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Sommario/riassunto

3D point clouds have broad applications across various industries and have contributed to advancements in fields such as autonomous driving, immersive media, metaverse, and cultural heritage protection. With the fast growth of 3D point cloud data and its applications, the need for efficient compression technologies has become paramount. This book delves into the forefront of point cloud compression, exploring key technologies, standardization efforts, and future prospects. This comprehensive book uncovers the foundational concepts, data acquisition methods, and datasets associated with point cloud compression. By examining the fundamental compression technologies, readers can obtain a clear understanding of prediction coding, transform coding, quantization techniques, and entropy coding. Through vivid illustrations and examples, the book elucidates how these techniques have evolved over the years and their potentials for the future. To provide a complete picture, the book presents cutting-edge research methods in point cloud compression and facilitates comparisons among them. Readers can be equipped with an in-depth understanding of the latest advancements, and can gain insights into the various approaches employed in this dynamic field. Another distinguishing aspect of this book is its exploration of standardization works for point cloud compression. Notable standards, such as MPEG G-PCC, AVS PCC, and MPEG V-PCC, are thoroughly illustrated. By delving into the methods used in geometry-based, video-based, and deep learning-based compression, readers become familiar with the latest breakthroughs in the standard communities.