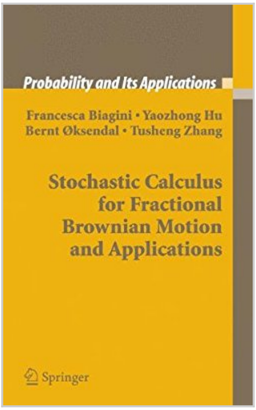

Stochastic Calculus for Fractional Brownian Motion and Applications (Probability and Its Applications)

By Francesca Biagini, Yaozhong Hu, Bernt Øksendal, Tusheng Zhang

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The purpose of this book is to present a comprehensive account of the different definitions of stochastic integration for fBm, and to give applications of the resulting theory. Particular emphasis is placed on studying the relations between the different approaches. Readers are assumed to be familiar with probability theory and stochastic analysis, although the mathematical techniques used in the book are thoroughly exposed and some of the necessary prerequisites, such as classical white noise theory and fractional calculus, are recalled in the appendices. This book will be a valuable reference for graduate students and researchers in mathematics, biology, meteorology, physics, engineering and finance.

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Editorial Review

Review
From the reviews: “The development of stochastic integration with respect to fBm continues to be a very active area of research … became a necessity to collect the different approaches into a single monograph, in order to allow researchers in this field to have a general and quick view of the state of the art. This book very nicely attains this aim, and I can recommend it to any person interested in fractional Brownian motion.” (Ivan Nourdin, Mathematical Reviews, Issue 2010 a)

From the Back Cover

Fractional Brownian motion (fBm) has been widely used to model a number of phenomena in diverse fields from biology to finance. This huge range of potential applications makes fBm an interesting object of study.

fBm represents a natural one-parameter extension of classical Brownian motion therefore it is natural to ask if a stochastic calculus for fBm can be developed. This is not obvious, since fBm is neither a semimartingale (except when $H = ½$), nor a Markov process so the classical mathematical machineries for stochastic calculus are not available in the fBm case.

Several approaches have been used to develop the concept of stochastic calculus for fBm. The purpose of this book is to present a comprehensive account of the different definitions of stochastic integration for fBm, and to give applications of the resulting theory. Particular emphasis is placed on studying the relations between the different approaches.

Readers are assumed to be familiar with probability theory and stochastic analysis, although the mathematical techniques used in the book are thoroughly exposed and some of the necessary prerequisites, such as classical white noise theory and fractional calculus, are recalled in the appendices.

This book will be a valuable reference for graduate students and researchers in mathematics, biology, meteorology, physics, engineering and finance. Aspects of the book will also be useful in other fields where fBm can be used as a model for applications.

About the Author

Bernt Oksendal is a proven Springer author. His book, Stochastic Differential Equations: An Introduction with Applications, has sold over 10,000 copies and has been translated into Japanese and Chinese.

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