Maxime Turgeon, Ph.D. ***Curriculum vitae***

CONTACT INFORMATION

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RESEARCH INTERESTS

High-dimensional data, dimension reduction techniques, multivariate analysis, manifold learning, statistical genetics, competing risk analysis, case-base sampling

EDUCATION

University McGill, Montréal, QC

Ph.D., Biostatistics, May 2019

- Topic: *Principal component of explained variance: High-dimensional estimation and inference*
- Advisors: Celia M.T. Greenwood, Ph.D and Aurélie Labbe, Ph.D

M.Sc., Mathematics, September 2013

- Topic: *A relative fundamental lemma for U(4)*
- Advisor: Jayce R. Getz, Ph.D

University of Ottawa, Ottawa, ON

B.Sc., Mathematics (Honours), April 2011

- *Summa Cum Laude*
- Topic: *Representation theory of* p*-adic algebraic groups*
- Advisor: Monica Nevins, Ph.D

EMPLOYMENT

Current appointment

Assistant Professor Jul 2019–

Department of Statistics,
Department of Computer Science,
University of Manitoba, Winnipeg MB

Previous appointments

Business Intelligence and HR Analytics, Lead Oct 2018–Jun 2019

AIMS Project,
Saskatchewan Health Authority, Saskatoon, SK

Senior Biostatistical & Study Design Strategies Specialist Sep 2016–Sep 2018

Strategic Health and Information Performance Support,
Saskatoon Health Region, Saskatoon, SK

REFEREED JOURNAL PUBLICATIONS

1. **Turgeon, M.**, Oualkacha, K., Ciampi, A., Miftah, H., Dehghan, G., Zanke, B.W., Benedet, A.L., Rosa-Neto, P., Greenwood, C.M.T., Labbe, A., for the Alzheimer's Disease Neuroimaging Initiative. "Principal component of explained variance: An efficient and optimal data dimension reduction framework for association studies". *Statistical Methods in Medical Research*, 27: 2018. doi:10.1177/0962280216660128

Name of trainees is underlined.

2. Wang, Y., Murphy, O., **Turgeon, M.**, Wang, Z.Y., Bhatnagar, S.R., Schulz, J., and Moodie, E.E.M. "The perils of quasi-likelihood information criteria", *Stat*, 4: 2015. doi:10.1002/sta4.95

3. Ahmad, O.S., Morris, J.A.,Mujammami, M., Forgetta, V., Leong, A., Li, R., **Turgeon, M.**, Greenwood, C.M.T., Thanassoulis, G., Meigs, J.B., Sladek, R., and Richards, J.B. "A Mendelian randomization study of the effect of type-2 diabetes on coronary heart disease" *Nature Communications*, 6: 2015. doi:10.1038/ncomms8060

Submitted Journal Publications

4. **Turgeon, M.**, Labbe, A., Greenwood, C.M.T. "A Tracy-Widom Empirical Estimator For Valid P-values With High-Dimensional Datasets". Submitted to *Journal of Computational and Graphical Statistics*.

5. Bhatnagar, S., **Turgeon, M.** (co-primary author), Islam, J., Hanley, J., Saarela, O. "`casebase`: An Alternative Framework For Survival Analysis and Comparison of Event Rates". Submitted to *The R Journal*.

6. Prystajecky, M., Basi, R., **Turgeon, M.**, Mittelstadt, M., Sparrow, C. "Improving Discharge Communication on an Internal Medicine Service". Submitted.

7. Farkas, C., Mella, A., **Turgeon, M.**, Haig, J.J. "Generation and use of a novel SARS-CoV-2 viral sequence tracking platform has found genetic evidence that the viral 3' untranslated region (UTR) is evolving and generating increased viral diversity". Submitted to *Emerging Microbes & Infections*.

Papers in Preparation

1. **Turgeon, M.**, Hoque, M.E., Bhatnagar, S. "Absolute risk estimation using dimension reduction and case-base sampling".

2. Islam, J., **Turgeon, M.**, Bhatnagar, S.R. "Dynamic reversion of survival functions to estimate the original dataset."

3. **Turgeon, M.**, Islam, J., Bhatnagar, S.R., Saarela, O. "Variable selection and competing risk analysis using case-base sampling".

4. Czubryt, T., **Turgeon, M.** "Redundancy Analysis and Principal Component of Explained Variance: A Tale of Two Disciplines".

