Message from the President

Société statistique du Canada Statistical Society of Canada

The late summer and early fall are relatively quiet times for the SSC, but the Executive and the Board, as well as the Sections and many committees, are busy as we ramp up towards planning the upcoming year's activities.

Planning is well under way for the 2019 SSC Annual Meeting, to be held at the University of Calgary from May 26-29, 2019. **Alex De Leon and Karen Kopciuk** and their local organizing committee are hard at work getting ready to host us, and the Program committee led by **Lisa Lix** is planning an exciting scientific program for us. The Sections are heavily involved in program development, and we're looking forward to the usual set of workshops before the meeting. And of course, we look forward to the **Canadian Statistics Student Conference** on May 25; this meeting, which has grown significantly over the years, provides a great setting for students to present their work, learn about career opportunities, and network with other students and with faculty. And as always, it's run and organized 100% by students!

Thank you to all who joined us in hosting the **Joint Statistical Meetings in Vancouver.** The program, led by **Program Chair Christian Leger,** was great - there was almost too much to see! The SSC reception, held at the Steamworks Brewpub (thanks to P**ublic Relations Officer Dave Campbell** for the help finding the site) was a great success. We got out of the convention centre and were able to enjoy great food and drinks, and microbrew beer, in a nice environment. Finally, thanks to all who helped out with the booth. The booth was very busy, and it was great to catch up with everyone who visited. **JSM 2019 in Denver** is on our radar, too; **Johanna Neslehova** is the SSC rep on the JSM program committee. Look forward to seeing Canadian statisticians' work there!

The **Elections Committee**, chaired by past-president **Hugh Chipman**, are looking for candidates for elected positions on the Board and in the Sections. I hope many of you will consider running for one of these positions and serving the society! And the **Awards Committee,** chaired by past-

past-president **Jack Gambino,** is planning the usual set of awards, to be presented in Calgary. Look for the calls for nominations for both elections and awards, elsewhere in this issue.

The Executive met on the weekend of September 21-23 to start planning the year's activities, and in particular to look at the upcoming year's budget. The full Board met on October 20th and 21st to approve the budget and several new initiatives for 2019. We also had a presentation and discussion with Susie Fortier, president of the Survey Methods Section, on new developments at Statistics Canada.

You'll be hearing in the coming months from the SSC about **membership renewals.** Please look for these messages from the Office, and please renew!

The new slate of committees for 2018-19 is almost completely full. Again, thanks to all who volunteered, and thanks to everyone who is participating in the running of the society. Without the substantial ongoing contribution from our members, the SSC could not function.

Robert Platt, SSC President

The SSC Endowment Fund

In the SSC's First Annual Fundraising Drive, which took place in 2016, the Past Presidents were invited to make substantial gifts in support of the broad educational mission of the SSC, and did so with great generosity, to a total of $31,305. Other SSC members were then invited to contribute to match these funds. By the end of 2016 altogether $42,420 had been collected. The total collected has continued to increase, as SSC members continue to respond with enthusiasm.

In June 2017 the SSC Fundraising Committee was formed and began to consider and investigate the establishment of an endowment (permanent fund). The purposes were to allow donated funds to grow and to use the existence of the endowment to attract planned gifts and corporate donations. At its meeting of March 16, 2018 the SSC Board accepted the recommendation of the Fundraising Committee to use $20,000 from the donated funds to start a permanent fund managed by the Ottawa Community Foundation. The disbursement from the fund to the SSC will be 4.25%

each year and the service fee will be 1.5%, with any investment return from the fund above 5.75% being added to the principal.

The funds not deposited to the endowment are being directed toward education and outreach projects proposed by SSC committees and the general membership. In future new deposits to the endowment will be made from time to time as more donated funds accumulate.

The Ottawa Community Foundation (OCF) celebrated its 30th anniversary in 2017. Besides managing funds for many charitable organizations, large and small, the OCF advises potential donors of opportunities. For example, a person or group interested in donating to public education or to advancing numeracy might be directed to the SSC Endowment Fund. In 2012 the OCF became a signatory to the United Nations Principles for Responsible Investment. It aspires to incorporate environmental, social and governance (ESG) considerations into its investment practices. A member of the national network Community Foundations of Canada, the OCF is also a signatory to the Declaration of Action in support of work on Reconciliation.

FUNDRAISING COMMITTEE
Mary Thompson, Chair

Hugh Chipman	Melody Ghaharmani
Edward Chen	Bovas Abraham
Shirley Mills	Karen Kopciuk
Bruce Smith	Cody Hyndman

Transparency and oversight of SSC financial processes

Over the last year, the SSC has been working to improve transparency and oversight of its financial processes. Our 2016 audit (completed in June 2017), identified several weaknesses in the SSC's financial procedures. These are outlined below, along with actions taken by the SSC to address these weaknesses. This list is adapted from a report presented to the Board in May 2018. Some technical points have been combined into broader headings, but the issues are all listed.

1. *Reconciling section funds with our accounting records was difficult and time consuming*
    - Additional review of financial records is now conducted by the executive, the office and our bookkeeper, before providing records to the auditor.

- Adjustment errors that had accumulated from previous years were corrected in June 2017 by interfund transfers. Moving forward, any necessary corrections will be applied annually

2. *Recording errors in financial records, and missing details on some entries*

   - A monthly reconciliation spreadsheet is now used to track income and expenses. This can be viewed by the treasurer, the office and our bookkeeper, as well as signing authorities (see below).
   - A revised chart of accounts was developed and implemented for 2018. In revising the chart of accounts, all account codes were reviewed, and account codes added, removed and changed to better reflect SSC financial operations. For example, new account codes are in use to track donations made with different designations. The revised chart of accounts is intended to reduce errors due to ambiguous coding.
   - The office and our bookkeeper are entering invoices as soon as received and then later marking as paid.
   - For 2017 and 2018, entries include more details

3. *Single signing officer: Expenses were approved for payment by only the treasurer. Invoices lacked visible proof of approval.*

   - At its June 28, 2017 meeting, the Board passed a motion establishing the Treasurer, President and Secretary as its three signing officers.
   - All cheques now require signatures of two of the three signing officers.
   - The Treasurer can issue etransfer payments under a single authorization for amounts no greater than $3000.
   - However, all financial claims and invoices are approved by two of three signing officers.
   - The office has revised the workflow for approval and payments and is cataloging regularly recurring expenses and revenue.
   - The Board has approved policies on payments and fund transfers, developed by the financial procedures committee.
   - The Board has approved a motion that the SSC set up electronic funds transfer for payments. Such a system will include approval from two signing officers for each payment and be possible for amounts over $3000.

4. *Payments made to the treasurer were approved and authorized by the treasurer*

   - In addition to moving the creation of 3 signing officers, the Board moved that: If a claimant is a signing officer, the claim must be approved by two other signing officers.
   - Any claims submitted by a signing officer since July 2017 have been approved by the other two signing officers.

5. *Only the treasurer had access to banking information*

   - All three signing officers have access to view banking information

6. *The auditor made several adjusting journal entries to reconcile both balance sheet and income statement accounts*

   - In preparation for the 2017 year-end audit, financial records were not provided to the auditor until there had been a period of internal review and review by our bookkeeper.

