

## Computer Transformation Of Digital Images And Patterns

This book introduces perspective, and discusses the mathematics of perspective in a detailed, yet accessible style. It also reviews nonlinear projections, including the fisheye, panorama, and map projections frequently used to enhance digital images. Topics and features include a complete and self-contained presentation of concepts, principles, and methods; a 12-page colour section, and numerous figures. This essential resource for computer professionals both within and outside the field of Computer Graphics is also suitable for graduates and advanced undergraduates in Computer Graphics and Computer-Aided Design. Key ideas are introduced, examined and illustrated by figures and examples, and reinforced through solved exercises.

Basic topological algorithms are the subject of this new book. It presents their underlying theory and discusses their applications. Due to the wide variety of topics treated in the seven chapters, no attempt has been made to standardize the notation and terminology used by the authors. Each chapter, however, is self-contained and can be read independently of the others. Some of the basic terminology and fundamental concepts of digital topology are reviewed in the appendix which also describes important areas of the field. A bibliography of over 360 references is also provided. The notations and terminologies used in this book will serve to introduce readers to the even wider variety that exists in the voluminous literature dealing with topological algorithms.

Digital transformation (DT) has become a buzzword. Every industry segment across the globe is consciously jumping toward digital innovation and disruption to get ahead of their competitors. In other words, every aspect of running a business is being digitally empowered to reap all the benefits of the digital paradigm. All kinds of digitally enabled businesses across the globe are intrinsically capable of achieving bigger and better things for their constituents. Their consumers, clients, and customers will realize immense benefits with real digital transformation initiatives and implementations. The much-awaited business transformation can be easily and elegantly accomplished with a workable and winnable digital transformation strategy, plan, and execution. There are several enablers and accelerators for realizing the much-discussed digital transformation. There are a lot of digitization and digitalization technologies available to streamline and speed up the process of the required transformation. Industrial Internet of Things (IIoT) technologies in close association with decisive advancements in the artificial intelligence (AI) space can bring forth the desired transitions. The other prominent and dominant technologies toward forming digital organizations include cloud IT, edge/fog computing, real-time data analytics platforms, blockchain technology, digital twin paradigm, virtual and augmented reality (VR/AR) techniques, enterprise mobility, and 5G communication. These technological innovations are intrinsically competent and versatile enough to fulfill the varying requirements for establishing and sustaining digital enterprises. Enterprise Digital Transformation: Technology, Tools, and Use Cases features chapters on the evolving aspects of digital transformation and intelligence. It covers the unique competencies of digitally transformed enterprises, IIoT use cases, and applications. It explains promising technological solutions widely associated with digital innovation and disruption. The book focuses on setting up and sustaining smart factories that are fulfilling the Industry 4.0 vision that is realized through the IIoT and allied technologies.

The book provides an up-to-date and authoritative treatment of pattern recognition and computer vision, with chapters written by leaders in the field. On the basic methods in pattern recognition and computer vision, topics range from statistical pattern recognition to array grammars to projective geometry to skeletonization, and shape and texture measures. Recognition applications include character recognition and document analysis, detection of digital mammograms, remote sensing image fusion, and analysis of functional magnetic resonance imaging data, etc. There are six chapters on current activities in human identification. Other topics include moving object tracking, performance evaluation, content-based video analysis, musical style recognition, number plate recognition, etc.

An Algorithmic Introduction Using Java

19th IAPR International Conference, DGCI 2016, Nantes, France, April 18-20, 2016. Proceedings

Digital Image Processing Methods

Digital Geometry

Digital Image Processing Algorithms and Applications

Principles and Applications

The Digital image processing is the use of computer algorithms to perform image processing on digital images.It allows a much wider range of algorithms to be applied to the input data and can avoid problems such as the build-up of noise and signal distortion during processing.The distance transform (DT) is a general operator forming the basis of many methods in computer vision and geometry, with great potential for practical applications.

