[22] **Tang, Y.**, Qazi, M.A., Brown, K.R., Mikolajewicz, N., Moffat, J., Singh, S.K. and McNicholas, P.D. (2021), 'Identification of five important genes to predict glioblastoma subtypes', *Neuro-Oncology Advances* **3**(1), vdab144.

[23] McNicholas, S.M., McNicholas, P.D. and Ashlock, D.A. (2021), 'An evolutionary algorithm with crossover and mutation for model-based clustering', *Journal of Classification* **38**(2), 264–279.

[24] **Roick, T.**, Karlis, D. and McNicholas, P.D. (2021), 'Clustering discrete valued time series', *Advances in Data Analysis and Classification* **15**(1), 209–229.

[25] **Tortora, C.**, **Browne, R.P.**, **ElSherbiny, A.**, **Franczak, B.C.** and McNicholas, P.D. (2021), 'Model-based clustering, classification, and discriminant analysis using the generalized hyperbolic distribution: MixGHD R package', *Journal of Statistical Software* **98**:3.

[26] **Subedi, S.** and McNicholas, P.D. (2021), 'A variational approximations-DIC rubric for parameter estimation and mixture model selection within a family setting', *Journal of Classification* **38**(1), 89–108.

[27] Mayhew, A.J., Phillips, S.M., Sohel, N., Thabane, L., McNicholas, P.D., de Souza, R.J., Parise, G. and Raina, P. (2021), 'Methodological issues and the impact of age stratification on the proportion of participants with low appendicular lean mass when adjusting for height and fat mass using linear regression: Results from the Canadian Longitudinal Study on Aging', *The Journal of Frailty and Aging* **10**, 150–155.

[28] Mayhew, A.J., Phillips, S.M., Sohel, N., Thabane, L., McNicholas, P.D., de Souza, R.J., Parise, G. and Raina, P. (2021), 'Do different ascertainment techniques identify the same individuals as sarcopenic in the Canadian Longitudinal Study on Aging?', *Journal of the American Geriatrics Society* **69**(1), 164–172.

[29] Mayhew, A.J., Phillips, S.M., Sohel, N., Thabane, L., McNicholas, P.D., de Souza, R.J., Parise, G. and Raina, P. (2020), 'The impact of different diagnostic criteria on the association of sarcopenia with injurious falls in the CLSA', *Journal of Cachexia, Sarcopenia and Muscle* **11**(6), 1603–1613.

[30] **Paton, F.** and McNicholas, P.D. (2020), 'Detecting British Columbia coastal rainfall patterns by clustering Gaussian processes', *Environmetrics* **31**(8), e2631.

[31] **Murray, P.M.**, **Browne, R.P.** and McNicholas, P.D. (2020), 'Mixtures of hidden truncation hyperbolic factor analyzers', *Journal of Classification* **37**(2), 366–379.

[32] **Gallaugher, M.P.B.** and McNicholas, P.D. (2020), 'Mixtures of skewed matrix variate bilinear factor analyzers', *Advances in Data Analysis and Classification* **14**(2), 415–434.

[33] **Počuča, N.**, Jevtic, P., McNicholas, P.D. and Miljkovic, T. (2020), 'Modeling frequency and severity of claims with the zero-inflated generalized cluster-weighted models', *Insurance: Mathematics and Economics* **94**, 79–93.

[34] **Wei, Y.**, **Tang, Y.** and McNicholas, P.D. (2020), 'Flexible high-dimensional unsupervised learning with missing data', *IEEE Transactions on Pattern Analysis and Machine Intelligence* **42**(3), 610–621.

[35] **Tortora, C.**, McNicholas, P.D. and Palumbo, F. (2020), 'A probabilistic distance clustering algorithm using Gaussian and Student-t multivariate density distributions', *SN Computer Science* **1**(2):65.

[36] Punzo, A., **Blostein, M.** and McNicholas, P.D. (2020), 'High-dimensional unsupervised classification via a contaminated mixture', *Pattern Recognition* **98**:107031.

[37] **Gallaugher, M.P.B.** and McNicholas, P.D. (2019), 'On fractionally-supervised classification: Weight selection and extension to the multivariate *t*-distribution', *Journal of Classification* **36**(2), 232–265.

[38] Turco, C.V., **Pesevski, A.**, McNicholas, P.D., Beaulieu, L.-D. and Nelson, A.J. (2019), 'Reliability of transcranial magnetic stimulation measures of afferent inhibition', *Brain Research* **1723**:146394.

[39] Silva, A., Rothstein, S.J., McNicholas, P.D., and **Subedi, S.** (2019), 'A multivariate Poisson-log normal mixture model for clustering transcriptome sequencing data', *BMC Bioinformatics* **20**:394.

[40] **Tortora, C.**, **Franczak, B.C.**, **Browne, R.P.**, McNicholas, P.D. (2019), 'A mixture of coalesced generalized hyperbolic distributions', *Journal of Classification* **36**(1), 26–57.

[41] **Murray, P.M.**, **Browne, R.P.** and McNicholas, P.D. (2019), Note of Clarification on 'Hidden truncation hyperbolic distributions, finite mixtures thereof, and their application for clustering, by Murray, Browne, and McNicholas, J. Multivariate Analysis 161 (2017) 141-156.', *Journal of Multivariate Analysis* **171**, 475-476.

[42] **Morris, K.**, Punzo, A., McNicholas, P.D. and **Browne, R.P.** (2019), 'Asymmetric clusters and outliers: Contaminated non-elliptical mixtures', *Computational Statistics and Data Analysis* **132**, 145–166.

[43] Mayhew, A.J., Amog, K., Phillips, S., Parise, G., McNicholas, P.D., de Souza, R.J., Thabane, L. and Raina, P. (2019), 'The prevalence of sarcopenia in community dwelling older adults, an exploration of differences between studies and within definitions: A systematic review and meta-analyses', *Age and Aging* **48**(1), 48–56.

