Chapter III

Feature-Based Multimedia Semantics: Representational Forms for Instructional Multimedia Design

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Abstract

The aim of this chapter is to sketch a semantic taxonomy of representational forms (or "sign types" in the terminology of semiotics) relevant for the compositional analysis, design, and indexing of multimodal multimedia, specifically, in the domain of instructional design of learning objects, and to contribute to current attempts to bridge the "semantic gap" between the technical and spatio-temporal description of media objects and the contextual perception and interpretation by users of their content.

Introduction

In the present chapter, it is suggested that descriptions of graphical and multimedia content, as it is known from multimedia databases, multimedia programming, and graphic design, should be extended to include taxonomic information about the representa-
Rhetorical problem in designing usable and adequate presentations, since there are many criteria of usability as well as adequacy of presentations (i.e., presentations that are relevant, intelligible, efficient, consistent, aesthetic, etc.) and many levels of design that have to be considered in the design or automated generation of presentations (functional specification, spatial layout, temporal organisation, forms of interaction, forms of cognitive support for users, contextual relations to activities and situations of use, etc.). In this chapter, we will only address the rhetorical problem of “media and modality” and specifically the problem of taxonomy, that is, the need for some kind of classification of media types and representational forms to support a conceptual understanding of the design space of available types and its operational specification in particular design contexts (where the example given here is multimedia content specification for instructional design).

**Taxonomies of Media and Representational Forms**

**Taxonomies in Graphic Design**

One might think that taxonomic issues in graphic design have been settled for a long time, since the representation and layout of simple graphical objects like two-dimensional documents with “text” and “illustrations” appear simple compared to the full complexity of computer-based animation, video, gesture, and haptics. This appearance of simplicity is an illusion, however, and the problems of representation and layout of multimodal documents have not yet been fully solved (Bateman, Delin, & Henschel, 2002; Bateman, Kamps, Kleinz, & Reichenberger, 2001). It is important, from the point of view presented in the present chapter, to note that multimedia communication as well as multimodality (of representations) does not originate with modern computer technology or electronic audio-visual technologies like television. We know multimodal representations from the printed graphical media in the form of combinations of language, images, and diagrams, and before the invention of printing, from combinations of writing and drawing within the graphical media. The fundamental origin of multimedia communication and multimodality, however, is coextensive with the origin of language, since the embodied language of human speech combining multiple media (speech, gestures) and multiple forms of representation (natural language discourse, intonation patterns, schematic “conversational gestures”, facial expression, etc.) is an advanced form of multimodal communication (Quek, McNeil, Bryll, Duncan, Ma, Kirbas, McCullough, & Ansari, 2002).
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