7. *For Board expense reports, there was no written approval by an independent Board member evident on the expense reimbursement form.*

   - Expense claim forms have been revised to require approval by two of three signing authorities.
   - Any claims submitted by a signing officer since July 2017 have been approved by the other two signing officers.
   - Additionally, the SSC has revised its travel claim form, and adopted a set of policies for travel claims.

8. *For specific expense transactions examined by the auditor, there was not adequate supporting documentation. Honoraria and award claims were specifically identified.*

- The minutes of Board meetings now include the names of all recipients of travel grants awards, presentation awards, and awards for case studies in data analysis.

9. *The auditor did not note a consistent review by the Board of monthly financial reports or section statements in the minutes.*

   - The Board reviewed a year-to-date financial report at the October 2017 Board meeting. The three signing officers and Executive Assistant have reviewed the financial reports more regularly – twice in the last half of 2017 and at year-end. This is done through the reconciliation of the journal entries and the financial reports generated from the profit and loss files by our bookkeeper.
   - The SSC is working with our bookkeeper to increase the frequency of regular reporting.
   - The SSC Treasurer does not have access to section accounts. Section accounts merit further consideration.

10. *There is no policy or procedure in place with respect to the timing of payments of expenses. Expenses are often paid ahead of time, before invoices are received. Other invoices are not paid for periods of time.*

    - Any advance payments (most notably, funds provided to the host university department for expenses incurred in advance of an Annual Meeting) require an invoice and approval of two of three signing officers.
    - The Treasurer currently works to issue payment within one month of receipt of an invoice or claim or within the timeline specified on the invoice. This was largely achieved in 2017, with some exceptions.

Additional financial changes during the last year, not related to the weaknesses identified by the auditor, include:

- Establishment of an endowment fund, managed by the Ottawa Community Foundation. The fund holds a portion of donations for future projects. In 2018, $20,000 was placed in the endowment.
- Adoption of policies governing the management of GICs and other investments.
- Groundwork in setting up an electronic fund transfer system
- Discussions with our bookkeeper on setting up an electronic system for entering and tracking transactions

The significant changes are the result of work by many people, including Treasurer Edward Chen, Executive Secretary Llwellyn Armstrong, Executive Assistant Miaclaire Woodland, Past-President Hugh Chipman, bookkeeper Rachel Boutet of Envolta, Inc., the ad-hoc “financial processes group” (Hugh Chipman, Edward Chen, Llwellyn Armstrong, Shirley Mills, Robert Platt, Miaclaire Woodland and Rachel Boutet) and the Committee on Financial Procedures (John Koval (chair), Edward Chen, Shirley Mills, Jean-François Plante and Patrick Brown).

Global Data Crunch Looms

International Data Science in Schools Project (IDSSP)

Big data is exploding so rapidly around the world, there are not enough skilled operators to handle and interpret it. The demand for expert data professionals is outstripping supply many times over, an international group of scholars and educators warned today. Details of a global project to beef up the teaching of data studies in high schools in countries around the world and to train school teachers in data science, as a science of central importance to the human future have been released by the group.

“The last decade has seen spectacular growth in data collection and usage in most areas of human endeavour – from government to business, to health, science and the environment,” a

spokesperson for the group, Alison Gibbs, said. “The scale and complexity of the data now being amassed are far beyond the ability of single computers or individuals to manage. We need teams of data science experts working together in real time, around the world. That is why we have launching an urgent project aimed at meeting the global shortfall in trained data science professionals.

“At the same time there is an urgent need for ordinary people to be able to understand and use the data now available to them – whether it is about their health, their financial situation, in their job or education.”

“The project is a collaborative activity involving leading computer scientists, statistical scientists, curriculum experts and teachers from Australia, Canada, England, Germany Holland, New Zealand and the USA and supported by several national and international societies, groups and companies.

The aim of the International Data Science in Schools Project (IDSSP) is to transform the way data science is taught in the last two years of secondary school. Its objectives are:

1. To ensure that school children develop a sufficient understanding and appreciation of how data can be acquired and used to make decisions so that they can make informed judgments in their daily lives, as children and then as adults,
2. To inspire mathematically able school students to pursue tertiary studies in data science and its related fields, with a view to a career.

“In both cases, we want to teach people how to learn from data,” Prof. Gibbs said.

Two **curriculum frameworks** are being created to support development of a pre-calculus course in data science that is rigorous, engaging and accessible to all students, and a joy to teach.

- Framework 1 (*Data Science for students*). This framework is designed as the basis for developing a course with a total of some 240 hours of instruction.
- Framework 2 (*Data Science for teachers*). As a parallel development, this framework is designed as the basis for guiding the development of teachers from a wide variety of backgrounds (mathematics, computer science, science, economics, …) to teach a data science course well.

Prof. Gibbs said that the draft frameworks will be released for widespread public consultation in early 2019, ahead of their scheduled completion in August. “We envisage the material will be used not just in schools, but also as a valuable source of information for data science courses in community colleges and universities and for private study.”

For further information: idssp.info@gmail.com, or visit www.idssp.org.

The Status of Statistics Education in Canada

Introduction

The purpose of this report is twofold:

a) to present summative data on post-secondary statistics education,and

b) to examine the structure of undergraduate statistics programs in Canada.

This information is important for planning and designing statistical curricula, and is of particular interest to educators, administrators and other stakeholders. In the following sections, we describe our data in more detail and present results along our two lines of inquiry. We conclude with a discussion of our findings and their implications for directing future efforts in statistics education. An earlier version of this report was presented in a contributed session at the 2017 SSC Annual Meeting.

Data Sources

STUDENT DATA

Student data come from Statistics Canada's (StatCan) Post-secondary Student Information System (PSIS)[1], a national survey of Canadian public post-secondary institutions. PSIS collects data on enrolments and graduates, classified by degree, program of study, and other geographic and demographic information. PSIS data are publicly available[2] across broad areas of study, and we looked at data across all programs in Mathematics, Computer and Information Sciences (MCIS) for comparison. For statistics programs we extracted PSIS data down at the program level through StatCan's Real-Time Remote Access[3] (RTRA) system, available through our institution's data library. Specifically, we looked at three types of programs: a) Biostatistics, b) General Statistics, and c) Mathematical Statistics and Probability, corresponding to the program classification[4] used by StatCan. Our student data consist of enrolment and graduate numbers spanning the academic years 2010/11 to 2015/16, organized by the following variables:

- YEAR: Academic year, from 2010 to 2015 (2010 corresponds to 2010/11 academic year, etc.)
- PROGRAM: Type of program, one of *Biostatistics, General Statistics, Mathematical Statistics and Probability*
- LEVEL: Degree level, one of *BSc, MSc, PhD*
- REGION: Region/province of Canada, one of *Atlantic* (NB/NL/NS/PE), *QC, ON, Prairies* (AB/MB/SK), *BC*
- SEX: Student's sex, one of *Female, Male*

