

The Working Group on Risk - CREAR, with the support of the IDS dpt, Institut des Actuaire, LabEx MME-DII and the group BFA (SFdS), has the pleasure to invite you to the Seminar by:

Prof. Richard SAMWORTH

Cambridge University, UK

December 20, 2017, 12:30pm – 1:30pm
EEE - ESSEC La Défense (CNIT) – Amphi 202

High Dimensional Change Point Estimation via Sparse Projection

Change points are a very common feature of 'big data' that arrive in the form of a data stream. We study high dimensional time series in which, at certain time points, the mean structure changes in a sparse subset of the co-ordinates. The challenge is to borrow strength across the co-ordinates to detect smaller changes than could be observed in any individual component series. We propose a two-stage procedure called inspect for estimation of the change points: first, we argue that a good projection direction can be obtained as the leading left singular vector of the matrix that solves a convex optimization problem derived from the cumulative sum transformation of the time series. We then apply an existing univariate change point estimation algorithm to the projected series. Our theory provides strong guarantees on both the number of estimated change points and the rates of convergence of their locations, and our numerical studies validate its highly competitive empirical performance for a wide range of data-generating mechanisms. Software implementing the methodology is available in the R package *InspectChangepoint*.

Financial support from ESSEC Research Center and LabEx MME-DII is gratefully acknowledged.



For any information, please contact
Frédérique JEAN-LOUIS
(01 34 43 32 49 / jeanlouis@essec.edu)

<http://crear.essec.edu/working-group-on-risk>



Prof. Richard SAMWORTH

Cambridge University, UK

Richard Samworth obtained his PhD in Statistics from the University of Cambridge in 2004, and has remained in Cambridge since, becoming a professor in 2013 and the Professor of Statistical Science in 2017. His main research interests are in nonparametric and high-dimensional statistics, including problems in shape-constrained inference, classification, variable selection and change point estimation, among others.

He has received several honours and awards for his work, including an IMS Medallion lecture (to be given in 2018), the Adams prize (2017, jointly with Graham Cormode), ASA Fellow (2015), IMS Fellow (2014), Philip Leverhulme prize (2014) and RSS Guy Medal in Bronze (2012).



For any information, please contact
Frédérique JEAN-LOUIS
(01 34 43 32 49 / jeanlouis@essec.edu)

<http://crear.essec.edu/working-group-on-risk>