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The Department of Automatic Control & Systems Engineering
is pleased to announce the following seminar:

Monte-Carlo Methods for Bayesian filtering in High-Dimensional spaces and/or Likelihood-free Models

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Wednesday, 8 October 2014 at 14:00
LT02, Sir Henry Stephenson Building

Abstract

Nonlinear non-Gaussian state-space models arise in numerous applications in control and signal processing. In this context, one of the most successful and popular approximation techniques is Sequential Monte Carlo (SMC) methods, also known as particle filters. Nevertheless, these methods tend to be inefficient when applied to high dimensional problems. In this talk, I will present an overview of Markov chain Monte Carlo (MCMC) methods for sequential simulation from posterior distributions, which represent efficient alternatives to SMC methods especially in high dimensional spaces. Therefore, I will describe some advanced features of sequential MCMC for Bayesian filtering in complex models.

Finally, I will present a method based on Sequential MCMC and Approximate Bayesian Computation to solve bayesian filtering when the likelihood function is either computationally prohibitive or intractable to evaluate point-wise but trivial to simulate.

Biography

François Septier received the Engineer Degree in electrical engineering and signal processing in 2004 from Télécom Lille, France, , the M.Sc. degree in digital communications and a Ph.D. in Electrical Engineering both from the University of Valenciennes, France, in 2004 and 2008 respectively. From March 2008 to August 2009, he was a Research Associate in the Signal Processing and Communications Laboratory, Cambridge University, Engineering Department, UK. From September 2009, he is an Associate Professor with the Institut Mines-Télécom / Télécom Lille / LAGIS UMR 8219 CNRS, France. His research focuses on Monte Carlo statistical methods for digital communications, multitarget tracking and source term estimation.