PROGRAM DATA

Data on statistics curricula come from the academic calendars of Canadian universities for the 2016/17 academic year. We collected information on undergraduate statistics programs satisfying two criteria: a) the program focuses on Statistics proper (i.e. excludes Biostatistics, Mathematical or Business Statistics, and Actuarial Science), and b) it is a 4-year stand-alone program, i.e a typical Honours BSc program that does not need to be combined with another program to lead to a degree (as in a double major). In total, 24 programs satisfied our conditions for inclusion in the study. Programs are expressed as collections of course requirements, and our basic data units are individual course requirements. For each course requirement, we recorded the following information:

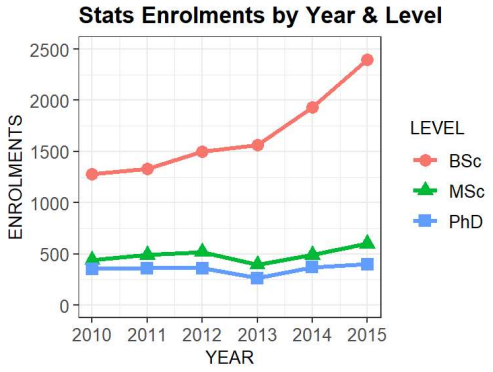
- DISCIPLINE: Discipline that offers course requirement, one or more of *Computer Science, Mathematics, Statistics, Other*
- LEVEL: Year of study that course requirement is typically taken, one or more of *1, 2, 3, 4*
- CREDIT: Number of course credits, *1 credit = 1 semester course*
- TYPE: Type of course requirement, one of *Core, Elective*
- TOPIC CATEGORY: Categorization of content, one or more of *Computation, Mathematics, Probability, Statistical Methodology, Statistical Practice, Statistical Theory, Other*

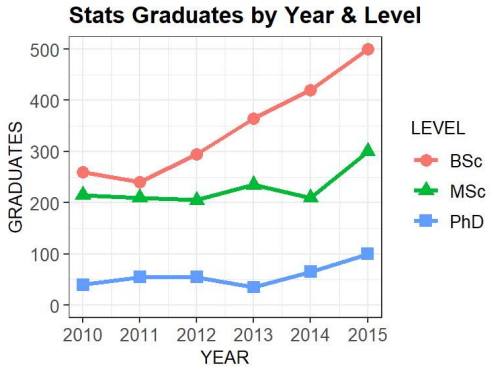
The first four variables are objective, whereas the final categorization is subjective, based on our interpretation of the calendar description for the course. Certain requirements were expressed in terms of sets of courses (e.g. 3 credits from 3rd or 4thyear mathematics or statistics courses). For the analysis, we distributed the credits from such requirements evenly among the possible values. The data and R scripts used for creating this report are available on GitHub[5].

Results

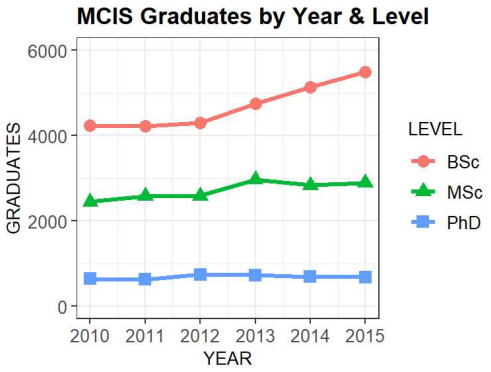
STUDENT DATA

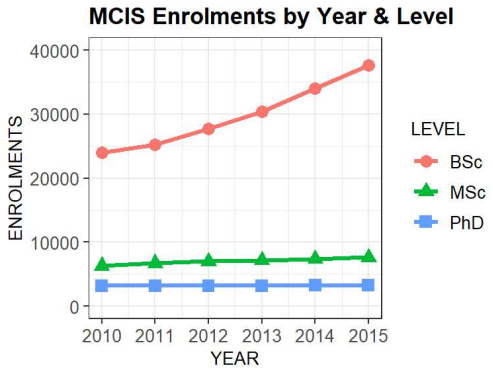
We now present "vital statistics" on statistics education, i.e. information on the number of students who enter and complete statistics programs in Canada. Below are time series plots of total enrolments and graduates[6] in statistics programs, broken down by degree level. Obviously, there is rapid growth in enrolments at all levels, measuring around 20% in the last two available years. This growth is also reflected in the number of awarded BSc degrees, although with some lag. Relative differences between enrolments and graduates are due, among other things, to the different lengths of the degrees: MSc programs are typically much shorter than BSc or PhD programs.



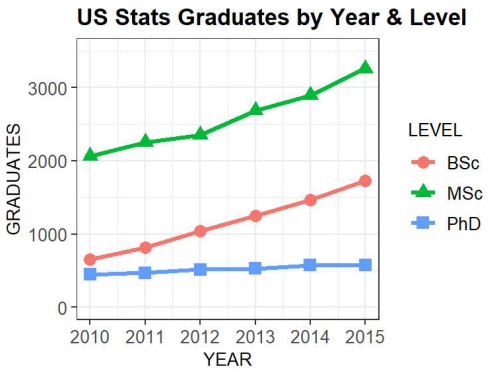


We compared Statistics with its parent group of programs in Mathematics, Computer & Information Sciences (MCIS). The corresponding time series plots are presented below. Statistics is included in the MCIS grouping, and constitutes from 5 to 10% of awarded degrees at different levels. Nevertheless, Statistics BSc enrolments seem to grow faster than MCIS, the latter increasing by around 10% in recent years. If Statistics enrolments continue to grow at twice this rate, the discipline will soon make up a bigger part of this group.

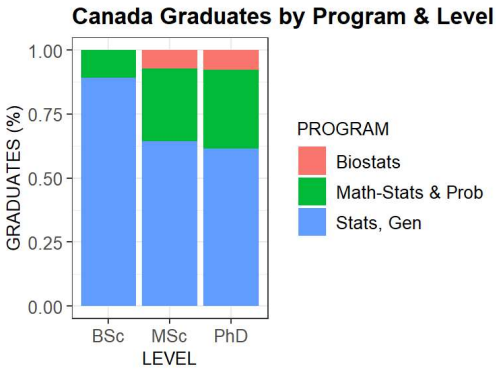


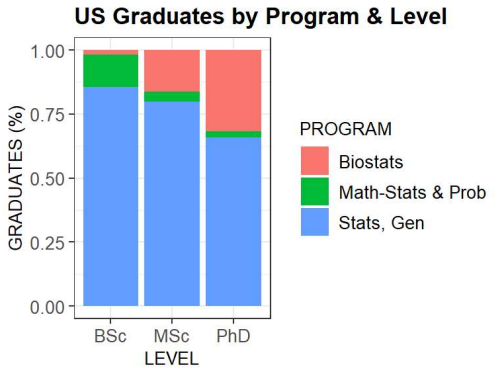


We also compared the number of Statistics graduates in Canada to those from the United States (US). US data come from the Integrated Post-secondary Education Data System (IPEDS) that is conducted by the Department of Education's National Center for Education Statistics (NCES)[7]. The ratio of statistics degrees in Canada vs the US is comparable to the ratio of their populations (14% vs 11%, respectively). The most important difference is qualitative: the majority of degrees in the US are at the MSc level, and almost twice as many as at the BSc level. In Canada the situation is reversed: the majority of statistics graduates come from the BSc level, at an approximate ratio of 5-to-3 compared to the MSc level. This places particular emphasis on undergraduate statistics education in Canada, as the majority of statisticians enter the profession with a BSc degree.

