

A Survey On Digital Image Steganography And Steganalysis

This pioneering two-year project explored the legal, technical, and practical issues involved in using digital images of museum collections for educational purposes. The report includes essays by project participants for the fourteen museums and universities that participated in this project, and recommends terms and conditions for distributing digital museum images via the Internet and university campus networks. Digital Image Computing: Techniques and Applications is the premier biennial conference in Australia on the topics of image processing and image analysis. This seventh edition of the proceedings has seen an unprecedented level of submission, on such diverse areas as: Image processing; Face recognition; Segmentation; Registration; Motion analysis; Medical imaging; Object recognition; Virtual environments; Graphics; Stereo-vision; and Video analysis. These two volumes contain all the 108 accepted papers and five invited talks that were presented at the conference. These two volumes provide the Australian and international imaging research community with a snapshot of current theoretical and practical developments in these areas. They are of value to any engineer, computer scientist, mathematician, statistician or student interested in these matters.

Advances in digital technology led to the development of digital x-ray detectors that are currently in wide use for projection radiography, including Computed Radiography (CR) and Digital Radiography (DR). Digital Imaging Systems for Plain Radiography addresses the current technological methods available to medical imaging professionals to ensure the optimization of the radiological process concerning image quality and reduction of patient exposure. Based on extensive research by the authors and reference to the current literature, the book addresses how exposure parameters influence the diagnostic quality in digital systems, what the current acceptable radiation doses are for useful diagnostic images, and at what level the dose could be reduced to maintain an accurate diagnosis. The book is a valuable resource for both students learning the field and for imaging professionals to apply to their own practice while performing radiological examinations with digital systems.

This textbook is the third of three volumes which provide a modern, algorithmic introduction to digital image processing, designed to be used both by learners desiring a firm foundation on which to build, and practitioners in search of critical analysis and concrete implementations of the most important techniques. This volume builds upon the introductory material presented in the first two volumes with additional key concepts and methods in image processing. Features: practical examples and carefully constructed chapter-ending exercises; real implementations, concise mathematical notation, and precise algorithmic descriptions designed for programmers and practitioners; easily adaptable Java code and completely worked-out examples for easy inclusion in existing applications; uses ImageJ; provides a supplementary website with the complete Java source code, test images, and corrections; additional presentation tools for instructors including a complete set of figures, tables, and mathematical elements.

This book comprehensively reviews the various automated and semi-automated signal and image processing techniques, as well as deep-learning-based image analysis techniques, used in healthcare diagnostics. It highlights a range of data pre-processing methods used in signal processing for effective data mining in remote healthcare, and discusses pre-processing using filter techniques, noise removal, and contrast-enhanced methods for improving image quality. The book discusses the status quo of artificial intelligence in medical applications, as well as its future. Further, it offers a glimpse of feature extraction methods for reducing dimensionality and extracting discriminatory information hidden in biomedical signals. Given its scope, the book is intended for academics, researchers and practitioners interested in the latest real-world technological innovations.

In recent years, libraries have embraced new technologies that organize and store a variety of digital information, such as multimedia databases, digital medical images, and content-based images. Modern Library Technologies for Data Storage, Retrieval, and Use highlights new features of digital library technology in order to educate the database community. By contributing research from case studies on the emerging technology use in libraries, this book is essential for academics and scientists interested in the efforts to understand the applications of data acquisition, retrieval and storage.

The International Conference on Signals, Systems and Automation (ICSSA 2011) aims to spread awareness in the research and academic community regarding cutting-edge technological advancements revolutionizing the world. The main emphasis of this conference is on dissemination of information, experience, and research results on the current topics of interest through in-depth discussions and participation of researchers from all over the world. The objective is to provide a platform to scientists, research scholars, and industrialists for interacting and exchanging ideas in a number of research areas. This will facilitate communication among researchers in different fields of Electronics and Communication Engineering. The International Conference on Intelligent System and Data Processing (ICISD 2011) is organized to address various issues that will foster the creation of intelligent solutions in the future. The primary goal of the conference is to bring together worldwide leading researchers, developers, practitioners, and educators interested in advancing the state of the art in computational intelligence and data processing for exchanging knowledge that encompasses a broad range of disciplines among various distinct communities. Another goal is to promote scientific information interchange between researchers, developers, engineers, students, and practitioners working in India and abroad.

