Job advertisement for CRC-1 in Mathematics of Large Data Sets and Machine Learning

Faculty Position – Department of Mathematics in the Faculty of Science at the University of British Columbia, Vancouver.

Posting date: April 1, 2025

Position Overview
We seek an internationally recognized mathematics research leader for a **Tier 1 NSERC Canada Research Chair** position in the **mathematics of large data sets and machine learning**. The successful candidate will be eligible to hold a **tenured** appointment at the rank of **Associate Professor or Professor** in the **Department of Mathematics** at the University of British Columbia (UBC). The anticipated start date is **January 1, 2026**, or as soon as possible thereafter.

Research Focus and Expertise
The Chair will lead an internationally competitive research program in the mathematical foundations of analyzing and interpreting large-scale, high-dimensional data, with applications to modern machine learning. We seek candidates with expertise in mathematical techniques central to **compressed sensing, optimization, numerical linear algebra, and randomized algorithms for high-dimensional data analysis**. Specific topics of interest include:

- **Compressed sensing and sparse recovery** – Development of novel theoretical and algorithmic frameworks for signal reconstruction from **incomplete or noisy measurements**, including structured sparsity models and stochastic methods.
- **Numerical and randomized linear algebra** – Scalable algorithms for solving large-scale **least squares problems, low-rank approximations, and matrix completion**, with applications to high-dimensional data processing.
- **Optimization for machine learning** – Advances in **stochastic and convex optimization, iterative algorithms (e.g., gradient-based methods, iterative hard thresholding), and provable guarantees for deep learning and neural networks**.
- **High-dimensional probability and statistical learning theory** – Theoretical insights into **the behavior of machine learning models on large, structured data sets**, including generalization bounds and sample complexity analysis.
- **Applications in imaging, signal processing, and biomedical data analysis** – Development of novel techniques for **MRI and medical imaging reconstruction, high-dimensional genomics data, and robust learning methods in computational biology and engineering**.

The successful candidate will enhance UBC's growing research community in applied and computational mathematics, including collaborations in mathematical machine learning, data-driven modeling, and interdisciplinary applications.

Responsibilities
The **Tier 1 Chair** is expected to:

- **Lead an internationally recognized research program** in the mathematics of large data sets and machine learning.

- Provide leadership in **mentoring junior faculty, postdoctoral fellows, and graduate students** in mathematical data science.
- Attract and manage **major external research funding** to support an innovative research team.
- Collaborate across disciplines in areas such as **mathematical machine learning, optimization, and signal processing**.
- Teach and supervise undergraduate and graduate students in mathematics.
- Engage in academic service and outreach, including initiatives to increase **equity, diversity, and inclusion (EDI)** in mathematical sciences.

Required Qualifications
Candidates must have:

- A **Ph.D. in Mathematics** or a closely related field.
- An **outstanding record of research excellence** in compressed sensing, optimization, numerical linear algebra, or related fields relevant to large-scale data analysis.
- Demonstrated ability to attract **substantial external research funding** and build strong research teams.
- A strong commitment to **excellence in teaching and mentoring** at both undergraduate and graduate levels.
- The successful candidate will have a strong commitment to equity, diversity and inclusion, to create a welcoming community for all, particularly those who are historically, persistently or systemically marginalized.
- Experience in engaging with broader scientific communities and interdisciplinary collaborations.

The starting salary for this position will be commensurate with experience, in the range of $200,000-$250,000.

Canada Research Chair Eligibility
Applicants must meet the eligibility requirements for a **Tier 1 Canada Research Chair**. Tier 1 nominees must be **Full Professors or Associate Professors** who are expected to be promoted to Full Professor within one or two years of nomination. The **Canada Research Chairs Program** supports exceptional scholars in areas that advance UBC's strategic research priorities. All Chair nominations are subject to review and final approval by the CRC Secretariat. More details on **eligibility criteria** are available at the Canada Research Chairs website.

