introduction to data compression 4th edition

Introduction to Data Compression 4th Edition: A Comprehensive Overview

introduction to data compression 4th edition serves as an essential resource for anyone interested in understanding the principles, techniques, and applications of data compression. Whether you're a student, software developer, or a professional working with digital media, this edition offers a thorough update to a classic text that has guided countless readers through the complex world of compressing data efficiently.

Data compression is the backbone of modern computing, enabling faster data transmission, reduced storage space, and optimized performance across various platforms. The 4th edition of this book dives deeper into contemporary algorithms, theoretical foundations, and practical implementations, making it a must-have reference for both beginners and seasoned experts.

What Makes the 4th Edition Stand Out?

The 4th edition of "Introduction to Data Compression" builds upon the solid foundation laid by its predecessors but incorporates significant advancements in the field. It addresses the latest trends such as machine learning-based compression methods and enhanced video codecs, reflecting the evolution of data consumption and storage needs.

One of the key features is the inclusion of expanded content on multimedia compression, especially in audio, image, and video formats. The book also provides updated examples and exercises, which help readers apply theoretical concepts to real-world scenarios.

Updated Algorithms and Techniques

The book explores both lossless and lossy compression techniques with a balanced approach. While classical algorithms like Huffman coding, arithmetic coding, and Lempel-Ziv-Welch (LZW) remain central topics, the 4th edition expands on newer methods such as:

- Context-based adaptive binary arithmetic coding (CABAC)
- Advanced video coding standards (e.g., HEVC/H.265)
- Deep learning approaches in compression

These additions make the material highly relevant for current and future applications, from streaming services to embedded systems.

Comprehensive Coverage of Multimedia Compression

In today's digital age, multimedia content dominates internet traffic. The 4th edition recognizes this shift by offering in-depth explanations of image and video compression standards like JPEG, JPEG2000, and MPEG series. It explains how these standards achieve efficient compression without significantly compromising quality, a balance crucial for applications like video conferencing, online gaming, and broadcasting.

The book also discusses audio compression formats such as MP3, AAC, and emerging codecs, making it a holistic guide to handling various data types.

Understanding Core Concepts of Data Compression

Before diving into complex algorithms, the book ensures readers grasp the foundational principles that govern data compression. This approach helps in building intuition about why compression works and how different methods impact data integrity and size.

Entropy and Information Theory

A significant portion is dedicated to explaining entropy, a measure of randomness or unpredictability in data. By understanding entropy, readers learn the theoretical limits of compression—how much a file can be compressed before losing essential information.

The book introduces Shannon's source coding theorem, which sets the stage for lossless compression techniques. This theoretical framework is essential for anyone aiming to develop or optimize compression algorithms.

Lossless vs. Lossy Compression

Differentiating between lossless and lossy compression is critical. The 4th edition clearly outlines scenarios where each is appropriate. Lossless compression ensures exact data reconstruction, ideal for text files, executable programs, and certain images like medical scans. Lossy compression, on the other hand, sacrifices some data fidelity for much higher compression ratios, suitable for multimedia files where minor quality loss is often imperceptible.

The book details the trade-offs involved and helps readers make informed decisions depending on their specific use cases.

Practical Applications and Real-World Examples

What makes the "Introduction to Data Compression 4th Edition" particularly engaging is its focus on practical relevance. It doesn’t just dwell on theory; it connects concepts to technologies and products we use daily.

Data Compression in Networking and Storage

The text explores how compression drives efficiency in data transmission across networks, reducing bandwidth requirements and improving speed. This is especially important in mobile communications and cloud storage, where resource constraints demand optimized data handling.

In storage, compression reduces the physical space required for data centers, lowering costs and energy consumption. The book discusses file systems and database compression techniques that leverage these principles.

Compression in Multimedia and Streaming Services

With the explosion of video streaming platforms like Netflix, YouTube, and Spotify, effective compression is vital. The book walks readers through how these services utilize codecs to stream high-quality content seamlessly over varying internet speeds.

It also highlights challenges such as latency, error resilience, and adaptive streaming, showing how compression algorithms evolve to meet these needs.

Learning Tips and How to Get the Most Out of the Book

Approaching a technical subject like data compression can be daunting, but this book’s structure aids comprehension. Here are some suggestions to maximize your learning experience:

- **Start with the basics:** Don’t skip the introductory chapters on information theory and entropy. They set the foundation for understanding more complex topics.
- **Work through examples:** The 4th edition includes numerous practical examples. Implementing these in code can solidify your grasp of the concepts.

