Christopher Meaney

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Education

Degrees

PhD. Biostatistics (Candidate), University of Toronto, 2016–Present.

MSc. Biostatistics, University of Toronto, 2008–2010.

BSc. Honours Health Studies Co-op, University of Waterloo, 2003–2008.

Selected Coursework

Mathematical Statistics, Statistical Inference, Likelihood Inference, Differentiable Inference, Artificial Intelligence, Data Mining, Multivariate Statistics, Bayesian Methods, Monte Carlo Estimation, Statistical Computing, Applied Statistics, Categorical Data Analysis, Survival Analysis, Spatial Data Analysis, Econometrics, Epidemiology, Design of Experiments, Advanced Research Design, Research Design.

Work Experience

Professional Experience

Dept. of Family and Community Medicine, University of Toronto, Biostatistician, 2010–present.

Department of Psychiatry, Toronto General Hospital, Biostatistical Consultant, 2012–2016.

Toronto Hepatitis C Alliance, Biostatistical Consultant, 2012–2016.

Department of Infectious Disease, Toronto East General Hospital, Biostatistical Consultant, 2014.

Movement Disorders Clinic, Toronto Western Hospital, Biostatistical Consultant, 2009–2014.

Liver Clinic, Toronto Western Hospital, Biostatistical Consultant, 2009–2011.

Child Health Evaluative Sciences, Sick Kids Hospital, Research Assistant, 2008–2010.

Biostatistical Methodology Unit, Sick Kids Hospital, Research Assistant, 2009–2010.

Studentships & Practicum/Co-op Placements

ICES, Ontario Ministry of Health and Long Term Care, PhD Student, 2017-present.

Vector Institute for Artificial Intelligence, University of Toronto, PhD Student, 2017-2020.

Department of Medical Imaging, University of Toronto, Biostatistics Practicum Student, 2016–2017.

Biostatistical Methodology Unit, Sick Kids Hospital, Biostatistics Practicum Student, 2008–2009.

Shared Information Management Services, Toronto General Hospital, Analyst, 2007.

Child Health Evaluative Sciences, Sick Kids Hospital, Research Assistant, 2006.

Air Quality Research Branch, Environment Canada, Chemical Technician, 2005.

Fields of Research Interest

Natural language understanding, topic modeling, word vectors, and sentiment analysis.

Unsupervised machine learning for summarizing complex medical data (e.g. text, images, networks).

Development of accurate, well-calibrated, and fair/unbiased supervised clinical predictive models.

Application of (temporal) topic models for characterizing and monitoring primary care systems.

Application of deep NLP models for deidentification of clinical text data.

Application of deep NLP models for developing computable EMR phenotypes.

Application of matrix factorization for community identification in patient-provider networks.

Web scraping, text mining, and their intersection with high performance computing.

Computational Skills

Operating Systems: Windows, Linux/Unix, Mac OS.

Shell: Bash.

Scientific Computing: Python, Julia.

Statistical Computing Languages: R, SAS, SPSS, Stata.

Database languages: PostGreSQL, SQLite, Microsoft SQL Server.

Markup Type Languages: XML, HTML, Markdown.

Typesetting: Latex.

Research

Selected Peer-Reviewed Scientific Publications

Meaney, C., Moineddin, R., Kalia, S., Aliarzadeh, B., Greiver, M. (2022). Using Primary Care Text Data and Natural Language Processing to Monitor COVID-19 in Toronto, Canada. `https://www.medrxiv.org/content/10.1101/2022.04.27.22274400v1`.

Meaney, C., Hakimpour, W., Kalia, S., Moineddin, R. (2022). A Comparative Evaluation of Transformer Models for De-Identification of Clinical Text Data. Arxix: Computing and Language. `https://arxiv.org/abs/2204.07056`.

Meaney, C., Escobar, M., Moineddin, R., Stukel, T., Kalia, S., Aliarzadeh, B., Chen T., O'Neill, B., Greiver, M. (2022). Non-Negative Matrix Factorization Topic Models and Clinical Text Data Identify COVID-19 Pandemic Effects on Primary Healthcare and Community Health in Toronto, Canada. Journal of Biomedical Informatics. Volume 128, pp. 1-10.

Khattak, F., Jeblee, S., Pou-Prom, C., Abdalla, M., **Meaney, C.**, Rudzicz, F. (2019). A Survey of Word Embeddings for Clinical Text. Journal of Biomedical Informatics. Vol. 4, pp. 1-18.

Moineddin, R., **Meaney, C.**, Grunfled, E. (2017). On the Analysis of Composite Measures of Quality in Medical Research. Statistical Methods in Medical Research. Vol. 26, pp. 633-660.

Meaney, C., Moineddin, R., Voruganti, T., OBrien, M., Krueger, P., Sullivan, F. (2015). Text Mining Describes the Use of Statistical and Epidemiological Methods in Published Medical Research. Journal of Clinical Epidemiology. Vol. 74, pp. 124-132.

