Part I
Introduction and Multimedia Data Representations

As an introduction to multimedia, in Chap. 1 we consider the question of just what multimedia is. The components of multimedia are first introduced and then current multimedia research topics and projects are discussed to put the field into a perspective of what is actually at play at the cutting edge of work in this field.

Since Multimedia is indeed a practical field, Chap. 1 also supplies an overview of multimedia software tools, such as video editors and digital audio programs.

A Taste of Multimedia

As a "taste" of multimedia, in Chap. 2, we introduce a set of tasks and concerns that are considered in studying multimedia. Then issues in multimedia production and presentation are discussed, followed by a further "taste" by considering how to produce sprite animation and "build-your-own" video transitions.

We then go on to review the current and future state of multimedia sharing and distribution, outlining later discussions of Social Media, Video Sharing, and new forms of TV.

Finally, the details of some popular multimedia tools are set out for a quick start into the field.

Multimedia Data Representations

As in many fields, the issue of how best to represent the data is of crucial importance in the study of multimedia, and Chaps. 3–6 consider how this is addressed in this field. These Chapters set out the most important data representations for use in multimedia applications. Since the main areas of concern are images, video, and audio, we begin investigating these in Chap. 3, Graphics and Image Data Representations. Before going on to look at Fundamental Concepts in Video in Chap. 5. we take a side-trip in Chap. 4 to explore several issues in the use of color, since color is vitally important in multimedia programs.

Audio data has special properties and Chap. 6, Basics of Digital Audio, introduces methods to compress sound information, beginning with a discussion of digitization of audio, and linear and nonlinear quantization,including companding. MIDI is explicated, as an enabling technology to capture, store, and play back

musical notes. Quantization and transmission of audio is discussed, including the notion of subtraction of signals frompredicted values, yielding numbers that are easier to compress. Differential Pulse Code Modulation (DPCM) and Adaptive DPCM are introduced, and we take a look at encoder/decoder schema.