- **Focus on applications relevant to you:** If you’re interested in video compression, pay extra attention to chapters covering video codecs and streaming technologies.
- **Utilize exercises:** The end-of-chapter problems are designed to test your understanding and encourage deeper exploration.

Who Should Read the Introduction to Data Compression 4th Edition?

This book caters to a broad audience. Graduate and advanced undergraduate students in computer science will find it an excellent textbook. Software engineers and developers working on multimedia applications, networking, or storage solutions will appreciate the practical insights.

Moreover, researchers and professionals keeping up with the latest trends in compression technologies will value the updated content on modern algorithms and standards.

Bridging Theory and Practice

One of the standout qualities of this edition is its balance between rigorous mathematical explanations and real-world applicability. Readers are not only shown how compression algorithms work but also why they work, supported by mathematical proofs and performance analyses.

This dual approach empowers readers to innovate, optimize, and troubleshoot compression systems effectively.

Final Thoughts on Introduction to Data Compression 4th Edition

Navigating the world of data compression can feel overwhelming given its technical depth and rapid evolution. However, the "Introduction to Data Compression 4th Edition" makes this journey accessible and engaging. Its comprehensive coverage, updated content, and practical orientation ensure that readers gain both foundational knowledge and current insights.

Whether you are enhancing your skills for academic pursuits or professional projects, this book remains a trusted guide in mastering the art and science of data compression.

Frequently Asked Questions

What is 'Introduction to Data Compression 4th Edition' about?

It is a comprehensive textbook that covers the fundamental concepts and techniques of data compression, including both lossless and lossy methods, widely used in digital media and communications.

Who is the author of 'Introduction to Data Compression 4th Edition'?

The book is authored by Khalid Sayood, a well-known expert in the field of data compression and signal processing.

What are the key topics covered in the 4th edition of 'Introduction to Data Compression'?

Key topics include entropy coding, Huffman coding, arithmetic coding, dictionary methods, transform coding, wavelet compression, and video and audio compression standards.

How does the 4th edition differ from previous editions of 'Introduction to Data Compression'?

The 4th edition includes updated content on recent compression standards, expanded coverage of multimedia compression techniques, and new exercises and examples to enhance learning.

Is 'Introduction to Data Compression 4th Edition' suitable for beginners?

Yes, the book starts with fundamental concepts and gradually progresses to advanced topics, making it suitable for both beginners and advanced readers in data compression.

Does the book include practical examples and exercises?

Yes, it contains numerous examples, exercises, and case studies to help readers understand and apply data compression techniques effectively.

Can 'Introduction to Data Compression 4th Edition'

be used for academic courses?

Absolutely, it is widely used as a textbook in university courses related to data compression, multimedia systems, and information theory.

Are there any online resources available to complement the book?

Some editions provide supplementary materials such as code examples and lecture slides, and readers often find additional resources on the author's or publisher's website.

What prior knowledge is recommended before reading 'Introduction to Data Compression 4th Edition'?

A basic understanding of probability, statistics, and digital signal processing concepts is helpful to fully grasp the material presented in the book.

Additional Resources

Introduction to Data Compression 4th Edition: A Comprehensive Review and Analysis

introduction to data compression 4th edition stands as a definitive resource for professionals, students, and researchers delving into the intricate world of data encoding and compression techniques. Authored by the eminent David Salomon, this edition builds upon its predecessors by incorporating the latest advancements and methodologies in data compression, making it an indispensable reference in the evolving landscape of digital information processing.

In-Depth Analysis of Introduction to Data Compression 4th Edition

The fourth edition of Introduction to Data Compression refreshes its foundational approach while expanding coverage to include contemporary algorithms and real-world applications. Data compression, a critical facet of computer science and information technology, involves reducing the size of data to optimize storage and facilitate faster transmission. This edition meticulously balances theoretical underpinnings with practical insights, making it appealing to both academic audiences and industry practitioners.

One notable aspect of this edition is its comprehensive treatment of both lossless and lossy compression techniques. The book navigates through

classical methods such as Huffman coding and arithmetic coding, while also exploring modern approaches like dictionary-based algorithms (LZ77, LZW) and transform coding techniques crucial for multimedia data. This wide array of topics ensures readers understand the trade-offs between compression efficiency and computational complexity.

