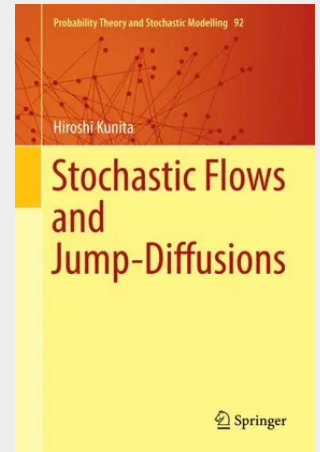


Stochastic Flows and Jump-Diffusions

This monograph presents a modern treatment of (1) stochastic differential equations and (2) diffusion and jump-diffusion processes. The simultaneous treatment of diffusion processes and jump processes in this book is unique: Each chapter starts from continuous processes and then proceeds to processes with jumps.

In the first part of the book, it is shown that solutions of stochastic differential equations define stochastic flows of diffeomorphisms. Then, the relation between stochastic flows and heat equations is discussed. The latter part investigates fundamental solutions of these heat equations (heat kernels) through the study of the Malliavin calculus. The author obtains smooth densities for transition functions of various types of diffusions and jump-diffusions and shows that these density functions are fundamental solutions for various types of heat equations and backward heat equations. Thus, in this book fundamental solutions for heat equations and backward heat equations are constructed independently of the theory of partial differential equations.

Researchers and graduate student in probability theory will find this book very useful.



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