Utilize modern methods for digital image processing and take advantage of the many time-saving templates provided for all of the projects in this book. Modern Algorithms for Image Processing approaches the topic of image processing through teaching by example. Throughout the book, you will create projects that resolve typical problems that you might encounter in the world of digital image processing. Some projects teach you methods for addressing the quality of images, such as reducing random errors or noise and suppressing pulse noise (salt and pepper), a method valuable for improving the quality of historical images. Other methods detail how to correct inhomogeneous illumination, not by means of subtracting the mean illumination, but through division, a far more efficient method. Additional projects cover contrasting, and a process for edge detection, more efficient than Canny's, for detecting edges in color images directly, without converting them into black and white images. What You'll Learn Apply innovative methods for suppressing pulse noise, enhancing contrast, and edge detectionKnow the pros and cons of enlisting a particular method Use new approaches for image compression and recognizing circles in photos Utilize a valuable method for straightening photos of paintings taken at an oblique angle, a critical concept to understand when using flash at a right angle Understand the problem statement of polygonal approximation of boundaries or edges and its solution Use a new method for detecting bicycles in trafficAccess complete source code examples in C# for all of the projects Who This Book Is For C# developers who work with digital image processing or are interested in informatics. The reader should have programming experience and access to an integrated development environment (IDE), ideally .NET. This book does not prove or disprove theorems, but suggests methods for learning valuable concepts that will enable you to customize your own image processing projects.

This book considers computer vision to be an integral part of the artificial intelligence system. The core of the book is an analysis of possible approaches to the creation of artificial vision systems, which simulate human visual perception. Much attention is paid to the latest achievements in visual psychology and physiology, the description of the functional and structural organization of the human perception mechanism, the peculiarities of artistic perception and the expression of reality. Computer vision models based on these data are investigated. They include the processes of external data analysis, internal environmental model synthesis, and the generating of behavioristic responses based on external and internal models comparison. Computer vision system evolution resulting from environmental effects is also considered. A unique feature of this book is the authors' use of black and white, and colour prints of traditional and contemporary Russian art to illustrate their principal theses. In doing so, they introduce the reader to a particularly Russian view of the world.

Basic principles of image processing and programming explained without college-level mathematics. This book explores image processing from several perspectives: the creative, the theoretical (mainly mathematical), and the programmatical. It explains the basic principles of image processing, drawing on key concepts and techniques from mathematics, psychology of perception, computer science, and art, and introduces computer programming as a way to get more control over image processing operations. It does so without requiring college-level mathematics or prior programming experience. The content is supported by PixelMath, a freely available software program that helps the reader understand images as both visual and mathematical objects. The first part of the book covers such topics as digital image representation, sampling, brightness and contrast, color models, geometric transformations, synthesizing images, stereograms, photomosaics, and fractals. The second part of the book introduces computer programming using an open-source version of the easy-to-learn Python language. It covers the basics of image analysis and pattern recognition, including edge detection, convolution, thresholding, contour representation, and K-nearest-neighbor classification. A chapter on computational photography explores such subjects as high-dynamic-range imaging, autofocusing, and methods for automatically inpainting to fill gaps or remove unwanted objects in a scene. Applications described include the design and implementation of an image-based game. The PixelMath software provides a “transparent” view of digital images by allowing the user to view the RGB values of pixels by zooming in on an image. PixelMath provides three interfaces: the pixel calculator; the formula page, an advanced extension of the calculator; and the Python window.

Building Intelligent Enterprises

Theoretical Foundations and Applications to Computational Imaging

Information Report

Digital Watermarking

Geometric Transformation Techniques for Digital Images: a Survey

Object Detection and Recognition in Digital Images

*Binary Digital Image Processing is aimed at faculty, postgraduate students and industry specialists. It is both a text reference and a textbook that reviews and analyses the research output in this field of binary image processing. It is aimed at both advanced researchers as well as educating the novice to this area. The theoretical part of this book includes the basic principles required for binary digital image analysis. The practical part which will take an algorithmic approach addresses problems which find applications beyond binary digital line image processing. The book first outlines the theoretical framework underpinning the study of digital image processing with particular reference to those needed for line image processing. The theoretical tools in the first part of the book set the stage for the second and third parts, where low-level binary image processing is addressed and then intermediate level processing of binary line images is studied. The book concludes with some practical applications of this work by reviewing some industrial and software applications (engineering drawing storage and primitive extraction, fingerprint compression). Outlines the theoretical framework underpinning the study of digital image processing with particular reference to binary line image processing Addresses low-level binary image processing, reviewing a number of essential characteristics of binary digital images and providing solution procedures and algorithms Includes detailed reviews of topics in binary digital image processing with up-to-date research references in relation to each of the problems under study Includes some practical applications of this work by reviewing some common applications Covers a range of topics, organised by theoretical field rather than being driven by problem definitions*

