

**De:** Centre de recherches mathématiques [crm@crm.umontreal.ca](mailto:crm@crm.umontreal.ca)  
**Objet:** CONFÉRENCE PRIX CRM-SSC 2017 (26/01/2018, Lei Sun)  
**Date:** 22 janvier 2018 09:03  
**À:** Activités CRM [activites@crm.umontreal.ca](mailto:activites@crm.umontreal.ca)



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CONFÉRENCE PRIX CRM-SSC 2017

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CONFÉRENCIER(S) / SPEAKER(S) :  
Lei Sun (University of Toronto)

TITRE / TITLE :  
"Back to the future: why I think REGRESSION is the new black in genetic association studies"

LIEU / PLACE :  
CRM, UdeM, Pav. André-Aisenstadt, 2920, ch. de la Tour, salle 6254

DATE :  
Le vendredi 26 janvier 2018 / Friday, January 26, 2018

HEURE / TIME :  
15h30 / 3:30 p.m.

RESUME / ABSTRACT :  
Linear regression remains an important framework in the era of big and complex data. In this talk I present some recent examples where we resort to the classical simple linear regression model and its celebrated extensions in novel settings. The Eureka moment came while reading Wu and Guan's (2015) comments on our generalized Kruskal-Wallis (GKW) test (Elif Acar and Sun 2013, Biometrics). Wu and Guan presented an alternative "rank linear regression model and derived the proposed GKW statistic as a score test statistic", and astutely pointed out that "the linear model approach makes the derivation more straightforward and transparent, and leads to a simplified and unified approach to the general rank based multi-group comparison problem." More recently, we turned our attention to extending Levene's variance test for data with group uncertainty and sample correlation. While a direct modification of the original statistic is indeed challenging, I will demonstrate that a two-stage regression framework makes the ensuing development quite straightforward, eventually leading to a generalized joint location-scale test (David Soave and Sun 2017, Biometrics). Finally, I will discuss on-going work, with graduate student Lin Zhang, on developing an allele-based association test that is robust to the assumption of Hardy-Weinberg equilibrium and is generalizable to complex data structure. The crux of this work is, again, reformulating the problem as a regression!

COURTE BIOGRAPHIE / SHORT BIOGRAPHY :  
Lei Sun est professeure de statistique et biostatistique à l'Université de Toronto. Elle a étudié les mathématiques au Fudan University et obtenu son doctorat de l'université de Chicago en 2001. Le domaine de recherche du professeur Sun est la statistique génétique et la génomique, développant des méthodes statistiques et des outils de calcul pour résoudre des problèmes découlant d'études génétiques des traits humains complexes. Sa recherche est soutenue financièrement par le CRSNG et l'IRSC. Elle est lauréate du prix de statistique CRM-SSC 2017.

Lei Sun is a Professor of Statistics and Biostatistics at the University of Toronto. She studied mathematics at Fudan University and obtained her PhD in statistics from the University of Chicago in 2001. Dr. Sun's research area is in statistical genetics and genomics, developing statistical methods and computational tools to solve problems arising from genetic studies of complex human traits. Her research is funded by NSERC and CIHR. She is the recipient of the 2017 CRM-SSC prize in Statistics.

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Le café sera servi à 15h00 et une réception suivra la conférence au Salon Maurice-L'Abbé (salle 6245).  
Coffee will be served before the conference and a reception will follow at the Salon Maurice-L'Abbé (Room 6245).

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<http://www.crm.math.ca/Sun>

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