Associated Sequences, Demimartingales and Nonparametric Inference

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Preface

One of the basic aims of theory of probability and statistics is to build stochastic models which explain the phenomenon under investigation and explore the dependence among various covariates which influence this phenomenon. Classic examples are the concepts of Markov dependence or of mixing for random processes. Esary, Proschan and Walkup introduced the concept of association for random variables. In several situations, for example, in reliability and survival analysis, the random variables of lifetimes for components are not independent but associated. Newman and Wright introduced the notion of a demimartingale whose properties extend those of a martingale. It can be shown that the partial sums of mean zero associated random variables form a demimartingale. The study of demimartingales and related concepts is the subject matter of this book. Along with a discussion on demimartingales and related concepts, we review some recent results on probabilistic inequalities for sequences of associated random variables and methods of nonparametric inference for such sequences.

The idea to write this book occurred following the invitation of Professor Tasos Christofides to me to visit the University of Cyprus, Nicosia in October 2010. Professor Tasos Christofides has contributed extensively to the subject matter of this book. It is a pleasure to thank him for his invitation. Professor Isha Dewan of the Indian Statistical Institute and I have been involved in the study of probabilistic properties of associated sequences and in developing nonparametric inference for such processes during the years 1990-2004 while I was at the Indian Statistical Institute. This book is a culmination of those efforts and I would like to thank Professor Isha Dewan for her collaboration over the years.

Thanks are due to my wife Vasanta Bhagavatula for her continued support to pursue my academic interests even after my retirement.

B.L.S. Prakasa Rao
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