Expanded Coverage of Multimedia Compression

Recognizing the surge in multimedia data, the fourth edition dedicates significant attention to image, audio, and video compression. It provides detailed explanations of standards like JPEG, JPEG 2000, MPEG-2, and H.264, incorporating mathematical formulations and algorithmic steps that underpin these widely used codecs. This focus reflects the real-world demand for efficient multimedia handling in streaming, broadcasting, and storage solutions.

Moreover, the book discusses emerging trends in compression technology, including scalable video coding and perceptual coding techniques, which optimize compression based on human sensory characteristics. Such inclusions demonstrate the author's commitment to keeping the content relevant amid rapidly shifting technological landscapes.

Comparative Evaluation of Compression Algorithms

A standout feature of Introduction to Data Compression 4th Edition is its analytical comparison of various algorithms. Through empirical data and performance metrics, it examines compression ratios, speed, and resource requirements across different methods. This approach enables readers to make informed decisions when selecting compression strategies tailored to specific applications.

For instance, the book contrasts the simplicity and speed of Huffman coding against the higher compression efficiency but increased complexity of arithmetic coding. Similarly, it evaluates dictionary-based schemes for text compression, highlighting their adaptability and limitations. Such comparisons are essential for understanding practical trade-offs in system design.

Integration of Coding Theory and Information Theory

Beyond algorithmic descriptions, the book delves into the theoretical frameworks that inform compression techniques. It bridges concepts from coding theory, such as error detection and correction, with information theory fundamentals like entropy and redundancy. This integration enriches the reader’s comprehension of why certain compression methods perform better

under specific data distributions and constraints.

By grounding practical algorithms in solid theoretical principles, the text equips readers with the analytical tools necessary to innovate and optimize compression solutions. This synthesis also underscores the interdisciplinary nature of data compression, intersecting mathematics, computer science, and engineering.

Key Features and Highlights

- **Comprehensive Algorithm Coverage:** From classic Huffman coding to advanced video compression standards, the book spans a broad spectrum of techniques.
- **Updated Content:** Incorporates recent developments in compression technology, including scalable and perceptual coding methods.
- **Practical Examples:** Provides real-world scenarios and coding examples to illustrate complex concepts effectively.
- **Mathematical Rigor:** Includes detailed derivations and proofs to support the theoretical discussions.
- **Comparative Analysis:** Offers performance evaluations and trade-off discussions to guide algorithm selection.

Pros and Cons of the Fourth Edition

To provide a balanced perspective, it is helpful to consider the strengths and limitations of the Introduction to Data Compression 4th Edition.

1. **Pros:**
    - Extensive and up-to-date coverage of compression algorithms and standards.
    - Clear explanations that bridge theory and practice.
    - Rich use of examples and illustrations enhances learning.
    - Useful for a wide audience, including students, researchers, and professionals.

2. **Cons:**
    - Some sections may be mathematically dense for readers without a strong technical background.
    - The broad scope occasionally results in less depth on niche or emerging compression methods.
    - Practical implementation details might require supplementary resources or coding experience.

Contextual Relevance and Industry Impact

In an era dominated by big data, cloud computing, and streaming media, understanding data compression principles is paramount. Introduction to Data Compression 4th Edition serves as a foundational text that equips readers with the skills to tackle challenges related to bandwidth constraints, storage limitations, and data transmission efficiency.

The book’s detailed exploration of compression standards like MPEG and JPEG aligns with industry requirements, enabling professionals to design and optimize systems for video conferencing, digital broadcasting, and multimedia storage. Furthermore, the inclusion of lossless compression techniques remains critical for applications demanding data integrity, such as archival systems and scientific data storage.

By emphasizing both theoretical and practical aspects, this edition fosters a nuanced understanding that is essential for innovation in fields like machine learning, where data preprocessing and efficient representation are increasingly vital.

Comparison with Previous Editions

While the core structure remains consistent with earlier editions, the fourth edition distinguishes itself through updated content reflecting the latest standards and research findings. It expands coverage of video compression, introducing newer codecs and scalable coding frameworks that were either nascent or absent in prior versions.

The enhancements also include refined explanations and reorganized chapters, improving readability and logical progression. For readers familiar with earlier editions, this update offers a valuable opportunity to stay current

with the state-of-the-art in data compression without sacrificing the foundational knowledge that made the book a classic.

Who Should Consider This Book?