5. **Turgeon, M.**. "Multi-precision linear algebra for computing largest root distributions using the `rootWishart` package".

Fellowships and Grants

Submitted

- NSERC Discovery Grant
  Dimension Reduction and Complex High-Dimensional Data
- New Frontiers in Research Fund–Exploration (co-PI)
  "Unlocking the Gate" to Targeted Drug Delivery: Understanding sulfated glycosaminoglycan binding of peptide-derivatized DNA nanostructures to predictably improve their cytosolic delivery

Awarded

- University Research Grants Program (URGP) ($6,000) 2020
- Faculty of Science Pedagogy Award ($3,000) 2020
- Gerald Clavet Fellowship (declined) 2016–2017
- FQRNT Doctoral Scholarship ($20,000 per year) 2014–2016
- FQRNT Masters Scholarship ($15,000 per year) 2011–2013
- Thomlinson Masters' Fellowship ($5,500) 2011–2012

Awards and Honours

- Ian C.P. Smith Integrated Science Faculty Scholar — 2020–2022
- Faculty of Medicine Graduate Mobility Award — 2017
  - Research stay at Stanford University
- SSC 2017 Student Research Presentation Award — 2017
- Dr. Jim Hanley Research Day Award — 2016
- McGill Graduate Excellence Award ($10,000) — 2013–2014

Presentations

Invited presentations

- Statistics Seminar, Université du Québec à Montréal, Montréal, QC — Mar 2021
- Bioinformatics-Biostatistics Research Seminar, Winnipeg MB — Mar 2021
- Science Online Public Talks, University of Manitoba, Winnipeg MB — Jun 2020
- Statistics Seminar, University of Winnipeg, Winnipeg MB — Feb 2020
- Bioinformatics-Biostatistics Research Seminar, Winnipeg MB — Nov 2019
- ICSA-Canada Chapter 2019 Symposium, Kingston ON — Aug 2019
- Maternal Adversity, Vulnerability, and Neurodevelopment (MAVAN) Methodology group, Montréal, QC — Mar 2016
- Montreal Genomics Meeting, Montréal, QC — Dec 2015

Contributed presentations

- useR! 2020, St Louis MO[1] — Jul 2020
- Statistical Society of Canada Annual Meeting, Montréal QC — Jun 2018
- Statistical Society of Canada Annual Meeting, Winnipeg MB — Jun 2017
- 5th Annual Canadian Statistics Student Conference, Winnipeg MB — Jun 2017
- Statistical Society of Canada Annual Meeting, St. Catherines, ON — May 2016
- EBOH Annual Research Day, Montréal, QC — Apr 2016
- 4th Annual Human and Statistical Genetics Meeting, Vancouver, BC — Apr 2015
- Biostatistics Reading Group, Montréal, QC — Oct 2015, Feb 2015, Mar 2014

Poster presentations

- EBOH 50th Anniversary Conference, Montréal, QC — Apr 2015
- 4th Annual Human and Statistical Genetics Meeting, Vancouver, BC — Apr 2015
- Statistical Society of Canada Annual Meeting, Toronto, ON — May 2014

Teaching Experience

Instructor

SCI 2000—*Introduction to Data Science* — Winter 2021
Faculty of Science
University of Manitoba

STAT 3150—*Statistical Computing* — Fall 2020
Department of Statistics
University of Manitoba

STAT 7200—*Multivariate Statistics I* — Winter 2020
Department of Statistics
University of Manitoba

STAT 4690—*Applied Multivariate Analysis* — Fall 2019
Department of Statistics
University of Manitoba

Guest Lecturer

Advanced Epidemiology — Summer 2020
Department of Community Health and Epidemiology
University of Saskatchewan

Principles of Surgery — Winter 2019
College of Medicine

[1] Moved online due to COVID-19

University of Saskatchewan

Research Trainees Supervised

Research Assistants

- Jay Khakhariya, Coop Student — Fall 2020
  Topic: *Code Comparison Web Application*
- Erfanul Hoque — Summer 2020
  Topic: *Dimension reduction and case-base sampling*

Graduate Students

- Asif Ahmed Neloy, MSc Computer Science — 2021–
  Topic: *Dimension reduction and anomaly detection*

