

Fa-Long Luo
Editor



Mobile Multimedia Broadcasting Standards

Technology and Practice

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Preface

Mobile multimedia broadcasting compasses a broad range of topics including radio propagation, modulation and demodulation, error control, signal compression and coding, transport and time slicing, system on chip real-time implementation in hardware, software and system levels. The major goal of this technology is to bring multimedia enriched contents to handheld devices such as mobile phones, portable digital assistants, and media players through radio transmission or internet protocol (IP) based broadband networks. Research and development of mobile multimedia broadcasting technologies are now explosively growing and regarded as new killer applications. A number of mobile multimedia broadcasting standards related to transmission, compression and multiplexing now coexist and are being extensively further developed. The development and implementation of mobile multimedia broadcasting systems are very challenging tasks and require the huge efforts of the related industry, research and regulatory authorities so as to bring the success.

From an implementation design and engineering practice point of view, this book aims to be the first single volume to provide a comprehensive and highly coherent treatment for multiple standards of mobile multimedia broadcasting by covering basic principles, algorithms, design trade-off, and well-compared implementation system examples. This book is organized into 4 parts with 22 chapters.

The first part of the book consists of seven well-organized chapters to mainly deal with system, implementation, compatibility and comparison of all the coexisting standards related to mobile TV and multimedia broadcasting including T-DMB, DAB, DVB-H/T, CM-MB, Media-FLO, ISDB-T and WiMAX, ATSC digital TV and NTSC analog TV.

Part 2 is devoted to fundamental principles, algorithms, implementation, design and testing for baseband processing in mobile multimedia broadcasting. Organized into six chapters, this part presents the link layer, transport mechanisms, basic modulation schemes, error control methods, and channel coding techniques employed in multiple standards.

The third part consists of five chapters to cover all the aspects related to the compression, transmission, error concealment, quality assessment, and real-time implementation of video coding in broadcasting systems with emphasis on H.264 and AVS-M.

Four chapters on the standards for audio coding, classification, and surround effects are organized in the last part of this book. The general principles and algorithms in audio coding are first presented. Then, the overview of China's DRA audio coding standard and MPEG-4 AAC standard family (AAC, High Efficiency AAC and High Efficiency AAC Version 2) is given. The last chapter explains the general concepts behind spatial audio coding and then discusses the specific aspects of MP3 Surround and MPEG Surround which are playing a very important role in digital audio/multimedia broadcasting systems for multichannel contents.

It is hoped that this book could serve as a complete and invaluable reference for engineers, researchers, broadcasters, manufacturers, network operators, software developers, content providers, service providers, and regulatory bodies for the delivery of television, data service and multimedia enriched contents to mobile systems. This book is also very suitable as a textbook for graduate students in electronics engineering, communications, networking and computer sciences.

Silicon Valley, California, USA
August 2008

Fa-Long Luo, Ph.D.

List of the Standards Covered in this Book

Transmission and Multiplexing Standards:

1. DVB-H
2. DVB-T
3. DAB
4. Media-FLO
5. T-DMB
6. CMMB
7. DMB-T/H
8. ISDB-T
9. WiMax
10. A-VSB (ATSC)
11. NTSC (Analog TV)
12. MPEG-2 TS
13. DAB-IP

Video Coding Standards:

1. H.264 (MPEG-4 AVC)
2. MPEG-2
3. AVS-M

Audio Coding Standards:

1. MPEG-4 AAC
2. MPEG-4 HE-AAC
3. MPEG-4 HE-AAC V2
4. DRA
5. MPEG-Surround

Contents

Part I System, Implementation, Compatibility and Comparison of Multiple Standards

1	Fundamentals of DVB-H Broadcasting Transmission and Reception	3
	Wout Joseph and Luc Martens	
2	Digital Video Broadcast: Systems and Implementations	49
	Yue Zhang, Kok-Keong Loo, John Cosmas, and Yong-Hua Song	
3	Digital Audio/Video Broadcasting and Digital Implementation of Analog TV	77
	Daniel Iancu, Hua Ye, Joon-Hwa Chun, John Glossner, Andrei Iancu, and Mayan Moudgille	
4	Video Streaming over DVB-H	109
	Mehdi Rezaei	
5	Overview of Mobile TV Standards and their CMOS Tuners	133
	Iason Vassiliou, Nikos Haralabidis, and Kostis Vavelidis	
6	Multimedia Broadcasting and Communications with WiMAX and Implementation for Its Downlink Physical Layer	163
	Daniel Iancu, Joon-Hwa Chun, Hua Ye, Murugappan Senthilvelan, John Glossner, and Mayan Moudgill	
7	MediaFLO Technology: FLO Air Interface Overview	189
	Qiang Gao, Murali Chari, An Chen, Fuyun Ling, and Kent Walker	

Part II Baseband Processing in Mobile Multimedia Broadcasting

8	DVB-H Link Layer	223
	Onno Eerenberg, Arie Koppelaar, and Peter H.N. de With	

9	Transport and Time-Slicing Mechanisms in Multistandards for Mobile Broadcasting	281
	Georgios Gardikis	
10	Basic Modulation Schemes in Digital Mobile Multimedia Broadcasting Systems	295
	Qinghua Han and Chan Ho Ham	
11	Error Control for Broadcasting and Multicasting: An Overview	313
	Ivan V. Bajić	
12	Convolutional, Turbo, and Turbo-Like Codes for Digital Multimedia Broadcasting: Theory and Applications	337
	Fred Daneshgaran, Massimiliano Laddomada, and Marina Mondin	
13	ASIC Design for Broadcasting Baseband Processing: Practices and Architectures	391
	Peijun Shan	
Part III Video Coding in Mobile Multimedia Broadcasting		
14	Objective and Subjective Assessment Methods of Video Quality in Multimedia Broadcasting	417
	Harilaos G. Koumaras	
15	Video Coding Using the H.264/AVC Standard	435
	Kun-Bin Lee	
16	H.264/AVC Error Concealment for DVB-H Video Transmission	461
	Susanna Spinsante, Ennio Gambi, and Damiano Falcone	
17	AVS-M: Mobile Video Standard	485
	Liang Fan	
18	Design and Implementation of H.264/AVC Decoder	509
	Kun-Bin Lee	
Part IV Audio Processing in Mobile Multimedia Broadcasting		
19	Audio Coding and Classification: Principles and Algorithms	539
	Karthikeyan Umapathy and Sridhar Krishnan	
20	DRA Audio Coding Standard: An Overview	587
	Yu-Li You and Wenhua Ma	

21	Audio Coding Standard Overview: MPEG4-AAC, HE-AAC, and HE-AAC V2	607
	Yujie Gao	
22	Spatial Audio Coding and MPEG Surround	629
	Christof Faller	
	Index	655