

SEMINARI DE PROBABILITATS PROBABILITY SEMINAR Barcelona

Facultat de Ciències. Universitat Autònoma de Barcelona
Aula C1/-128 ; 16 :00

09/11/2005 Arne Løkka, Kings College, London, United Kingdom

Bayesian detection of a change point before an observable event.

Abstract: I consider a continuously observable process, which behaves like a standard Brownian motion up to a random time t_1 , and as a Brownian motion with a known drift after t_1 . At some stopping-time t_2 after the change change point t_1 , an observable event occurs. I derive the optimal detection policy for two different formulations of optimality, which corresponds to variations of the classical criterion of “probability of false alarm plus a multiple of the expected delay in sounding the alarm”, and the “expected miss criterion”. In particular, the formulations take into account the information provided by the non-occurrence of the observable event, and where it is favourable to “raise the alarm” before this event. Further, I prove that our formulations of the change point detection problem is equivalent to a certain one-dimensional optimal stopping problem, to which I derive an explicit solution. Examples of possible applications might be found in areas such as geology (e.g. volcanic activity), manufacturing and engineering (e.g. “crash” of electronic or mechanical components), finance (e.g insider trading prior to press release) or medicine (detection of critical deceases prior to fatal observable symptoms).

Facultat de Matemàtiques, Universitat de Barcelona
Gran Via de les Corts Catalanes, 585; E-08007 Barcelona
Aula/Room IMUB-Facultat de Matemàtiques, 2nd floor
16:00

16/11/2005 Salvador Ortiz-Latorre, Universitat de Barcelona, Barcelona, Spain

Intersection local time for two independent fractional Brownian motions.

Abstract: This is a joint work with David Nualart. Let B^H and \tilde{B}^H be two independent, d -dimensional fractional Brownian motions with Hurst parameter $H \in (0, 1)$. Assume $d \geq 2$. We prove that the intersection local time of B^H and \tilde{B}^H ,

$$I(B^H, \tilde{B}^H) = \int_0^T \int_0^T \delta(B_t^H - \tilde{B}_s^H) ds dt$$

exists in L^2 if and only if $Hd < 2$. For the case $Hd \geq 2$ we address the problem of the weak convergence of the renormalization of an approximation of $I(B^H, \tilde{B}^H)$ to a normal law, finding partial results on the Wiener chaos projections for the case $Hd = 2$.

23/11/2005 Carles Rovira, Universitat de Barcelona, Barcelona, Spain
Equacions diferencials estocàstiques amb retard dirigides per un brownià fraccional amb paràmetre de Hurst $H > 1/2$.

Resum: Considerem una equació diferencial estocàstica amb retard dirigida per un Brownià fraccional amb paràmetre de Hurst $H > \frac{1}{2}$. Demostrem, utilitzant tècniques del càlcul estocàstic clàssic, un resultat d'existència i unicitat quan els coeficients són prou regulars. A més a més, sota un conjunt d'hipòtesis addicionals, obtenim que la llei de la solució té densitat regular respecte la mesura de Lebesgue a \mathbb{R} .

30/11/2005 Joao Guerra, Universidade Tecnica de Lisboa, Lisbon, Portugal
Stochastic differential equations driven by fractional Brownian motion and standard Brownian motion.

Abstract: We present existence and uniqueness theorems for solutions of stochastic differential equations driven by both fractional Brownian motion and standard Brownian motion. These theorems are based on a priori estimates and in an existence result which is based on a generalization of the Theorem of Yamada and Watanabe.

14/12/2005 Vlad Bally, Univesité de Marne-la-Vallée, Marne-la-Vallée, France
Lower bound for the density of a locally elliptic Itô process.

Abstract: We consider a diffusion process which has the ellipticity property on a tube around a deterministic curve. We find a lower bound for the density of the law of this process. The interesting point is that the lower bound depends on the local behaviour of the coefficients and in particular we may have lower bounds which are not Gaussian (as it is the case of the uniform elliptic frame). This approach extends to a large class of Itô processes including solutions of SPDE's.

21/12/2005 David Màrquez, Universitat de Barcelona, Barcelona, Spain
Una versió diluïda del model del perceptró. (A diluted version of the perceptron model).

Abstract: There are some models of mean fields glasses for which the basic theory is not complete. Our paper studies one of them. In this talk we consider a diluted version of the usual perceptron model. First we prove

that the spin correlations vanish. In fact we obtain a more general property. Then we give the magnetization. Here the limiting law is a more complicated object than in the non-diluted perceptron model. One of the main tasks is to identify the order parameter of the model.

This talk is based on a joint work with Carles Rovira from Universitat de Barcelona and Samy Tindel from Universit de Nancy 1.