*This book is a detailed description of the basics of three-dimensional digital image processing. A 3D digital image (abbreviated as “3D image” below) is a digitalized representation of a 3D object or an entire 3D space, stored in a computer as a 3D array. Whereas normal digital image processing is concerned with screens that are a collection of square shapes called “pixels” and their corresponding density levels, the “image plane” in three dimensions is represented by a division into cubical graphical elements (called “voxels”) that represent corresponding density levels. Inthecontextofimageprocessing,inmanycases3Dimageprocessingwill refer to the input of multiple 2D images and performing processing in order to understand the 3D space (or “scene”) that they depict. This is a result of research into how to use input from image sensors such as television cameras as a basis for learning about a 3D scene, thereby replicating the sense of vision for humans or intelligent robots, and this has been the central problem in image processing research since the 1970s. However, a completely di?erent type of image with its own new problems, the 3D digital image discussed in this book, rapidly took prominence in the 1980s, particularly in the ?eld of medical imaging. These were recordings of human bodies obtained through computed (or “computerized”) tomography (CT),imagesthatrecordednotonlytheexternal,visiblesurfaceofthesubject but also, to some degree of resolution, its internal structure. This was a type of image that no one had experienced before.*

*A unique collection of algorithms and lab experiments for practitioners and researchers of digital image processing technology With the field of digital image processing rapidly expanding, there is a growing need for a book that would go beyond theory and techniques to address the underlying algorithms. Digital Image Processing Algorithms and Applications fills the gap in the field, providing scientists and engineers with a complete library of algorithms for digital image processing, coding, and analysis. Digital image transform algorithms, edge detection algorithms, and image segmentation algorithms are carefully gleaned from the literature for compatibility and a track record of acceptance in the scientific community. The author guides readers through all facets of the technology, supplementing the discussion with detailed lab exercises in EIKONA, his own digital image processing software, as well as useful PDF transparencies. He covers in depth filtering and enhancement, transforms, compression, edge detection, region segmentation, and shape analysis, explaining at every step the relevant theory, algorithm structure, and its use for problem solving in various applications. The availability of the lab exercises and the source code (all algorithms are presented in C-code) over the Internet makes the book an invaluable self-study guide. It also lets interested readers develop digital image processing applications on ordinary desktop computers as well as on Unix machines.*

*Character and handwriting recognition by computers is attracting much attention particularly because of its potential for application in many areas such as office automation, bank check processing, recognition of postal addresses and ZIP Codes, signature verification, and document and text recognition. Over the past four decades, many methods have been proposed, developed and tested for computers to recognize characters, and they have been reported in a variety of publications. The present volume is a coherent and integrated publication containing papers which give new research results in this increasingly active field. It is a boon to researchers, scientists and engineers who need to keep abreast of new developments in character and handwriting methodologies and applications. Contents: Foreword (C Y Suen)OCR and Off-Line Character Recognition:Optical Character Recognition – A Survey (S Impedovo et al.)Transformation-Ring-Projection (TRP) Algorithm and its VLSI Implementation (Y Y Tang et al.)Regularities and Singularities in Line Pictures (J C Simon & O Baret)On-Line Character Recognition:Speed, Accuracy, and Flexibility Trade-Offs in On-Line Character Recognition (C C Tappert)Chinese and Japanese Character Recognition: Some Research Achievements on Chinese Character Recognition in China (J-W Tai)Applications:Understanding Handwritten Text in a Structured Environment: Determining ZIP Codes from Addresses (E Cohen et al.)A Structural Approach to On-Line Character Recognition: System Design and Applications (F Nouboud & R Plamondon)Progress in Verification of Skillfully Simulated Handwritten Signatures (M Ammar)and other papers Readership: Computer scientists, engineers, researchers and industrialists.*