This book covers the technology of digital image processing in various fields with big data and their applications. Readers will understand various technologies and strategies used in digital image processing as well as handling big data, using machine-learning techniques. This book will help to improve the skills of students and researchers in such fields as engineering, agriculture, and medical imaging. There is a need to be able to understand and analyse the latest developments of digital image technology. As such, this book will cover: · Applications such as biomedical science and biometric image processing, content-based image retrieval, remote sensing, pattern recognition, shape and texture analysis · New concepts in color interpolation to produce the full color from the sub-pattern bare pattern color prevalent in today's digital cameras and other imaging devices · Image compression standards that are needed to serve diverse applications · Applications of remote sensing, medical science, traffic management, education, innovation, and analysis in agricultural design and image processing · Both soft and hard computing approaches at great length in relation to major image processing tasks · The direction and development of current and future research in many areas of image processing · A comprehensive bibliography for additional research (integrated within the framework of the book)

This book focuses not only on theoretical and practical knowledge in the field but also on the traditional and latest tools and techniques adopted in image processing and data science. It also provides an indispensable guide to a wide range of basic and advanced techniques in the fields of image processing and data science.

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. The survey in this report is directed toward the CRT display systems in order to assess the current state of interactive display systems. This report goes further than previous surveys in that monitor systems were reviewed independent of the total systems. Another primary element in the digital image display system the refresh technology used by any system. This report pays particular attention to the refresh technique. The results show that most new developments in the field were predicted, such as solid state memory for refresh of the monitor and the appearance of a new '1000' line monitor from two suppliers. (Author). The challenge behind the processing of digital images is the huge amounts of data that has to be processed in an extremely short period of time. This book is a broad-ranging technical survey of computational and analytical methods and tools for digital image analysis and interpretation. The ultimate goal is to create a rich set of computational methods for image analysis and interpretation that can achieve rapid response times. This book will serve as an excellent up-to-date resource for computer scientists and engineers in digital imaging and analysis.

This book constitutes the thoroughly refereed post-proceedings of the International Workshop on Integrated Databases, Digital Images and GIS, ISD'99, held in Portland, Maine, USA in June 1999. The 18 revised full papers presented went through a double reviewing process and were selected from nearly 40 original submissions. The book is divided into parts on object extraction from raster images, geospatial analysis, formalisms and modeling, and data access.

This book presents a compilation of current trends, technologies, and challenges in connection with Big Data. Many fields of science and engineering are data-driven, or generate huge amounts of data that are ripe for the picking. There are now more sources of data than ever before, and more means of capturing data. At the same time, the sheer volume and complexity of the data have sparked new developments, where many Big Data problems require new solutions. Given its scope, the book offers a valuable reference guide for all graduate students, researchers, and scientists interested in exploring the potential of Big Data applications.

We welcome you to the Third Pacific-Rim Symposium on Image and Video Technology (PSIVT 2009), sponsored by the National Institute of Informatics, Microsoft Research, and the Forum for Image Informatics in Japan. PSIVT 2009

was held in Tokyo, Japan, during January 13–16. The main conference comprised eight major themes spanning the field of image and video technology, namely, image sensors and multimedia hardware, graphics and visualization, image and video analysis, recognition and retrieval, multi-view imaging and processing, computer vision applications, video communications and networking, and multimedia processing. To heighten interest and participation, PSIVT also included workshops, tutorials, demonstrations and invited talks, in addition to the traditional technical presentations. For the technical program of PSIVT 2009, a total of 247 paper submissions underwent a full review process. Each of these submissions was evaluated in a double-blind manner by a minimum of three reviewers. The review assignments were determined by a set of two to four Chairs for each of the eight themes. Final decisions were jointly made by the Theme Chairs, with some adjustments by the Program Chairs in an effort to balance the quality of papers among the themes and to emphasize novelty. Rejected papers with significant discrepancies in review evaluations received consolidation reports explaining the decisions.

