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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, CMMB, 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 *Fa-Long Luo, Ph.D.*
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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

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