Digital Geometry Algorithms

Euclidean Distance Transform Algorithms in Image Processing

Topological Algorithms for Digital Image Processing

An Interdisciplinary Introduction to Image Processing

Morphological Image Analysis

Digital Image Processing

**Computer Transformation of Digital Images and Patterns**World Scientific

*In the development of digital multimedia, the importance and impact of image processing and mathematical morphology are well documented in areas ranging from automated vision detection and inspection to object recognition, image analysis and pattern recognition. Those working in these ever-evolving fields require a solid grasp of basic fundamentals, theory, and related applications—and few books can provide the unique tools for learning contained in this text. Image Processing and Mathematical Morphology: Fundamentals and Applications is a comprehensive, wide-ranging overview of morphological mechanisms and techniques and their relation to image processing. More than merely a tutorial on vital technical information, the book places this knowledge into a theoretical framework. This helps readers analyze key principles and architectures and then use the author’s novel ideas on implementation of advanced algorithms to formulate a practical and detailed plan to develop and foster their own ideas. The book: Presents the history and state-of-the-art techniques related to image morphological processing, with numerous practical examples Gives readers a clear tutorial on complex technology and other tools that rely on their intuition for a clear understanding of the subject Includes an updated bibliography and useful graphs and illustrations Examines several new algorithms in great detail so that readers can adapt them to derive their own solution approaches This invaluable reference helps readers assess and simplify problems and their essential requirements and complexities, giving them all the necessary data and methodology to master current theoretical developments and applications, as well as create new ones.*

*This book is concerned with linear and nonlinear transformations of digitized images and patterns. Transformation models include linear, quadratic, cubic, bilinear, biquadratic, bicubic, Coons model and other nonlinear forms such as harmonic, projective, and perspective transformations. Discrete techniques have been developed to realize both forward and inverse transformations. The latter can be applied to normalize distorted images and to enhance the pattern recognition process. Efficient algorithms such as the splitting-shooting methods and splitting-integrating methods have been developed and analysed in this book for the first time. Graphical examples are given and compared with existing algorithms. This book is of interest to researchers in the areas of pattern recognition, character recognition, image processing, computer vision, computer graphics and other related fields.*

*Digital geometry emerged as an independent discipline in the second half of the last century. It deals with geometric properties of digital objects and is developed with the unambiguous goal to provide rigorous theoretical foundations for devising new advanced approaches and algorithms for various problems of visual computing. Different aspects of digital geometry have been addressed in the literature. This book is the first one that explicitly focuses on the presentation of the most important digital geometry algorithms. Each chapter provides a brief survey on a major research area related to the general volume theme, description and analysis of related fundamental algorithms, as well as new original contributions by the authors. Every chapter contains a section in which interesting open problems are addressed.*

**From Humans to Computers**

***Cognition Through Visual Perception  
Improved Binary Images by Achieving Euclidean Distance Transformation  
Understanding Digital Image Processing  
Pixels, Numbers, and Programs***

***Progress In Image Analysis And Processing - Proceedings Of The 5th International Conference***

This book introduces the fundamental concepts of modern digital image processing. It aims to help the students, scientists, and practitioners to understand the concepts through clear explanations, illustrations and examples. The discussion of the general concepts is supplemented with examples from applications and ready-to-use implementations of concepts in MATLAB®. Program code of some important concepts in programming language 'C' is provided. To explain the concepts, MATLAB® functions are used throughout the book. MATLAB® Version 9.3 (R2017b), Image Acquisition Toolbox Version 5.3 (R2017b), Image Processing Toolbox, Version 10.1 (R2017b) have been used to create the book material. Meant for students and practicing engineers, this book provides a clear, comprehensive and up-to-date introduction to Digital Image Processing in a pragmatic manner.

While there are many spatial/frequency domain watermarking techniques, optimization is a commonly encountered mathematical problem in data security related issues. The research on new embedding domains, hardware implementations and bio-inspired algorithms for optimization problems is on rise as natural computing is able to solve computationally complex problems. This book covers the introduction of and state-of-the-art watermarking techniques developed in various domains along with their hardware implementations explaining how bio-inspiring techniques can find optimum solutions in relevant issues. It also include the applications, challenges faced by such algorithms and future research.

Images or discrete objects, to be analyzed based on digital image data, need to be represented, analyzed, transformed, recovered etc. These problems have stimulated many interesting developments in theoretical foundations of image processing. This coherent anthology presents 27 state-of-the-art surveys and research papers on digital image geometry and topology. It is based on a winter school held at Dagstuhl Castle, Germany in December 2000 and offers topical sections on topology, representation, geometry, multigrid convergence, and shape similarity and simplification.

Written as an introduction for undergraduate students, this textbook covers the most important methods in digital image processing. Formal and mathematical aspects are discussed at a fundamental level and various practical examples and exercises supplement the text. The book uses the image processing environment ImageJ, freely distributed by the National Institute of Health. A comprehensive website supports the book, and contains full source code for all examples in the book, a question and answer forum, slides for instructors, etc. Digital Image Processing in Java is the definitive textbook for computer science students studying image processing and digital processing.

