SEMINAR

Department of Mathematics
Faculty of Natural Sciences—UPR-Río Piedras
P O Box 70377, San Juan, PR 00936-8377

Prof. Son Lyy Nguyen
School of Mathematics & Statistics
Carleton University, Ontario Canada

Pathwise Convergence Rate for Numerical Solutions of Stochastic Differential Equations

Devoted to numerical solutions of stochastic differential equations (SDEs), in this talk we construct a sequence of re-embedded numerical solutions having the same distribution as that of the original SDE in a new probability space. It is shown that the re-embedded numerical solutions converge strongly to the solution of the SDE. Moreover, the rate of convergence is ascertained. Different from the well-known results in numerical solutions of SDEs, in lieu of the usually used Brownian motion increments in the algorithm, an easily implementable sequence of independent and identically distributed (i.i.d.) random variables is used. Being easier to implement compared to the construction of Brownian increments, such an i.i.d. sequence is preferable in the actual computation. As far as the convergence and uniform mean squares error estimates are concerned, the use of the i.i.d. sequence does not introduce essential difficulties compared with that of the Brownian increments. Nevertheless, the analysis becomes much more difficult for the study of rates of convergence because one has to deal with the diference of the Brownian increments and the i.i.d. sequence in the almost sure sense. Our work presents a new angle of ascertaining the convergence rates."

Wednesday, April 25, 2012
10:30-11:30 AM
C-356