

Preface

During the last decades, digital audiovisual information has become omnipresent in professional and private life. Audiovisual media have changed our ways of communication and collaboration, information acquisition, learning, working and interacting. Simultaneously, Internet, mobile networks and digital storage have superseded traditional ways of distribution and access. In this context, multimedia communication establishes novel forms of communication between people and/or machines, which are characterized by ubiquity, multimodality, interactivity and increasing intelligence.

Based on my lectures on topics of multimedia communication systems held over many years at RWTH Aachen University, this book, along with another release to appear soon, represents a substantially upgraded version of the textbook “Multimedia Communication Technology” of 2004. The topic of the current book is multimedia signal compression and transmission, the second book’s topic is identification and recognition of multimedia signals entitled as “Multimedia Content Analysis” (MCA). Both books (as well as the two lectures they are based upon) are self-contained and therefore not to be understood as volume 1 and 2 of a package. However, due to commonalities between coding and content analysis (both based on concepts from signal processing and information theory), it is not surprising that the reader will frequently find cross references (including pointers to section/chapter numbers) between one and the other book. Fundamental knowledge about both SP and IT is helpful for understanding, but chapters 2 and 4 target to summarize the most relevant underlying concepts.

Since the above-mentioned 2004 release, the progress that was made in compression of audiovisual data has again been breath-taking. Consequently, newest developments are reflected, including the deeper understanding of concepts that enabled the emergence of the High Efficiency Video Coding (HEVC) standard, as well as methods to compress 3D video and audio data, and possible future trends are sketched. However, rather than explaining the precise implementation of existing standards, the book intends to provide the reader with deep understanding for the underlying concepts, to eventually give support becoming a designer of novel technology in the field.

Most chapters are again supplemented by homework problems, for which solutions are made available from <http://www.ient.rwth-aachen.de>.

The book would not have been possible without contributions of numerous students, scientific staff, colleagues in academia and standardization bodies and many other people who have worked with me on topics of image, video and audio processing, encoding and recognition over more than 25 years. For the sake of brevity, I would like to express my thanks globally without naming anybody explicitly.

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