Multimedia Security Steganography And Digital Watermarking Techniques For Protection Of Intellectual Property

Multimedia Security: Steganography and Digital Watermarking Techniques for Protection of Intellectual PropertySteganography and Digital Watermarking Techniques for Protection of Intellectual PropertyIGI Global

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 in multimedia security. Two related disciplines, steganalysis and data forensics, are also increasingly attracting researchers and forming another new research field in 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 inaugural issue contains five papers dealing with a wide range of topics related to multimedia security. The first paper deals with evaluation criteria for the performance of audio watermarking algorithms. The second provides a survey of problems related to watermark security. The third discusses practical implementations of zero-knowledge watermark detectors and proposes efficient solutions for correlation-based detectors. The fourth introduces the concept of Personal Entertainment Domains (PED) in Digital Rights Management (DRM) schemes. The fifth reports on the use of fusion techniques to improve the detection accuracy of steganalysis.

Presents theories and models associated with information privacy and safeguard practices to help anchor and guide the development of technologies, standards, and best practices. Provides recent, comprehensive coverage of all issues related to information security and ethics, as well as the opportunities, future challenges, and emerging trends related to this subject.

Security is a major concern in an increasingly multimedia-defined universe where the Internet serves as an indispensable resource for information and entertainment. Digital Rights Management (DRM) is the technology by which network systems protect and provide access to critical and time-sensitive copyrighted material and/or personal information. This book equips savvy technology professionals and their aspiring collegiate protégés with the latest technologies, strategies and methodologies needed to successfully thwart off those who thrive on security holes and weaknesses. Filled with sample application scenarios and algorithms, this book provides an in-depth examination of present and future field technologies including encryption, authentication, copy control, tagging, tracing, conditional access and media identification. The authors present a diversified blend of theory and practice and focus on the constantly changing developments in multimedia applications thus providing an admirably comprehensive book. * Discusses state-of-the-art multimedia authentication and fingerprinting techniques * Presents several practical methodologies from industry, including broadcast encryption, digital media forensics and 3D mesh watermarking * Focuses on the need for security in multimedia applications found on computer networks, cell phones and emerging mobile computing devices

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.

A successor to the popular Artech House title Information Hiding Techniques for Steganography and Digital Watermarking, this comprehensive and up-to-date new resource gives the reader a thorough review of steganography, digital watermarking and media fingerprinting with possible applications to modern communication, and a survey of methods used to hide information in modern media. This book explores Steganography, as a means by which two or more parties may communicate using invisible or subliminal communication. "Steganalysis" is described as methods which can be used to break steganographic communication. This comprehensive resource also includes an introduction to watermarking and its methods, a means of hiding copyright data in images and discusses components of commercial multimedia applications that are subject to illegal use. This book demonstrates a working knowledge of watermarking’s pros and cons, and the legal implications of watermarking and copyright issues on the Internet.

Understand the building blocks of covert communication in digital media and apply the techniques in practice with this self-contained guide. 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.

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.

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.

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 second issue contains five papers dealing with a wide range of topics related to multimedia security. The first paper introduces Fingercasting, which allows joint fingerprinting and decryption of broadcast messages. The second paper presents an estimation attack on content-based video fingerprinting. The third proposes a statistics and spatiality-based feature distance measure for error resilient image authentication. The fourth paper reports on LTSB steganalysis. Finally, the fifth paper surveys various blind and robust watermarking schemes for 3D shapes.

The widespread use of high-speed networks has made the global distribution of digital media contents readily available in an instant. As a result, data hiding was created in an attempt to control the distribution of these copies by verifying or tracking the media signals picked up from copyright information, such as the author or distributor ID. Multimedia Information Hiding Technologies and Methodologies for Controlling Data presents the latest methods and research results in the emerging field of Multimedia Information Hiding (MIH). This comprehensive collection is beneficial to all researchers and engineers working globally in this field and aims to inspire new graduate-level students as they explore this promising field.

As data hiding detection and forensic techniques have matured, people are creating more advanced stealth methods for spying, corporate espionage, terrorism, and cyber warfare all to avoid detection. Data Hiding provides an exploration into the present day and next generation of tools and techniques used in covert communications, advanced malware methods and data concealment tactics. The hiding techniques outlined include the latest technologies including mobile devices, multimedia, virtualization and others. These concepts provide corporate, goverment and military personnel with the knowledge to investigate and defend against insider threats, spy techniques, espionage, advanced malware and secret communications. By understanding the plethora of threats, you will gain an understanding of the methods to defend oneself from these threats through detection, investigation, mitigation and prevention. Provides many real-world examples of data concealment on the latest technologies including iOS, Android, VMware, MacOS X, Linux and Windows 7 Dives deep into the less known approaches to data hiding, covert communications, and advanced malware Includes never before published information about next generation methods of data hiding Outlines a well-defined methodology for countering threats Looks ahead at future predictions for data hiding

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.

