Probability Seminar

Title: Euler's Method for Stochastic Differential Equations

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Date: 15/06/2018
Time: 2:40pm

Place: Room MAT-A(Miniauditorium)

Abstract: Usually we do not know the solutions of a Stochastic Differential Equation explicitly, so we use simulations to try discover something about them. Euler's method is the most elementary approximation technique for solving initial-value problems.

In this seminar, we will discuss about Stochastic Euler's Method for approximate an Ito process $\mathbf{X} = \{X(t); 0 \leq t \leq T\}$ satisfying the Stochastic Differential Equation

$$\begin{cases} dX(t) = b(t, X(t))dt + \sigma(t, X(t))dW(t), & 0 \leq t \leq T, \\ X(0) = X_0, \end{cases}$$

where $\mathbf{W} = \{W(t); 0 \leq t \leq T\}$ is a Brownian Motion.

We will consider some examples of typical problems that can be handled by simulation of approximation time discrete trajectories. Moreover, we will show how to implement this method in R programming language.

References

[1] Peter E. Kloeden; Eckhard Platen. Numerical Solution to Stochastic Differential Equations. Springer.

[2] Richard L. Burden; J. Douglas Faires. Numerical Analysis. Ninth Edition.