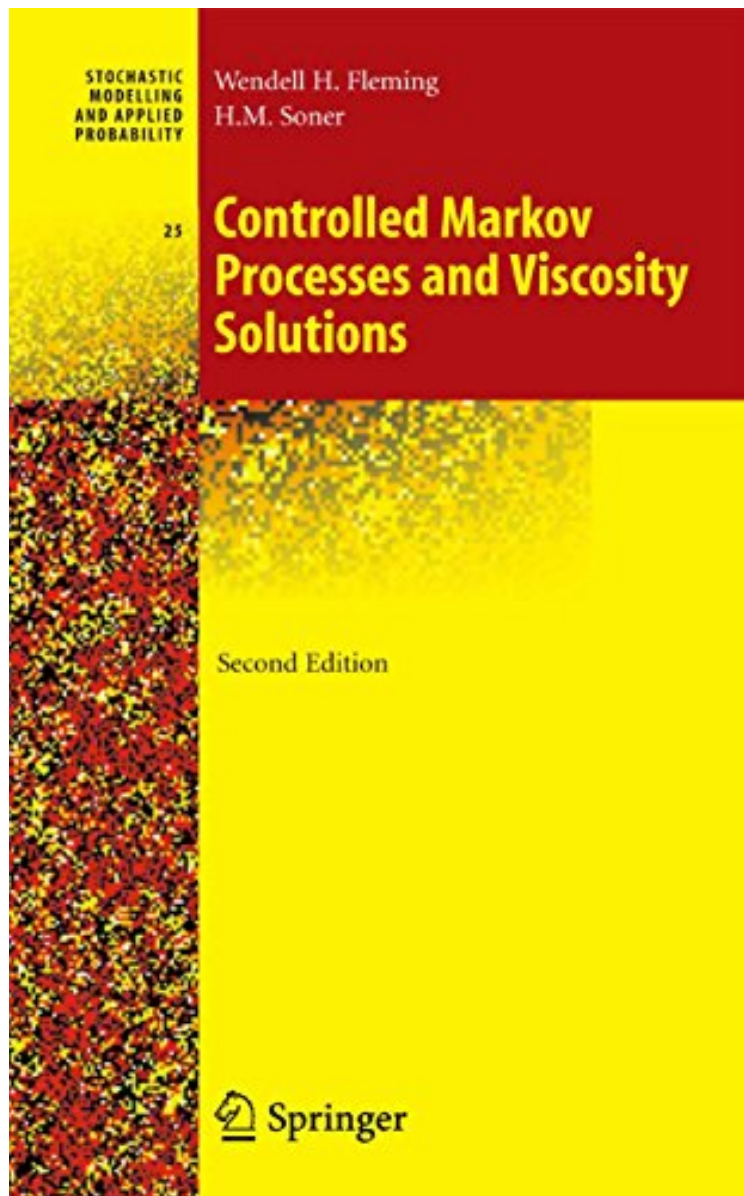


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## Controlled Markov Processes and Viscosity Solutions: 25 (Stochastic Modelling and Applied Probability)

Wendell H. Fleming, Halil Mete Soner  
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This book is an introduction to optimal stochastic control for continuous time Markov processes and the theory of viscosity solutions. It covers dynamic programming for deterministic optimal control problems, as well as to the corresponding theory of viscosity solutions. New chapters in this second edition introduce the role of stochastic optimal control in portfolio optimization and in pricing derivatives in incomplete markets and two-controller, zero-sum differential games.

From the Back Cover This book is intended as an introduction to optimal stochastic control for continuous time Markov processes and to the theory of viscosity solutions. Stochastic control problems are treated using the dynamic programming approach. The authors approach stochastic control problems by the method of dynamic programming. The fundamental equation of dynamic programming is a nonlinear evolution equation for the value function. For controlled Markov diffusion processes, this becomes a nonlinear partial differential equation of second order, called a Hamilton-Jacobi-Bellman (HJB) equation. Typically, the value function is not smooth enough to satisfy the HJB equation in a classical sense. Viscosity solutions provide framework in which to study HJB equations, and to prove continuous dependence of solutions on problem data. The theory is illustrated by applications from engineering, management science, and financial economics. In this second edition, new material on applications to mathematical finance has been added. Concise introductions to risk-sensitive control theory, nonlinear H-infinity control and differential games are also included. of the earlier edition: "This book is highly recommended to anyone who wishes to learn the dynamic principle applied to optimal stochastic control for diffusion processes. Without any doubt, this is a fine book and most likely it is going to become a classic on the area... ." SIAM , 1994