Digital and Image Geometry  
Soft Computing Approach to Pattern Recognition and Image Processing

Expanding Frontiers  
Theory and Practice  
Fundamentals of Digital Imaging in Medicine

Digital Transformation  
The image analysis community has put much effort into developing systems for the automatic reading of various types of documents containing text, graphic information, and pictures. A closely related but much more problematic task is the reading and interpretation of line drawings such as maps, engineering drawings, and diagrams. This book considers the problem in detail, analyzes its theoretical foundations, and analyzes existing approaches and systems.

The book is self-contained in the sense that it is accessible to engineers, scientists, and practitioners having no prior experience with morphology. In addition, most necessary background notions about digital image processing are covered. The emphasis being put on the techniques useful for solving practical problems rather than the theory underlying mathematical morphology, no special knowledge about set theory and topology is required. Nevertheless, the book goes well beyond an introduction to mathematical morphology. Indeed, starting from the fundamental transformations, more elaborate methods which have proven their practical usefulness are explained. This is achieved through a step by step process pursued until the most recent advances.

This book constitutes the refereed proceedings of the 19th IAPR International Conference on Discrete Geometry for Computer Imagery, DGCI 2016, held in Nantes, France, in April 2016. The 32 revised full papers presented together with 2 invited talks were carefully selected from 51 submissions. The papers are organized in topical sections on combinatorial tools; discretization; discrete tomography; discrete and combinatorial topology; shape descriptors; models for discrete geometry; circle drawing; morphological analysis; geometric transforms; and discrete shape representation, recognition and analysis.

The first book on digital geometry by the leaders in the field.

Theory, Architecture and Implementation  
Fundamentals and Applications  
Transformations and Projections in Computer Graphics  
Handbook Of Pattern Recognition And Computer Vision (3rd Edition)  
Computer Transformation of Digital Images and Patterns  
Fundamentals of Three-dimensional Digital Image Processing

Object detection, tracking and recognition in images are key problems in computer vision. This book provides the reader with a balanced treatment between the theory and practice of selected methods in these areas to make the book accessible to a range of researchers, engineers, developers and postgraduate students working in computer vision and related fields. Key features: Explains the main theoretical ideas behind each method (which are augmented with a rigorous mathematical derivation of the formulas), their implementation (in C++) and demonstrated working in real applications. Places an emphasis on tensor and statistical based approaches within object detection and recognition. Provides an overview of image clustering and classification methods which includes subspace and kernel based processing, mean shift and Kalman filter, neural networks, and k-means methods. Contains numerous case study examples of mainly automotive applications. Includes a companion website hosting full C++ implementation, of topics presented in the book as a software library, and an accompanying manual to the software platform.

This book discusses different types of distance functions defined in an n-D integral space for their usefulness in approximating the Euclidean metric. It discusses the properties of these distance functions and presents various kinds of error analysis in approximating Euclidean metrics. It also presents a historical perspective on efforts and motivation for approximating Euclidean metrics by digital distances from the mid-sixties of the previous century. The book also contains an in-depth presentation of recent progress, and new research problems in this area.

Digital holography and digital image processing are twins born by computer era. They share origin, theoretical base, methods and algorithms. The present book describes these common fundamentals principles, methods and algorithms including image and hologram digitization, data compression, digital transforms and efficient computational algorithms, statistical and Monte-Carlo methods, image restoration and enhancement, image reconstruction in tomography and digital holography, discrete signal resampling and image geometrical transformations, accurate measurements and reliable target localization in images, recording and reconstruction of computer generated holograms, adaptive and nonlinear filters for sensor signal perfecting and image restoration and enhancement. The book combines theory, heavily illustrated practical methods and efficient computational algorithms and is written for senior-level undergraduate and graduate students, researchers and engineers in optics, photonics, opto-electronics and electronic engineering.

Design has long expressed and established itself as an independent research competence – a fact that also companies, institutions and politicians have come to acknowledge. What is still needed, however, is a stronger public platform for design to confidently reflect upon this process and to establish and communicate the specific innovative and experimental dimension of design research. For this reason, BIRD, the Board of International Research in Design, has developed the New Experimental Research in Design / NERD format. The edited conference contributions of twelve young researchers from all over the world provide an impressive and diverse and insightful range of intelligent and inspiring approaches in design research, giving rise to further debate and action in the rapidly evolving field.

