

# **MULTIMEDIA SECURITY:**

**WATERMARKING,  
STEGANOGRAPHY, AND FORENSICS**

**EDITED BY**

**FRANK Y. SHIH**

# Multimedia Security Watermarking Steganography And Forensics

**Yun-Qing Shi, Hyoung Joong  
Kim, Fernando Pérez-González, Ching-  
Nung Yang**

## **Multimedia Security Watermarking Steganography And Forensics:**

**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 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** Bhaskar Mondal, Shyam Singh Rajput, 2025-07-07 Multimedia security has become one of the most important topics for organizations and individuals

Presenting important state of the art multimedia security techniques and algorithms this book focuses on data encryption steganography watermarking authentication data hiding biometric template security quantum based video cryptosystems pan sharpening and digital signatures to help in protecting the unauthorized access alteration of multimedia over the Internet and cloud It also covers the application of machine learning blockchain and AI based methods for multimedia security Mathematical models used in data hiding and data evaluation techniques are discussed thoroughly to provide a good understanding of the principles of multimedia security Multimedia Forensics and Security Li, Chang-Tsun,2008-07-31 As information technology is rapidly progressing an enormous amount of media can be easily exchanged through Internet and other communication networks Increasing amounts of digital image video and music have created numerous information security issues and is now taken as one of the top research and development agendas for researchers organizations and governments worldwide Multimedia Forensics and Security provides an in depth treatment of advancements in the emerging field of multimedia forensics and security by tackling challenging issues such as digital watermarking for copyright protection digital fingerprinting for transaction tracking and digital camera source identification *Security, Forensics, Steganography, and Watermarking of Multimedia Contents X*,2008 Digital Forensics and Watermarking Xianfeng Zhao,Yun-Qing Shi,Alessandro Piva,Hyoung Joong Kim,2021-02-11 This volume constitutes the proceedings of the 19th International Workshop on Digital Forensics and Watermarking IWDW 2020 held in Melbourne VIC Australia in November 2020 The 20 full papers in this volume were carefully reviewed and selected from 43 submissions They cover topics such as novel research development and application of digital watermarking and forensics techniques for multimedia security

**Digital-Forensics and Watermarking** Yun-Qing Shi,Hyoung Joong Kim,Fernando Pérez-González,Ching-Nung Yang,2015-06-24 This book constitutes the thoroughly refereed post conference proceedings of the 13th International Workshop on Digital Forensics and Watermarking IWDW 2014 held in Taipei Taiwan during October 2014 The 32 full and 14 poster papers presented together with 1 keynote speech were carefully reviewed and selected from 79 submissions The papers are organized in topical sections on forensics watermarking reversible data hiding visual cryptography and steganography and steganalysis Multimedia Forensics Husrev Taha Sencar,Luisa Verdoliva,Nasir Memon,2022-04-02 This book is open access Media forensics has never been more relevant to societal life Not only media content represents an ever increasing share of the data traveling on the net and the preferred communications means for most users it has also become integral part of most innovative applications in the digital information ecosystem that serves various sectors of society from the entertainment to journalism to politics Undoubtedly the advances in deep learning and computational imaging contributed significantly to this outcome The underlying technologies that drive this trend however also pose a profound challenge in establishing trust in what we see hear and read and make media content the preferred target of malicious attacks In this new threat landscape powered by innovative imaging technologies and sophisticated tools based on

autoencoders and generative adversarial networks this book fills an important gap It presents a comprehensive review of state of the art forensics capabilities that relate to media attribution integrity and authenticity verification and counter forensics Its content is developed to provide practitioners researchers photo and video enthusiasts and students a holistic view of the field

