Swishchuk

Random Evolutions and their Applications

New Trends

The book is devoted to the new trends in random evolutions and their various applications to stochastic evolutionary sytems (SES). Such new developments as the analogue of Dynkin's formulae, boundary value problems, stochastic stability and optimal control of random evolutions, stochastic evolutionary equations driven by martingale measures are considered. The book also contains such new trends in applied probability as stochastic models of financial and insurance mathematics in an incomplete market. In the famous classical financial mathematics Black-Scholes model of a (B,S) market for securities prices, which is used for the description of the evolution of bonds and stocks prices and also for their derivatives, such as options, futures, forward contracts, etc., it is supposed that the dynamic of bonds and stocks prices are set by a linear differential and linear stochastic differential equations, respectively, with interest rate, appreciation rate and volatility such that they are predictable processes. Also, in the Arrow-Debreu economy, the securities prices which support a Radner dynamic equilibrium are a combination of an Ito process and a random point process, with the all coefficients and jumps being predictable processes.

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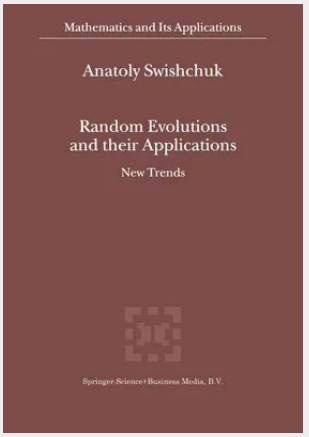

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