

DIGITAL WATERMARK



INTRODUCTION TO

DIGITAL WATERMARKING

Digital Watermarking

**Michael Arnold, Martin
Schmucker, Stephen D. Wolthusen**



Digital Watermarking:

Digital Watermarking Ingemar J. Cox, Ton Kalker, Heung-Kyu Lee, 2005-02-09 We are happy to present to you the proceedings of the 3rd International Workshop on Digital Watermarking IWDW 2004 Since its modern reappearance in the academic community in the early 1990s great progress has been made in understanding both the capabilities and the weaknesses of digital watermarking On the theoretical side we all are now well aware of the fact that digital watermarking is best viewed as a form of communication using side information In the case of digital watermarking the side information in question is the document to be watermarked This insight has led to a better understanding of the limits of the capacity and robustness of digital watermarking algorithms It has also led to new and improved watermarking algorithms both in terms of capacity and imperceptibility Similarly the role of human perception and models thereof has been greatly enhanced in the study and design of digital watermarking algorithms and systems On the practical side applications of watermarking are not yet abundant The original euphoria on the role of digital watermarking in copy protection and copyright protection has not resulted in widespread use in practical systems With hindsight a number of reasons can be given for this lack of practical applications

Digital Watermarking and Steganography Ingemar Cox, Matthew Miller, Jeffrey Bloom, Jessica Fridrich, Ton Kalker, 2007-11-23 Digital audio video images and documents are flying through cyberspace to their respective owners Unfortunately along the way individuals may choose to intervene and take this content for themselves Digital watermarking and steganography technology greatly reduces the instances of this by limiting or eliminating the ability of third parties to decipher the content that he has taken The many techniques of digital watermarking embedding a code and steganography hiding information continue to evolve as applications that necessitate them do the same The authors of this second edition provide an update on the framework for applying these techniques that they provided researchers and professionals in the first well received edition Steganography and steganalysis the art of detecting hidden information have been added to a robust treatment of digital watermarking as many in each field research and deal with the other New material includes watermarking with side information QIM and dirty paper codes The revision and inclusion of new material by these influential authors has created a must own book for anyone in this profession This new edition now contains essential information on steganalysis and steganography New concepts and new applications including QIM introduced Digital watermark embedding is given a complete update with new processes and applications

Digital Watermarking and Steganography Frank Y. Shih, 2017-12-19 Every day millions of people capture store transmit and manipulate digital data Unfortunately free access digital multimedia communication also provides virtually unprecedented opportunities to pirate copyrighted material Providing the theoretical background needed to develop and implement advanced techniques and algorithms Digital Watermarking and Steganography Demonstrates how to develop and implement methods to guarantee the authenticity of digital media Explains the categorization of digital watermarking techniques based on characteristics as well

as applications Presents cutting edge techniques such as the GA based breaking algorithm on the frequency domain steganalytic system The popularity of digital media continues to soar The theoretical foundation presented within this valuable reference will facilitate the creation on new techniques and algorithms to combat present and potential threats against information security

Digital Image Watermarking Surekha Borra,Rohit Thanki,Nilanjan Dey,2018-12-07 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

Digital Watermarking for Digital Media Juergen Seitz,2005-01-01 The book discusses new aspects of digital watermarking in a worldwide context Provided by publisher

Digital Watermarking Mohammad Ali Nematollahi,Chalee Vorakulpipat,Hamurabi Gamboa Rosales,2016-08-08 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

Digital Watermarking for Machine Learning Model Lixin Fan,Chee Seng Chan,Qiang Yang,2023-05-29 Machine learning ML models especially large pretrained deep learning DL models are of high economic value and must be properly protected with regard to intellectual property rights IPR Model watermarking methods are proposed to embed watermarks into the target model so that in the event it is stolen the model s owner can extract the pre defined watermarks to assert ownership Model watermarking methods adopt frequently used techniques like backdoor training multi task learning decision boundary analysis etc to generate secret conditions that constitute model watermarks or fingerprints only known to model owners These methods have little or no effect on model performance which makes them applicable to a wide variety of contexts In terms of robustness embedded watermarks must be robustly detectable against varying adversarial attacks that attempt to remove the watermarks The efficacy of model watermarking methods is showcased in diverse applications including image classification image generation image captions natural language processing and reinforcement learning This book covers the motivations fundamentals techniques and protocols for protecting ML models using watermarking Furthermore it showcases cutting edge work in e g model watermarking signature and passport embedding and their use cases in distributed federated learning settings

Techniques and Applications of Digital Watermarking and Content Protection Michael Arnold,Martin Schmucker,Stephen D. Wolthusen,2003 This

informative new resource presents the first comprehensive treatment of silicon germanium heterojunction bipolar transistors SiGe HBTs It offers you a complete from the ground up understanding of SiGe HBT devices and technology from a very broad perspective The book covers motivation history materials fabrication device physics operational principles and circuit level properties associated with this new cutting edge semiconductor device technology Including over 400 equations and more than 300 illustrations this hands on reference shows you in clear and concise language how to design simulate fabricate and measure a SiGe HBT

