

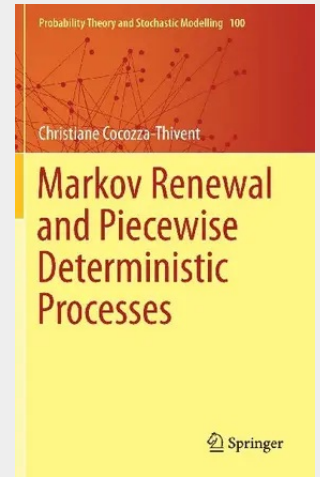
Markov Renewal and Piecewise Deterministic Processes

This book is aimed at researchers, graduate students and engineers who would like to be initiated to Piecewise Deterministic Markov Processes (PDMPs). A PDMP models a deterministic mechanism modified by jumps that occur at random times. The fields of applications are numerous : insurance and risk, biology, communication networks, dependability, supply management, etc.

Indeed, the PDMPs studied so far are in fact deterministic functions of CSMPs (Completed Semi-Markov Processes), i.e. semi-Markov processes completed to become Markov processes. This remark leads to considerably broaden the definition of PDMPs and allows their properties to be deduced from those of CSMPs, which are easier to grasp. Stability is studied within a very general framework. In the other chapters, the results become more accurate as the assumptions become more precise. Generalized Chapman-Kolmogorov equations lead to numerical schemes. The last chapter is an opening on processes for which the deterministic flow of the PDMP is replaced with a Markov process.

Marked point processes play a key role throughout this book.

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