[44] **Gallaugher, M.P.B.** and McNicholas, P.D. (2019), 'Three skewed matrix variate distributions', *Statistics and Probability Letters* **145**, 103–109.

[45] **Wei, Y.**, **Tang, Y.** and McNicholas, P.D. (2019), 'Mixtures of generalized hyperbolic distributions and mixtures of skew-t distributions for model-based clustering with incomplete data', *Computational Statistics and Data Analysis* **130**, 18–41.

[46] **Pesevski, A.**, **Franczak, B.C.** and McNicholas, P.D. (2018), 'Subspace clustering with the multivariate-t distribution', *Pattern Recognition Letters* **112**(1), 297–302.

[47] **Shaikh, M.R.**, Antonie, M.L., Murphy, T.B., and McNicholas, P.D. (2018), 'Standardizing interestingness measures for association rules', *Statistical Analysis and Data Mining* **11**(6), 282–295.

[48] Jones, A., Costa, A.P., **Pesevski, A.** and McNicholas, P.D. (2018), 'Predicting hospital and emergency department utilization among community-dwelling older adults: statistical and machine learning approaches', *PLOS ONE* **13**(11): e0206662.

[49] Morton, R.W., Sato, K., **Gallaugher, M.P.B.**, Oikawa, S.Y., McNicholas, P.D., Fujita, S. and Phillips, S.M. (2018), 'Muscle androgen receptor content but not systemic hormones is associated with resistance training-induced skeletal muscle hypertrophy in healthy, young men', *Frontiers in Physiology* **9**, 1373.

[50] Punzo, A., Mazza, A., and McNicholas, P.D. (2018), 'ContaminatedMixt: An R package for fitting parsimonious mixtures of multivariate contaminated normal distributions', *Journal of Statistical Software* **85**:10.

[51] **Gallaugher, M.P.B.** and McNicholas, P.D. (2018), 'Finite mixtures of skewed matrix variate distributions', *Pattern Recognition* **80**, 83–93.

[52] **Tang, Y.**, **Browne, R.P.** and McNicholas, P.D. (2018), 'Flexible clustering of high-dimensional data via mixtures of joint generalized hyperbolic distributions', *Stat* **7**(1), e177.

[53] **Andrews, J.L.**, Wickins, J.R., Boers, N.M. and McNicholas, P.D. (2018), 'teigen: An R package for model-based clustering and classification via the multivariate t distribution', *Journal of Statistical Software* **83**:7.

[54] Skinnider, M.A., Dejong, C.A., **Franczak, B.C.**, McNicholas, P.D. and Magarvey, N.A. (2017), 'Comparative analysis of chemical similarity methods for modular natural products with a hypothetical structure enumeration algorithm', *Journal of Cheminformatics* **9**:46.

[55] **Murray, P.M.**, **Browne, R.P.** and McNicholas, P.D. (2017), 'Hidden truncation hyperbolic distributions, finite mixtures thereof, and their application for clustering', *Journal of Multivariate Analysis* **161**, 141–156.

[56] Punzo, A. and McNicholas, P.D. (2017), 'Robust clustering in regression analysis via the contaminated Gaussian cluster-weighted model', *Journal of Classification* **34**(2), 249–293.

[57] **Murray, P.M.**, **Browne, R.P.** and McNicholas, P.D. (2017), 'A mixture of SDB skew-t factor analyzers', *Econometrics and Statistics* **3**, 160–168.

[58] **Gallaugher, M.P.B.** and McNicholas, P.D. (2017), 'A matrix variate skew-t distribution', *Stat* **6**(1), 160–170.

[59] **Wong, M.H.T.**, Mutch, D.M., and McNicholas, P.D. (2017), 'Two-way learning with one-way supervision for gene expression data', *BMC Bioinformatics* **18**:150.

[60] **Cheam, A.S.M.**, **Marbac, M.**, and McNicholas, P.D. (2017), 'Model-based clustering for spatio-temporal data on air quality monitoring', *Environmetrics* **28**(3), e2437.

[61] **Dang, U.J.**, Punzo, A., McNicholas, P.D., Ingrassia, S. and **Browne, R.P.** (2017), 'Multivariate response and parsimony for Gaussian cluster-weighted models', *Journal of Classification* **34**(1), 4–34.

[62] **Marbac, M.** and McNicholas, P.D. (2016), 'Dimension reduction in clustering', *Wiley StatsRef: Statistics Reference Online.*

[63] **Franczak, B.C.**, **Castura, J.C.**, **Browne, R.P.**, Findlay, C.J. and McNicholas, P.D. (2016), 'Handling missing data in consumer hedonic tests arising from direct scaling: Imputation techniques for consumer hedonic tests', *Journal of Sensory Studies* **31**(6), 514–523.

[64] **Tortora, C.**, McNicholas, P.D. and **Browne, R.P.** (2016), 'A mixture of generalized hyperbolic factor analyzers', *Advances in Data Analysis and Classification* **10**(4), 423–440.

[65] Punzo, A. and McNicholas, P.D. (2016), 'Parsimonious mixtures of multivariate contaminated normal distributions', *Biometrical Journal* **58**(6), 1506–1537.

[66] McNicholas, P.D. (2016), 'Model-based clustering', *Journal of Classification* **33**(3), 331–373.

[67] Punzo, A., **Browne, R.P.** and McNicholas, P.D. (2016), 'Hypothesis testing for mixture model selection', *Journal of Statistical Computation and Simulation* **86**(14), 2797–2818.

[68] Azzalini, A., **Browne, R.P.**, Genton, M.G. and McNicholas, P.D. (2016), 'On nomenclature for, and the relative merits of, two formulations of skew distributions', *Statistics and Probability Letters* **110**, 201–206.