Digital Watermarking and Steganography Frank Y. Shih,2017-04-10 This book intends to provide a comprehensive overview on different aspects of mechanisms and techniques for information security It is written for students researchers and professionals studying in the field of multimedia security and steganography Multimedia security and steganography is especially relevant due to the global scale of digital multimedia and the rapid growth of the Internet Digital watermarking technology can be used to guarantee authenticity and can be applied as proof that the content has not been altered since insertion Updated techniques and advances in watermarking are explored in this new edition The combinational spatial and frequency domains watermarking technique provides a new concept of enlarging the embedding capacity of watermarks The genetic algorithm GA based watermarking technique solves the rounding error problem and provide an efficient embedding approach Each chapter provides the reader with a fundamental theoretical framework while developing the extensive advanced techniques and considering the essential principles of the digital watermarking and steganographic systems Several robust algorithms that are presented throughout illustrate the framework and provide assistance and tools in understanding and implementing the fundamental principles

Multimedia Security: Steganography and Digital Watermarking Techniques for Protection of Intellectual Property Lu, Chun-Shien,2004-07-31 Multimedia security has become a major research topic yielding numerous academic papers in addition to many watermarking related companies In this emerging area there are many challenging research issues that deserve sustained study towards an effective and practical system This book explores the myriad of issues regarding multimedia security including perceptual fidelity analysis image audio and 3D mesh object watermarking medical watermarking error detection authentication and concealment fingerprinting digital signature and digital right management

Multimedia Watermarking Techniques and Applications Darko Kirovski,2006-04-18 Intellectual property owners must continually exploit new ways of reproducing distributing and marketing their products However the threat of piracy looms as a major problem with digital distribution and storage technologies Multimedia Watermarking Techniques and Applications covers all current and future trends in the design of modern

Innovations in Digital Watermarking Techniques Feng-Hsing Wang,2009-10-13 Information security and copyright protection are more important today than before Digital watermarking is one of the widely used techniques used in the world in the area of information security This book introduces a number of digital watermarking techniques and is divided into four parts The first part introduces the importance of watermarking techniques and intelligent technology The

second part includes a number of watermarking techniques The third part includes the hybrid watermarking techniques and the final part presents conclusions This book is directed to students professors researchers and application engineers who are interested in the area of information security

Information Hiding: Steganography and Watermarking-Attacks and Countermeasures Neil F. Johnson,Zoran Duric,Sushil Jajodia,2012-12-06 Information Hiding Steganography and Watermarking Attacks and Countermeasures deals with information hiding With the proliferation of multimedia on the Internet information hiding addresses two areas of concern privacy of information from surveillance steganography and protection of intellectual property digital watermarking Steganography literally covered writing explores methods to hide the existence of hidden messages These methods include invisible ink microdot digital signature covert channel and spread spectrum communication Digital watermarks represent a commercial application of steganography Watermarks can be used to track the copyright and ownership of electronic media In this volume the authors focus on techniques for hiding information in digital media They analyze the hiding techniques to uncover their limitations These limitations are employed to devise attacks against hidden information The goal of these attacks is to expose the existence of a secret message or render a digital watermark unusable In assessing these attacks countermeasures are developed to assist in protecting digital watermarking systems Understanding the limitations of the current methods will lead us to build more robust methods that can survive various manipulation and attacks The more information that is placed in the public s reach on the Internet the more owners of such information need to protect themselves from theft and false representation Systems to analyze techniques for uncovering hidden information and recover seemingly destroyed information will be useful to law enforcement authorities in computer forensics and digital traffic analysis Information Hiding Steganography and Watermarking Attacks and Countermeasures presents the authors research contributions in three fundamental areas with respect to image based steganography and watermarking analysis of data hiding techniques attacks against hidden information and countermeasures to attacks against digital watermarks Information Hiding Steganography and Watermarking Attacks and Countermeasures is suitable for a secondary text in a graduate level course and as a reference for researchers and practitioners in industry

Digital Watermarking Ingemar Cox,Matthew Miller,Mathew Miller,Jeffrey Bloom,2002 Applications and properties Models of watermarking Basic message coding Watermarking with side information Analyzing errors Using perceptual models Robust watermarking Watermark security Content authentication

Innovations and Advanced Techniques in Systems, Computing Sciences and Software Engineering Khaled Elleithy,2008-08-17 Innovations and Advanced Techniques in Systems Computing Sciences and Software Engineering includes a set of rigorously reviewed world class manuscripts addressing and detailing state of the art research projects in the areas of Computer Science Software Engineering Computer Engineering and Systems Engineering and Sciences Innovations and Advanced Techniques in Systems Computing Sciences and Software Engineering includes selected papers form the conference proceedings of the