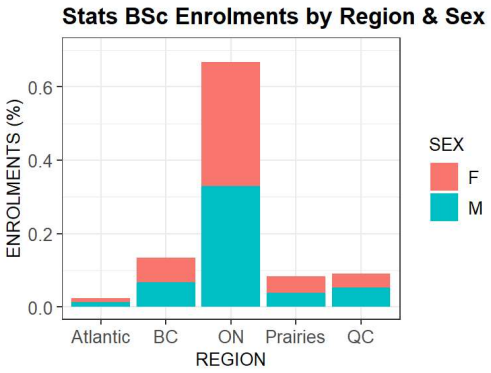


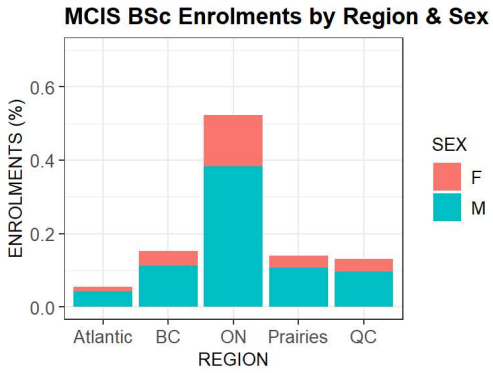
Next, we look at the breakdown of awarded degrees in terms of programs. The following barplots present the proportion of graduates in Biostatistics, General Statistics, and Mathematical Statistics & Probability, at different levels in Canada and the US. At least 85% of undergraduate degrees are in General Statistics, but this proportion drops to around 65% for graduate degrees. In Canada, around 30% of graduate degrees are in Mathematical Statistics and Probability, whereas in the US this is replaced by Biostatistics.





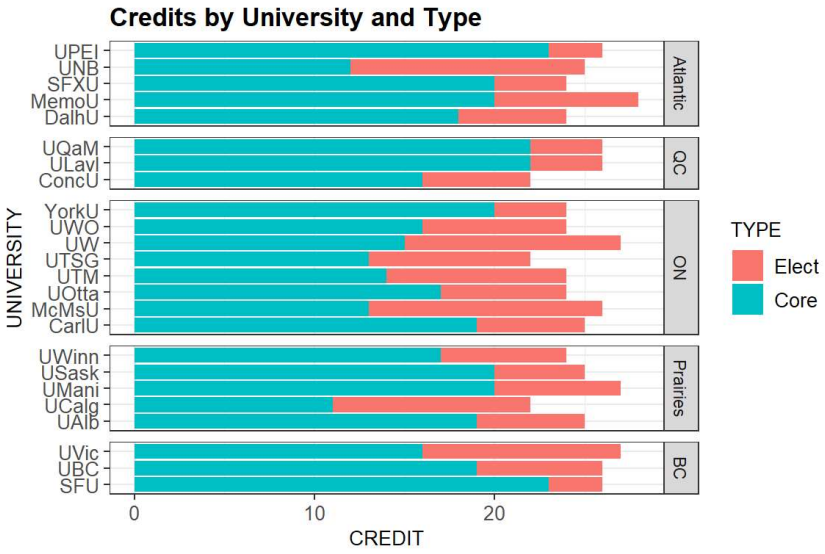
Lastly, we look at the composition of undergraduate enrolments for Statistics and its parent MCIS group by region and sex. The barplots below show that Ontario has disproportionately more Statistics students, with 65% of the total in Canada. This is at the expense of Quebec and the Atlantic and Prairie provinces, which have a smaller share of students relative to their MCIS numbers. The great news is that Statistics enrolments have gender parity, whereas for MCIS there are three males for every female.



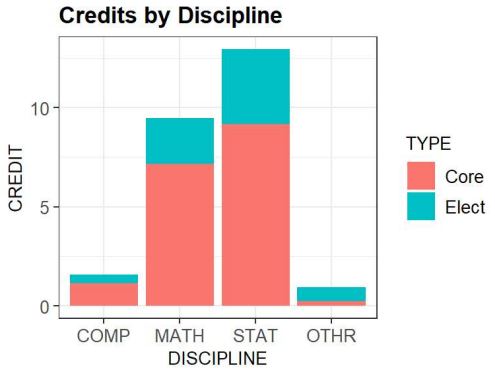


PROGRAM DATA

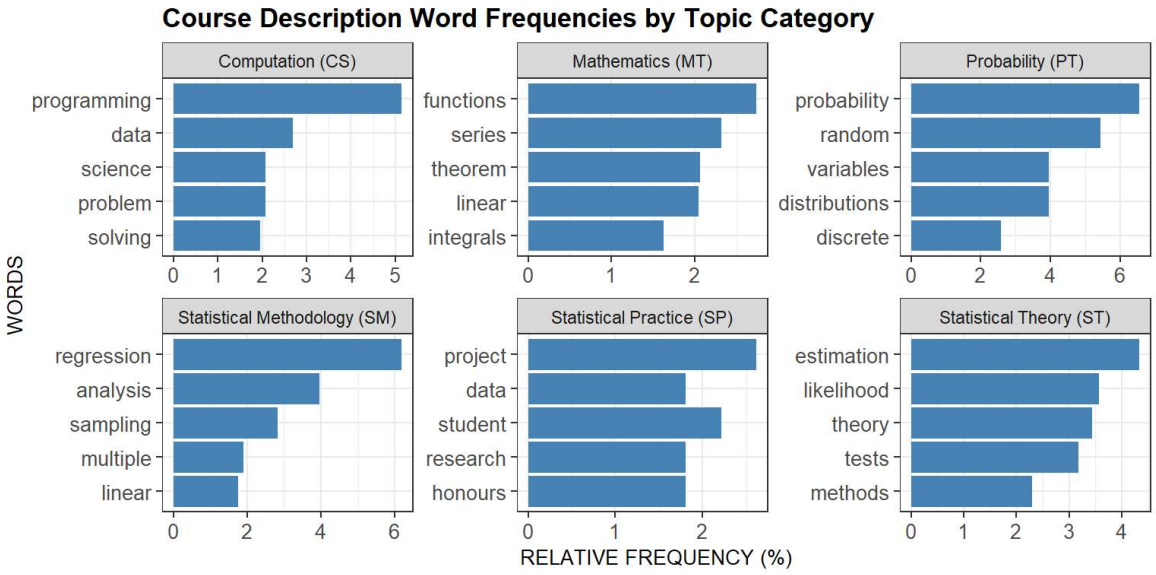
In this section we examine the structure of Statistics curricula in Canada. The 24 programs in the study are listed in the plot below, labeled by offering institution and grouped by region. The horizontal bars represent the number of required credits (equivalent to semester courses) broken down by requirement type (core or elective). The average program requires 25 courses, of which around 18 are core and 7 are electives.