[69] **Morris, K.** and McNicholas, P.D. (2016), 'Clustering, classification, discriminant analysis, and dimension reduction via generalized hyperbolic mixtures', *Computational Statistics and Data Analysis* **97**, 133–150.

[70] **Cheam, A.S.M.** and McNicholas, P.D. (2016), 'Modelling receiver operating characteristic curves using Gaussian mixtures', *Computational Statistics and Data Analysis* **93**, 192–206.

[71] O'Hagan, A., Murphy, T.B., Gormley, I.C., McNicholas, P.D., and Karlis, D. (2016), 'Clustering with the multivariate normal inverse Gaussian distribution', *Computational Statistics and Data Analysis* **93**, 18–30.

[72] **Dang, U.J.**, **Browne, R.P.** and McNicholas, P.D. (2015), 'Mixtures of multivariate power exponential distributions', *Biometrics* **71**(4), 1081–1089.

[73] **Vrbik, I.** and McNicholas, P.D. (2015), 'Fractionally-supervised classification', *Journal of Classification* **32**(3), 359–381.

[74] **Subedi, S.**, Punzo, A., Ingrassia, S. and McNicholas, P.D. (2015), 'Cluster-weighted t-factor analyzers for robust model-based clustering and dimension reduction', *Statistical Methods and Applications* (Journal of the Italian Statistical Society) **24**(4), 623–649.

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[80] **Tang, Y.**, **Browne, R.P.** and McNicholas, P.D. (2015), 'Model-based clustering of high-dimensional binary data', *Computational Statistics and Data Analysis* **87**, 84–101.

[81] Coneva, V., **Simopoulos, C.**, Casaretto, J.A., El-kereamy, A., Guevara, D.R., Cohn, J., Zhu, T., Guo, L., Alexander, D.C., Bi, Y.-M., McNicholas, P.D. and Rothstein, S.J. (2014), 'Metabolic and co-expression network-based analyses associated with nitrate response in rice', *BMC Genomics* **15**:1056.

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[105] **Virbik, I.** and McNicholas, P.D. (2012), 'Analytic calculations for the EM algorithm for multivariate skew-t mixture models', *Statistics and Probability Letters* **82**(6), 1169–1174.

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Discussions of Peer-Reviewed Articles

[127] McNicholas, P.D., McNicholas, S.M. and **Tait, P.A.** (2018), Discussion of 'Statistical challenges of administrative and transaction data' by Hand, *Journal of the Royal Statistical Society: Series A* **181**(3), 594–595.

[128] **Gallaugher, M.P.B.** and McNicholas, P.D. (2017), Discussion of 'Random-projection ensemble classification' by Cannings and Samworth, *Journal of the Royal Statistical Society: Series B* **79**(4), 1011–1012

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Peer-Reviewed Proceedings and Book Chapters

[133] **Gallaugher, M.P.B.** and McNicholas, P.D. (2020), 'Parsimonious mixtures of matrix variate bilinear factor analyzers' in T. Imaizumi et al. (eds.), *Advanced Studies in Behaviormetrics and Data Science: Essays in Honor of Akinori Okada*, Springer: Singapore, pp. 177–196.

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Non-Peer-Reviewed Article (Opinion)

[140] McNicholas P.D. (2016). 'Turning the spit: A perspective on the NSERC Discovery Grant review process'. *Liaison* **30**(4), 45–55.

Non-Peer-Reviewed Proceeding

[141] **Gallaugher, M.P.B.** and McNicholas, P.D. (2018), 'Mixtures of matrix variate bilinear factor analyzers' in *Proceedings of the Joint Statistical Meetings*, American Statistical Association, Alexandria, VA.

Editorials

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[143] McNicholas, P.D. (2024), 'Editorial: Journal of Classification Vol. 41-1', *Journal of Classification* **41**(1), 1.

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[155] McNicholas, P.D. (2019), 'Data science', *FACETS* **4**(1), 131–135.

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R and Julia Software Packages

Note: R and Julia are free software environments for statistical computing and graphics. All R packages are on CRAN.

[160] **Počuča, N.**, **Browne, R.P.**, and McNicholas, P.D. (2024). mixture: Mixture models for clustering and classification. R package version 2.1.1.

[161] McNicholas, P.D., **Jampani, K.R.**, **Subedi, S.** (2023). longclust: Clustering longitudinal data. R package version 1.5.

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[163] **Andrews, J.L.**, **Neal, M.R.**, and McNicholas, P.D. (2023). vscc: Variable selection for clustering and classification. R package version 0.6.

[164] **Clark, K.M.** and McNicholas, P.D. (2022). oclust: Gaussian model-based clustering with outliers. R package version 0.2.0.

[165] **Athey, T.B.T.**, McNicholas, P.D. and Phillips, J (2022). VLF: Frequency matrix approach for assessing very low frequency variants in sequence records. R package version 1.1.

[166] **Tortora, C.**, Vidales, N., Palumbo, F., Kalra, T. and McNicholas, P.D. (2022). FPDclustering: PD-clustering and factor PD-clustering. R package version 1.4.1.

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[168] **Tortora, C.**, **ElSherbiny A.**, **Browne, R.P.**, **Franczak, B.C.**, McNicholas, P.D. and Amos, D.D. (2022). MixGHD: Model based clustering, classification and discriminant analysis using the mixture of generalized hyperbolic distributions. R package version 2.3.7.

[169] **Browne, R.P.**, **Dang, U.J.**, **Gallaugher, M.P.B.** and McNicholas, P.D. (2021). mixSPE: Mixtures of power exponential and skew power exponential distributions for use in model-based clustering and classification. R package version 0.9.1.