In accordance with UBC's CRC Equity, Diversity, & Inclusion Action Plan [https://research.ubc.ca/federal-research-chair-programs/canada-research-chairs/ubcs-commitment-equity-diversity-and] and pursuant to Section 42 of the BC Human Rights code, the selection will be restricted to members of any of the following federally designated groups: Indigenous Peoples, racialized people, people with disabilities, and/or women and gender equity-seeking groups. Applicants to CRC positions are asked to complete this equity survey [https://ubc.ca1.qualtrics.com/jfe/form/SV_6WJHol7SfPxRMu9); as part of the application, and candidates from these groups must self-identify as belonging to one or more of the federally designated groups to be considered for the position. Candidates must also provide their name in the survey to be considered.

Personal information is collected under the authority of sections 26(a), 26(c) and 26(e) of the BC Freedom of Information and Protection of Privacy Act. The information you provide will be used to determine whether you qualify for participation in this restricted process, and to advance accessibility, equity, and fair adjudication in this process. Data will be collected by the Equity & Inclusion Office and only the names of those eligible for the search process will be shared confidentially with the search committee. All responses will be stored in a secure database.

Application Procedure
Applicants should submit the following materials via the **MathJobs online portal** (link here):

- **Cover letter** outlining interest in the position.
- **Curriculum vitae** including a full list of publications.
- **Research statement** describing current work and future research plans.
- **Teaching and mentorship statement** detailing teaching philosophy and student supervision experience.
- **Diversity statement** (1 page) describing your lived background experience (if comfortable), and your past experience and future plans regarding working with a diverse student body, and contributing to a culture of equity and inclusion.
- **References** – names and contact information of at least four referees.

For application related enquiries please contact Allen Yang at exec-coord@math.ubc.ca

Application Deadline: May 2nd, 2025

Our department:
The Department of Mathematics at UBC is recognized as one of the largest and strongest in Canada, with research strengths across many fields of pure and applied mathematics. We have close connections with many other units in the Faculties of Science, Engineering, Medicine, and others on campus, through our extensive teaching and research activities. UBC hosts the headquarters of the Pacific Institute for Mathematical Sciences (pims.math.ca) which supports mathematical research activities locally and across Western Canada. UBC's campuses are located on the traditional, ancestral, and unceded territories of the Syilx (Okanagan) Peoples and of the Coast Salish Peoples, including the territories of the xwməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and Stó:lō and Səl̓ílwətaʔ/Selilwitulh (Tsleil Waututh) Nations.

UBC hires on the basis of merit and is committed to employment equity. Equity and diversity are essential to academic excellence. An open and diverse community fosters the inclusion of voices that have been underrepresented or discouraged. Inclusion is built by individual and institutional responsibility through continuous engagement with diversity to inspire people, ideas, and actions for a better world. We encourage applications from members of groups that have been marginalized on any grounds enumerated under the B.C. Human Rights Code, including sex, sexual orientation, gender identity or expression, racialization, disability, political belief, religion, marital or family status, age, and/or status as a First Nation, Métis, Inuk, or Indigenous person. UBC acknowledges that certain circumstances may cause career interruptions that legitimately affect an applicant's record of research or educational leadership achievement. We encourage applicants to note in their applications whether they would like consideration given to

the impact of any circumstances, such as those due to health or family reasons, in order to allow for a fair assessment of their research productivity.

All qualified candidates are encouraged to apply; however Canadian citizens and permanent residents will be given priority, and members of historically marginalized groups will be given special consideration.

The University is committed to creating and maintaining an accessible work environment for all members of its workforce. Within this hiring process we will make efforts to create an accessible process for all candidates (including but not limited to disabled people). Confidential accommodations are available on request by contacting Allen Yang by email at exec-coord@math.ubc.ca. To learn more about how the University is working to create a more inclusive working and learning environment, please see the UBC Inclusion Action Plan's goals related to recruitment and retention at: https://equity.ubc.ca/stear-framework-and-roadmap-for-change/

If you have any questions regarding accommodations or accessibility during the recruitment and hiring process or for more information and support, please visit UBC's Center for Workplace Accessibility website at https://hr.ubc.ca/health-and-wellbeing/workplace-accessibility/centre-workplace-accessibility or contact the Centre at workplace.accessibility@ubc.ca.