Undergraduate Students

- Jiyoung Kim, FoS Undergraduate Summer Research Award — Summer 2021
  Topic: *Dimension reduction and missing data*
- Thomas Czubryt, UMSU Undergraduate Research Award — Summer 2020
  Topic: *Comparison of Principal Component of Explained Variance and Redundancy Analysis*
- Wanmeng Wang, FoS Undergraduate Summer Research Award — Summer 2020
  Topic: *Matrix completion for imputing missing data*
- Joshua Hamilton, Joint Honours Computer Science/Statistics — Winter 2020
  Topic: *Dimension reduction and natural language processing*

Thesis Committees

- Ye Su, PhD Individual Interdisciplinary Studies — 2020–
  Advisors: Pingzhao Hu and Hani El-Gabalawy
- Hafsa Moontari Ali, MSc Computer Science — 2019–
  Advisors: Pingzhao Hu and Yang Wang
- Meghan Chua, MSc Computer Science — 2019–
  Advisor: Olivier Tremblay-Savard
- Kaari Landry, PhD Computer Science — 2019–
  Advisor: Olivier Tremblay-Savard
- Elham Alfazi, PhD Statistics — 2019–
  Advisors: Liqun Wang and Saman Muthukumarana
- Robyn Ritchie, MSc Statistics — 2019–
  Advisor: Alexandre Leblanc
- Jingyu Wang, MSc Statistics — 2018–2020
  Advisor: Mohammad Jafari Jozani
- Isuru Dharmasena, MSc Statistics — 2018-2020
  Advisor: Saman Muthukumarana
- Zimo Zhu, MSc Statistics — 2018–2020
  Advisors: Aerambamoorthy Thavaneswaran and Ruppa Thulasiram

Reviewing Experience

Journals

- International Journal of Epidemiology
- Genetic Epidemiology
- Entropy
- Communications in Statistics—Simulation and Computation

Conferences

- Regina Qu'Appelle Health Region Annual Research Day
- Canadian Society for Epidemiology and Biostatistics Annual Meeting
- Canadian Statistics Students Conference

Poster competitions

- 2020 Undergraduate Research Poster Competition, University of Manitoba, Winnipeg MB

- Annual Faculty of Science SURE Poster Competition, University of Manitoba, Winnipeg MB
- 2019 Undergraduate Research Poster Competition, University of Manitoba, Winnipeg MB

Other Academic Activities

Hiring Committees

- Faculty of Science Indigenous Scholar — 2021
  University of Manitoba
- Department of Statistics — 2021
  University of Manitoba

Member of various committees

- Integrated Science Program Committee — Jul 2020–
  University of Manitoba
- Statistics–IT Committee — Jul 2020–
  University of Manitoba
- Faculty of Science–Executive Committee — Jul 2020–
  University of Manitoba
- Computer Science–Graduate Studies Committee — Sep 2019–
  University of Manitoba
- Statistics–Website Ad Hoc Committee — Sep 2019–Dec 2020
  University of Manitoba
- Statistics–Research and Seminar Committee — Jul 2019–Jun 2020
  University of Manitoba
- Epidemiology, Biostatistics and Occupational Health Student Society, McGill University — Sep 2014-2016
- Biostatistics Reading Group — Sep 2014-Apr 2016
  McGill University
- Review Committee for the Department of Pathology — Mar 2013
  McGill University

Organised Conferences

- Data Science Conference Nexus — May 2021
  University of Manitoba, Winnipeg MB
- 6th Annual Canadian Statistics Student Conference — Jun 2018
  McGill University, Montréal QC

Organised Workshops

- Data Science Nexus Workshops — Sep 2020–Dec 2020
  University of Manitoba, Winnipeg MB
- 6th Annual Canadian Statistics Student Conference — Jun 2018
  McGill University, Montréal QC

Software

R packages:

- `pcev`, implementing *Principal Component of Explained Variance*.
- `casebase`, implementing case-base sampling for survival analysis.
- `covequal`, implementing a test of equality of covariance matrices valid for high-dimensional data.
- `multiKernel`, implementing multivariate prediction using kernel-machine regression.
- `rootWishart`, implementing exact computations of largest root distributions in single and double Wishart settings using arbitrary-precision linear algebra.
- `funtooNorm`, providing functions for normalization of Illumina Infinium Human Methylation 450 BeadChip (Illumina 450K) data when samples are collected from multiple tissues or cell types.

Python modules:

- `umi-bayes`, providing tools for the analysis of tagged DNA sequencing reads and implementing the parametric clustering-based deduplication algorithm.