[170] **Počuča, N.**, **Gallaugher, M.P.B.** and McNicholas, P.D. (2019). MatrixVariate.jl: A complete statistical framework for analyzing matrix variate data. Julia package version 0.2.0. URL: `github.com/nikpocuca`

[171] **Gallaugher, M.P.B.** and McNicholas, P.D. (2019). ClickClustCont: Mixtures of continuous time Markov models. R package version 0.1.7.

[172] **Andrews, J.L.**, Wickins, J.R., Boers, N.M. and McNicholas, P.D. (2018). teigen: Model-based clustering and classification with the multivariate t-distribution. R package version 2.2.2.

[173] **Franczak, B.C.**, **Browne, R.P.** and McNicholas, P.D. (2016). sensory: Simultaneous model-based clustering and imputation via a progressive expectation-maximization algorithm. R package version 1.1.

Research Support Held as Principal Investigator

Agency, Program	Total	Year(s)
Killam Fund/National Research Council, Dorothy Killam Fellowship	$160,000	2023–25
NSERC, Discovery Grant	$230,000	2023–28
Canada Research Chair, Tier 1 (renewal)	$1,400,000	2022–29
NSERC, Discovery Grant	$215,000	2017–23
Canada Research Chair, Tier 1	$1,400,000	2015–22
MITACS, Accelerate	$60,000	2020–21
NSERC, E.W.R. Steacie Memorial Fellowship	$250,000	2019–21
NSERC, Engage	$25,000	2018–19
NSERC, Discovery Grant	$125,000	2012–17
Ontario Research Fund, Small Infrastructure	$149,999	2016

NSERC, Collaborative Research & Development Grant	$400,000	2012–16
Industry support (Grant-In-Aid)	$200,000	2012–16
Canada Foundation for Innovation, John R. Evans Leaders Fund	$149,999	2015
Ontario Ministry for Research & Innovation, Early Researcher Award	$150,000	2011–14
University of Guelph, University Research Chair in Comp. Statistics	$440,000	2011–14
NSERC, Discovery Grant	$13,000	2011–12
NSERC, Collaborative Research & Development	$220,000	2009–12
Industry support (Grant-In-Aid)	$150,000	2009–12
NSERC, Research Tools & Instruments	$36,500	2011
Ontario Centres of Excellence, Collaborative Research	$100,000	2009–11
NSERC, Discovery Grant	$36,000	2008–11
NSERC, Engage	$25,000	2010
Canada Foundation for Innovation, Leaders Opportunity Fund	$118,362	2009
Ontario Ministry for Research & Innovation, Small Infrastructure Fund	$118,362	2009
MITACS, Accelerate	$15,000	2009

Research Support Held as Co-Investigator or Co-PI

Agency, Program	Total	Year(s)
Weston Family Foundation, Grant	$12,240,322	2021–28
CIHR, Project Grant	$1,225,000	2022–27
CIHR, Project Grant	$300,000	2023–26
SSHRC, Partnership Grant	$2,499,863	2020–26
Labarge Centre for Mobility in Aging, McMaster University	$5,000,000	2019–24
MIRA, McMaster University	$1,000,000	2019–24
AGE-WELL Core Research Program, Grant	$600,000	2020–23
Strategic Alignment Fund, McMaster University	$501,357	2019–22
AGE-WELL Core Research Program, Catalyst Grant	$30,000	2020

Invited Presentations at Conferences and Meetings

Note: Named and Special Lectures listed on page 2 are not repeated here.

i. *Selected Themes from Articles Published in the Journal of Classification in 2023*, The Classification Society Annual Meeting, Kelowna, BC, 06/2024.

ii. *Variable Selection for Skewed Clustering and Classification*, Statistical Society of Canada Annual Meeting, St. John's, NL, 06/2024.

iii. *Clustering Three-Way Data with Outliers*, Classification and Data Analysis Group of the Italian Statistical Society, Salerno, Italy, 09/2023.

iv. *Clustering Multivariate Longitudinal Data Using Matrix-Variate Mixtures*, Joint Statistical Meetings, Toronto, ON, 08/2023.

v. *Some Current Challenges In Clustering*, Statistical Society of Canada Annual Meeting, Ottawa, ON, 05/2023.

vi. *Clustering Multivariate Longitudinal Data Using Matrix-Variate Mixture Models*, ERCIM Working Group on Computing & Statistics, London, England, 12/2022 (virtual).

vii. *Using Subset Log-Likelihoods to Trim Outliers in Gaussian Mixture Models*, Classification and Data Analysis Group of the Italian Statistical Society, Firenze, Italy, 09/2021 (virtual).

viii. *Flexible Clustering of High-Dimensional Data via Mixtures of Joint Generalized Hyperbolic Distributions*, Joint Statistical Meetings, Seattle, WA, 09/2021 (virtual).

ix. *Outlier Detection in Model-Based Clustering*, Statistics 2021, Ottawa, 07/2021 (virtual).

x. *Thoughts on Some Problems in Clustering*, Isobel Loutit Lecture (2020), Statistical Society of Canada Annual Meeting, Ottawa, 06/2021 (virtual).

xi. *Selected Problems in Classification*, Data Science Applied Research and Education Seminar, CANSSI Ontario, Toronto, 02/2021 (virtual).

xii. *Data Science, Classification and Three-Way Data*, Colloque des sciences mathématiques du Québec, CRM, Montreal, 10/2020 (virtual).

xiii. *Mixtures of Skewed Matrix Variate Bilinear Factor Analyzers*, MBC2: An International Workshop on Model-Based Clustering and Classification, Catania, Italy, 09/2020 (virtual).

xiv. *Using Subset Log-Likelihoods to Predict the Number of Outliers in Gaussian Mixture Models*, AMS Fall Eastern Sectional Meeting, Binghamton, NY, 10/2019.

xv. *Contributions to Model Selection and Cluster Analysis*, Special Session in Honour of Prof. Stan Sclove, The Classification Society Annual Meeting, Edmonton, AB, 06/2019.