International Conference on Systems Computing Sciences and Software Engineering SCSS 2007 which was part of the International Joint Conferences on Computer Information and Systems Sciences and Engineering CISSE 2007 *Handbook of Information Security, Information Warfare, Social, Legal, and International Issues and Security Foundations* Hossein Bidgoli, 2006-03-10 The Handbook of Information Security is a definitive 3 volume handbook that offers coverage of both established and cutting edge theories and developments on information and computer security The text contains 180 articles from over 200 leading experts providing the benchmark resource for information security network security information privacy and information warfare

Handbook of Communications Security F. Garzia, 2013 Communications represent a strategic sector for privacy protection and for personal company national and international security The interception damage or lost of information during communication can generate material and non material economic damages from both a personal and collective point of view The purpose of this book is to give the reader information relating to all aspects of communications security beginning at the base ideas and building to reach the most advanced and updated concepts The book will be of interest to integrated system designers telecommunication designers system engineers system analysts security managers technicians intelligence personnel security personnel police army private investigators scientists graduate and postgraduate students and anyone that needs to communicate in a secure way

Information Hiding: Steganography and Watermarking-Attacks and Countermeasures Neil Johnson, Zoran Duric, Sushil Jajodia, 2011-11-01 Information Hiding Steganography and Watermarking Attacks and Countermeasures deals with information hiding With the proliferation of multimedia on the Internet information hiding addresses two areas of concern privacy of information from surveillance steganography and protection of intellectual property digital watermarking Steganography literally covered writing explores methods to hide the existence of hidden messages These methods include invisible ink microdot digital signature covert channel and spread spectrum communication Digital watermarks represent a commercial application of steganography Watermarks can be used to track the copyright and ownership of electronic media In this volume the authors focus on techniques for hiding information in digital media They analyze the hiding techniques to uncover their limitations These limitations are employed to devise attacks against hidden information The goal of these attacks is to expose the existence of a secret message or render a digital watermark unusable In assessing these attacks countermeasures are developed to assist in protecting digital watermarking systems Understanding the limitations of the current methods will lead us to build more robust methods that can survive various manipulation and attacks The more information that is placed in the public s reach on the Internet the more owners of such information need to protect themselves from theft and false representation Systems to analyze techniques for uncovering hidden information and recover seemingly destroyed information will be useful to law enforcement authorities in computer forensics and digital traffic analysis Information Hiding Steganography and Watermarking Attacks and Countermeasures presents the authors research contributions in three fundamental areas with

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Digital Watermarking Techniques in Curvelet and Ridgelet Domain Channapragada Rama Seshagiri Rao, Munaga V.N.K. Prasad, 2016-05-20 This book describes the design development and testing of a novel digital watermarking technique for color images using Magic Square and Ridgelet transforms The novel feature of the method is that it generates and uses multiple copies of the digital watermark The book describes how the method was tested for embedding digital watermarks into color cover images resulting in very high PSNR value and yielding comparable results with existing watermarking techniques To reach this new method eight different techniques are designed developed and tested First the authors test two digital watermarking techniques based on encryption Image Watermark Using Complete Complementary Code Technique CCCT and Image Watermarking Using CCC Fast Walsh Hadamard Transform Technique CCC FWHTT Next four digital watermarking techniques based on curvelet transforms are discussed Image Watermarking Using Curvelet Transform WCT Watermark Wavelets in Curvelets of Cover Image WWCT Resized Watermark into Curvelets of Cover Image RWCT and Resized Watermark Wavelets into Curvelets of Cover Image RWWCT Then two final techniques are presented Image Watermarking Based on Magic Square MST and Image watermarking based on Magic Square and Ridgelet Transform MSRTT Future research directions are explored in the final chapter Designed for professionals and researchers in computer graphics and imaging Digital Watermarking Techniques in Curvelet and Ridgelet Domain is also a useful tool for advanced level students

Multimedia Security Handbook Borko Furht, Darko Kirovski, 2004-12-28 Intellectual property owners who exploit new ways of reproducing distributing and marketing their creations digitally must also protect them from piracy Multimedia Security Handbook addresses multiple issues related to the protection of digital media including audio image and video content This volume examines leading edge multimedia securit

The Enigmatic Realm of **Digital Watermarking**: Unleashing the Language is Inner Magic

In a fast-paced digital era where connections and knowledge intertwine, the enigmatic realm of language reveals its inherent magic. Its capacity to stir emotions, ignite contemplation, and catalyze profound transformations is nothing lacking extraordinary. Within the captivating pages of **Digital Watermarking** a literary masterpiece penned by a renowned author, readers set about a transformative journey, unlocking the secrets and untapped potential embedded within each word. In this evaluation, we shall explore the book's core themes, assess its distinct writing style, and delve into its lasting impact on the hearts and minds of those who partake in its reading experience.

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Digital Watermarking Introduction

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