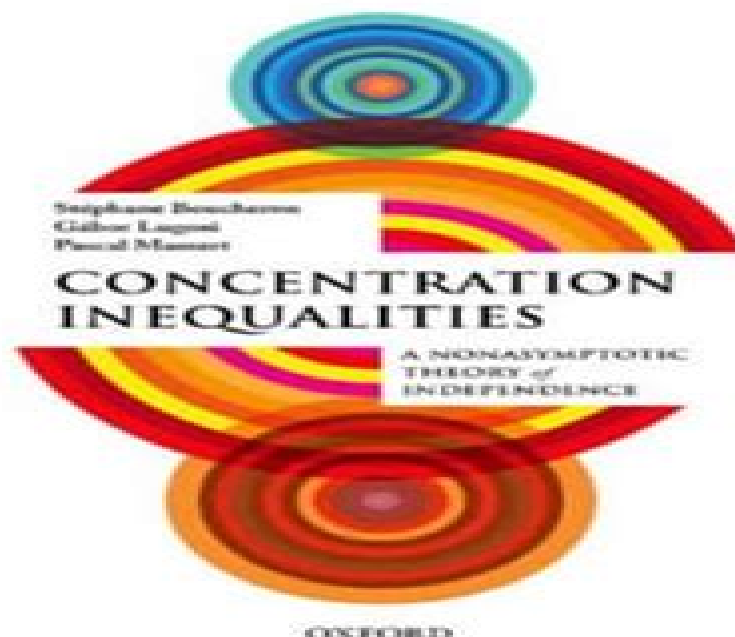


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Basics and Trends in Sensitivity Analysis:

Theory and Practice in R Sébastien Da Veiga, Fabrice Gamboa, Bertrand Iooss, Clémentine Prieur, 2021-10-14 This book provides an overview of global sensitivity analysis methods and algorithms including their theoretical basis and mathematical

properties The authors use a practical point of view and real case studies as well as numerous examples and applications of the different approaches are illustrated throughout using R code to explain their usage and usefulness in practice Basics and Trends in Sensitivity Analysis Theory and Practice in R covers a lot of material including theoretical aspects of Sobol indices as well as sampling based formulas spectral methods and metamodel based approaches for estimation purposes screening techniques devoted to identifying influential and noninfluential inputs variance based measures when model inputs are statistically dependent and several other approaches that go beyond variance based sensitivity measures and a case study in R related to a COVID 19 epidemic model where the full workflow of sensitivity analysis combining several techniques is presented This book is intended for engineers researchers and undergraduate students who use complex numerical models and have an interest in sensitivity analysis techniques and is appropriate for anyone with a solid mathematical background in basic statistical and probability theories who develops and uses numerical models in all scientific and engineering domains

Univalent Functions in Quantum Probability Theory Sebastian Schleissinger, 2025-09-22 This book reveals how univalent functions appear in quantum probability theory Building upon the recently established one to one correspondence between Loewner theory and the theory of non commutative additive processes the author invites readers to explore the interplay between complex analysis classical probability theory and quantum probability theory Monotone independence and its relations to classical free and Boolean independence underpin the development of ideas Beginning with essential concepts from classical probability theory and complex analysis the book goes on to define a quantum probability space and introduce five notions of independence From this foundation the central chapters explore convolutions and their respective central limit theorems univalent functions classical Loewner chains on the unit disk slit mappings and the relationship between free hemigroups Loewner chains and nonlinear resolvents The final chapter offers an outlook on higher dimensional generalizations including several open problems Exercises with solutions invite readers to engage with the material throughout *Univalent Functions in Quantum Probability Theory* is an essential resource at the intersection of previously distinct fields Intended for graduate students and researchers alike it assumes a solid foundation in real and complex analysis with basic knowledge of classical probability theory and Hilbert spaces

Sampling Theory, a Renaissance Götz E. Pfander, 2015-12-08 Reconstructing or approximating objects from seemingly incomplete information is a frequent challenge in mathematics science and engineering A multitude of tools designed to recover hidden information are based on Shannon's classical sampling theorem a central pillar of Sampling Theory The growing need to efficiently obtain precise and tailored digital representations of complex objects and phenomena requires the maturation of available tools in Sampling Theory as well as the development of complementary novel mathematical theories Today research themes such as Compressed Sensing and Frame Theory re energize the broad area of Sampling Theory This volume illustrates the renaissance that the area of Sampling Theory is currently experiencing It touches upon trendsetting areas such as

Compressed Sensing Finite Frames Parametric Partial Differential Equations Quantization Finite Rate of Innovation System
Theory as well as sampling in Geometry and Algebraic Topology

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