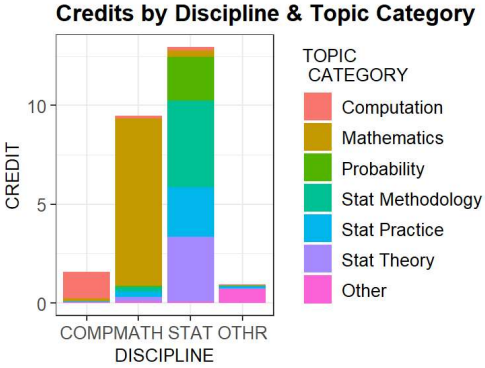
Next, we examine the distribution of course requirements by discipline. The following barplot on the left presents the average number of credits by discipline and type. Out of the 25 courses that are required on average, roughly 13 are offered by Statistics, 9.5 by Mathematics, 1.5 by Computer Science and 1 by other disciplines. The plot on the right shows the typical sequence of course requirements over the length of a program. The horizontal axis represents the level (year of study) at which a requirement is offered, and the vertical axis represents the average number of credits across programs. It seems that most programs are heavy on mathematics courses in the first two years, after which they are dominated by statistics courses. Computer science courses are almost exclusively taken in the first year, and the same is true for courses from other disciplines. It is interesting to note that there is fewer than a single statistics course offered, on average, in the first year of the statistics programs.

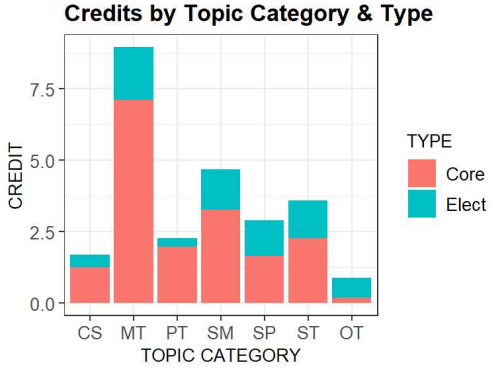


The offering discipline provides a relatively rough idea of what is covered in a course, as certain material can be offered under various course codes. For this reason, we created a new variable to describe the contents of a course. We used six descriptive topic categories and an extra one for everything else, and we tagged each course requirement with one or more topic categories, based on its calendar description. The six topic categories we used are presented below, together with the five most frequent terms in their calendar descriptions. Our assignment is necessarily subjective, but the plot gives a better sense of what each category represents.



We now present the results of our course categorization. The barplot on the left shows the breakdown of course credits by topic category and discipline. All topics are almost exclusively offered by a single discipline and the most interesting one is Probability. Although Probability Theory is a branch of (Applied) Mathematics, it is primarily taught under a Statistics course code. This brings the average number of mathematics-related credits on par with statistics, at around 11 credits. The barplot on the right presents the number of credits per topic category, broken down by type. Mathematics and Probability Theory consist of mostly core requirements, whereas Statistical Practice is the least developed of the Statistics topics.





Summary and Conclusions

Statistics is experiencing a period of rapid growth, with university enrolments increasing at double-digit rates. The majority of statisticians in Canada come from BSc programs, which has important implications for how and what we teach our undergrads. Ontario has a higher proportion of statistics students compared to other provinces, but the gender ratio in the discipline is balanced. In terms of undergraduate programs, most curricula have extensive Mathematical components and a relatively theoretical focus. There are typically few courses in Statistics during the first two years of study, and after that there is more emphasis on statistical methodology and theory.

Given our results, and the role that undergraduate education plays in preparing students for the statistical profession, we make **three broad recommendations** for undergraduate curricula:

1. *Offer more statistics courses*. Statistical topics, rather than mathematical ones, should constitute the bulk of the curriculum.
2. *Offer statistics courses early on*. Students should be introduced to the main concepts and uses of Statistics from the start, and they should continue to refine them throughout their studies.
3. *Place more emphasis on Statistical practice*. Students should be given multiple opportunities to apply Statistics in real settings, and develop relevant communication, collaboration and computing skills.

Acknowledgements

We would like to thank Olivia Rennie for her excellent research support in collecting program data.

1. http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5017↩

2. For enrolments: https://open.canada.ca/data/en/dataset/f4ee8c35-ac77-4b12-ace8-b6d8e0908eb1, and graduates: https://open.canada.ca/data/en/dataset/e7150d2d-63ee-42af-ae00-9914cf69a496↩

3. https://www.statcan.gc.ca/eng/rtra/rtra↩

4. http://www.statcan.gc.ca/eng/subjects/standard/cip/2011/index↩

5. https://github.com/damouras/SoSE_liaison↩

6. Values for 2015 are rounded to a hundred, due to RTRA's new controlled rounding system.↩

7. https://ncsesdata.nsf.gov/webcaspar/index.jsp?subHeader=WebCASPARHome↩

Sotirios Damouras & Sohee Kang

Perceptions of retirement could have negative impacts

The perceptions of retirement could have negative impacts. Not only do Canadians nearing retirement or already retired expect to work longer, but a majority of them believe they'll have low liquid retirement assets.

PhD candidate **Saisai Zhang** and professors **Mary Hardy and David Saunders** of the University of Waterloo conducted the 2016 Ontario Retirement Survey (ORS). The report examines the retirement concerns and risk preferences of 1,000 randomly selected Ontario pre-retirees and retirees aged 50 to 80. "Canadians nearing retirement, or already retired, are not optimistic about their financial futures," said Hardy. "As our retirement population grows, governments and plan sponsors need to make sure that there are checkpoints in place to protect Canada's economic security."

Previously pre-retirees estimated that they would retire around the age of 60. Now on average pre-retirees expect to retire at 65. Despite the fact that these subjects will have five more years to work, they're also likely to live longer. The survey found that the respondents are underestimating

the chances that they will survive to the age of 95, which could hamper their financial security late in life.

The majority of respondents already have concerns about their financial security with 61% of respondents expecting that they will have low liquid retirement assets. More alarmingly, 10 % of respondents anticipate having less than $25,000 in total liquid and property retirement assets.

Respondents were also asked about income expectations, bequest motives, positions on life annuities, as well as the likelihood of seeking professional financial advice when planning for retirement.

After analyzing responses, the researchers discovered **three key areas** of interest that require further observation: **(1)** the preferences and objectives of Canadian retirees, **(2)** the level of wealth in retirement or pre-retirement savings, as well as **(3)**the difference between expectations and experience of retired Canadians. More research in these areas could help ensure the financial well-being of all Canadians.

The paper, Retirement Consumption, Risk Perception and Planning Objectives, was released by the Canadian Institute of Actuaries on June 29, 2018.

CANSSI News and Deadlines

CANSSI INCASS

Canadian Statistical Sciences Institute
Institut canadien des sciences statistiques

Data • Discoveries • Decisions
Données • Découvertes • Décisions

CANSSI CRTs in CJS!

