

SUJET STAGE MASTER VIETNAM

Lieu : MAPMO (Orléans)

Email : richard.emilion@univ-orleans.fr

Statistical estimation of diffusion processes in medicine

The aim of this training is to study various methods which can be relevant for estimating the parameters of diffusions with random drift observed with noise, at discrete times: Maximum likelihood, Bayesian estimation methods, SEM and the Gibbs sampler algorithms, Euler-Maruyama approximation method, latent auxiliary data introduced to complete the diffusion process, tuned hybrid Gibbs algorithm based on conditional Brownian bridges, simulations of the unobserved process paths.

The methods will be tested on recent real datasets coming from medicine.

REFERENCES

Sophie Donnet and Adeline Samson (2005). Parametric estimation for diffusion processes from discrete-time and noisy observations

<ftp://ftp.inria.fr/INRIA/publication/publi-pdf/RR/RR-5809.pdf>

Rubens Penha Cysne (2004). On the statistical estimation

of Diffusion processes: A partial Survey. Brazilian Review of Econometrics. v. 24, n° 2, pp 273-301 Nov. 2004.

<http://www.fgv.br/professor/rubens/HOMEPAGE/publica%C3%A7%C3%B5es/Artigos%20Publicados/On%20the%20Statistical%20Estimation%20of%20Diffusion%20.pdf>

Helle Sorensen (2002). Parametric inference for diffusion processes observed at discrete points in time : a survey.

<http://www.econ.ku.dk/Research/Publications/pink/2002/0208.pdf>

Danielle Florens-Zmirou (1989). Approximate discrete-time schemes for statistics of diffusion processes. *Statistics*, **20**:547–557.

Danielle Florens-Zmirou (1993). On estimating the diffusion coefficient from discrete observations. *J. Appl. Probab.*, **30**:790–804.

A. Roland Gallant and Jonathan R. Long (1997). Estimating stochastic differential equations efficiently by minimum chi-squared. *Biometrika*, **84**:125–141.

Valentine Genon-Catalot and J. Jacod (1994). Estimation of the diffusion coefficient for diffusion processes: random sampling. *Scand. J. Statist.*, **21**:193–221.

Valentine Genon-Catalot, Catherine Laredo, and D. Picard (1992). Non-parametric estimation of the diffusion coefficient by wavelets methods. *Scand. J. Statist.*, **19**:317–335.

Jean Jacod (2000). Non-parametric kernel estimation of the coefficient of a diffusion. *Scand. J. Statist.*, **27**:83–96.

Helle Sorensen (2001). Discretely observed diffusions: approximation of the continuous-time score function. *Scand. J. Statist.*, **28**:113–121.

Helle Sorensen (2003). Simulated likelihood approximations for stochastic volatility models. *Scand. J. Statist.*, **30**:Forthcoming.