
Preface

Digital multimedia is ubiquitous in our daily lives. Due to the tremendous advances in signal processing and signal transmission techniques, it is easy to acquire and duplicate multimedia data. The wide spread use of internet in business, research and security has necessitated to protect the data and owner identity.

This book presents the latest research in the area of multimedia data hiding paradigms. The book is divided into four parts and an appendix. The first part includes chapter 1. Chapter 1 by Huang, et al. introduces multimedia signal processing and information hiding techniques. It includes multimedia representation, the need for multimedia, concepts of digital watermarking and some requirements of watermarking. Part two of this book describes the recent advances in multimedia signal processing. It contains two chapters. Chapter 2 by Pan is on digital video coding. It describes the principles of digital video compression, mainly focussing on the main techniques used in various coding standards. Chapter 3 by Peng et al. is on advances of MPEG scalable video coding standard. Two major approaches have been considered as the potential technologies. One is the wavelet-based scheme and the other is the scalable extension of MPEG-4 AVC/H.264. The latter is now chosen as the MPEG SVC standard to be finalized in 2007. This chapter presents a brief overview on the latest advances of these technologies with a focus on the MPEG standard activities. Part three of this book presents information hiding techniques including steganography, secret sharing and watermarking. It contains five chapters. Chapter 4 by Chang et al. is on a bit-level visual secret sharing scheme for multi-secret images using rotation and reversion operations. The authors have extended the concept of visual secret sharing to gray-scale image visual secret sharing. The rotation and reversion operations are applied to increase the security of the secret images. Chapter 5 by Chang et al. is on adaptive data hiding scheme for palette images applications that can offer a high embedding capacity and good image quality. The clustering technique is adopted to achieve high embedding capacity and two embedding mechanisms are used to do embedding according to the size of the cluster. The proposed

scheme is a perfect balance between embedding capacity and image quality. Chapter 6 by Niu et al. is on GIS watermarking. It presents a 2D vector map data hiding for applications such as digital copyright protection, data authentication and data source tracing. Some new research directions are presented. Chapter 7 by Echizen et al. is on adapting embedding and detection for improved video watermarking. Experimental evaluations using motion pictures have demonstrated that the proposed techniques are effective for in the pixel-based watermarking maintaining picture quality and withstanding video processing. Chapter 8 by Noda et al. is on steganographic methods focussing on bit-plane complexity segmentation (BPCS) steganography. Steganography is a technique to hide secret information in some other data without leaving any apparent evidence without leaving any apparent evidence of data alteration. The authors have also presented histogram preserving JPEG steganography including experimental results.

The final part of this book includes practical applications of intelligent multimedia signal processing and data hiding systems. This part contains five chapters. Chapter 9 by Liao is on intelligent video event detection for surveillance systems. This chapter includes solutions for video-based surveillance systems in spatial and compressed domain. The techniques presented are efficient and accurate in the video retrieval process. Chapter 10 by Liu is on print-to-web linking technology using mobile phone camera and its applications in Japan. Chapter 11 by Lu et al. is on multipurpose image watermarking algorithms and applications. Chapter 12 by Huang et al. is on tabu search based multi-watermarking over lossy networks. An innovative algorithm on vector quantization based image watermarking is proposed. Experimental verification demonstrates the utility of the approach. The final chapter by Weng et al. is on reversible watermarking techniques and applications. In the appendix, authors from five chapters of this book contribute programs including source codes and/or executables related to the topics in their chapters. Interested readers are invited to use the programs. This book will be valuable to both academia and industry. This book is directed to the final year undergraduate and junior postgraduate students. Researchers and professors in the departments of electrical/electronics/communication engineering, computer science, and relating departments will find this book useful. We are indebted to the authors and the reviewers for their contribution. The editorial assistance by Springer is acknowledged.

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