

Jeffrey Hughes

Employment and Social Development Canada
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Skills Summary

- Understanding of and experience with wide range of supervised and unsupervised machine learning algorithms and statistical techniques, including: linear and logistic regression, support vector machines (SVM), neural networks/deep learning, natural language processing, *k*-means clustering, principal components analysis (PCA), mixture models, multi-level models, and structural equation modelling (SEM)
- Experience with numerous web development, programming, and database tools: R, Python, Rust, JavaScript, PHP, Git, SQL, Flask, Django, SQLite, PostgreSQL, Neo4j, Apache Spark
- Strong oral and written presentation skills developed through academic and workplace career

Work Experience

Data scientist (EC-04) – Employment and Social Development Canada, Gatineau, QC January 2020 – present

- Develop machine learning/artificial intelligence (ML/AI) algorithms for increasing efficiency and automation within the department, using Python, Pytorch & Tensorflow
- Leverage ML for research and analysis to provide insights from complex administrative data
- Assess potential biases or ethical issues resulting from the use of ML/AI, and develop approaches to mitigate their impact
- Liaise with clients to identify key areas where ML/AI can provide insights and efficiency gains in operations, human resources, and policy work
- Present progress updates and analytic results of projects to clients and management

Researcher (EC-04) – Employment and Social Development Canada, Gatineau, QC December 2017 – January 2020

- Conducted quantitative research regarding economic and social outcomes of persons with disabilities, primarily sourced from Statistics Canada surveys, using R, SAS, and Stata
- Developed research proposals for long-term research projects, establishing the methodology to be used to address key research questions of relevance to the department
- Wrote research reports and presentations that served to inform policy and program development; some research reports published in partnership with Statistics Canada
- Designed and conducted project to analyze employment, income, and education trends among persons with disabilities from 2013-2017, based on Canadian Income Survey
- Managed relationships with internal policy and program clients, providing answers to short-term information requests, which often required data analysis with quick turnaround time

Education

Ph.D., Social Psychology, University of Waterloo	September 2013 – September 2017
M.A., Social Psychology, University of Waterloo	September 2011 – August 2013
B.A. (Honours), Psychology & Business, University of Waterloo	September 2006 – April 2011

During educational career:

- Gained in-depth experience in statistics and data sampling methodologies, including experimental and correlational designs
- Developed research projects both independently and collaboratively, with a focus on motivational processes, consumer decision-making, and attitude change toward social groups
- Provided assistance and advice as teaching assistant for courses on research design and statistics (both undergraduate and graduate-level), as well as courses in psychology
- Authored several research articles for publication in scholarly journals (available on request)
- Presented research numerous times at conferences and departmental meetings
- Awarded with SSHRC or Ontario scholarships 5 of 6 years during graduate school

Volunteer Experience

Statistical consultant, statistics tutor – Freelance December 2015 – June 2019

- Provide statistical assistance to researchers needing help with design/analysis
- Topics have included structural equation modelling (SEM), analysis of variance (ANOVA), factor analysis, linear and non-linear regression, multi-level models, and general help with R

Steering committee member – PsyArXiv.com August 2016 – June 2019

- As part of team, organized and oversaw development of PsyArXiv preprint service for psychological research, committed to making research more open and accessible

Instructor, Learning R Workshop – University of Waterloo, Waterloo, ON December 2014

- Created and led a one-day workshop on using the R statistical program, oriented toward faculty and graduate students
- Covered R programming structures, common statistics functions and packages, use of RStudio

Activities and Interests

- Strong self-directed learner – enjoy keeping up to date on new tools and technologies related to machine learning, statistics, and web development; have taken several online courses to gain understanding of Hadoop, deep learning, Docker, Bayesian data analysis
- Authored two R packages (available on GitHub: <https://github.com/jeff-hughes>, and CRAN)
- Enjoy cooking delicious food, reading classic literature, and listening to podcasts