The *Canadian Journal of Statistics* will feature CANSSI research in a special section of its first issue in 2019. Six papers from Collaborative Research Teams have undergone the usual peer review process and are on their way to press. Thanks are due to **Mary Thompson**, the guest editor for the special section, and **Grace Yi,** the editor of *CJS,* for their work in making this happen.

ASA DataFest Support for CANSSI Members

This year's ASA DataFest promises to be very exciting. Teams of undergraduates will spend two days wrangling data and preparing a presentation as part of this competition. CANSSI member institutes can apply for $1000 in support towards hosting this event. The organizer must be a faculty or staff member at one of these institutions. The dataset, rules and structure of the event

are provided by the ASA. To register your institution's intent to host a local ASA DataFest event, please register here **no later than January 3, 2018**. To apply for CANSSI funding to help host this event, use the template application available here.

CANSSI Headquarters Grand Opening

CANSSI is very pleased to open our new headquarters at Simon Fraser University. We're planning some exciting activities as part of our Grand Opening Celebration this December 6-7. The official ribbon cutting ceremony will take place the morning of December 7. Please join us while we celebrate this momentous occasion.

We're Hiring!

The Department of Statistics and Actuarial Science at Simon Fraser University (SFU), in partnership with the Canadian Statistical Sciences Institute (CANSSI), is seeking applications for a faculty member at the rank of Professor, who will serve as the Scientific Director of CANSSI. The appointment as Scientific Director is for a five-year term. The appointee will be nominated for a Tier 1 Canada Research Chair.

Learn more about the position and how to apply here.

SAMSI Undergraduate Workshops

We're sending three undergraduates to SAMSI's October workshop this year. Students who have gone in the past have all returned and told us what a great experience it was. The next deadline is **January 10, 2019** for the February workshop. Learn more here.

Upcoming Deadlines

- Call for Proposals for the Distinguished Visitor Program – due **November 30, 2018**
- ASA Datafest Applications – due **January 3, 2019**
- RSVP for Collaborative Research Team Project Proposal Webinar – due **January 9, 2019**
- SAMSI Undergraduate Workshop Support – due **January 10, 2019**
- Webinar about the CRT Proposal Writing Process – **January 23, 2019**
- CANSSI Call for Postdoctoral Fellowship Positions – due **January 31, 2019**
- Call for Workshop and Conference Proposals – due **February 15, 2019**
- Call for Collaborative Research Team Project LOIs – due **April 30, 2019**
- Call for Proposals for the Kick Start Research Program – applications accepted at any time
- Support for Undergraduate Datathons – applications accepted at any time

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News from the University of British Columbia

It is with great pleasure that the Department of Statistics at the University of British Columbia welcomes Assistant Professor **Trevor Campbell.**

Trevor received his PhD from MIT in 2016. His research focuses on automated, scalable Bayesian inference algorithms, Bayesian nonparametrics, streaming data, and Bayesian theory. To learn more, visit his webpage: https://www.stat.ubc.ca/users/trevor-campbell

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News from University of Toronto

The Department of Statistical Sciences at the University of Toronto has recently advertised its rapid expansion in (research) depth and (expertise) width (for a brief warm-up, see *Growing pains and Gains in Statistics - the Toronto Way*, Liaison 32.4, 2018). After "talking a good game", we are extremely pleased to welcome six outstanding new colleagues who will help us play one too!

Monica Alexander (Assistant Professor in the Department of Statistical Sciences and the Department of Sociology, University of Toronto) received her PhD in Demography at the University of California, Berkeley, in 2018. Her research interests include statistical demography, mortality and health inequalities, and small-area population issues. Monica has worked on research projects with the World Health Organization, UNICEF, the Bill and Melinda Gates Foundation, and the Human Mortality Database. She has also been a Fellow at Data Science for Social Good and a research officer at the ANU's Centre for Aboriginal Economic Policy Research.

Murat Erdogdu (Assistant Professor in the Department of Statistical Sciences and the Department of Computer Science, University of Toronto; Faculty Member of the Vector Institute) has been a postdoctoral researcher at Microsoft Research - New England lab. In 2017 he earned his PhD from the Department of Statistics at Stanford University. Murat has an MS degree in Computer Science from Stanford, and BS degrees in Electrical Engineering and Mathematics, both from Bogazici University. His research interests include optimization,

machine learning, statistics, applied probability, and connections among these fields.

Nathalie Moon (Assistant Professor, Teaching Stream, in the Department of Statistical Sciences, University of Toronto) obtained her PhD in Biostatistics from the University of Waterloo earlier this year. She also holds an MMath in Biostatistics from the University of Waterloo (2013) and a BScH in Statistics from Queen's University (2011). Nathalie's research focuses on the design of life history studies, with particular interest in studying the progression of chronic diseases using multi-state modeling approaches.

Linbo Wang (Assistant Professor in the Department of Statistical Sciences, University of Toronto, and the Department of Computer and Mathematical Sciences, University of Toronto Scarborough) received a PhD in Biostatistics from the University of Washington in 2016, and a postdoctoral fellowship in the Department of Biostatistics at Harvard University. Linbo's research interests include causal modeling, missing data, graphical models and robust inference in infinite-dimensional models. He is currently interested in discovering the causal structures underlying complex statistical dependencies. His methodological contributions have found useful applications in public health and social sciences.

Ting-Kam Leonard Wong(Assistant Professor in the Department of Statistical Sciences, University of Toronto, and the Department of Computer and Mathematical Sciences, University of Toronto Scarborough) completed his PhD in Mathematics at the University of Washington in 2016 after which he was a non-tenure track Assistant Professor at the University of Southern California. His research interests include probability, mathematical finance, as well as the geometry of information. In particular, he is trying to apply optimal transport and geometry to design robust investment algorithms.

Yuchong Zhang (Assistant Professor in the Department of Statistical Sciences, University of Toronto) has received her BSc in Mathematics from the Chinese University of Hong Kong in 2010, and her PhD in Applied and Interdisciplinary Mathematics from the University of Michigan in 2015. Before joining U of T in 2018 she worked at Columbia University as a Term Assistant Professor. Her main research interests include stochastic optimal control, mathematical finance, game theory and applied probability. Yuchong has published several papers on fundamental theorem of asset pricing and optimal investment problems under model uncertainty and/or transaction costs, and more recently, on mean field games and its interaction with economics. She was the winner of the 2016 SIAG/FME Conference Paper Prize.

Radu Craiu, Chair of the Department of Statistical Sciences at the University of Toronto

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News from McGill University

On September 21, 2018, the Biostatistics and Statistics graduate students at McGill University hosted the second annual **(Bio)Statistics Research Day and Career Panel.** The day featured three keynote speakers: **Luke Bornn** (SFU and Sacramento Kings), **Joelle Pineau** (McGill University and Facebook), and **James Robins** (Harvard School of Public Health). There were also several student and postdoc presentations, and the day concluded with a career panel and a networking wine and cheese.

