

Ingemar J. Cox  
Matthew L. Miller  
Jeffrey A. Bloom  
Jessica Fridrich  
Ton Kalker

# Digital Watermarking *and* Steganography



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SECOND EDITION

# Steganography And Digital Watermarking

**Luke Andrew Johnson**



## **Steganography And Digital Watermarking:**

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 **Information Hiding Techniques for Steganography and Digital Watermarking** Stefan Katzenbeisser, Fabien A. P. Petitcolas, 2000 Steganography a means by which two or more parties may communicate using invisible or subliminal communication and watermarking a means of hiding copyright data in images are becoming necessary components of commercial multimedia applications that are subject to illegal use This new book is the first comprehensive survey of steganography and watermarking and their application to modern communications and multimedia

**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

*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

**Information Hiding** Stefan Katzenbeisser, Ahmad-Reza Sadeghi, 2009-09-03 This book constitutes the thoroughly refereed post workshop proceedings of the 11th International Workshop on Information Hiding IH 2009 held in Darmstadt Germany in June 2009 The 19 revised full papers presented were carefully reviewed and selected from 55 submissions The papers are organized in topical sections on steganography steganalysis watermarking fingerprinting hiding in unusual content novel applications and forensics

*Information Hiding: Steganography and Watermarking-Attacks and Countermeasures* Neil F. Johnson, Zoran Duric, Sushil Jajodia, 2001 The more information placed in the public s reach on the Internet the more owners of such information need to protect themselves from unwanted surveillance theft and false representation and reproduction Systems to analyze techniques for uncovering hidden information and recovering seemingly destroyed information are thus of great importance to many groups including law enforcement authorities in computer forensics and digital traffic analysis

*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 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. **Steganography and Watermarking** Ching-Nung Yang, Chia-Chen

Lin, Chin-Chen Chang, 2013. Privacy and Copyright protection is a very important issue in our digital society where a very large amount of multimedia data are generated and distributed daily using different kinds of consumer electronic devices and very popular communication channels such as the Web and social networks. This book introduces state-of-the-art technology on data hiding and copyright protection of digital images and offers a solid basis for future study and research.

**Multimedia Security** Frank Y. Shih, 2017-12-19. **Multimedia Security: Watermarking, Steganography, and Forensics** outlines essential principles, technical information, and expert insights on multimedia security technology used to prove that content is authentic and has not been altered. Illustrating the need for improved content security as the Internet and digital multimedia applications rapidly evolve, this book presents a wealth of everyday protection application examples in fields including multimedia mining and classification, digital watermarking, steganography, and digital forensics. Giving readers an in-depth overview of different aspects of information security mechanisms and methods, this resource also serves as an instructional tool on how to use the fundamental theoretical framework required for the development of extensive advanced techniques. The presentation of several robust algorithms illustrates this framework, helping readers to quickly master and apply fundamental principles. Presented case studies cover the execution and feasibility of techniques used to discover hidden knowledge by applying multimedia duplicate mining methods to large multimedia content. Different types of image steganographic schemes based on vector quantization. Techniques used to detect changes in human motion behavior and to classify different types of small group motion behavior. Useful for students, researchers, and professionals, this book consists of

a variety of technical tutorials that offer an abundance of graphs and examples to powerfully convey the principles of multimedia security and steganography Imparting the extensive experience of the contributors this approach simplifies problems helping readers more easily understand even the most complicated theories It also enables them to uncover novel concepts involved in the implementation of algorithms which can lead to the discovery of new problems and new means of solving them Digital Image and Video Watermarking and Steganography Srinivasan Ramakrishnan,2019-09-18

