3. codecs and standards

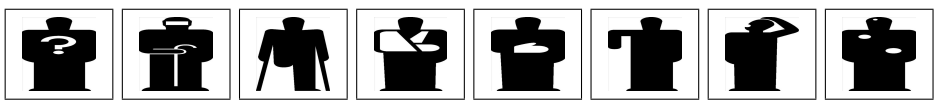
without compression delivery is virtually impossible

learning objectives

After reading this chapter you should be able to demonstrate the necessity of compression, to discuss criteria for the selection of codecs and mention some of the alternatives, to characterize the MPEG-4 and SMIL standards, to explain the difference between MPEG-4 and MPEG-2, and to speculate about the feasibility of a semantic multimedia web.

Without compression and decompression, digital information delivery would be virtually impossible. In this chapter we will take a more detailed look at compression and decompression. It contains the information that you may possibly need to decide on a suitable compression and decompression scheme (codec) for your future multimedia productions. We will also discuss the standards that may govern the future (multimedia) Web, including MPEG-4, SMIL and RM3D. We will explore to what extent these standards allow us to realize the optimal multimedia platform, that is one that embodies digital convergence in its full potential. Finally, we will investigate how these ideas may ultimately lead to a (multimedia) semantic web.

1



18

questions

codecs and standards

1. (*) What role do standards play in *multimedia*? Why are standards necessary for compression and delivery. Discuss the MPEG-4 standard and indicate how it is related to other (possible) standards.

concepts

2. What is a *codec*?
3. Give a brief overview of current multimedia standards.
4. What criteria must a *(multimedia) semantic web* satisfy?

technology

5. What is the *data rate* for respectively (*compressed*) voice, audio and video?
6. Explain how a *codec* functions.
7. Which considerations can you mention for choosing a compression method?
8. Give a brief description of: XML, MPEG-4, SMIL, RM3D.

projects & further reading As a project, you may think of implementing for example JPEG compression, following Li and Drew (2004), or a SMIL-based application for cultural heritage.

You may further explore the technical issues on authoring DV material, using any of the Adobe[1], mentioned in appendix E. or compare

For further reading I advice you to take a look at the respective specifications of MPEG-4 and SMIL[2], and compare the functionality of MPEG-4 and SMIL-based presentation environments. An invaluable book dealing with the many technical aspects of compression and standards in Li and Drew (2004).

the artwork

1. costume designs – photographed from *Die Russchische Avantgarde und die Buhne 1890-1930*
2. theatre scene design, also from (above)
3. dance Erica Russel, Wiedermann (2004)
4. MPEG-4 – bits rates, from Koenen (2000).
5. MPEG-4 – scene positioning, from Koenen (2000).
6. MPEG-4 – up and downstream data, from Koenen (2000).
7. MPEG-4 – left: scene graph; right: sprites, from Koenen (2000).
8. MPEG-4 – syntax, from Koenen (2000).
9. MIT Media Lab[3] web site.
10. student work – *multimedia authoring I*, dutch windmill.

[1] www.adobe.com/tutorials
[2] www.w3c.org/AudioVideo
[3] medai.mit.edu

11. student work – *multimedia authoring I*, Schröder house.
12. student work – *multimedia authoring I*, train station.
13. animation – Joan Gratch, from Wiedermann (2004).
14. animation – Joan Gratch, from Wiedermann (2004).
15. animation – Joan Gratch, from Wiedermann (2004).
16. animation – Joan Gratch, from Wiedermann (2004).
17. Agneta and Frieda example.
18. diagram (Clima Futura) game elements
19. signs – people, van Rooijen (2003), p. 246, 247.

Both the costume designs and theatre scene designs of the russian avantgarde movement are *expressionist* in nature. Yet, they show humanity and are in their own way very humorous. The dance animation by Erica Russell, using basic shapes and rhythms to express the movement of dance, is to some extent both solemn and equally humorous. The animations by Joan Gratch use *morphing*, to transform wellknown artworks into other equally wellknown artworks.