This book discusses blind investigation and recovery of digital evidence left behind on digital devices, primarily for the purpose of tracing cybercrime sources and criminals. It presents an overview of the challenges of digital image forensics, with a specific focus on two of the most common forensic problems. The first part of the book addresses image source investigation, which involves mapping an image back to its camera source to facilitate investigating and tracing the source of a crime. The second part of the book focuses on image-forgery detection, primarily focusing on "copy-move forgery" in digital images, and presenting effective solutions to copy-move forgery detection with an emphasis on additional related challenges such as blur-invariance, similar genuine object identification, etc. The book concludes with future research directions, including counter forensics. With the necessary mathematical information in every chapter, the book serves as a useful reference resource for researchers and professionals alike. In addition, it can also be used as a supplementary text for upper-undergraduate and graduate-level courses on "Digital Image Processing", "Information Security", "Machine Learning", "Computer Vision" and "Multimedia Security and Forensics".

This authoritative text (the second part of a complete MSc course) provides mathematical methods required to describe images, image formation and different imaging systems, coupled with the principle techniques used for processing digital images. It is based on a course for postgraduates reading physics, electronic engineering, telecommunications engineering, information technology and computer science. This book relates the methods of processing and interpreting digital images to the 'physics' of imaging systems. Case studies reinforce the methods discussed, with examples of current research themes. Provides mathematical methods required to describe images, image formation and different imaging systems Outlines the principle techniques used for processing digital images Relates the methods of processing and interpreting digital images to the 'physics' of imaging systems

Today, the scope of image processing and recognition has broadened due to the gap in scientific visualization. Thus, new imaging techniques have developed, and it is imperative to study this progression for optimal utilization. Advanced Image Processing Techniques and Applications is an essential reference publication for the latest research on digital image processing advancements. Featuring expansive coverage on a broad range of topics and perspectives, such as image and video steganography, pattern recognition, and artificial vision, this publication is ideally designed for scientists, professionals, researchers, and academicians seeking current research on solutions for new challenges in image processing.

Computer vision is a rapidly expanding field that depends on the capability to automatically segment and, thus, to classify and interpret images. In this report, the primary computer vision subarea-segmentation-is investigated. Many of the latest publications on the subject of segmentation are detailed in a survey format. Special attention is given to a few specialized techniques for segmenting digital images. Powerful segmentation techniques are available; however, each technique is ad hoc. The creation of hybrid techniques seems to be a promising future research area with respect to current Navy digital mapping applications.

In diagnostic medicine a large part of information about the patient is drawn from data, which, more or less, are represented in an optical pictorial form. There is a very wide range of such data as e.g. the patients appearance, the various kinds of radiological images, or cytological imagery. In conventional diagnostics the data, as it comes from the acquisition device, is perceived by the physician and is interpreted with the help of a large amount of "a priori" knowledge to give a diagnostic finding. During the last 15 years a steadily rising number of attempts have been made to support these processes by the application of computers. The attempts mainly concentrate on three objectives: 1. Support of the perception process by the production of better or new types of images, e.g. by Computer tomography or Computer angiography (image processing) . 2. Automation of the interpretation process, e.g. for bloodcell differentiation (pattern recognition) . 3. Management of the steeply rising amount of medical image data in the hospital (image data bases) . Although the early applications of digital methods aimed at the second . . objective, in the last years much more success has been achieved in the support of the perception process

by methods of image processing. The reason for this is obvious - in the case of automatic interpretation the a priori knowledge of the physician has to be formalized.

Photographic imagery has come a long way from the pinhole cameras of the nineteenth century. Digital imagery, and its applications, develops in tandem with contemporary society's sophisticated literacy of this subtle medium. This book examines the ways in which digital images have become ever more ubiquitous as legal and medical evidence, just as they have become our primary source of news and have replaced paper-based financial documentation. Crucially, the contributions also analyze the very profound problems which have arisen alongside the digital image, issues of veracity and progeny that demand systematic and detailed response: It looks real, but is it? What camera captured it? Has it been doctored or subtly altered? Attempting to provide answers to these slippery issues, the book covers how digital images are created, processed and stored before moving on to set out the latest techniques for forensically examining images, and finally addressing practical issues such as courtroom admissibility. In an environment where even novice users can alter digital media, this authoritative publication will do much to stabilize public trust in these real, yet vastly flexible, images of the world around us.

