

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. Mohamed BEN ALAYA

Institut Galilée, LAGA UMR 7539, Université Paris 13

June 15, 2017, 12:30pm – 1:30pm
EEE - ESSEC La Défense (CNIT) – Amphi 103

Improved Adaptive Multilevel Monte Carlo and Applications to Option Pricing

This paper focuses on the study of an original combination of the Euler Multilevel Monte Carlo introduced by Giles and the popular importance sampling technique. To compute the optimal choice of the parameter involved in the importance sampling method, we rely on Robbins-Monro type stochastic algorithms. On the one hand, we extend our previous work to the Multilevel Monte Carlo setting. On the other hand, we improve by providing a new adaptive algorithm avoiding the discretization of any additional process. We firstly prove the almost sure convergence of this stochastic algorithm towards the optimal parameter. Then, we prove a central limit theorem of type Lindeberg-Feller for the new adaptive Euler Multilevel Monte Carlo algorithm together with non-asymptotic Berry-Essen bounds. Finally, we illustrate the efficiency of our method through applications in option pricing for the Heston model.

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Dr. Mohamed Ben Alaya is 'Maître de Conférences' at the Institute Galilée (LAGA), Univ. Paris 13, and member of the probability & statistics team. Until 2002, he was an affiliated member of CERMICS (Centre d'Enseignement et de Recherche en Mathématiques et Calcul Scientifique) at the ENPC (Ecole Nationale des Ponts et Chaussées). His research addresses a broad range of topics in numerical probabilities, multilevel Monte Carlo methods, variance reduction methods, statistics of processes, and calibration techniques for the Cox-Ingersoll-Ross model and its extensions.

Prof. Ben Alaya was also a lecturer in various engineering and business schools (ENPC, ENSTA, HEC). Now he is involved in the master of actuarial sciences of the University Tunis-Dauphine.



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