Introduction to Data Compression 4th Edition is particularly well-suited for:

- Graduate students in computer science, electrical engineering, and information technology seeking a comprehensive curriculum resource.
- Software engineers and developers working on data storage and transmission systems.
- Researchers focusing on algorithm development and optimization in compression techniques.
- Technical professionals aiming to deepen their understanding of multimedia codecs and standards.

Its balanced approach caters to those who want to grasp both the theoretical foundations and the practical applications of data compression, making it a versatile addition to technical libraries.

The fourth edition of Introduction to Data Compression continues to uphold its reputation as a definitive text, offering readers a thorough and insightful exploration into the multifaceted world of data compression. Its careful integration of theory, practice, and recent technological advances ensures its place as an essential reference in a rapidly evolving digital landscape.

Introduction To Data Compression 4th Edition

introduction to data compression 4th edition: Introduction to Data Compression Khalid Sayood, 2017-10-23 Introduction to Data Compression, Fifth Edition, builds on the success of what is widely considered the best introduction and reference text on the art and science of data compression. Data compression techniques and technology are ever-evolving with new applications in image, speech, text, audio and video. This new edition includes all the latest developments in the field. Khalid Sayood provides an extensive introduction to the theory underlying today's compression techniques, with detailed instruction for their applications using several examples to explain the concepts. Encompassing the entire field of data compression, the book includes lossless and lossy compression, Huffman coding, arithmetic coding, dictionary techniques, context based compression, and scalar and vector quantization. The book provides a comprehensive working knowledge of data compression, giving the reader the tools to develop a complete and concise compression package. - Explains established and emerging standards in- depth, including JPEG 2000, JPEG-LS, MPEG-2,

H.264, JBIG 2, ADPCM, LPC, CELP, MELP, iLBC and the new HEVC standard - Includes more coverage of lattices in vector quantization - Contains improved and expanded end-of-chapter problems - Source code is provided via a companion website that gives readers the opportunity to build their own algorithms and choose and implement techniques in their own applications

introduction to data compression 4th edition: A Concise Introduction to Data Compression David Salomon, 2007-12-18 This clearly written book offers readers a succinct foundation to the most important topics in the field of data compression. Part I presents the basic approaches to data compression and describes a few popular techniques and methods that are commonly used to compress data. The reader will discover essential concepts. Part II concentrates on advanced techniques, such as arithmetic coding, orthogonal transforms, subband transforms and Burrows-Wheeler transform. This book is the perfect reference for advanced undergraduates in computer science and requires a minimum of mathematics. An author-maintained website provides errata and auxiliary material.

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introduction to data compression 4th edition: Handbook of Data Compression David Salomon, Giovanni Motta, 2010-01-18 Data compression is one of the most important fields and tools in modern computing. From archiving data, to CD-ROMs, and from coding theory to image analysis, many facets of modern computing rely upon data compression. This book provides a comprehensive reference for the many different types and methods of compression. Included are a detailed and helpful taxonomy, analysis of most common methods, and discussions on the use and comparative benefits of methods and description of how to use them. Detailed descriptions and explanations of the most well-known and frequently used compression methods are covered in a self-contained fashion, with an accessible style and technical level for specialists and non-specialists.

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computing make use of data compression in one form or another. This book is intended to provide an overview of the many different types of compression: it includes a taxonomy, an analysis of the most common systems of compression, discussion of their relative benefits and disadvantages, and their most common usages. Readers are presupposed to have a basic understanding of computer science: essentially the storage of data in bytes and bits and computing terminology, but otherwise this book is self-contained. The book divides naturally into four main parts based on the main branches of data compression: run length encoding, statistical methods, dictionary-based methods, and lossy image compression (where in contrast to the other techniques, information in the data may be lossed but an acceptable standard of image quality retained). Detailed descriptions of many of the most well-known compression techniques are covered including: Zip, BinHex, Huffman coding, GIF and many others.

introduction to data compression 4th edition: *Digital Signal Processing* Li Tan, 2007-09-04 This book will enable electrical engineers and technicians in the fields of the biomedical, computer, and electronics engineering, to master the essential fundamentals of DSP principles and practice. Coverage includes DSP principles, applications, and hardware issues with an emphasis on applications. Many instructive worked examples are used to illustrate the material and the use of mathematics is minimized for easier grasp of concepts.In addition to introducing commercial DSP hardware and software, and industry standards that apply to DSP concepts and algorithms, topics covered include adaptive filtering with noise reduction and echo cancellations; speech compression; signal sampling, digital filter realizations; filter design; multimedia applications; over-sampling, etc. More advanced topics are also covered, such as adaptive filters, speech compression such as PCM, u-law, ADPCM, and multi-rate DSP and over-sampling ADC. - Covers DSP principles and hardware issues with emphasis on applications and many worked examples - End of chapter problems are helpful in ensuring retention and understanding of what was just read

