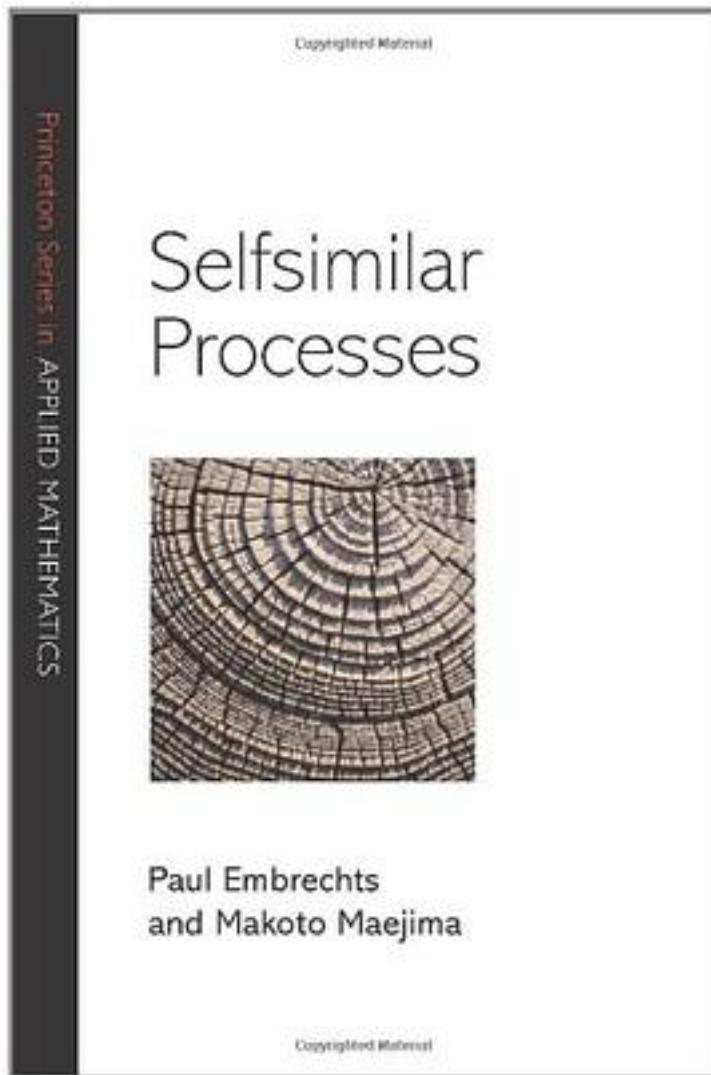


Selfsimilar Processes



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The modeling of stochastic dependence is fundamental for understanding random systems evolving in time. When measured through linear correlation, many of these systems exhibit a slow correlation decay - a phenomenon often referred to as long-memory or long-range dependence. An example of this is the absolute returns of equity data in finance. Selfsimilar stochastic processes (particularly fractional Brownian motion) have long been postulated as a means to model this behavior, and the concept of selfsimilarity for a stochastic process is now proving to be extraordinarily useful. Selfsimilarity translates into the equality in distribution between the process under a linear time change and the same process properly scaled in space, a simple scaling property that yields a remarkably rich theory with far-flung applications. After a short historical overview, this book describes the current state of knowledge about selfsimilar processes and their applications. Concepts, definitions and basic properties are emphasized, giving the reader a road map of the realm of selfsimilarity that allows for further exploration. Such topics as noncentral limit theory, long-range dependence, and operator selfsimilarity are covered alongside statistical estimation, simulation, sample path properties, and stochastic differential equations driven by selfsimilar processes. Numerous references point the reader to current applications. Though the text uses the mathematical language of the theory of stochastic processes, researchers and end-users from such diverse fields as mathematics, physics, biology, telecommunications, finance, econometrics, and environmental science will find it an ideal entry point for studying the already extensive theory and applications of selfsimilarity.

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