Meant for students and practicing engineers, this book provides a clear, comprehensive and up-to-date introduction to Digital Image Processing in a pragmatic style. Illustrative approach, practical examples and MATLAB applications given in the book help in bringing theory to life.

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.

In the past decade, the way image based media is created, disseminated, and shared has changed exponentially, as digital imaging technology has replaced traditional film based media. Digital Images for the Information Professional provides an overview of This book carries forward recent work on visual patterns and structures in digital images and introduces a near set-based a topology of digital images. Visual patterns arise naturally in digital images viewed as sets of non-abstract points endowed with some form of proximity (nearness) relation. Proximity relations make it possible to construct uniform topologies on the sets of points that constitute a digital image. In keeping with an interest in gaining an understanding of digital images themselves as a rich source of patterns, this book introduces the basics of digital images from a computer vision perspective. In parallel with a computer vision perspective on digital images, this book also introduces the basics of proximity spaces. Not only the traditional view of spatial proximity relations but also the more recent descriptive proximity relations are considered. The beauty of the descriptive proximity approach is that it is possible to discover visual set patterns among sets that are non-overlapping and non-adjacent spatially. By combining the spatial proximity and descriptive proximity approaches, the search for salient visual patterns in digital images is enriched, deepened and broadened. A generous provision of Matlab and Mathematica scripts are used in this book to lay bare the fabric and essential features of digital images for those who are interested in finding visual patterns in images. The combination of computer vision techniques and topological methods lead to a deep understanding of images.

The Book presents an overview of newly developed watermarking techniques in various independent and hybrid domains Covers the basics of digital watermarking, its types, domain in which it is implemented and the application of machine learning algorithms onto digital watermarking Reviews hardware implementation of watermarking Discusses optimization problems and solutions in watermarking with a special focus on bio-inspired algorithms Includes a case study along with its MATLAB code and simulation results

This long-established and well-received monograph offers an integral view of image processing - from image acquisition to the extraction of the data of interest - written by a physical scientists for other scientists. Supplements discussion of the general concepts is supplemented with examples from applications on PC-based image processing systems and ready-to-use implementations of important algorithms. Completely revised and extended, the most notable extensions being a detailed discussion on random variables and fields, 3-D imaging techniques and a unified approach to regularized parameter estimation.

This coherent and articulate volume summarizes work carried out in the field of theoretical signal and image processing. It focuses on non-linear and non-parametric models for time series as well as on adaptive methods in image processing. The aim of this volume is to bring together research directions in theoretical signal and imaging processing developed rather independently in electrical engineering, theoretical physics, mathematics and the computer sciences.

A comprehensive review of the most recent applications of intelligent multi-modal data processing Intelligent Multi-Modal Data Processing contains a review of the most recent applications of data processing. The Editors and contributors - noted experts on the topic - offer a review of the new and challenging areas of multimedia data processing as well as state-of-the-art algorithms to solve the problems in an intelligent manner. The text provides a clear understanding of the real-life implementation of different statistical theories and explains how to implement various statistical theories. Intelligent Multi-Modal Data Processing is an authoritative guide for developing innovative research ideas for interdisciplinary research practices. Designed as a practical resource, the book contains tables to compare statistical analysis results of a novel technique to that of the state-of-the-art techniques and illustrations in the form of algorithms to establish a pre-processing and/or post-processing technique for model building. The book also contains images that show the efficiency of the algorithm on standard data set. This important book: Includes an in-depth analysis of the state-of-the-art applications of signal and data processing Contains contributions from noted experts in the field Offers information on hybrid differential evolution for optimal multilevel image thresholding Presents a fuzzy decision based multi-objective evolutionary method for video summarisation Written for students of technology and management, computer scientists and professionals in information technology, Intelligent Multi-Modal Data Processing brings together in one volume the range of multi-modal data processing.

