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Nota di contenuto	Part I: A prologue: mostly historical -- Part II: Three classical inequalities -- Part III: A fourth inequality -- Part IV: Elementary properties of the Frechet variation- an introduction to tensor products -- Part V: The Grothendieck factorization theorem -- Part VI: An introduction to multidimensional measure theory -- Part VII: An introduction to harmonic analysis -- Part VIII: Multilinear extensions of the Grothendieck inequality (via "V"(2)-uniformizability) -- Part IX: Product Frechet measures -- Part X: Brownian motion and the Wiener process -- Part XI: Integrators -- Part XII: A '3/2-dimensional' Cartesian product -- Part XIII: Fractional cartesian products and cominatorial dimension -- Part XIV: The last chapter: leads and loose ends.

Sommario/riassunto

This book provides a thorough and self-contained study of interdependence and complexity in settings of functional analysis, harmonic analysis and stochastic analysis. It focuses on 'dimension' as a basic counter of degrees of freedom, leading to precise relations between combinatorial measurements and various indices originating from the classical inequalities of Khintchin, Littlewood and Grothendieck. The basic concepts of fractional Cartesian products and combinatorial dimension are introduced and linked to scales calibrated by harmonic-analytic and stochastic measurements. Topics include the (two-dimensional) Grothendieck inequality and its extensions to higher dimensions, stochastic models of Brownian motion, degrees of randomness and Frechet measures in stochastic analysis. This book is primarily aimed at graduate students specialising in harmonic analysis, functional analysis or probability theory. It contains many exercises and is suitable to be used as a textbook. It is also of interest to scientists from other disciplines, including computer scientists, physicists, statisticians, biologists and economists.