**Handbook of Digital Forensics of Multimedia Data and Devices, Enhanced E-Book** Anthony T. S. Ho, Shujun Li, 2016-05-20 Digital forensics and multimedia forensics are rapidly growing disciplines whereby electronic information is extracted and interpreted for use in a court of law These two fields are finding increasing importance in law enforcement and the investigation of cybercrime as the ubiquity of personal computing and the internet becomes ever more apparent Digital forensics involves investigating computer systems and digital artefacts in general while multimedia forensics is a sub topic of digital forensics focusing on evidence extracted from both normal computer systems and special multimedia devices such as digital cameras This book focuses on the interface between digital forensics and multimedia forensics bringing two closely related fields of forensic expertise together to identify and understand the current state of the art in digital forensic investigation Both fields are expertly attended to by contributions from researchers and forensic practitioners specializing in diverse topics such as forensic authentication forensic triage forensic photogrammetry biometric forensics multimedia device identification and image forgery detection among many others Key features Brings digital and multimedia forensics together with contributions from academia law enforcement and the digital forensics industry for extensive coverage of all the major aspects of digital forensics of multimedia data and devices Provides comprehensive and authoritative coverage of digital forensics of multimedia data and devices Offers not only explanations of techniques but also real world and simulated case studies to illustrate how digital and multimedia forensics techniques work Includes a companion website hosting continually updated supplementary materials ranging from extended and updated coverage of standards to best practice guides test datasets and more case studies

Multimedia Security 2 William Puech, 2022-06-21 Today more than 80% of the data transmitted over networks and archived on our computers tablets cell phones or clouds is multimedia data images videos audio 3D data The applications of this data range from video games to healthcare and include computer aided design video surveillance and biometrics It is becoming increasingly urgent to secure this data not only during transmission and archiving but also during its retrieval and use Indeed in today's all digital world it is becoming ever easier to copy data view it unrightfully steal it or falsify it Multimedia Security 2 analyzes issues relating to biometrics protection integrity and encryption of multimedia data It also covers aspects such as crypto compression of images and videos homomorphic encryption data hiding in the encrypted domain and secret sharing

**Multimedia Security** Kaiser J. Giri, Shabir Ahmad Parah, Rumaan Bashir, Khan Muhammad, 2021-01-11 This book is a collection of outstanding content written by experts working in the field of multimedia security It provides an insight about various techniques used in multimedia security and identifies its progress in both technological and algorithmic perspectives In the contemporary world

digitization offers an effective mechanism to process preserve and transfer all types of information The incredible progresses in computing and communication technologies augmented by economic feasibility have revolutionized the world The availability of efficient algorithms together with inexpensive digital recording and storage peripherals have created a multimedia era bringing conveniences to people in sharing the digital data that includes images audio and video The ever increasing pace at which the multimedia and communication technology is growing has also made it possible to combine replicate and distribute the content faster and easier thereby empowering mankind by having a wealth of information at their disposal However security of multimedia is giving tough time to the research community around the globe due to ever increasing and efficient attacks carried out on multimedia data by intruders eaves droppers and hackers Further duplication unauthorized use and mal distribution of digital content have become a serious challenge as it leads to copyright violation and is considered to be the principal reason that refrains the information providers in freely sharing their proprietary digital content The book is useful for students researchers and professionals to advance their study     Transactions on Data Hiding and Multimedia Security VIII Yun Q. Shi,2012-07-30 Since the mid 1990s data hiding has been proposed as an enabling technology for securing multimedia communication and is now used in various applications including broadcast monitoring movie fingerprinting steganography video indexing and retrieval and image authentication Data hiding and cryptographic techniques are often combined to complement each other thus triggering the development of a new research field of multimedia security Besides two related disciplines steganalysis and data forensics are increasingly attracting researchers and becoming another new research field of multimedia security This journal LNCS Transactions on Data Hiding and Multimedia Security aims to be a forum for all researchers in these emerging fields publishing both original and archival research results This special issue contains five selected papers that were presented at the Workshop on Pattern Recognition for IT Security held in Darmstadt Germany in September 2010 in conjunction with the 32nd Annual Symposium of the German Association for Pattern Recognition DAGM 2010 It demonstrates the broad range of security related topics that utilize graphical data The contributions explore the security and reliability of biometric data the power of machine learning methods to differentiate forged images from originals the effectiveness of modern watermark embedding schemes and the use of information fusion in steganalysis     *Digital Forensics and Watermarking* Hongxia Wang,Xianfeng Zhao,Yunqing Shi,Hyoung Joong Kim,Alessandro Piva,2020-03-12 The 22 full papers and 12 shorts papers presented in this volume were carefully reviewed and selected from 70 submissions The contributions are covering the following topics deep learning for multimedia security digital forensics and anti forensics digital watermarking information hiding steganography and steganalysis authentication and security     **Multimedia Security 1** William Puech,2022-03-15 Today more than 80% of the data transmitted over networks and archived on our computers tablets cell phones or clouds is multimedia data images videos audio 3D data The applications of this data range from video games to healthcare and include computer aided design

