Preface

Early in 1998, SC24, the subcommittee of ISO/IEC JTC 1 concerned with computer graphics and image processing, completed work on a new standard for multimedia presentation, called PREMO (PResentation Environment for Multimedia Objects), and published under the official reference ISO/IEC 14478. The original proposal for PREMO was for a new computer graphics standard, to be based explicitly on an object-oriented approach. Such an approach was seen as timely, given that object-oriented design and programming had rapidly become established, and work on a number of object-oriented APIs for computer graphics had generated interest within the graphics community for this technology (Inventor, the precursor of OpenInventor, is probably the best known example). Development of a new standard was also seen as an opportunity to address further technological issues. First, the new standard should encompass *other* media, such as video, audio (both captured and synthetic), and in principle be extensible to new modalities such as haptic output and speech or gestural input, which have become increasingly integrated within graphics applications; virtual environments and systems for visualization being prime examples. The second requirement was that the standard should allow the construction of distributed systems, where parts of a system involved in the generation, processing, or the presentation of media data could be distributed across geographically remote sites, interacting through a network.

Although the original goals for the development of PREMO included the detailed specification of an API for multimedia programming, including all kinds of rendering and media-coding facilities, it soon became clear that such goals were unrealistic. The diversity of requirements for various applications and the wide range of different techniques made the development of a detailed specification problematic. Instead, *interoperability* became the key issue: *existing* tools, applications, and programming interfaces should be able to cooperate, even if they come from different implementations and vendors. The term "middleware" came to the fore, denoting a software layer between the operating system facilities and application programs: in this way PREMO evolved into a middleware specification for multimedia programming.

Although PREMO defines objects for implementing multimedia middleware, the emphasis on interoperability means that PREMO also functions as a *reference model* for distributed multimedia. Concepts common to a range of approaches in this area have been described and integrated in the PREMO model, and consequently the standard has an important role in education, and in promoting cooperation between programmers involved in multimedia development projects across potentially heterogeneous platforms.

The text of an International Standard is usually dry, and notoriously difficult to read. Although this book does not replace the official text, its goal is to provide a more readable version of the concepts, to present some of the more interesting details of the PREMO multimedia objects, to highlight the reasons for specific design decisions, and to give simple examples which clarify the underlying concepts. If the goal of the reader is to implement the PREMO standard, this book should aid in understanding the precise specification of the ISO text. However, the book should also be useful for students and

professionals whose goal is to gain a better understanding of the issues involved in distributed multimedia, regardless of the intricate details of the PREMO standard; this group probably represents the majority of our readers.

Obviously, PREMO is the result of team work, which involved experts from four continents and more than 10 countries. It is impossible to list all the people who, for a shorter or a longer period, participated in the work. Nevertheless, we would like to mention the contributions of three people who played particularly important roles. Horst Stenzel (FH Köln, Germany) was the rapporteur of the working group within ISO which was responsible for the development of PREMO. It was his task to coordinate the development of the standard. James Van Loo (Sun Microsystems Inc., USA) was a co–editor of the document, and was instrumental in integrating the so–called Multimedia Systems Services definition, which became the core of the final PREMO document. Finally, David Duce (Rutherford Appleton Laboratory, UK) coordinated the ERCIM Computer Graphics Network which, between 1993 and 1997, played a seminal role in the precise specification of large portions of the standard. We express our gratitude to them, as well as to all experts who participated in the development of PREMO; this book is the result of their work.

February 1999   David Duke
                                                                    Ivan Herman
                                                                 Scott Marshall