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Edizione	[2nd ed. 2020.]
Descrizione fisica	1 online resource (XII, 736 p. 266 illus., 220 illus. in color.)
Disciplina	006.693
Soggetti	Image Processing and Computer Vision Optical data processing Computer Imaging, Vision, Pattern Recognition and Graphics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Introduction -- Part I 3D Shape Acquisition, Representation and Visualization -- Passive 3D Imaging -- Active-triangulation 3D Imaging Systems for Industrial Inspection -- Active Time-of-Flight 3D Imaging Systems for Medium-range Applications -- Consumer-grade RGB-D cameras -- 3D Data Representation, Storage and Processing -- Part II: 3D Shape Analysis and Inference -- 3D Local Descriptors -- from Hand-crafted to Learned -- 3D Shape Registration -- 3D Shape Matching for Retrieval and Recognition -- 3D Morphable Models: the Face, Ear and Head -- Deep Learning on 3D Data -- Part III: 3D Imaging Applications -- 3D Face Recognition -- 3D Digitization of Cultural Heritage -- 3D Phenotyping of Plants -- Index.
Sommario/riassunto	This textbook is designed for postgraduate studies in the field of 3D Computer Vision. It also provides a useful reference for industrial practitioners; for example, in the areas of 3D data capture, computer-aided geometric modelling and industrial quality assurance. This second edition is a significant upgrade of existing topics with novel findings. Additionally, it has new material covering consumer-grade RGB-D cameras, 3D morphable models, deep learning on 3D datasets, as well as new applications in the 3D digitization of cultural heritage and the 3D phenotyping of crops. Overall, the book covers three main

areas: 3D imaging, including passive 3D imaging, active triangulation 3D imaging, active time-of-flight 3D imaging, consumer RGB-D cameras, and 3D data representation and visualisation; 3D shape analysis, including local descriptors, registration, matching, 3D morphable models, and deep learning on 3D datasets; and 3D applications, including 3D face recognition, cultural heritage and 3D phenotyping of plants. 3D computer vision is a rapidly advancing area in computer science. There are many real-world applications that demand high-performance 3D imaging and analysis and, as a result, many new techniques and commercial products have been developed. However, many challenges remain on how to analyse the captured data in a way that is sufficiently fast, robust and accurate for the application. Such challenges include metrology, semantic segmentation, classification and recognition. Thus, 3D imaging, analysis and their applications remain a highly-active research field that will continue to attract intensive attention from the research community with the ultimate goal of fully automating the 3D data capture, analysis and inference pipeline. .

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