

<<数据压缩导论>>

图书基本信息

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前言

Within the last decade the use of data compression has become ubiquitous. From mp3 players whose headphones seem to adorn the ears of most young (and some not so young) people, to cell phones, to DVDs, to digital television, data compression is an integral part of almost all information technology. This incorporation of compression into more and more of our lives also points to a certain degree of maturation of the technology. This maturity is reflected in the fact that there are fewer differences between this and the previous edition of this book than there were between the second and first editions. In the second edition we had added new techniques that had been developed since the first edition of this book came out. In this edition our purpose is more to include some important topics, such as audio compression, that had not been adequately covered in the second edition. During this time the field has not entirely stood still and we have tried to include information about new developments. We have added a new chapter on audio compression (including a description of the mp3 algorithm). We have added information on new standards such as the new video coding standard and the new facsimile standard. We have reorganized some of the material in the book, collecting together various lossless image compression techniques and standards into a single chapter, and we have updated a number of chapters, adding information that perhaps should have been there from the beginning. All this has yet again enlarged the book. However, the intent remains the same: to provide an introduction to the art or science of data compression. There is a tutorial description of most of the popular compression techniques followed by a description of how these techniques are used for image, speech, text, audio, and video compression. Given the pace of developments in this area, there are bound to be new ones that are not reflected in this book. In order to keep you informed of these developments, we will periodically provide updates at <http://www.mkp.com>.

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内容概要

本书是数据压缩方面的经典著作，介绍了各种类型的压缩模式。

书中首先介绍了基本压缩方法(包括无损压缩和有损压缩)中涉及的数学知识，为常见的压缩形式打牢了信息论基础，然后从无损压缩体制开始，依次讲述了霍夫曼编码、算术编码以及字典编码技术等，对于有损压缩，还讨论了使用量化的模式，描述了标量、矢量以及微分编码和分形压缩技术，最后重点介绍了视频加密。

本书不但分析了各种压缩模式及其优缺点，而且还说明了它们最适合处理哪种内容。

本书非常适合从事数据压缩相关工作的专业技术人员、软硬件工程师、学生等阅读，数字图书馆、多媒体等领域的技术人员也可参考。

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插图：Example 9.6.1: Suppose we have a source that can be modeled as a random variable taking values in the interval $[-4, 4]$ with more probability mass near the origin than away from it. We want to quantize this using the quantizer of Figure 9.3. Let us try to flatten out this distribution using the following compander, and then compare the companded quantization with straightforward uniform quantization. The compressor characteristic we will use is given by the following equation：

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“从各方面来看，本书都无愧于数据压缩圣经的称号。
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编辑推荐

数据压缩技术在网络、通信、图像处理、多媒体、数据库等诸多领域应用广泛，在现实需求推动下，近年来发展尤为迅速。

《数据压缩导论(英文版·第3版)》是数据压缩领域毋庸置疑的权威指南，以内容全面、新颖而著称。书中不仅深入地阐述了各种压缩技术背后的理论、优缺点和适用范围，更通过丰富实例，详细讨论了各自的应用。

书中提供了许多工具，读者足以由此自己开发出完整的压缩方案。

《数据压缩导论(英文版·第3版)》特色涵盖各种常用和重要的视频、音频、文本以及传真的压缩标准。

包括有损压缩和无损压缩技术在图像、语音、文本、音频以及视频压缩中的应用。

增加了新的一章，讨论音频压缩，包括MP3算法。

讨论了视频编码新标准，包括H.264、MPEG-4等。

每个新概念或算法都辅有详细的例子。

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