The event was attended by more than 90 participants, and was entirely student-run (Organizing committee: Simon Chatelain, Steve Ferreira, Yu Luo and Guanbo Wang) with financial support from CANSSI, the departments of Mathematics & Statistics and Epidemiology, Biostatistics & Occupational Health, the McGill Health Statistics Training Network, and the Post-Graduate Students' Society of McGill University.

News from the University of Waterloo

It is with great pleasure that the Department of Statistics and Actuarial Science at the University of Waterloo welcomes Professor Jeroen de Mast and Assistant Professor Peijun (Perry) Sang.

Jeroen is a visiting full professor who will be in Waterloo every Fall term for the next number of years. He received his PhD in Industrial Statistics from the University of Amsterdam in 2002 and until recently was also a professor in the Business School at the University of Amsterdam. His research expertise covers operations management, operations strategy, industrial statistics, quality and reliability engineering, product and process design, project and process management and organizational change. He also has extensive experience as an industry/business consultant.

Perry is a tenure-track assistant professor. He received his PhD in Statistics from Simon Fraser University in 2018. His research interests include functional data analysis, high dimensional regression, copula modeling and risk analysis.

University of Waterloo receives $3.7 million grant

The University of Waterloo's Laboratory for Knowledge Inference in Medical Image Analysis (Kimia Lab) recently announced that its AI project for digital pathology has been awarded a grant by the Ontario Research Fund – Research Excellence program (ORF-RE). The project aims to develop an intelligent search engine for digital pathology that can retrieve relevant cases from large archives, auto-caption the images and facilitate consensus building.

“Digital pathology has opened new horizons in medical diagnosis” says Professor Hamid Tizhoosh, the director of Kimia Lab and the principal investigator of the project. “At the same time, we have been witnessing the rise of artificial intelligence technologies in recent years that could be applied to discover and exploit the collective wisdom in the big image data”. The project, entitled “Computational Peer Review through Identification and Captioning of Gigapixel Digital Pathology Scans” is entirely focused on using, fine-tuning and designing AI algorithms for whole-slide imaging.

The Ontario government will fund the 5-year project with a grant in amount of $3.2M. Huron Digital Pathology, as the industrial partner of Kimia Lab, will contribute $500k to the project. The company is the only Canadian manufacturer of digital scanners for pathology. Four professors from the University of Waterloo (Mark Crowley, Ali Ghodsi, Oleg Mikhailovich, and Hamid Tizhoosh), together with the machine learning group at the University of Guelph led by professor Graham Taylor (Vector Institute), and professor Shahryar Rahnamayan (UOIT) will collaborate with three hospitals to design and test an advanced search engine for large pathology archives. Grand River Hospital (Kitchener, ON), Southlake Regional Health Centre (Newmarket, ON) and University of Pittsburgh Medical Center (PA, USA) will not only provide data but also validate the results of the project.

"We regard this as an exciting and historic opportunity to contribute to the improvement of the healthcare system in such a sensitive and significant field as pathology" adds Tizhoosh, "specially at this point of time when the research in artificial intelligence has started to yield practical results."

The Laboratory for Knowledge Inference in Medical Image Analysis (Kimia Lab), a member of Waterloo Artificial Intelligence Institute, conducts research at the forefront of mass image data in medical archives using machine learning schemes with ultimate goal of extracting information that cannot only support a more speedy and accurate diagnosis and treatment of many diseases but also establish new quality assurance based on mining of existing evidence.

KIMIA Lab
Laboratory for Knowledge Inference in Medical Image Analysis

Source: Daily Bulletin

Society of Actuaries Research Grant Awarded

SOCIETY OF ACTUARIES

UNIVERSITY OF WATERLOO

The **University of Waterloo** has won the 2017 Centers of Actuarial Excellence (CAE) grant competition. The university has been awarded a research grant of USD $297,000 on a 3-year project entitled "Maintaining Financial Stability in an Era of Changing Climate and Demographics". This project is intended to develop models and pricing methods and to create new risk measures and risk management solutions pertaining to changes with the climate and demographics. Professor Johnny Li is the project's principal investigator.

The National Institute of Statistical Sciences (NISS) Award Granted

NISS NATIONAL INSTITUTE OF STATISTICAL SCIENCES

Matthias Schonlau of the University of Waterloo is the 2018 winner of the NISS Distinguished Alumni Award. The National Institute of Statistical Sciences is the US-based National Institute of Statistical Sciences. Prior to his appointment as full professor at the University of Waterloo in 2011, Matthias worked at the RAND Corporation in Pittsburgh, PA and in Santa Monica, CA for 12 years.

His citation reads: “Honoring his distinguished career as a research statistician in both industry and academia, especially his contributions in the area of survey methodology.”

Job Announcement - University of Waterloo

DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE

UNIVERSITY OF WATERLOO

Open Position in Actuarial Science

The Department of Statistics and Actuarial Science in the Faculty of Mathematics at the University of Waterloo is in an exciting period of expansion and invites applications for one **Assistant Professor position in Actuarial Science.** In very special cases, Associate or Full Professor with tenure may be considered. Candidates must have a PhD in an area of the actuarial, statistical or mathematical sciences or mathematical finance, and have research interests in actuarial science, finance or related disciplines. Professional actuarial qualifications and experience, although not strictly necessary, would be a distinct asset. Applicants must also have potential or proven ability to develop an internationally recognized research program, excellent communication skills, and a strong commitment to teaching at the graduate and undergraduate levels. The expected start date for this position is July 1, 2019 though the actual start date is flexible.

The University of Waterloo is one of Canada’s leading universities with more than 30,000 full and part-time students in undergraduate and graduate programs. The Department of Statistics and Actuarial Science is one of the top academic units for the statistical and actuarial sciences in the world and is home to close to 50 research active full-time faculty and close to 200 graduate

students in programs including Statistics, Biostatistics, Data Science, Quantitative Finance and Actuarial Science. The department offers a vibrant research environment for a wide range of areas including risk management, finance, ruin theory, mathematical statistics, analysis of longitudinal and event history data, statistical learning, data science, survey methods, industrial statistics, and interdisciplinary collaborative work. The department benefits from close relationships with several research groups on campus including the Waterloo Research Institute in Insurance, Securities and Quantitative Finance.

The Department has the distinct feature of offering both Masters and PhD degrees in Actuarial Science, including the professional Masters of Actuarial Science, which delivers an elite, fast-tracked education in actuarial science and practice. In addition, the Department also offers a Masters in Quantitative Finance. Departmental strengths in the actuarial science group cover a wide range of research topics including risk and ruin theory, quantitative finance, risk management in insurance and finance, longevity risk and pensions, solvency management, financial modeling and computational methods. The University of Waterloo is also designated as a Center of Actuarial Excellence by the Society of Actuaries, and was on the inaugural list of universities fully accredited by the Canadian Institute of Actuaries.

Interested individuals should apply using MathJobs(www.mathjobs.org/jobs). Applications should include a cover letter, a curriculum vitae, research and teaching statements, teaching evaluation summaries (if available) and up to three reprints/preprints. In addition, applicants should arrange to have at least three reference letters submitted on their behalf. Completed applications will be reviewed on an ongoing basis. The application deadline is December 7, 2018. The salary offered will be commensurate with qualifications and experience. The salary range for this position is $110,000 to $150,000. Negotiations beyond this salary range will be considered for exceptionally qualified candidates.