video surveillance and biometrics It is becoming increasingly urgent to secure this data not only during transmission and archiving but also during its retrieval and use Indeed in today's all digital world it is becoming ever easier to copy data view it unrightfully steal it or falsify it Multimedia Security 1 analyzes the issues of the authentication of multimedia data code and the embedding of hidden data both from the point of view of defense and attack Regarding the embedding of hidden data it also covers invisibility color tracing and 3D data as well as the detection of hidden messages in an image by steganalysis

*Digital Image Forensics* Husrev Taha Sencar, Nasir Memon, 2012-08-01 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

*Transactions on Data Hiding and Multimedia Security III* Yun Q. Shi, 2008-06-02 Since the mid 1990s data hiding has been proposed as an enabling technology for securing multimedia communication and is now used in various applications including broadcast monitoring movie fingerprinting steganography video indexing and retrieval and image authentication Data hiding and cryptographic techniques are often combined to complement each other thus triggering the development of a new research field of multimedia security Besides two related disciplines steganalysis and data forensics are increasingly attracting researchers and becoming another new research field of multimedia security This journal LNCS Transactions on Data Hiding and Multimedia Security aims to be a forum for all researchers in these emerging fields publishing both original and archival research results This third issue contains five contributions in the areas of steganography and digital watermarking The first two papers deal with the security of steganographic systems the third paper presents a novel image steganographic scheme Finally this volume includes two papers that focus on digital watermarking and data hiding The fourth paper introduces and analyzes a new covert channel and the fifth contribution analyzes the performance of additive attacks against quantization based data hiding methods

*Intelligent Techniques in Signal Processing for Multimedia Security* Nilanjan Dey, V. Santhi, 2016-10-18 This book proposes new algorithms to ensure secured communications and prevent unauthorized data exchange in secured multimedia systems Focusing on numerous applications algorithms and scenarios it offers an in depth analysis of data hiding

technologies including watermarking cryptography encryption copy control and authentication The authors present a framework for visual data hiding technologies that resolves emerging problems of modern multimedia applications in several contexts including the medical healthcare education and wireless communication networking domains Further it introduces several intelligent security techniques with real time implementation As part of its comprehensive coverage the book discusses contemporary multimedia authentication and fingerprinting techniques while also proposing personal authentication recognition systems based on hand images surveillance system security using gait recognition face recognition under restricted constraints such as dry wet face conditions and three dimensional face identification using the approach developed here This book equips perception technology professionals with the latest technologies techniques and strategies for multimedia security systems offering a valuable resource for engineers and researchers working to develop security systems

*Transactions on Data Hiding and Multimedia Security* X Yun Q. Shi, 2015-04-16 Since the mid 1990s data hiding has been proposed as an enabling technology for securing multimedia communication and is now used in various applications including broadcast monitoring movie fingerprinting steganography video indexing and retrieval and image authentication Data hiding and cryptographic techniques are often combined to complement each other thus triggering the development of a new research field of multimedia security Besides two related disciplines steganalysis and data forensics are increasingly attracting researchers and becoming another new research field of multimedia security This journal LNCS *Transactions on Data Hiding and Multimedia Security* aims to be a forum for all researchers in these emerging fields publishing both original and archival research results The six papers included in this issue deal with watermarking security perceptual image hashing infrared hiding steganography and steganalysis

**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

**Emerging Digital Forensics Applications for Crime Detection, Prevention, and Security** Li, Chang-Tsun, 2013-05-31 The revolutionary way in which modern technologies have enabled us to exchange information with ease has led to the emergence of interdisciplinary research in digital forensics and investigations which aims to combat the abuses of computer technologies *Emerging Digital Forensics Applications for Crime Detection Prevention and Security* presents various digital crime and forensic disciplines that use electronic devices and software for crime prevention and detection This book provides theoretical and empirical research articles and case studies for a broad range of academic readers as well as professionals industry consultants and practitioners involved in the use design and development of techniques related to digital forensics and investigation

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