xvi. *Mixtures of Matrix Variate Bilinear Factor Analyzers*, MBC2: An International Workshop on Model-Based Clustering and Classification, Catania, Italy, 09/2018.

xvii. *Clustering Longitudinal Data Using Mixture Models*, Joint Statistical Meetings, Vancouver, BC, 08/2018.

xviii. *Mixtures of Skewed Matrix Variate Distributions*, University of Washington Working Group on Model-Based Clustering, Ann Arbor, MI, 07/2018.

xix. *Selected Problems in Classification* (President's Address), The Classification Society Annual Meeting, Long Island, NY, 06/2018.

xx. *Securing Funding as a New Investigator* (part of a panel discussion), Statistical Society of Canada Annual Meeting, Montreal, QC, 06/2018.

xxi. *Clustering Longitudinal Data*, ENAR Spring Meeting, Atlanta, GA, 03/2018.

xxii. *On Clustering Longitudinal Data*, International Federation of Classification Societies Meeting, Tokyo, Japan, 08/2017.

xxiii. *Model-Based Clustering of Big Data*, Joint Statistical Meetings, Baltimore, MD, 07/2017 (topic contributed).

xxiv. *Some Experiences From an Industry Collaboration*, Statistical Society of Canada Annual Meeting, Winnipeg, MB, 06/2017.

xxv. *Mixtures of Coalesced Generalized Hyperbolic Distributions*, International Conference on Statistical Distributions and Applications, Niagara Falls, ON, 10/2016.

xxvi. *A Cluster, Clustering and Mixture Models*, The Classification Society Annual Meeting, Columbia, MO, 06/2016.

xxvii. *Clustering Ultra High-Dimensional Data*, Statistical Society of Canada Annual Meeting, St. Catharines, ON, 05/2016.

xxviii. *Implicit Versus Explicit Variable Selection*, ERCIM Working Group on Computing & Statistics, London, England, 12/2015.

xxix. *Averaging and Asymmetry in Cluster Analysis*, International Federation of Classification Societies Meeting, Bologna, Italy, 07/2015.

xxx. *Outlier Detection via Contaminated Mixture Distributions*, Classification and Data Analysis Group of the Italian Statistical Society, Modena, Italy, 09/2013.

xxxi. *Classification via Mixtures of SAL and Generalized Hyperbolic Distributions*, International Federation of Classification Societies Meeting, Tilburg, The Netherlands, 07/2013.

xxxii. *Recent Work on Non-Gaussian Methods*, MBC^2: Workshop on Model Based Clustering and Classification, Catania, Sicily, Italy, 09/2012. Keynote speaker.

xxxiii. *Mixtures of Generalized Hyperbolic Distributions*, University of Washington Working Group on Model-Based Clustering, ON, Canada, 07/2012.

xxxiv. *Clustering and Classification of High-dimensional Data via Modified t-factor Analyzers*, ERCIM, London, England, 12/2011.

xxxv. *Model-based Clustering and Classification via Mixtures of Multivariate t-Distributions*, Classification and Data Analysis Group of the Italian Statistical Society, Pavia, Italy, 09/2011.

xxxvi. *Model-Based Clustering: An Overview*, Sensometrics 10, Rotterdam, The Netherlands, 07/2010.

xxxvii. *Model-Based Clustering via Mixtures of Multivariate t-Distributions*, University of Washington Working Group on Model-Based Clustering, INRIA, Grenoble, France, 07/2010.

xxxviii. *Model-Based Clustering of Longitudinal Data*, University of Washington Working Group on Model-Based Clustering, Seattle, WA, 07/2008.

xxxix. *Parsimonious Gaussian Mixture Models*, Royal Statistical Society Conference, Belfast, Northern Ireland, 09/2006.

Selected Seminars

i. *Handling Outliers in Model-Based Clustering*, Trinity College Dublin, Ireland, 03/2024.

ii. *Model-Based Clustering of Three-Way Data*, UBC–Okanagan, BC, 03/2023.

iii. *Clustering Higher-Order Data*, Miami University, OH, 03/2022 (virtual).

iv. *Selected Problems in Classification*, Lakehead University, ON, 12/2021 (virtual).

v. *Using Subset Log-Likelihoods to Trim Outliers in Gaussian Mixture Models*, Wirtschaftsuniversität Wien, Vienna University of Economics and Business, Austria, 10/2021 (virtual).

vi. *Clustering Higher-Order Data*, Trinity College Dublin, Ireland, 10/2019.

vii. *Clustering Higher-Order Data*, Binghamton University, NY, 10/2019.

viii. *Data Science, Classification and Three-Way Data*, University of Windsor, ON, 04/2019.

ix. *Model-Based Clustering of Matrix Variate and Tensor Variate Data*, University of Alberta, AB, 03/2019.

x. *Data Science, Classification and Clustering*, MacEwan University, AB, 03/2019.

xi. *Clustering, Classification and Data Science*, University College Dublin, Ireland, 10/2018.

xii. *Clustering, Classification and Data Science*, Queens University Belfast, UK, 10/2018.

xiii. *Experiences From an Industry Collaboration*, University of Toronto, ON, 09/2018.

xiv. *Clustering Three-Way Data Using Mixture Models*, University of Rochester, NY, 03/2018.

xv. *Cluster-Weighted Models and Machine Learning for Insurance Data*, Arizona Actuarial Club, AZ, 10/2017.

xvi. *Clustering via Mixture Models*, Arizona State University, AZ, 10/2017.

xvii. *Clustering via Mixture Models*, Dalhousie University, NS, 10/2017.

xviii. *Clustering via Mixture Models*, Wharton School, University of Pennsylvania, PA, 04/2017.

xix. *Clustering and Discriminant Analysis via Mixture Models*, Acadia University, NS, 03/2016.

