DSI Bits & Bytes

The UBC Data Science Institute Newsletter

Fall 2018

New DSI Funded Projects

In its second year, the ***Discovery Projects*** PDF Matching Program funded two new projects:

Automated diagnosis and prognostication of severity in COPD via deep learning frameworks using multi-modal data: This project awarded to Drs. Roger Tam and Leonid Sigal will build on the recent successes of advanced machine learning (ML) techniques applied to automated image analyses of medical scans in multiple medical fields to improve chronic obstructive pulmonary disease (COPD) diagnosis and prognostication. Specifically, this project will implement and test new frameworks based on deep learning to automate staging of COPD disease severity and to predict disease progression. The outcome of this project is the development of new machine learning tools to better support clinicians treating COPD patients.

Large-scale Bayesian modelling of drug resistance and evolution in human cancers at single-cell resolution: This project awarded to Drs. Alex Bouchard-Côté and Sohrab Shah aims to develop a suite of state-of-the-art Bayesian methods for learning from single-cell cancer genomics data to improve treatment efficacy. Specifically, it will focus on scalable inference to help address challenges such as how individual tumour cells mutate and evolve in response to drug therapy. Development of these tools will enable precision medicine by equipping clinicians the ability to better predict which treatment(s) will work best, and adjust appropriately, for each individual cancer patient.

New DSI Postdoctoral Fellows

We are excited to introduce our 2018/2019 DSI postdoctoral fellows below!

Kieran Campbell

Dr. Campbell received his DPhil (PhD) from the University of Oxford working on statistical models of single-cell transcriptomics. His research interest centres around Bayesian statistical modelling of moecular cancer data with a particular focus on understanding why certain cancer cells evade chemotherapy and cause relapse. He is working with Drs. Bouchard-Côté and Shah.

Sébastien Lallé

Dr. Lallé received his MsC and PhD in Computer Science from the Joseph Fourier University. His research interests lies in designing user models and personalized support in interactive computer systems, including intelligent tutoring systems and visualization-based interfaces. This also include user-adapted interaction, intelligent agents, affective computing, and eye-tracking data processing. He is working with Dr. Cristina Conti.

Lisa Tang

Dr. Tang obtained her PhD and BSc in Computing Science from Simon Fraser University. Her research interests include computer vision, machine learning, medical image analyses, and deep learning strategies. She is currently exploring the use of various deep learning architectures for the staging and prognosis of COPD using lung computed tomographic imaging data with Drs. Roger Tam and Leonid Sigal.

Huawei-DSI Research Program

This past May, the Data Science Institute and Huawei Canada entered into a three-year research partnership. This partnership will provide funding to data science research projects at UBC and support the development of talented postdoctoral fellows and graduate students. Below are three projects that are being funded by the Huawei-DSI Research Program:

Leveraging more accurate and flexible discourse structures in question-answering and summarization:
Dr. Giuseppe Carenini's team seek to improve discourse parsing performance and to apply discourse parsing outputs to improve the performance of other natural language processing tasks, with a specific focus on state-of-the-art approaches to Q&A systems and text summarization.

Computer vision and machine learning techniques for video and facial understanding:
In this project the team led by Drs. Leonid Sigal and Mark Schmidt are pursuing a number of research goals at the intersection of computer vision and machine learning. Specifically, it aims to advance the performance and runtime of computer vision tasks like recognition of objects, faces and even tasks.

Knowledge Graphs – Mining, Cleaning and Maintenance:
Dr. Laks Lakshmanan and his team are applying knowledge graphs (KG) for Q&A systems and computational fact checking by leverage the pattern search capabilities of a KG. They will mine publicly available documents—including structured sources such as tables and semi-structured data—and develop techniques for cleaning the KG and updating it in near real-time.

Data Science for Social Good 2018

The DSI offered the UBC Data Science for Social Good (DSSG) for a second year. This year, the summer research program brought together 10 UBC undergraduate and 6 graduate students from diverse backgrounds (e.g., computer science, engineering, geography, mathematics, medicine, physics, statistics) to work on collaborative data science projects with non-profit organizations such as the BC Centre for Disease Control and the City of Surrey. This year the projects focused on the topics of early childhood education, housing, sustainability, and public health. The talented teams of students were able to generate various tools and data platforms to help participating partner organizations look at their problems through a data lens.

The DSSG program was funded by Microsoft under the Cascadia Urban Analytics Cooperative.

Fore more details about the projects and program, please visit: https://dsi.ubc.ca/dssg

Welcome Hermie Lam to the DSI

This past summer, Hermie Lam joined the Data Science Institute as our new administrative assistant. We are very fortunate to have her join our team as she brings over a decade of UBC experience with finance, appointments, and research support to the DSI. Hermie may be familiar to many members of the DSI as she worked in the Computer Science Department as a Research Group Assistant prior to joining us. Hermie is located in the same space as Kevin (ICCS 353), feel free to drop by and say hi!

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