Preface

"European industry has already developed successful standards in the past, and I am very confident that on the basis of DVB-H, Mobile TV services can develop the economies of scale they need for take-up across Europe and around the world," With these words of EU's Telecom Commissioner Viviane Reding, DVB-H is destined to be a dominating mobile TV technology in Europe and even in the world.

I was first getting in touch with the DVB technology when I was doing my PhD research in Brunel University in UK in 2002. At that time DVB-T was already a mature and widely used digital broadcast technology and anyone could easily buy a DVB-T receiver in the market to try the digital broadcast signals that have been already broadcasted in UK since 1998. Then the DVB technology world changed dramatically. As a more flexible and robust terrestrial broadcast system targeting handsets, DVB-H was developed based on DVB-T. In 2003 the DVB-H community were continuously working to finalize the standard. Finally in November 2004 DVB-H was adopted as an ETSI standard EN 302 304. I was lucky to see all these changes when I was doing my PhD research in DVB technology. And I was very proud to be involved in the different DVB-H research projects since the beginning of the DVB-H standard development stage. I was also lucky enough that I am one of the first persons who finished PhD degree by focusing on DVB-H research. The more I was involved in the DVB-H research, the more I realized that there was a shortage of books which can systematically introduce the DVB-H technology to researchers, engineers and all those who are interested in this technology. Therefore I decided to write a comprehensive book about DVB-H by focusing on the DVB-H handover technology. No books about handover technology in DVB-H was available up to writing of this book. As one of the main persons in the world who are doing the handover technology research in DVB-H, I attempted to fill this gap in the literature.

DVB-H is the broadcast technology that broadcasts IP data packets to the handheld devices. Due to its broadcast nature DVB-H can support large scale consumption of Mobile TV that the telecommunication technology such

as 3G can no longer accommodate. In order to have a large mobile reception coverage more transmitters and repeaters (gap fillers) are needed for DVB-H than for DVB-T. In this case, multi-frequency network structure will be one of the main network topology for DVB-H in the future. As a result, just like traditional telecommunication technologies, handover in DVB-H is also necessary when the users move from one DVB-H cell to another. As a novel mobile broadcast technology, DVB-H blurred the traditional border between telecommunications domain and the broadcast domain. In this background, a novel network structure that combined telecommunications and broadcast technology was created, which is called converged network. Handover in such converged networks became also a hot research topic.

This book will focus on the handover technology in DVB-H and in the converged networks between DVB-H and UMTS. As it also gives much introduction and analysis for DVB-H handover related information, for example ESG, it is a must-have book for any person who is not only interested in the DVB-H handover but also in DVB technology in general. Each chapter of the book is complete and independent which can be read independently by those who are interested in only some particular topics. By reading the whole book, the readers will see a complete picture of DVB-H technology. At the end of each chapter, there are some questions which are mostly asked by others to me when I am doing the research and I believe they will probably also come to the minds of the readers when the readers read the chapter. And at the end of the book, there are solutions to the questions raised in each chapter. This book can be used by broadcast and telecommunications researchers, engineers, academics, regulatory bodies and business managers as a reference book, or by university students as a text book or a reference book.

The chapter structure of this book is as follows:

Chapter 1 introduces the DVB-H technology, its evolution and technical features, its network components and network structure.

Chapter 2 presents the motivation of the handover research in DVB-H and the approaches used to address the handover problems in the DVB-H research.

Chapter 3 provides a comprehensive survey of the research that has been conducted on the handover issues in DVB-H networks.

Chapter 4 presents a comprehensive introduction of the signalling information in DVB-H and pointed out which signalling information can be utilized for the DVB-H handover.

Chapter 5 is a chapter focusing on the Electronic Service Guide in DVB-H. It also points out how the Electronic Service Guide can be used in the handover in DVB-H.

Chapter 6 presents different handover algorithms for dedicated DVB-H networks. General introduction and analysis for the handover in dedicated DVB-H networks are given.

Chapter 7 focuses on the handover algorithm based on post processing of SNR values for a dedicated DVB-H network.

Chapter 8 presents the repeater aided handover algorithm for a dedicated DVB-H network.

Chapter 9 provides the soft handover probability calculation of the repeater aided handover algorithm.

Chapter 10 introduces the handover in the converged networks. As an example, the handover algorithm between DVB-H and UMTS in the converged network is presented. The stochastic trees model for such handover is used and analyzed.

Chapter 11 introduces the handover in the hybrid broadcast networks. The vertical handovers between different broadcast technologies such as between DVB-H and DMB are presented and analyzed.

Chapter 12 concludes the book by giving a comparison of the different handover algorithms in the dedicated DVB-H networks. It also presents some of the future research topics of DVB-H and DVB-H handover technology.

I believe this book will help raise new research problems and bring new solutions in the DVB or other multimedia communication technologies. Any comments to improve the book will be highly appreciated.

The last but not the least I would like to thank all those people who have helped and advised me in my research in DVB-H. Special thanks are given to EU project IST INSTINCT and IST MING-T which have given great impulse to my research.

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