xx. *Model-Based Clustering: Past, Present and Future*, Simon Fraser University, BC, 03/2016.

xxi. *Averaging and Asymmetry in Cluster Analysis*, University of Manitoba, MB, 09/2015.

xxii. *Contaminated Mixtures and Fractionally-Supervised Classification*, Wilfrid Laurier University, ON, 10/2013.

xxiii. *Non-Gaussian Model-Based Clustering & Classification*, University of Toronto, ON, 11/2011.

xxiv. *Non-Gaussian Model-Based Clustering & Classification*, University of Waterloo, ON, 10/2011.

xxv. *Model-Based Clustering, Classification and Discriminant Analysis via Mixtures of Multivariate t-Distributions*, University of Ottawa (joint with Carleton University), ON, 11/2010.

xxvi. *Recent Work in Model-Based Clustering & Classification*, University of Windsor, ON, 03/2010.

xxvii. *Recent Work in Model-Based Clustering & Classification*, University of Waterloo, ON, 01/2010.

xxviii. *Recent Work in Model-Based Clustering & Classification*, University of Toronto, ON, 12/2009.

xxix. *On Clustering Gene Expression Time Course Data*, University of Western Ontario, ON, 10/2009.

xxx. *Clustering & Data Mining*, Université de Montréal, QC, 01/2009.

xxxi. *Model-Based Clustering: An Overview*, McGill University, Montreal, QC, 10/2008.

xxxii. *Model-Based Clustering of Longitudinal Data*, Colloque de statistique de Montréal, McGill University, 10/2008.

xxxiii. *Analysis of Gene Expression Time Course Data via Model-Based Clustering*, York University, ON, 10/2008.

xxxiv. *Model-Based Clustering: An Overview*, National University of Ireland, Galway, 04/2008.

xxxv. *Standardizing the Lift of an Association Rule*, University College Dublin, Ireland, 11/2007.

xxxvi. *Model-Based Clustering: An Overview*, McMaster University, ON, 10/2007.

Workshops and Schools Delivered/Led

- Instructor and Co-organizer, Winter School in Data Science and Optimization, Fields Institute, Toronto, 11/2019.

- Instructor and Co-organizer, Summer School in Data Science, McMaster University, Hamilton, 05/2019.

- Faculty Mentor, Industrial Problem Solving Workshop, Fields Institute, Toronto, 08/2016.

- Academic Lead, Big Data Industrial Problem Solving Workshop, Fields Institute, Toronto, 05/2015.

- Instructor, *Imputation of Data for Preference Segmentation in Incomplete Designs*, Sensometrics 2014, Chicago, 07/2014.

- Instructor, *R for Bioinformaticians*, IEEE Computational Intelligence in Bioinformatics and Computational Biology (CIBCB), Montreal, 05/2010.

- Faculty Mentor, *Automatic Classification & Data Reduction for Food Authenticity Problems*, PIMS/MITACS Graduate Industrial Mathematical Modelling Camp, Calgary, 05/2009.

- Faculty Mentor, *Detecting Important Animal Health Events*, PIMS/MITACS Graduate Industrial Problem Solving Workshop, Calgary, 05/2009.

Training: Quality and Impact

- Former Ph.D. and postdoctoral trainees currently continuing pertinent work as faculty:
    - Jeffrey Andrews (Ph.D., 2012), Associate Professor, University of British Columbia–Okanagan, BC.
    - Ryan Browne (PDF, 2011), Associate Professor, University of Waterloo, ON.
    - Katharine Clark (Ph.D., 2024), Assistant Professor, Trent University, ON.
    - Utkarsh Dang (Ph.D., 2014), Assistant Professor, Carleton University, ON.
    - Brian Franczak (Ph.D., 2014), Associate Professor, MacEwan University, AB.
    - Michael Gallaugher (Ph.D., 2020), Assistant Professor, Baylor University, TX.
    - Matthieu Marbac (PDF, 2016), Associate Professor, École nationale de la statistique et de l'analyse de l'information (Campus de Ker Lann), France.
    - Orla Murphy (PDF, 2021), Assistant Professor, Dalhousie University, NS.
    - Nkumbuludzi Ndwapi (Ph.D., 2017), Lecturer, Botswana International University of Science and Technology.
    - Mateen Shaikh (Ph.D., 2013), Assistant Professor, Thompson Rivers University, BC.
    - Sanjeena Subedi (Ph.D., 2012), Assistant Professor and Canada Research Chair, Carleton University, ON.
    - Cristina Tortora (PDF, 2016), Associate Professor, San Jose State University, CA.
    - Irene Vrbik (Ph.D., 2014), Assistant Professor, University of British Columbia–Okanagan, BC.

- Ph.D. students who won the Distinguished Dissertation Award from The Classification Society:
    - Jeffrey Andrews (Ph.D., 2012), winner 2013.
    - Michael Gallaugher (Ph.D., 2020), winner 2021.
    - Paula Murray (Ph.D., 2016), winner 2017.
    - Yang Tang (Ph.D., 2017), winner 2018.
    - Irene Vrbik (Ph.D., 2014), winner 2015.

- Former Ph.D. trainee who later won the Helga and Wolfgang Gaul Stiftung Award (for excellent researchers ≤ 30 years old), given biennially by the International Federation of Classification Societies:
    - Michael Gallaugher (Ph.D., 2020), winner 2021.

- Former Ph.D. and postdoctoral trainees who later won the prestigious Chikio Hayashi Award (for excellent researchers ≤ 35 years old), given biennially by the International Federation of Classification Societies:
    - Jeffrey Andrews (Ph.D., 2012), winner 2017.
    - Ryan Browne (PDF, 2011), winner 2015.
    - Brian Franczak (Ph.D., 2014), winner 2019.
    - Sanjeena Subedi (Ph.D., 2012), winner 2019.
    - Cristina Tortora (PDF, 2016), winner 2019.