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.

This second issue in the LNCS Transactions on Data Hiding and Multimedia Security contains five papers dealing with a wide range of topics related to multimedia security. Coverage includes an introduction to Fingercasting, which allows joint fingerprinting and decryption of broadcast messages; a presentation on estimation attack on content-based video fingerprinting; and a survey on various blind and robust watermarking schemes for 3D shapes.

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.

"This handbook is for both secure multimedia distribution researchers and also decision makers in obtaining a greater understanding of the concepts, issues, problems, trends, challenges and opportunities related to secure multimedia distribution"--Provided by publisher.

Advancing technologies, especially computer technologies, have necessitated the creation of a comprehensive investigation and collection methodology for digital and online evidence. The goal of cyber forensics is to perform a structured investigation while maintaining a documented chain of evidence to find out exactly what happened on a computing device or on a network and who was responsible for it. Critical Concepts, Standards, and Techniques in Cyber Forensics is a critical research book that focuses on providing in-depth knowledge

about online forensic practices and methods. Highlighting a range of topics such as data mining, digital evidence, and fraud investigation, this book is ideal for security analysts, IT specialists, software engineers, researchers, security professionals, criminal science professionals, policymakers, academicians, and students.

This book focuses on image based security techniques, namely visual cryptography, watermarking, and steganography. This book is divided into four sections. The first section explores basic to advanced concepts of visual cryptography. The second section of the book covers digital image watermarking including watermarking algorithms, frameworks for modeling watermarking systems, and the evaluation of watermarking techniques. The next section analyzes steganography and steganalysis, including the notion, terminology and building blocks of steganographic communication. The final section of the book describes the concept of hybrid approaches which includes all image-based security techniques. One can also explore various advanced research domains related to the multimedia security field in the final section. The book includes many examples and applications, as well as implementation using MATLAB, wherever required. Features: Provides a comprehensive introduction to visual cryptography, digital watermarking and steganography in one book Includes real-life examples and applications throughout Covers theoretical and practical concepts related to security of other multimedia objects using image based security techniques Presents the implementation of all important concepts in MATLAB

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.

The common use of the Internet and cloud services in transmission of large amounts of data over open networks and insecure channels, exposes that private and secret data to serious situations. Ensuring the information transmission over the Internet is safe and secure has become crucial, consequently information security has become one of the most important issues of human communities because of increased data transmission over social networks. Digital Media Steganography: Principles, Algorithms, and Advances covers fundamental theories and algorithms for practical design, while providing a comprehensive overview of the most advanced methodologies and modern techniques in the field of steganography. The topics covered present a collection of high-quality research works written in a simple manner by world-renowned leaders in the field dealing with specific research problems. It presents the state-of-the-art as well as the most recent trends in digital media steganography. Covers fundamental theories and algorithms for practical design which form the basis of modern digital media steganography Provides new theoretical breakthroughs and a number of modern techniques in steganography Presents the latest advances in digital media steganography such as using deep learning and artificial neural network as well as Quantum Steganography

Multimedia technologies are becoming more sophisticated, enabling the Internet to accommodate a rapidly growing audience with a full range of services and efficient delivery methods. Although the Internet now puts communication, education, commerce and socialization at our finger tips, its rapid growth has raised some weighty security concerns with respect to multimedia content. The owners of this content face enormous challenges in safeguarding their intellectual property, while still exploiting the Internet as an important resource for commerce. Data Hiding Fundamentals and Applications focuses on the theory and state-of-the-art applications of content security and data hiding in digital

multimedia. One of the pillars of content security solutions is the imperceptible insertion of information into multimedia data for security purposes; the idea is that this inserted information will allow detection of unauthorized usage. Provides a theoretical framework for data hiding, in a signal processing context Realistic applications in secure, multimedia delivery Compression robust data hiding Data hiding for proof of ownership--WATERMARKING Data hiding algorithms for image and video watermarking

This book constitutes the refereed proceedings of the 16th International Workshop on Digital Forensics and Watermarking, IWDW 2017, held in Magdeburg, Germany, in August 2017. The 30 papers presented in this volume were carefully reviewed and selected from 48 submissions. The contributions are covering the state-of-the-art theoretical and practical developments in the fields of digital watermarking, steganography and steganalysis, forensics and anti-forensics, visual cryptography, and other multimedia-related security issues. Also included are the papers on two special sessions on biometric image tampering detection and on emerging threats of criminal use of information hiding : usage scenarios and detection approaches.

