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Sommario/riassunto

This book concerns the theory of optimal transport (OT) and its applications to solving problems in geometric optics. It is a self-contained presentation including a detailed analysis of the Monge problem, the Monge-Kantorovich problem, the transshipment problem, and the network flow problem. A chapter on Monge-Ampère measures is included containing also exercises. A detailed analysis of the Wasserstein metric is also carried out. For the applications to optics, the book describes the necessary background concerning light refraction, solving both far-field and near-field refraction problems, and indicates lines of current research in this area. Researchers in the fields of mathematical analysis, optimal transport, partial differential equations (PDEs), optimization, and optics will find this book valuable. It is also suitable for graduate students studying mathematics, physics, and engineering. The prerequisites for this book include a solid understanding of measure theory and integration, as well as basic knowledge of functional analysis.