- Summary of trainees.

	Current		Previous	
	Supervised	**Co-Supervised**	**Supervised**	**Co-Supervised**
Postdoctroal	1	0	15	0
Doctoral	7	2	17	6
Master's	1	0	39	20
Undergraduate	2	0	31	4
Total	11	2	102	30

Selected External Service and Leadership

- Editorial Activities:
    - Editor-in-Chief, *Journal of Classification*, 2020–Present.
    - Associate Editor, *The Canadian Journal of Statistics*, 2013–2016 and 2022–2024.
    - Associate Editor, *Journal of Multivariate Analysis*, 2019–2020.
    - Data Science Section Editor, *FACETS*, 2018–2020.
    - Associate Editor, *Journal of Classification*, 2018–2020.
    - Associate Editor, *Advances in Data Analysis and Classification*, 2014–2020.
    - Associate Editor, *Environmetrics*, 2014–2019.

- Guest Editor, *Computational Statistics and Data Analysis* Fourth Special Issue on "Advances in Mixture Models", 2017–2018.
- Guest Editor, *Advances in Data Analysis and Classification*, Special Issue on the "Science of Big Data: Theory, Methods and Applications", 2014–2018.
- Associate Editor, *Econometrics and Statistics*, 2015–2018.
- Associate Editor, *Computational Statistics and Data Analysis*, 2013–2018.
- Guest Editor, *Econometrics and Statistics* Special Issue on "Advances in Mixture Models", 2015–2017.
- Associate Editor, *Statistical Methods and Applications* (Journal of the Italian Statistical Society), 2013–2017.
- Statistical Advisor, BMC-Series Editorial Board, 2013–2016.
- Guest Editor, *Computational Statistics and Data Analysis* Third Special Issue on "Advances in Mixture Models", 2013–2015.
- Associate Editor, *Journal of the Royal Statistical Society: Series C*, 2012–2015.
- Guest Editor, *Computational Statistics and Data Analysis* Second Special Issue on "Advances in Mixture Models", 2011–2013.

- Canadian Statistical Sciences Institute:
  - Chair, Data Science Committee, 2018–2019.
  - Associate Director, 2018–2019.
  - Member, Industrial Innovation Committee, 2015–2017.

- Statistical Society of Canada:
  - Research Committee: Chair, 2017–2019. Member, 2016–2017.
  - President-Elect/President/Past-President, Business and Industrial Statistics Section, 2013–2016.
  - Local Representative, University of Guelph, 2012–2014.
  - Member, *The Canadian Journal of Statistics* Awards Committee, 2011–2014.
  - Member, Canadian Statistical Institute Development Committee, 2011–2012.

- The Classification Society:
  - Member, Board of Directors, 2014–Present.
  - President, 2018–2019. President-Elect, 2016–2017. Past-President, 2020–2021.
  - Chair, Program Committee, Annual Meeting, Edmonton, Alberta, June 2019.
  - Chair, Program Committee, Annual Meeting, Long Island, New York, June 2018.
  - Member, Program Committee, Annual Meeting, Columbia, Missouri, June 2016.
  - Chair, Organizing Committee (Program and Local Arrangements), Annual Meeting, Hamilton, Ontario, Canada, June 2015.
  - Member, Editor-In-Chief Search Committee, *Journal of Classification*, 2014.

- International Federation of Classification Societies (IFCS):
  - Member, Scientific Program Committee, IFCS 2019, Thessaloniki, Greece, August 2019.
  - Publication Officer (and Executive Committee Member), 2012–2018.
  - Member, Scientific Program Committee, IFCS 2017, Tokyo, Japan, August 2017.
  - Member, Scientific Program Committee, IFCS 2015, Bologna, Italy, July 2015.

- ICT, Math and Physics Panel, Ontario Early Researcher Awards:
  - Chair: 2017, 2018, 2020, 2021, 2023, 2024.
  - Member: 2014, 2015, 2016.

- College Selection Panel, Royal Society of Canada:
  - Chair: 2024.
  - Member: 2018, 2019.

- NSERC Evaluation Group 1508 (Mathematics and Statistics):
  - Statistics Section: Chair, 2014/15, 2015/16. Incoming Chair, 2013/14.
  - Executive Committee: Member, 2013/14–2015/16.

- International Proposal Reviewer:
  - 3IA-Chairs, France, 2023.
  - Athens University of Economics & Business, Greece, 2010.
  - Comisión Nacional de Investigación Científica y Tecnológica, Chile: 2017, 2018, 2019.
  - INRIA, France, 2023.
  - Marsden Fund, The Royal Society Te Apārangi, New Zealand, 2023.

- MITACS Elevate Review Committee Member, 2010 (two).
- National Research Foundation, South Africa, 2022.
- NSERC Discovery Grants proposal reviewer (many).
- Sapienza University of Rome: 2020, 2023.
- The Netherlands Organisation for Scientific Research: 2014, 2015.

- External University Tenure and Promotion Reviewing (years omitted to protect confidentiality):
  - Carleton University, ON.
  - Dalhousie University, NS.
  - Rutgers University, NJ (multiple).
  - South Dakota State University, SD.
  - Toronto Metropolitan University, ON.
  - University of Alabama, AL (multiple).
  - University of Auckland, New Zealand.
  - University of Kentucky, KY.
  - University of Manitoba, MB.
  - University of Massachusetts Amherst, MA.
  - University of Ottawa, ON.
  - University of Pittsburgh, PA.
  - University of Rochester, NY (multiple).
  - Wilfred Laurier University, ON.

- Habilitation External Examiner:
  - University of Lille, France, 2021.