Steganography is the art of secret writing. The purpose of steganography is to hide the presence of a message from the intruder by using state-of-the-art methods, algorithms, architectures, models, and methodologies in the domains of cloud, internet of things (IoT), and the Android platform. Though security controls in cloud computing, IoT, and Android platforms are not much different than security controls in an IT environment, they might still present different types of risks to an organization than the classic IT solutions. Therefore, a detailed discussion is needed in case there is a breach in security. It is important to review the security aspects of cloud, IoT, and Android platforms related to steganography to determine how this new technology is being utilized and improved continuously to protect information digitally. The benefits and challenges, along with the current and potential developments for the future, are important keystones in this critical area of security research. Multidisciplinary Approach to Modern Digital Steganography reviews the security aspects of cloud, IoT, and Android platforms related to steganography and addresses emerging security concerns, new algorithms, and case studies in the field. Furthermore, the book presents a new approach to secure data storage on cloud infrastructure and IoT along with including discussions on optimization models and security controls that could be implemented. Other important topics include data transmission, deep learning techniques, machine learning, and both image and text stenography. This book is essential for forensic engineers, forensic analysts, cybersecurity analysts, cyber forensic examiners, security engineers, cybersecurity network analysts, cyber network defense analysts, and digital forensic examiners along with practitioners, researchers, academicians, and students interested in the latest techniques and state-of-the-art methods in digital steganography.

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.

Advanced image and video processing abilities in smart phones and digital cameras make them popular means to capture multimedia. In addition, the integration of internet into such devices users seek to capture and easily share multimedia right from their smartphone while most steganography techniques are computer based. Hence, it is of utmost importance that the multimedia be processed for steganography right within the devices for multimedia authentication. In this thesis, we first implement steganography into mobile smart devices that can capture multimedia. For devices such as smart phones, we propose a method to hide payload bits within video frames. The solution takes relatively less time and memory to process as opposed to existing computer based solutions. This is a major achievement over traditional techniques that have longer running times leading to power inefficiencies. The idea proposed is to divide the video frames being processed into smaller blocks and perform embedding at block levels, thus localizing any processing that is to be performed. Simulation results show that the solution proposed can perform about 60 percent faster and 40 percent BER improvement than conventional approach of video steganography. This thesis takes the foregoing solution to a greater height by using the same algorithm for steganography within Image Sensor Pipeline in digital cameras. The objective behind this is to ensure all images generated from all forms of digital cameras are watermarked automatically. The solutions that exist now are largely dependent on extraction of camera component information. The proposed steganography technique is image centric and aims to resolve existing issues in areas such as image source identification, discrimination of synthetic images and basic image forgery. After experiments, Peak Signal to Noise Values with a least value of 70 dB even for the worst compression quality (Q) factor of 50 shows how the perceptual quality of the image is preserved. Bit Error Rate of about 5 % for the same quality (Q=50) puts light on the robustness of the technique against JPEG compression.

"This book offers an in-depth explanation of multimedia technologies within their many specific application areas as well as presenting developing trends for the future"--Provided by publisher.

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This book constitutes the proceedings of the International Conference on Information and Communication Technologies held in Kochi, Kerala, India in September 2010.

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Multimedia Security, aims to be a forum for all researchers in these emerging fields, publishing both original and archival research results. The 7 papers included in this issue deal with the following topics: protection of digital videos, secure watermarking, tamper detection, and steganography.

This book constitutes the refereed proceedings of the 14th IFIP TC 6/TC 11 International Conference on Communications and Multimedia Security, CMS 2013, held in Magdeburg, Germany, in September 2013. The 5 revised full papers presented together with 11 short papers, 5 extended abstracts describing the posters that were discussed at the conference, and 2 keynote talks were carefully reviewed and selected from 30 submissions. The papers are organized in topical sections on biometrics; applied cryptography; digital watermarking, steganography and forensics; and social network privacy, security and authentication.

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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 techiniques 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

Annotation This work explores the myriad of issues regarding multimedia security. It covers various issues, including perceptual fidelity analysis, image, audio, and 3D mesh object watermarking, medical watermarking, and error detection (authentication) and concealment.

This book presents essential principles, technical information, and expert insights on multimedia security technology. Illustrating the need for improved content security as the Internet and digital multimedia applications rapidly evolve, it presents a wealth of everyday protection application examples in fields including . Giving readers an in-depth introduction to different aspects of information security mechanisms and methods, it also serves as an instructional tool on the fundamental theoretical framework required for the development of advanced

techniques.