Binary Digital Image Processing  
Principles, Methods, Algorithms  
NERD – New Experimental Research in Design  
Enterprise Digital Transformation  
Digital Image Watermarking

Modern Algorithms for Image Processing  
Exploring theories and applications developed during the last 30 years, Digital Geometry in Image Processing presents a mathematical treatment of the properties of digital metric spaces and their relevance in analyzing shapes in two and three dimensions. Unlike similar books, this one connects the two areas of image processing and digital geometry,

This volume contains papers presented at the 5th International Conference on Image Analysis and Processing. It covers the most important topics of current interest in the field, presenting a large collection of recent results achieved by leading academic and industrial research groups from several countries. It contains invited lectures and research papers dealing with theoretical and applicative aspects of Image Processing. It is a valuable and updated reference source for the Image Processing community. It contains advanced architectural concepts and describes new frontiers for applicants.

In general, image processing texts are intended for students of engineering and computer science, and there is little written at all on the specific requirements of medical image processing. Students of medical radiation science (Diagnostic radiography, Nuclear medicine, Radiation therapy) usually have minimal mathematical and computer science training and find the available texts incomprehensible. A text that explains the principles of image processing in minimally-mathematical language is needed for these students. Contrary to the claims of some textbook authors, the vast majority of technologists that process images do not need to understand the mathematics involved, but would nevertheless benefit from a thorough understanding of the general process.

This unique reference presents in-depth coverage of the latest methods and applications of digital image processing describing various computer architectures ideal for satisfying specific image processing demands.

Principles of digital image synthesis  
A Discrete Approach  
Computer Imagery by Example Using C#  
Advanced Lectures  
Character and Handwriting Recognition  
A Digital Optical Cellular Image Processor

*Building Intelligent Enterprises by leveraging the emerging and next-generation technologies to accelerate the adoption of digital transformation The speed of innovation and emerging IT technologies are changing at a very fast pace and enterprises are eager to join the digital revolution so they can stand above the competition and succeed as the enterprise of tomorrow. This book is an attempt to make the enterprise intelligent by providing the path to digital transformation and the adoption of new IT methods, tools and technologies. This book has been organized to cover the following topics: Digital Transformation, Design Thinking, Agile, DevOps, Robotic Process Automation, Internet of Things, Artificial Intelligence, Machine Learning, Blockchain, Drones, Augmented and Virtual Reality, 3D Printing, Big Data, Analytics, Cloud Computing, APIs, and SAP Leonardo. No prior knowledge of any technical coding or language is necessary to understand the content of this book. End-to-end storyline to accelerate the enterprise's digital transformation journey How an enterprise can stay relevant, compete, and perform in the digital economy How to leverage these technologies to build intelligent enterprises Understand and apply the emerging technologies across key business processes Industry-specific Use Cases for all technologies as a reference point to build the business case for implementation The book is very well suited towards the C-Suite executives, both IT and business leaders, directors and managers, project managers, solution architects, and all professionals who have an interest and desire to keep up-to-date with the latest technological trends, looking for a career change, want to help enterprise*

*adapt and onboard the digital roadmap, or have an agenda to digitize key processes within the enterprise to make it intelligent. This volume provides a collection of sixteen articles containing review and new material. In a unified way, they describe the recent development of theories and methodologies in pattern recognition, image processing and vision using fuzzy logic, artificial neural networks, genetic algorithms, rough sets and wavelets with significant real life applications.The book details the theory of granular computing and the role of a rough-neuro approach as a way of computing with words and designing intelligent recognition systems. It also demonstrates applications of the soft computing paradigm to case based reasoning, data mining and bio-informatics with a scope for future research.The contributors from around the world present a balanced mixture of current theory, algorithms and applications, making the book an extremely useful resource for students and researchers alike.*

*This book presents the state-of-the-arts application of digital watermarking in audio, speech, image, video, 3D mesh graph, text, software, natural language, ontology, network stream, relational database, XML, and hardware IPs. It also presents new and recent algorithms in digital watermarking for copyright protection and discusses future trends in the field. Today, the illegal manipulation of genuine digital objects and products represents a considerable problem in the digital world. Offering an effective solution, digital watermarking can be applied to protect intellectual property, as well as fingerprinting, enhance the security and proof-of-authentication through unsecured channels.*

Vol. 1  
Digital Holography and Digital Image Processing  
Theoretical and Computational Advances  
Image Processing and Mathematical Morphology

*Discrete Geometry for Computer Imagery*