Stochastic Analysis, Stochastic Systems, and Applications to Finance

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World Scientific

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Published by

World Scientific Publishing Co. Pte. Ltd.

5 Toh Tuck Link, Singapore 596224

USA office: 27 Warren Street, Suite 401-402, Hackensack, NJ 07601

UK office: 57 Shelton Street, Covent Garden, London WC2H 9HE

British Library Cataloguing-in-Publication Data

A catalogue record for this book is available from the British Library.

**STOCHASTIC ANALYSIS, STOCHASTIC SYSTEMS, AND APPLICATIONS
TO FINANCE**

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ISBN-13 978-981-4355-70-4

ISBN-10 981-4355-70-4

Printed in Singapore.

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Preface

This volume contains 11 chapters. It is an expanded version of the papers presented at the first Kansas–Missouri Winter School of Applied Probability, which was organized by Allanus Tsoi and was held at the University of Missouri, February 14 and 15, 2008. It brought together researchers from different parts of the country to review and to update the recent advances, and to identify future directions in the areas of applied probability, stochastic processes, and their applications.

After the successful conference was over, there was a strong support of publishing the papers delivered in the conference as an archival volume. Based on the support, we began the preparation on this project. In addition to papers reported at the conference, we have invited a number of colleagues to contribute additional papers.

As an archive, this volume presents some of the highlights of the conference, as well as some of most recent developments in stochastic systems and applications. This book is naturally divided into two parts. The first part contains some recent results in stochastic analysis, stochastic processes and related fields. It explores the Itô formula for multidimensional Gaussian processes using the Wick integral, introduces the notion of fractional white noise multiplication, and discusses the LaSalle type of invariance principles for hybrid switching diffusions. The second part of the book is devoted to financial mathematics, insurance models, and applications. Included here are optimal investment policies for irreversible capital investment projects under uncertainty in monopoly and Stackelberg leader-follower environments,

finding expectations of monotone functions of binary random variables by simulation, with applications to reliability, finance, and round robin tournaments, jump bond markets with general models in applications to hedging and utility problems, algorithm and weak convergence for recombining tree in a regime-switching model, applications of counting processes and martingales in survival analysis, extended filtering micro-movement model with counting process observations and applications to bond price tick data, optimal reinsurance for a jump diffusion model, recursive algorithms and numerical studies for mean-reverting asset trading.

Without the encouragement and assistance of many colleagues, this volume would have never come into being. We thank all the authors of this volume, and all of the speakers of the conference for their contributions. The financial support provided by the University of Missouri for this conference is also greatly acknowledged.

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