- Ph.D. External Examiner:
  - Arizona State University, AZ, 2023.
  - Institut Polytechnique de Paris, France, 2023.
  - McGill University, QC: 2013, 2021.
  - McMaster University, ON, 2013.
  - Université de Sherbrooke, QC, 2023.
  - University of Milano-Bicocca, Italy, 2018.
  - University of Pavia, Italy, 2021.
  - University of Waterloo, ON, 2013, 2019.
  - University of Western Ontario, ON: 2010, 2020.

- Journal Review Work (c. 8–12 articles per year, in addition to editorial work): *Advances in Data Analysis and Classification*; *Bioinformatics*; *Biostatistics*; *Computational Statistics and Data Analysis*; *Data Mining and Knowledge Discovery*; *Food Quality and Preference*; *IEEE Signal Processing Letters*; *International Journal of Biostatistics*; *Journal of Applied Statistics*; *Journal of Classification*; *Journal of Computational and Graphical Statistics*; *Journal of Multivariate Analysis*; *Journal of the Royal Statistical Society: Series C*; *Journal of the American Statistical Association*; *Knowledge-Based Systems*; *Multivariate Behavioural Research*; *Nature Machine Intelligence*; *Pattern Recognition*; *Pattern Recognition Letters*; *PLOS ONE*; *Psychological Methods*; *Psychometrika*; *Statistical Methods in Medical Research*; *Statistics and Computing*; *Statistics and Probability Letters*; *The American Statistician*; *The Annals of Applied Statistics*; *The Annals of Statistics*; *The Canadian Journal of Statistics*.

- Other Activities:
  - Reviewer, Steacie Prize draft application, Universities Canada, 2023.
  - Reviewer, Canada Research Chairs program (multiple).
  - Member, Highly Qualified Personnel Provincial Advisory Committee, Compute Ontario, 2017–2018.
  - Poster Chair, Joint Statistical Meetings 2018 (Vancouver, Canada), 2017–2018.
  - Co-Chair, 7th International Conference of ERCIM Working Group on Computational and Methodological Statistics, Pisa, Italy, December 2014.
  - Member, Scientific Program Committee, MBC^2: Workshop on Model Based Clustering and Classification, Catania, Sicily, Italy, September 2014.

Internal (McMaster University) Service Contributions

Semesters	Role, Committee	Level
S22– S23	Chair, Awards Committee	Department
S22	External Reviewer, Institute for Infectious Disease Research	University
F21–S22	Member, Graduate Council	University
F21	Member, Internal Review Panel for CFI Innovation Fund Competition	University
S21–W22	Member, Data Science in Actuarial and Financial Math Search Committee	Department
S21– S23	Member, Graduate Committee	Faculty
S21– S23	Member, Graduate Committee	Department
S21–F21	Member, RHPCS Director Search Committee	University
F18–S19	Member, Ad Hoc Committee on Data Science	Department
F18–W19	Member, Probability and Statistics Search Committee	Department
F18	Member, Science Research Chairs Committee	Faculty
S17	Member, Canada 150 Research Chairs Committee for Science	Faculty
S17–S18	Member, Research Technology Committee	University
S17–S18	Member, Sherman Centre Advisory Committee	University
F16	Member, School of Graduate Studies Scholarship Committee (NSERC doctoral)	University
S16–S17	Member, Employment Equity Working Committee	University
F15–S16	Member, Senate Executive Committee	University
W16	Member, Internal Review Panel for CFI Innovation Fund Competition	University
W16	Member, Associate Dean Research Search Committee	Faculty
F15	Member, Valedictorian Selection Committee	University
S15–S16	Member, Committee on University Ceremonials and Insignia	University
S15–S16	Member, University Senate	University
S15–S18	Member, Awards Committee	Department
S14–S18	Member, Graduate Committee	Department

Internal (University of Guelph) Service Contributions

Semesters	Role, Committee	Level
F12–S14	Member, (Graduate) Admissions and Progress Committee	University
F12–S13	Member, Senate Board of Graduate Studies	University
W12–S14	Chair, Bioinformatics Program Committee & Graduate Coordinator	College
F10, F11, F12	Member, Graduate Awards Committee (NSERC)	University
F10, F11, F13	Member, Promotion and Tenure Committee	Department
F10–S13	Member, University Senate	University
S09–S11	Chair, Graduate Studies Committee & Graduate Coordinator	Department
W08–S10	Member, Appointments Committee	Department

Teaching Summary

- McMaster University (2014–Present):
  - CSE 799: Special Topics (multiple)
  - HTHSCI 4B06: Thesis
  - ISCI 3A12: Integrated Science III (thesis)
  - ISCI 4A12: Integrated Science IV (thesis)
  - MATH 4P06: Senior Research Project (multiple)
  - STATS 4I03/6I03: Inference
  - STATS 4M03/STATS 6M03: Multivariate Analysis (multiple)
  - STATS 4T06: Senior Thesis (multiple)
  - STATS 4W03: Directed Reading (multiple)
  - STATS 743A: Foundations of Statistics
  - STATS 780/CSE 780: Data Science
  - STATS 794: Directed Reading (multiple)

- University of Guelph (2007–2014):
  - BINF*6970: Statistical Bioinformatics (reading, multiple)
  - MATH*1000: Introduction to Calculus I
  - MATH*1000 DE: Introduction to Calculus I (distance, multiple)
  - STAT*2120: Probability & Statistics for Engineers (multiple)

- STAT*4050: Generalized Linear Models (reading, multiple)
- STAT*4340: Statistical Inference (multiple)
- STAT*4350/6821: Multivariate Statistical Analysis (reading, multiple)
- STAT*6821: Multivariate Statistical Analysis (reading, multiple)
- STAT*6841: Statistical Inference (multiple)
- STAT*6920: Applied Statistical Methods (reading)
- STAT*6920: Finite Mixture Models (reading, multiple)
- STAT*6920: Statistics in the 21st Century (reading)