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**Ibe, Oliver C.**

**Elements of random walk and diffusion processes.**

Wiley Series in Operations Research and Management Science. Hoboken, NJ: John Wiley & Sons (ISBN 978-1-118-61809-7/hbk; 978-1-118-61805-9/ebook). xv, 260 p. (2013).

The author gives an overview on basic facts about one- and two-dimensional random walks, diffusions, and Lévy processes, as well as fractional calculus, fractional processes, and percolations. He does so from the point of view of possible applications, supplying numerous explicit practical examples or references to applications in a large diversity of fields of the natural sciences, engineering, computer science, economics, operations research, social sciences, and medicine. Several chapters also offer exercise problems. Proofs are given only as far as they can be kept within the framework of elementary calculus and probability. Facts needed from probability theory are collected in an introductory chapter. The book should be helpful for any researcher faced with a dynamic phenomenon of the real world to which a stochastic model is the only practicable or at least the most reasonable approach, and for whom working through a large bulk of abstract mathematical literature, before getting started on the problem at hand, is no realistic option.

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*Classification:* K65

*Keywords:* random walk; Brownian motion; diffusion; Lévy process; Lévy walk; Lévy flight; fractional calculus; fractional process; percolation

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