If you have any questions regarding the position, the application process, assessment process, eligibility, or a request for accommodation during the hiring process, please contact:

Stefan Steiner, Chair
Department of Statistics and Actuarial Science
University of Waterloo
200 University Avenue West, Waterloo ON N2L 3G1, CANADA
sas-chair@uwaterloo.ca

The University of Waterloo regards diversity as an integral part of academic excellence and is committed to employment equity and accessibility for all employees. As such, we encourage applications from women, Indigenous (First Nations, Métis and Inuit) peoples, persons with

disabilities, members of diverse gender identities, and others who may contribute to the further diversification of ideas. At Waterloo, you will have the opportunity to work across disciplines and collaborate with an international community of scholars and a diverse student body, situated in a rapidly growing community that has been termed a "hub of innovation". All qualified candidates are encouraged to apply; however, Canadians and permanent residents will receive priority in the recruitment process.

Three reasons to apply: https://uwaterloo.ca/faculty-association/why-waterloo

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More Job Announcements - University of Waterloo

DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE

UNIVERSITY OF WATERLOO

Open Positions in Statistics, Biostatistics or Data Science

The Department of Statistics and Actuarial Science in the Faculty of Mathematics at the University of Waterloo is in an exciting period of expansion and invites applications for **five Assistant Professor**positions, subject to budget approval. Tenured appointments at the Associate and Full Professor level are possible as circumstances warrant. Interested candidates from **any area of Statistics, Biostatistics or Data Science** are encouraged to apply. Requirements include a PhD in Statistics, Biostatistics or related areas, a potential or proven ability to develop an internationally recognized research program, excellent communication skills, and a strong commitment to teaching at the graduate and undergraduate levels. The expected start date for these positions is July 1, 2019 though the actual start date is flexible.

The University of Waterloo is one of Canada's leading universities with more than 30,000 full and part-time students in undergraduate and graduate programs. The Department of Statistics and Actuarial Science is one of the top academic units for the statistical and actuarial sciences in the world and is home to close to 50 research active full-time faculty and close to 200 graduate students in programs including Statistics, Biostatistics, Data Science, Quantitative Finance and Actuarial Science. The department offers a vibrant research environment for a wide range of areas

including statistical theory, applied probability, analysis of longitudinal and event history data, methods for incomplete data, statistical learning, data science, computational statistics, finance and risk management, survey methods, industrial statistics, and interdisciplinary collaborative work. The department benefits from close relationships with many research groups on campus including the Survey Research Centre, the Business and Industrial Statistics Research Group, the Computational Statistics Research Group, the Waterloo Research Institute in Insurance, Securities and Quantitative Finance, the School of Public Health and Health Systems, the Propel Centre for Population Health Impact, the Interdisciplinary Centre on Climate Change, and the Centre for Theoretical Neuroscience.

Interested individuals should apply using MathJobs(www.mathjobs.org/jobs). Applications should include a cover letter, a curriculum vitae, research and teaching statements, teaching evaluation summaries (if available) and up to three reprints/preprints. In addition, applicants should arrange to have at least three reference letters submitted on their behalf. Completed applications will be reviewed on an ongoing basis. The application deadline is December 7, 2018. The salary offered will be commensurate with qualifications and experience. The salary range for these positions is $110,000 to $150,000. Negotiations beyond this salary range will be considered for exceptionally qualified candidates.

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Job Announcements - York University

ASSISTANT PROFESSOR (PROFESSIORIAL STREAM) APPOINTMENT

The Department of Mathematics and Statistics, Faculty of Science, invites applications for a tenure-track professorial-stream appointment in statistics at the Assistant Professor level, to commence July 1, 2019. Salary will be commensurate with qualifications and experience. All York University positions are subject to budgetary approval.

The successful candidate must have a PhD in Statistics, a proven record of independent research excellence and evidence of excellence or the promise of excellence in teaching. The successful candidate will be expected to develop an excellent and innovative research program, building on the current strengths of the Department. Outstanding candidates in any area of statistics will be considered with particular emphasis on machine learning, high dimensional data analysis, data science and artificial intelligence.

The successful candidate must be suitable for prompt appointment to the Faculty of Graduate Studies. The position will involve graduate teaching and supervision, as well as undergraduate teaching. Pedagogical innovation in high priority areas such as experiential education and technology enhanced learning is preferred.

The deadline for receipt of completed applications is **December 1, 2018**. Only applications received through the AMS MathJobs website, www.mathjobs.org, will be considered. Applicants will be asked to provide three signed letters of reference, a statement on teaching, a statement on research and a covering letter. Applicants wishing to self-identify can do so by downloading, completing and submitting the forms found at: http://acadjobs.info.yorku.ca/. Please select the Affirmative Action tab under which forms pertaining to Citizenship and AA can be found.

York University is an Affirmative Action (AA) employer and strongly values diversity, including gender and sexual diversity, within its community. The AA program, which applies to Aboriginal

people, visible minorities, people with disabilities, and women, can be found at http://yorku.ca/acadjobs or by calling the AA office at 416-736-5713. All qualified candidates are encouraged to apply; however, Canadian citizens, Permanent Residents and Indigenous peoples in Canada will be given priority.

TEACHING-FOCUSED (ALTERNATE STREAM) APPOINTMENT

Applications are invited for one tenure-track, alternate stream (teaching-focused) appointment at the Assistant Lecturer level in the Department of Mathematics and Statistics at York University to commence July 1, 2019.

The successful candidate must have a PhD in the mathematical sciences, experience in curriculum development of undergraduate courses in mathematics or statistics, and provide evidence of excellence in classroom teaching. As a teaching-focused appointment, applicants will demonstrate excellence or clear potential for excellence in teaching and have strong motivation and proven dedication to using innovative, effective evidence-based approaches to teaching mathematics and statistics at the university level. Pedagogical innovation in high priority areas such as experiential education and technology-enhanced learning is preferred. The successful candidate is also expected to provide evidence of service contributions or potential to contribute to service in administrative and committee work.

Applications must be received by **December 1, 2018.** Only applications received through the AMS MathJobs website, www.mathjobs.org, will be considered. Applicants will be asked to provide three signed letters of reference, a statement on teaching and a covering letter. Applicants may provide a teaching dossier but, if this is not possible, the covering letter should provide a very brief description of the teaching dossier. Those applicants invited to give interviews will be asked to present their teaching dossiers on the day of the interview. Referees should be advised to address the candidate's qualifications and experience in relation to the position.

Applicants wishing to self-identify can do so by downloading, completing and submitting the form found at: http://acadjobs.info.yorku.ca/. Once this form has been signed it can be uploaded to MathJobs. Please select the "Affirmative Action" tab under which forms pertaining to Citizenship and AA can be found.

Salary will be commensurate with qualifications and experience. All York University positions are subject to budgetary approval.

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