Meaney, C., Moineddin, R. (2014). A Monte Carlo Simulation Study Comparing Linear Regression, Beta Regression, Variable-Dispersion Beta Regression and Fractional Logit Regression at Recovering Average Difference Measures in a Two Sample Design. BMC Medical Research Methodology. Vol. 14,

pp. 1-22.

Selected Oral Presentations

Meaney, C. Using Temporal Topic Models and Big Primary Care Clinical Text Data to Monitor/Evaluate Direct/Indirect COVID-19 Pandemic Effects in Toronto, Canada. DFCM Research Grand Rounds (May 2021).

Meaney, C., Stukel, T., Escobar, M. Decomposing Large and Sparse NLP Matrices. ICES Research Rounds (January 2019).

Meaney, C., Tu, K., Widdifield, J., Rudzicz, F., Jaakimainen, L., Escobar, M. (2018). Using Biomedical Text as Data and Representation Learning for Identifying Patients with an Osteoarthritis Phenotype in the Electronic Medical Record. IPDLN 2018.

Meaney, C., Tu, K., Widdifield, J., Rudzicz, F., Jaakimainen, L., Escobar, M. (2018). Learning Unsupervised Representations from Biomedical Text. IPDLN 2018.

Selected Non Peer-Reviewed Book Chapters

Department of Family and Community Medicine. Tu, K. et. al. **Meaney, C.** (Contributing Editor). (2019). Inaugural University of Toronto Family Medicine Report.

Doria, A., Tomlinson, G., Beyene, J., Moineddin, R., **Meaney, C.**, Shaikh, M. (2018). Research methods in radiology: A practical guide. Thieme Publishers.

Meaney, C., Moineddin R. (2018). Chapter 13 (Research methods in radiology: a practical guide): Statistical Inference: point estimation, confidence intervals, and hypothesis testing. Thieme Publishers.

Meaney, C., Moineddin R. (2018). Chapter 14 (Research methods in radiology: A practical guide): Linear and Logistic regression. Thieme Publishers.

Student Supervision

Select Biostatistics Practicum Students

Wali Hakimpour, Fall-Winter 2021: Deidentification of Clinical Text Data.

Pai-Shan Cheng, Fall-Winter 2018: Quantile Interrupted Time Series Analysis.

Xu Zhao, Fall-Winter 2015: Association Rule Mining and Primary Care Medicine.

Teaching

University of Toronto

Big Data for Health (MSc and PhD students in IHPME clinical informatics program)

Lecturer (Big EHR Data Analytics).

Winter 2020.

Correlated Data Analysis (MSc and PhD Students in Biostatistics)

Teaching Assistant and Lecturer for Prof. Rahim Moineddin.

Winter 2012, Winter 2013, Winter 2014, Winter 2015, Winter 2016.

Introduction to Biostatistics I (MSc Students in Epidemiology)

Teaching Assistant for Prof. Kevin Thorpe.

Fall 2009.

Sick Kids Hospital

Research Methods in Radiology (UT Radiology medical residents/fellows)
Lecturer in Sample Size Determination in Clinical Research for Dr. Andrea Doria.
Fall 2011, Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2017, Fall 2018, Fall 2019.

Biostatistics Design and Analysis Workshop Series (Researchers from Toronto Sick Kids Hospital)
Lecturer in Statistical Computing and Graphics Using R for Dr. Theresa To.
Spring 2014.

The University of Sao Paulo

Research Methods in Radiology (Univ. Sao Paolo Radiology medical residents/fellows)
Lecturer in Sample Introductory Statistics in Clinical Research for Dr. Andrea Doria.
Lecturer in Sample Size Determination in Clinical Research for Dr. Andrea Doria.
Fall 2014.

Selected Honours & Awards

IPDLN Conference Student Presentation Finalist
Selected as one of the top-3 student presentations at IPDLN Conference 2018.
Title: Learning Unsupervised Representations from Biomedical Text

NVIDIA Academic GPU Granting Program (2017)
Recipient of a donation from NVIDIA, of one GeForce Titan X Pascal GPU (value $2000 USD).
The GPU is being used to facilitate the exploration of deep learning methods in primary care research.

Selected Professional Service

R Users Group

Organizer of the GTA R Users group: 2015-Present
Interest group that discusses R programming language

Google Hour of Code

Co-organzier of the 2016 & 2017 Google Hour of Code at University of Toronto
Meet local high-school students and discuss/demo applications of statistical programming in science.

Volunteering and Community Service

Food Share Toronto (2014-2016)
Volunteer at various events: annual gala, annual general meetings, etc.

Pathway to Education (2008-2011)
Provide tutoring in mathematics, sciences, and language to at risk youth.