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Nota di contenuto	3D Images of Materials Structures; Foreword; Contents; Preface; Conventions and Notation; 1 Introduction; 2 Preliminaries; 2.1 General Notation; 2.1.1 Points and Sets in Euclidean Spaces; 2.1.2 Curvatures; 2.1.3 Measures and Measurable Spaces; 2.2 Characteristics of Sets; 2.2.1 The Euler Number and the Integral of Gaussian Curvature; 2.2.2 The Mean Width and the Integral of the Mean Curvature; 2.2.3 Intrinsic Volumes of Convex Bodies; 2.2.4 Additive Extensions on the Convex Ring; 2.2.5 The Principal Kinematic Formulae of Integral Geometry; 2.3 Random Sets; 2.3.1 Definition of Random Sets 2.3.2 Characteristics of Random Closed Sets2.3.3 Random Point Fields; 2.3.4 Random Tessellations; 2.4 Fourier Analysis; 2.4.1 Measurable Functions; 2.4.2 Fourier Transform; 2.4.3 Bochner's Theorem; 3 Lattices, Adjacency of Lattice Points, and Images; 3.1 Introduction; 3.2 Point Lattices, Digitizations and Pixel Configurations; 3.2.1 Homogeneous Lattices; 3.2.2 Digitization; 3.2.3 Pixel Configurations;

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5.4.3 Gradient and Hessian Matrix

Sommario/riassunto

Taking and analyzing images of materials' microstructures is essential for quality control, choice and design of all kind of products. Today, the standard method still is to analyze 2D microscopy images. But, insight into the 3D geometry of the microstructure of materials and measuring its characteristics become more and more prerequisites in order to choose and design advanced materials according to desired product properties.This first book on processing and analysis of 3D images of materials structures describes how to develop and apply efficient and versatile tools for geometric analys