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pseudocode conventions, basic terminology, and data structures, chapters cover compression, cryptography, graphs, searching and sorting, hashing, classification, strings, and chance. Each chapter describes real problems and then presents algorithms to solve them. Examples illustrate the wide range of applications, including shortest paths as a solution to paragraph line breaks, strongest paths in elections systems, hashes for song recognition, voting power Monte Carlo methods, and entropy for machine learning. Real-World Algorithms can be used by students in disciplines from economics to applied sciences. Computer science majors can read it before using a more technical text.

introduction to data compression 4th edition: New Perspectives on Optimization Algorithms Research Germano Lambert-Torres, Gilberto Capistrano Cunha de Andrade, Carlos Henrique Valério De Moraes, 2025-07-16 Optimization processes are present in nearly all human activities, aiming to reduce time and expenses, conserve resources, and maximize efficiency. Classical numerical optimization methods were initially employed in more complex or elaborate problems. This class of methods was convenient to use when equations could correctly and completely formulate all the attributes of the problem to be optimized and whose search space for the solution had convexity characteristics and was not multimodal. Expressing a problem completely through equations is often a difficult (if not impossible) task because linguistic values or employing quantities that are not easily dealt with by classical optimization methods can only describe certain limitations and barriers. Irregular and non-convex search spaces also present problems for classical methods, especially those with multiple local minima and maxima, as they can lead to suboptimal solutions. In this context, researchers in optimization have presented new techniques to overcome these barriers, introducing new concepts and methods that enable working with problems that are not well-defined and in multimodal search spaces. Many of these techniques utilize artificial intelligence methods, and it is possible to optimize problems where their limitations are not clearly defined or where their search spaces contain different local maxima and minima. This book is a contribution in this sense. In it, the reader will find two sections. The first, titled Methodologies, presents the frontier of state-of-the-art optimization techniques and their applications to various problems. The second section, titled Applications, presents examples of practical applications of modern techniques in optimizing issues, which can be easily adapted to others with similar characteristics. Thus, the reader can use this book to optimize their problems by applying the solutions presented in the chapters and adapting them to their specific issues.

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introduction to data compression 4th edition: Signal Processing Sebastian Miron, 2010-03-01 This book intends to provide highlights of the current research in signal processing area and to offer a snapshot of the recent advances in this field. This work is mainly destined to researchers in the signal processing related areas but it is also accessible to anyone with a scientific background desiring to have an up-to-date overview of this domain. The twenty-five chapters present methodological advances and recent applications of signal processing algorithms in various domains as telecommunications, array processing, biology, cryptography, image and speech processing. The methodologies illustrated in this book, such as sparse signal recovery, are hot topics in the signal processing community at this moment. The editor would like to thank all the authors for their excellent contributions in different areas of signal processing and hopes that this book will be of valuable help to the readers.

introduction to data compression 4th edition: Artificial Intelligence for Edge Computing Mudhakar Srivatsa, Tarek Abdelzaher, Ting He, 2023-12-21 It is undeniable that the recent revival of artificial intelligence (AI) has significantly changed the landscape of science in many application