Authenticating data such as image video and audio is an important task in digital communication Another critical task is establishing ownership of the copyright Digital watermarking is a technique used to provide authentication and ownership of the copyright to the data Too much digitalization of data in the form of image video and audio communicated through various web and mobile applications makes authentication a challenging task Steganography the art of hiding tiny pieces of data in image video and audio can also help in copyright protection authentication and access control This book provides three watermarking and two steganography methods and will be a useful resource for graduate students researchers and practicing engineers in the field of electrical engineering *Steganography and Watermarking* Ching-Nung Yang,Chia-Chen Lin,Chin-Chen Chang,2014-05-14 Privacy and Copyright protection is a very important issue in our digital society where a very large amount of multimedia data are generated and distributed daily using different kinds of consumer electronic devices and very popular communication channels such as the Web and social networks This book Steganography and Watermarking introduces state of the art technology on data hiding and copyright protection of digital images and offers a solid basis for future study and research Steganographic technique overcomes the traditional cryptographic approach providing new solutions for secure data transmission without raising users malicious intention In steganography some secret information can be inserted into the original data in imperceptible and efficient ways to avoid distortion of the image and enhance the embedding capacity respectively Digital watermarking also adopts data hiding techniques for copyright protection and tampering verification of multimedia data In watermarking an illegitimate copy can be recognized by testing the presence of a valid watermark and a dispute on the ownership of the image resolved Different kinds of steganographic and watermarking techniques providing different features and diverse characteristics have been presented in this book This book provides a reference for theoretical problems as well as practical solutions and applications for steganography and watermarking techniques In particular both the academic community graduate student post doc and faculty in Electrical Engineering Computer Science and Applied Mathematics and the industrial community engineers engineering managers programmers research lab staff and managers security managers will find this book interesting Steganography in Digital Media Jessica Fridrich,2009-11-12 Steganography the art of hiding of information in apparently innocuous objects or images is a field with a rich heritage and an area of rapid current development This clear self contained guide shows you how to understand the building blocks of covert communication in digital media files and how to apply the techniques in practice

including those of steganalysis the detection of steganography Assuming only a basic knowledge in calculus and statistics the book blends the various strands of steganography including information theory coding signal estimation and detection and statistical signal processing Experiments on real media files demonstrate the performance of the techniques in real life and most techniques are supplied with pseudo code making it easy to implement the algorithms The book is ideal for students taking courses on steganography and information hiding and is also a useful reference for engineers and practitioners working in media security and information assurance

**Information Hiding** Fabien A. P. Petitcolas, 2003-07-01 These post proceedings contain 27 papers that were accepted for presentation at the Fifth International Workshop on Information Hiding held 7-9 October 2002 in Noordwijkerhout The Netherlands The papers were selected from 78 submissions on the basis of their scientific excellence and novelty by the program committee We tried to have a balanced program covering several aspects of information hiding The program committee was composed of Ross J Anderson University of Cambridge UK Jan Camenisch IBM Zurich Research Laboratory Switzerland Ingemar J Cox NEC Research Institute USA John McHugh SEI CERT USA Ira S Moskowitz Naval Research Laboratory USA Job Oostveen Philips Research The Netherlands Andreas P tzmann Dresden University of Technology Germany Mike Reiter Carnegie Mellon University USA and me We all wish to thank all the authors of submissions for offering their papers for consideration This year contrary to the four previous workshops the call for papers requested anonymous submissions However anonymity was not compulsory and we did accept some papers in which the identity of the authors was clear Each submission was assigned to three members of the program committee Papers submitted by program committee members were assigned to four reviewers The program committee relied on the advice of outside colleagues We also insisted that 12 of the 27 accepted papers should be revised according to the comments of the reviewers

*Disappearing Cryptography* Peter Wayner, 2002 The bestselling first edition of *Disappearing Cryptography* was known as the best introduction to information hiding This fully revised and expanded second edition describes a number of different techniques that people can use to hide information such as encryption

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.

**Special Issue on Steganography and Digital Watermarking** Mauro Barni, 2006     *Covert Information* Luke Andrew Johnson, 2003     **Data Hiding and Its Applications** David Megías, Wojciech Mazurczyk, Minoru Kuribayashi, 2022-01-21

Data hiding techniques have been widely used to provide copyright protection, data integrity, covert communication, non repudiation, and authentication among other applications. In the context of the increased dissemination and distribution of multimedia content over the internet, data hiding methods such as digital watermarking and steganography are becoming increasingly relevant in providing multimedia security. The goal of this book is to focus on the improvement of data hiding algorithms and their different applications, both traditional and emerging, bringing together researchers and practitioners from different research fields including data hiding, signal processing, cryptography, and information theory among others.

*Methods for Digital Watermarking and Steganography* Sachin Gupta, 2003

## **Steganography And Digital Watermarking** Book Review: Unveiling the Magic of Language

In an electronic digital era where connections and knowledge reign supreme, the enchanting power of language has become much more apparent than ever. Its power to stir emotions, provoke thought, and instigate transformation is actually remarkable. This extraordinary book, aptly titled "**Steganography And Digital Watermarking**," published by a very acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound effect on our existence. Throughout this critique, we shall delve into the book's central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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