Probability Day / Journée de probabilité

Organisateurs / *Organizers***:**
Bruno Rémillard (HEC) et Donald Dawson (Carleton)

Le vendredi 22 novembre 2002 / *Friday, November 22, 2002*

Centre de recherches mathématiques
Université de Montréal
Pavillon André-Aisenstadt
2920, chemin de la Tour
Salle de conférence / Lecture Room
5340

9 h 30 -10 h 30
Pierre del Moral, Université Paul Sabatier, Toulouse
"Annealed Feynman-Kac models"

Abstract: This talk is concerned with the concentration properties of Feynman-Kac semi-groups associated to a potential function and a cooling schedule. This question has been motivated by physical and engineering problems. In trapping analysis Feynman-Kac models represent the law of a physical particle motion in an absorbing medium. In this context the temperature parameter corresponds to the strength of the obstacles, the more it decreases the more stringent become the obstacles.

We characterize the limiting concentration levels in terms of a variational problem in distribution space expressing a competition between the exploration transitions and the potential pressure. We exhibit different rates of convergence in terms of the mixing properties of the particle free motion. We also present a Feynman-Kac-Metropolis model which can be interpreted as a nonlinear simulated annealing algorithm. In this context we show that for an sub-linear decreasing temperature schedule the algorithm concentrates on the set of global minima of the energy function.

10h30-11h00: pause santé / coffee break
salle / room 6245 (6e étage, 6th floor)

11 h -12 h
Gail Ivanoff, Université d'Ottawa
"Random clouds and censoring in survival analysis"

Abstract: The theory of optional stopping is extended to general adapted random sets called "clouds". In particular, a stopping theorem may be proven for martingales indexed by a class of sets. The theory may then be applied to survival analysis of spatial data censored by clouds. An analogue to the classical Nelson-Aalen estimator of the integrated hazard is defined and its asymptotic behaviour is studied.

14 h -15 h
Daniel Dufresne, Université de Montréal
"Some recent results on the integral of geometric Brownian motion"

Abstract: The integral of the exponential of Brownian motion from 0 to T occurs naturally in many applied problems. Its distribution has been studied more systematically over the last dozen years. The density has at least five known expressions (all relatively complicated), and a number of other results on transforms, recursive relationships, and so on, are also known. The talk will describe some of these results, and show how they can be reconciled. It will also be shown that the computational problem for small T has a very simple solution.

15 h -15 h 30: pause santé / coffee break
salle / room 6245 (6e étage, 6th floor)

15 h 30-16 h 30
Michael Kouritzin, University of Alberta
"The implicit homeomorphism"

Abstract : In 1993, Bhatt and Kanandikan introduced a homeomorphism between a Polish space and a precompact subspace of $\mathbf{R}^\infty$. They used this homeomorphism to establish uniqueness of forward equations, existence to martingale problems, characterization of stationary measures, robustness of nonlinear filters, and weak convergence of Markov processes. This same homeomorphism can be used to generalize a few of the basic results of Ethier and Kurtz slightly and simplify their proofs. It is also a tool in representing measure-valued Markov processes in terms of interacting branching particle systems. We will discuss some of these new results emphasizing the simplification in proof brought forth by the homeomorphism.

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