This report investigates currently available devices which digitize data from film to use as input to a digital computer. The report describes the general specifications for a scanning/digitizing system and describes the various available devices which meet the requirements. The report found that vidicon camera systems were the lowest cost scanners and the flying spot scanners were the most expensive. The most precise instrument, and the most expensive, is the flat bed microdensitometer. In conclusion, the application scenario must be known and the requirements carefully evaluated before any of the digitizing systems described in the report are selected. (Author).

This book covers newly developed and novel Steganography techniques and algorithms. The book outlines techniques to provide security to a variety of applications using Steganography, with the goal of both hindering an adversary from decoding a hidden message, and also preventing an adversary from suspecting the existence of covert communications. The book looks into applying these newly designed and improved algorithms to provide a new and efficient Steganographic system, called Characteristic Region-Based Image Steganography (CR-BIS). The algorithms combine both the robustness of the Speeded-Up Robust Features technique (SURF) and Discrete Wavelet Transform (DWT) to achieve characteristic region Steganography synchronization. The book also touches on how to avoid hiding data in the whole image by dynamically selecting characteristic regions for the process of embedding. Applies and discusses innovative techniques for hiding text in a digital image file or even using it as a key to the encryption; Provides a variety of methods to achieve characteristic region Steganography synchronization; Shows how Steganography improves upon cryptography by using obscurity features.

Digital image sequences (including digital video) are increasingly common and important components in technical applications ranging from

medical imaging and multimedia communications to autonomous vehicle navigation. The immense popularity of DVD video and the introduction of digital television make digital video ubiquitous in the consumer domain. Digital Image Sequence Processing, Compression, and Analysis provides an overview of the current state of the field, as analyzed by leading researchers. An invaluable resource for planning and conducting research in this area, the book conveys a unified view of potential directions for further industrial development. It offers an in-depth treatment of the latest perspectives on processing, compression, and analysis of digital image sequences. Research involving digital image sequences remains extremely active. The advent of economical sequence acquisition, storage, and display devices, together with the availability of computing power, opens new areas of opportunity. This volume delivers the background necessary to understand the strengths and weaknesses of current techniques and the directions that consumer and technical applications may take over the coming decade. In recent years, Moore's law has fostered the steady growth of the field of digital image processing, though the computational complexity remains a problem for most of the digital image processing applications. In parallel, the research domain of optical image processing has matured, potentially bypassing the problems digital approaches were suffering and bringing new applications. The advancement of technology calls for applications and knowledge at the intersection of both areas but there is a clear knowledge gap between the digital signal processing and the optical processing communities. This book covers the fundamental basis of the optical and image processing techniques by integrating contributions from both optical and digital research communities to solve current application bottlenecks, and give rise to new applications and solutions. Besides focusing on joint research, it also aims at disseminating the knowledge existing in both domains. Applications covered include image restoration, medical imaging, surveillance, holography, etc... "a very good book that deserves to be on the bookshelf of a serious student or scientist working in these areas." Source: Optics and Photonics News

"This book examines novel designs and recent developments in cryptographic security control procedures to improve the efficiency of existing security mechanisms that can help in securing sensors, devices, networks, communication, and data"--

In order to utilize digital images effectively, specific techniques are needed to reduce the number of bits required for their representation. This Tutorial Text provides the groundwork for understanding these image compression techniques and presents a number of different schemes that have proven useful. The algorithms discussed in this book are concerned mainly with the compression of still-frame, continuous-tone, monochrome and color images, but some of the techniques, such as arithmetic coding, have found widespread use in the compression of bilevel images. Both lossless (bit-preserving) and lossy techniques are considered. A detailed description of the compression algorithm proposed as the world standard (the JPEG baseline algorithm) is provided. The book contains approximately 30 pages of reconstructed and error images illustrating the effect of each compression technique on a consistent image set, thus allowing for a direct comparison of bit rates and reconstructed image quality. For each algorithm, issues such as quality vs. bit rate, implementation complexity, and susceptibility to channel errors are considered.

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