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Mass transportation problems. Vol. 1: Theory. Vol. 2: Applications. (English) Zbl 0990.60500
Springer Series in Statistics. Probability and its Applications. New York, NY: Springer; 0-387-98352-X
(vol. 2)). xxv, 430 p. (vol. 1) xxv, 430 p. (vol. 2) (1998).

Publisher's description: The first comprehensive account of the theory of mass transportation problems and its applications.

In Volume I, the authors systematically develop the theory with emphasis on the Monge-Kantorovich mass transportation and the Kantorovich-Rubinstein mass transshipment problems. They then discuss a variety of different approaches towards solving these problems and exploit the rich interrelations to several mathematical sciences – from functional analysis to probability theory and mathematical economics.

The first volume consists of six chapters: 1. Introduction, 2. The Monge-Kantorovich problem, 3. Explicit results for the Monge-Kantorovich problem, 4. Duality theory for mass transfer problems, 5. Applications of the duality theory, 6. Mass transshipment problems and ideal metrics.

The second volume is devoted to applications of the above problems to topics in applied probability, theory of moments and distributions with given marginals, queuing theory, risk theory of probability metrics and its applications to various fields, among them general limit theorems for Gaussian and non-Gaussian limiting laws, stochastic differential equations and algorithms, and rounding problems.

It contains Chapters 7–10 as follows: 7. Modifications of the Monge-Kantorovich problems: transportation problems with relaxed or additional constraints, 8. Applications of Kantorovich-type metrics to various probabilistic-type limit theorems, 9. Mass transportation problems and recursive stochastic equations, 10. Stochastic differential equations and empirical measures. (There are slight differences between the chapter titles as given in the table of contents to Volume II and in the text.)

Useful to graduates and researchers in theoretical and applied probability, operations research, computer science, and mathematical economics, the prerequisites for this book are graduate level probability theory and real and functional analysis.

MSC:

- [60-02](#) Research exposition (monographs, survey articles) pertaining to probability theory
- [28-02](#) Research exposition (monographs, survey articles) pertaining to measure and integration
- [28A35](#) Measures and integrals in product spaces
- [28C15](#) Set functions and measures on topological spaces (regularity of measures, etc.)
- [49K27](#) Optimality conditions for problems in abstract spaces
- [60B05](#) Probability measures on topological spaces
- [60B10](#) Convergence of probability measures
- [90C48](#) Programming in abstract spaces
- [90B15](#) Stochastic network models in operations research

Cited in **4** Reviews
Cited in **253** Documents