domains, ranging from health to defense and from conversational interfaces to autonomous cars. With terms such as “Google Home”, “Alexa”, and “ChatGPT” becoming household names, the pervasive societal impact of AI is clear. Advances in AI promise a revolution in our interaction with the physical world, a domain where computational intelligence has always been envisioned as a transformative force toward a better tomorrow. Depending on the application family, this domain is often referred to as Ubiquitous Computing, Cyber-Physical Computing, or the Internet of Things. The underlying vision is driven by the proliferation of cheap embedded computing hardware that can be integrated easily into myriads of everyday devices from consumer electronics, such as personal wearables and smart household appliances, to city infrastructure and industrial process control systems. One common trait across these applications is that the data that the application operates on come directly (typically via sensors) from the physical world. Thus, from the perspective of communication network infrastructure, the data originate at the network edge. From a performance standpoint, there is an argument to be made that such data should be processed at the point of collection. Hence, a need arises for Edge AI -- a genre of AI where the inference, and sometimes even the training, are performed at the point of need, meaning at the edge where the data originate. The book is broken down into three parts: core problems, distributed problems, and other cross-cutting issues. It explores the challenges arising in Edge AI contexts. Some of these challenges (such as neural network model reduction to fit resource-constrained hardware) are unique to the edge environment. They need a novel category of solutions that do not parallel more typical concerns in mainstream AI. Others are adaptations of mainstream AI challenges to the edge space. An example is overcoming the cost of data labeling. The labeling problem is pervasive, but its solution in the IoT application context is different from other contexts. This book is not a survey of the state of the art. With thousands of publications appearing in AI every year, such a survey is doomed to be incomplete on arrival. It is also not a comprehensive coverage of all the problems in the space of Edge AI. Different applications pose different challenges, and a more comprehensive coverage should be more application specific. Instead, this book covers some of the more endemic challenges across the range of IoT/CPS applications. To offer coverage in some depth, we opt to cover mainly one or a few representative solutions for each of these endemic challenges in sufficient detail, rather that broadly touching on all relevant prior work. The underlying philosophy is one of illustrating by example. The solutions are curated to offer insight into a way of thinking that characterizes Edge AI research and distinguishes its solutions from their more mainstream counterparts.

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introduction to data compression 4th edition: *How Computers Make Books* John Whitington, 2024-03-19 Learn about computer science by exploring the fascinating journey of making this book! How Computers Make Books. by author and publishing software developer John Whitington, takes readers on a journey through the computer processes needed to create this very book. Each chapter explores the elegance of modern digital printing, from how a computer knows where to place ink to reproducing shades of grey and laying out paragraphs on the page. From graphics rendering, search algorithms, and functional programming to indexing and typesetting, you will discover: How human descriptions translate into computer programs How can a computer understand document formatting How a program decides where to print ink on a page Why computer science is so interesting to computer scientists, and why it might interest you ...and much more! How Computers Make Books introduces what is wonderful about computer science by telling the story of how computers have transformed the ancient art of publishing books. About the technology Computers have transformed every industry--even ones as traditional as creating books. If you have ever been mystified about what goes into programming a computer to do practical,

familiar tasks, then this book is for you. In it, you will answer interesting questions about human-computer interaction. How do computers represent all the different languages and letters used by humans? How do we compress a book's worth of complex information to be transferred in seconds? And what exactly is a computer program? This book answers all those questions by telling the story of how it was created!

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introduction to data compression 4th edition: Practical Image and Video Processing Using MATLAB Oge Marques, 2011-08-04 UP-TO-DATE, TECHNICALLY ACCURATE COVERAGE OF ESSENTIAL TOPICS IN IMAGE AND VIDEO PROCESSING This is the first book to combine image and video processing with a practical MATLAB®-oriented approach in order to demonstrate the most important image and video techniques and algorithms. Utilizing minimal math, the contents are presented in a clear, objective manner, emphasizing and encouraging experimentation. The book has been organized into two parts. Part I: Image Processing begins with an overview of the field, then introduces the fundamental concepts, notation, and terminology associated with image representation and basic image processing operations. Next, it discusses MATLAB® and its Image Processing Toolbox with the start of a series of chapters with hands-on activities and step-by-step tutorials. These chapters cover image acquisition and digitization; arithmetic, logic, and geometric operations; point-based, histogram-based, and neighborhood-based image enhancement techniques;

the Fourier Transform and relevant frequency-domain image filtering techniques; image restoration; mathematical morphology; edge detection techniques; image segmentation; image compression and coding; and feature extraction and representation. Part II: Video Processing presents the main concepts and terminology associated with analog video signals and systems, as well as digital video formats and standards. It then describes the technically involved problem of standards conversion, discusses motion estimation and compensation techniques, shows how video sequences can be filtered, and concludes with an example of a solution to object detection and tracking in video sequences using MATLAB®. Extra features of this book include: More than 30 MATLAB® tutorials, which consist of step-by-step guides toexploring image and video processing techniques using MATLAB® Chapters supported by figures, examples, illustrative problems, and exercises Useful websites and an extensive list of bibliographical references This accessible text is ideal for upper-level undergraduate and graduate students in digital image and video processing courses, as well as for engineers, researchers, software developers, practitioners, and anyone who wishes to learn about these increasingly popular topics on their own.

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