IOTO-Mitacs Post-doctoral Fellowship

Drs. Max Turgeon and Alexandre Leblanc, from the Department of Statistics, in partnership with IOTO International Inc., seek to hire a post-doctoral fellow to work on measuring performance of Canadian and American politicians using sparse multivariate methods.

Description of the position:

IOTO International Inc., a non-partisan analysis company that specializes in using artificial intelligence to gain insights from political data, collects and analyzes a variety of data on federal, state, provincial, and municipal legislators, as well as on the corresponding legislative proceedings. In this project, the intern will use different tools to understand the structure of complex high-dimensional data (including text data) and, ultimately, measure performance. Theoretical, methodological and computational tools related to the analysis of high-dimensional data will be central to the work.

In particular, to tackle problems related to ranking and measuring outlyingness for complex data, approaches relying on the concept of statistical depth functions will be investigated, including the suitability of common depth functions in the context of IOTO's data platforms. To tackle the problem of identifying structure in high-dimensional data, dimension reduction methods will be investigated as well, including different techniques related to Principal Components Analysis, and extended to handle issues associated with sparsity, robustness and missing data. By studying the structure of high-dimensional data through both lenses, this project aims at developing methodologies that provide new insights into performance.

More generally, with this project, the intern will help develop a robust and efficient computational pipeline that incorporates and integrates the above tools with IOTO's data platforms. From a research perspective, the intern will expand their computational skills and position themselves favourably in the rapidly evolving field of high-dimensional complex data analysis and, in particular, of text mining. The fellow will also develop industry experience, communication and project management skills, and be exposed to a fast-paced start-up environment. They will also develop important applied skills by working on real-world applications.

Qualifications: Minimum requirements:

- A PhD in Statistics or a relevant field, obtained within the last five (5) years.
- Extensive experience using a programming language (e.g. R or Python) to develop and implement statistical methodologies. Experience with Python specifically is considered an asset.
- Demonstrable communication skills.
- Prior exposure (beyond the basics) to any of the following will be considered an asset: analysis of high-dimensional data, data depth, dimension reduction techniques, analysis of text data, analysis of functional data.

Remuneration: $50,000-60,000 for one (1) year.

Duration: September 2021–August 2022 (inclusively).

To apply, please email your resume and cover letter describing your relevant experiences to `max.turgeon@umanitoba.ca` by August 22, 2021.